

# Mid-term evaluation of the Renewable Energy Directive

## A study in the context of the REFIT programme

Prepared for:  
European Commission DG ENER



**Report**  
Delft, April 2015



**Main authors:**

Bettina Kampman (CE Delft)  
Stephan Sina, Christine Lucha (Ecologic Institute)  
Stephanie Cesbron (Ricardo-AEA)  
Zsuzsanna Pato (REKK)  
Ole Flörcken (E-Bridge)

**RICARDO-AEA**



**Co-authors:**

Anouk van Grinsven, Sebastiaan Hers, Marit van Lieshout (CE Delft)  
Andreas Prah, Lena Donat (Ecologic Institute)  
Anna-Liisa Kaar, Oliver Edberg, Lisa Groves (Ricardo-AEA)  
Lajos Kerekes (REKK)  
Marzena Chodor, Diana Parusheva (associates)



# Publication Data

## **Bibliographical data:**

CE Delft, Ecologic Institute, Ricardo-AEA, REKK, E-Bridge  
Mid-term evaluation of the Renewable Energy Directive  
A study in the context of the REFIT programme  
Delft, CE Delft, April 2015

Renewable energy / Policy / EU directive / Regulation / Measures / Evaluation

Publication code: 15.3D59.28

CE publications are available from [www.cedelft.eu](http://www.cedelft.eu)

Commissioned by: European Commission.

Further information on this study can be obtained from the contact person, Bettina Kampman.

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# Summary

## Introduction

This mid-term evaluation of the Renewable Energy Directive<sup>1</sup> (RED) aims to assess the effectiveness and efficiency so far of measures and actions laid down in the Directive. The RED came into force at the end of 2009, and set binding national renewable energy targets and a mandatory target for renewable energy use in transport for 2020, among a range of other provisions. The study also assesses the impact of the RED requirements for administrations and businesses (the administrative burden) at Member State (MS) level, in line with the requirements of the regulatory fitness programme (REFIT) of the European Commission.

This project was commissioned by DG Energy, and carried out by a consortium of CE Delft, Ricardo-AEA, Ecologic Institute, E-Bridge and REKK.

## Study objectives

The main objective of this study is to provide a mid-term evaluation of the RED. The evaluation assesses **relevance, effectiveness, efficiency and added value** of the RED as a whole and of the various provisions laid down in the Directive, in view of achieving the desired outcomes.

This evaluation furthermore aims to understand a number of core issues related to the various provisions of the RED:

- best practices: what provisions are most effective and efficient, and what can we learn from this;
- implementation and enforcement challenges and failures;
- administrative burden on public authorities and economic operators;
- impacts and effects, both financial and non-financial;
- key bottlenecks and barriers to achieving the directive's provisions in an effective and efficient way;
- solutions that might resolve any of the issues and improve the provisions.

## Methodology

The study started by clarifying the RED's **intervention logic**. For each of the RED's provisions, the rationale, objectives, expected outcomes and impacts were identified.

These were used as a basis for the **evaluation framework**, which detailed the questions that were to be addressed in this study, regarding both the individual provisions and the RED as a whole.

With this framework in place, **article assessment reports** were drafted. For each topical group of RED provisions, a mid-term evaluation was carried out, based on available literature and data and some stakeholder interviews. These reports resulted in an EU-wide assessment of effectiveness, efficiency and added value of each topical group of RED provisions.

Six **country case studies** were carried out to gather more detailed information and stakeholder views on the effectiveness, efficiency and added value of the RED as well as recommendations to improve the RED. Case studies were carried out for Bulgaria, Estonia, Germany, Poland, Spain and Sweden,

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<sup>1</sup> Directive 2009/28/EC.



selected to ensure a broad range of political opinions and geographical regions.

The results from both the article assessments and the country case studies were then combined into a comprehensive overview of findings. The **regulatory fitness** of the RED was assessed, **best practices and key issues** were identified and potential EU level actions and policy options were compiled that might resolve these issues.

As a final step of this mid-term evaluation, **conclusions** were drawn and **recommendations** were derived regarding the regulatory fitness of the RED, both for the directive as a whole and for the various (groups of) provisions.

### Key issues and best practices

For each of the RED articles analysed, a number of positive effects towards the objectives of the RED were identified, as well as any key issues and barriers to reach their full potential. A summarized overview of these findings is provided below, per article or article group of the RED.

#### Article 3: Targets and measures

Positive contributions	Key issues and barriers
Mandatory targets backed by indicative interim targets seem to be effective, especially in MS with low renewable energy sources (RES) shares and investments. They have also enhanced investor security and contributed to drive RES technology cost down. The indicative interim targets contribute to ensure that measures to achieve the national targets are introduced timely, and allow a continuing assessment whether MS are on track.	10% target for transport is still controversial, especially due to environmental concerns. Efficiency benefits are mainly related to the overall RES-target, the transport target is affected by uncertainty about the EU level indirect land use change (ILUC) decision and is expected to have limited innovation benefits. Progress monitoring towards targets and timely intervention are hampered by non-linear growth paths of many MS.

#### Article 4: National Renewable Energy Action Plans (NREAPs)

Positive contributions	Key issues and barriers
EU-wide transparency of plans and policy measures has significantly improved, administrative burden seems reasonable. Indicative trajectories enable progress monitoring.	NREAPs become outdated over time.

#### Articles 6 to 12: Cooperation mechanisms

Positive contributions	Key issues and barriers
Potential benefits may be significant on EU and MS level, in particular for RES importing countries. Various MS are starting to explore possibilities.	Very limited use and effects so far. Various barriers to cooperation may exist: national preferences, uncertainties about longer term framework, insufficient interconnector capacities, etc. Mechanisms are rather considered as a complementary means to securing target achievement than as means to enhance cost-efficiency.



### **Article 13: Administrative procedures, RES in buildings, heating**

Positive contributions	Key issues and barriers
Good progress in some MS. Potential benefits still relevant.	Most MS still rated poorly on the quality of the administrative procedures in place. Few MS have RES requirements in buildings written into building codes. Administrative procedures continue to present a challenge for investors and developers and delay RES developments. Key barriers: a lack of awareness and knowledge at the local level; the quality and accessibility of information regarding administrative procedures can be further improved in many MS; complex and/or drawn-out granting and licensing procedures.

### **Article 14: Information, certification, training**

Positive contributions	Key issues and barriers
Certification and qualification schemes have been introduced to various degrees, certification in photovoltaics most progressed. The provisions are expected to result in a cost-effective approach to certification.	Training still lacking in several MS, for various reasons: lack of incentives for installers, lack of control from public authorities, poor understanding of benefits and potential by installers. The administrative burden of certification and training varies between MS. The time needed for training can pose a barrier to participation. Mutual recognition of certificates between MS still challenging.

### **Article 15: Guarantees of origin (GOs)**

Positive contributions	Key issues and barriers
Transparency on RES generation has increased and GOs proved to be a useful tool to reduce fraud and inaccuracies. Systems throughout the EU have become more standardised.	There are still barriers to the trade and transfer of GOs; differences in the comprehensiveness of procedures and the use of GOs remain. The administrative burden seems reasonable but data are lacking and likely to depend on MS implementation and starting point.

### **Article 16: Grid access and operation**

Positive contributions	Key issues and barriers
These provisions are generally seen to ensure a transparent and legitimate integration of RES into the grid. Priority grid access is considered to be a key provision that supports RES deployment.	<ul style="list-style-type: none"><li>– A public national investment schedule is not yet available in many cases, the level of coordination is uncertain. Grid capacity issues not yet resolved in all MS.</li><li>– Article implementation highlights burdens and challenges which slow down the connection of RES.</li><li>– Benefits of smart grids may be significant, but not yet assessed on EU level and in many MS.</li><li>– Data on administrative burden lacking.</li></ul>



### Articles 17, 18,19, 21: RES in transport, biofuels and bioliquid sustainability

Positive contributions	Key issues and barriers
<p>Direct environmental impacts of biofuels production have been limited.</p> <p>Harmonisation of voluntary certification systems and certification of a much larger volume of biofuels have been achieved, the mass balance approach seems to be effective and efficient.</p> <p>Administrative burdens have been high for all actors in the first years to set up the system, but efforts of economic operators to prove compliance are seen as reasonable and proportional.</p>	<p>Indirect effects not yet included and not all direct environmental impacts are covered, limiting the benefits of these provisions.</p> <p>The delay in ILUC decision making may provide a barrier to meet the transport target of Article 3 (affecting both effectiveness and efficiency).</p> <p>Double counting (Art. 21(2)) not yet implemented in several MS, definition of waste differs between MS which increases cost to fuel suppliers.</p> <p>Limited incentive for more advanced biofuels production processes or exceeding the minimum sustainability criteria, resulting in limited innovation so far.</p>

### 22-23: Reporting

Positive contributions	Key issues and barriers
<p>The progress reports provide a regular overview of the measures taken or planned, and allow monitoring and analysis of progress.</p> <p>The reports and data quality improved over time as MS bring their procedures and data monitoring in line with the template.</p> <p>Administrative costs are considered reasonable, compared to the benefits.</p>	<p>Questions not currently asked by the template could provide useful information, such as how the progress on each measure will be monitored. Also, information relating to administrative reforms and evidence on the impact of increased biofuel production on land use patterns is limited.</p>

Based on the literature review, stakeholder interviews and the authors' expertise, a broad range of suggestions for potential EU level actions to deal with and resolve the issues and barriers was compiled.

Looking at the key findings from both the article assessments and country case studies, the following **best practices** could be identified:

1. Provisions are most effective and efficient if they are both mandatory and well defined (i.e. specific).
2. Provisions that can be achieved by national authorities are likely to be more effective and efficient than provisions that require specific actions at regional or municipal level. If actions are demanded at regional or municipal level or from a large number of stakeholders, more thought is required to allow for an effective and efficient implementation and more time will be needed for the benefits to develop.
3. Provisions are most effective and efficient if the relevant rules and regulations are set from the beginning and remain stable during the duration of the regulation. If it is likely that provisions are to be revised in the short or medium term, both MS and investors are hesitant to decide on longer term policies and strategies.
4. EU level involvement in sustainability certification of specific commodities can be effective. The biofuels and bioliquids sustainability criteria (Articles 17 to 19) have demonstrated that EU level certification systems can be an effective and efficient means to reduce environmental impacts of the feedstock used, if implemented and monitored correctly.





## Main conclusions

Concerning regulatory fitness, we find all RED provisions to be **relevant** for the objectives of the directive.

A number of provisions are found to be **both effective and efficient**:

- Article 3: Targets and measures;
- Article 4: NREAPs;
- Articles 17 to 19, 21(b): RES in transport, biofuels and bioliquid sustainability and double counting;
- Articles 22, 23: Reporting.

Most of these provisions still have potential for further improvement, though. This is especially the case for Articles 17 to 19 where the effectiveness can be significantly improved if indirect effects are included and the EU level decision making on the ILUC proposal is sped up.

The effectiveness and efficiency of the remaining provisions **cannot yet be thoroughly assessed**, due to either lack of data, delays in MS implementation or limited use of the provisions so far. This concerns:

- Article 6-12: Cooperation mechanism;
- Article 13: Administrative procedures, RES in buildings, heating;
- Article 14: Information, certification, training;
- Article 15: Guarantees of origin;
- Article 16: Grid access and operation.

Overall, the **administrative burden** related to the RED seems reasonable. When assessing effectiveness and efficiency of provisions, it is important to distinguish between long term and short term. Typically, benefits increase over time<sup>2</sup>, whereas in some cases, administrative costs are relatively high in the beginning, but decrease over time. This is typically the case if processes and procedures need to be developed at first; once operational, the administrative costs reduce. Examples are the biofuels and bioliquids sustainability criteria (Articles 17-19) and the various procedures that are to be set up for Articles 13 and 14.

The RED is seen by most stakeholders as a **key contributor to EU-wide renewable energy deployment**. The binding targets are considered by many to be an important driver for RES policies and investments in many Member States. The planning, monitoring and reporting obligations have enabled quantitative analyses and transparency, the grid access and operation provisions are crucial to RES growth in many Member States and the biofuels sustainability criteria are found to effectively reduce direct environmental impacts of the biofuels used in most of the EU. The resulting EU-scale energy system transformation is also seen to be more cost efficient than a transformation on a smaller scale, for various reasons.

Meeting the **mandatory transport target** effectively and efficiently is hampered inter alia by the delay in the ILUC decision making process. As a result, many Member State biofuels policies for the coming years still need to be decided on and investments in the biofuels sector are limited as the demand and market outlook is not yet clear.

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<sup>2</sup> Even quite abruptly at some point in time, as may be the case with the cooperation mechanisms, closer to 2020.



Some provisions, namely Articles 3 and 16, were found to have relatively little **added value** in some Member States, but a significant effect in others. For example, RES capacity would probably have increased in Germany and Denmark at this rate also without a binding target, whereas in Member States with low renewable energy ambitions, the RED can be considered to be a key driver in RES capacity development. Therefore, even though their impact on the 2020 EU level RES deployment may be relatively small, EU-wide implementation of these provisions may still have significant impacts on capacity building throughout the EU, furthering the EU internal market, regional development and harmonisation of processes.

The effectiveness and efficiency of almost all RED provisions can be further enhanced by putting a **stable post-2020 policy framework** in place that includes a continuation of these measures as well as a clear governance system. A stable longer term outlook will enhance investor certainty and increase the incentive for stakeholders and government authorities to put in the effort needed. It will also contribute to justify the initial effort and cost of setting up the necessary procedures and processes, as it provides an outlook for much more long term, higher benefits.

### **Main recommendations**

A number of issues and potential solutions were identified for all articles of the RED, in other words they all have the potential for further improvements. Nevertheless, as **stable policies** are key to investor security and therefore to the effective and efficient achievement of the 2020 targets and objectives, it is recommended that the current provisions should not be modified. As an exception to the rule, in order to facilitate meeting the 10% transport target in 2020 effectively and efficiently, the indirect land use change (ILUC) proposal related to Art. 19.6 should be decided on as quickly as possible.

Some provisions, for example Articles 6-12 (Cooperation Mechanisms) and Article 13 (Administrative Procedures), could benefit from additional **guidance** from the Commission.

RES deployment in the EU is not only affected by the RED, but also by a range of **other EU policies**, such as the State Aid guidelines, the European Emission Trading System (ETS), the Fuel Quality Directive (FQD) and energy infrastructure policies. Streamlining and adapting these policies over time to take into account RES growth throughout the EU can provide an important contribution to further effective and efficient RES deployment.

It is further recommended to decide on the **longer term framework for RES** regulation in the EU well before 2020, to provide clarity on market outlook and continuation of the current RED provisions beyond 2020. This framework can take the learning points from the RED into consideration and should be adapted to the changing circumstances, such as higher shares of RES and cost reductions. This would ensure a seamless and efficient transition from the 2020 to the 2030 policy package, which will strengthen the current regulation and measures and encourage investments in RES throughout the EU.



# 1 Introduction

## 1.1 This report

This report is the result of a study on the ‘Mid-term evaluation of the Renewable Energy Directive’ as driven by the REFIT requirement. The Renewable Energy Directive (RED, directive 2009/28/EC) came into force at the end of 2009, and set binding renewable energy targets for 2020, for each Member State and for the EU as a whole, among a range of other provisions. This study aims to provide a mid-term evaluation of the effectiveness and efficiency of the various provisions of the RED, and to provide the Commission with conclusions and recommendations that follow from these findings. The study was commissioned by DG Energy, and carried out by a consortium of CE Delft, Ricardo-AEA, Ecologic Institute, E-Bridge and REKK.

The approach taken for this evaluation was to first derive a well-founded evaluation methodology, and then carry out an extensive literature review on the various articles of the RED that are evaluated here. A number of stakeholder interviews was conducted to support and enhance the results found in the literature. Secondly, six country case studies were carried out: Bulgaria, Estonia, Germany, Poland, Spain and Sweden were chosen for this step. These case studies were mainly based on national stakeholder interviews in each of the six countries. A number of EU level stakeholder interviews were carried out in the course of this project.

## 1.2 Main objectives of this study

The study aims to evaluate the Renewable Energy Directive, and fulfil the requirements by the regulatory fitness programme (REFIT) of the European Commission<sup>3</sup>.

The Commission describes the purpose of REFIT as follows: ‘*Under REFIT, the Commission regularly screens the entire stock of EU legislation for burdens, inconsistencies and ineffective measures and identifies corrective action. The aim is to make sure that the policy objectives are achieved and the benefits of EU legislation are enjoyed at lowest cost and with a minimum of administrative burden*’<sup>4</sup>.

This defines the main objectives of this study: to provide a mid-term evaluation of the RED in order to assess the efficiency of measures and actions laid down in the Directive in view of achieving their outcomes, namely the binding EU and national renewable energy targets, and the mandatory transport target.

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<sup>3</sup> On 18 June 2014, the Commission reported on the progress in implementing REFIT and proposed a number of new initiatives (see COM(2014) 368 final, and the related SWD(2014) 192 in which the evaluation of the Renewable Energy Directive, RED, is mentioned explicitly.

<sup>4</sup> [http://europa.eu/rapid/press-release\\_MEMO-14-426\\_en.htm](http://europa.eu/rapid/press-release_MEMO-14-426_en.htm)



In more detail, this evaluation aims to understand the following:

1. A number of core issues related to the provisions, for all 28 Member States:
  - Do implementation and enforcement challenges and failures exist? If yes, where and why?
  - What is the administrative burden on public authorities and economic operators?
  - What are their impacts and effects, both financial and non-financial and at different levels, compared to the situation without the RED?
  - What are the key bottlenecks and barriers to achieving the article's provisions in an effective and efficient way?
  - What solutions can be proposed to resolve any of the issues and improve the provision, either at national or at EU level?
  
2. A number of broader evaluation questions related to the RED as a whole, regarding:
  - **Relevance:**
    - In view of the EU's energy and climate change policy, and other EU initiatives.
  - **Effectiveness:**
    - assessing status of the implementation at MS level;
    - effects of the implementation of the RED;
    - the way in which these effects contribute to the RED's objectives;
    - barriers that hinder the effectiveness of the RED.
  - **Efficiency:**
    - assessing whether the RED and its binding targets have been efficient means in driving the increased use of renewable energy at EU level;
    - cost-efficiency of the RED and its national implementation measures (excluding support schemes);
    - identification of potential measures or alternative policy instruments to achieve the same results at lower cost.
  - **Added value:**
    - the EU added value in achieving the RED's objectives;
    - assessing if the same results could have been achieved without the RED, pros and cons.
  
3. A number of specific evaluation questions, as given in the Technical Specifications:
  - Do implementation and enforcement challenges and failures exist? If yes, where and why?
  - Has RED effectively led to better planning and streamlining of the approval and licensing procedures for RES producers at national and local level?
  - Has RED effectively improved grid access conditions for renewable electricity producers? Has it done so in a cost-efficient manner?
  - Has the establishment of the sustainability scheme for biofuels and bioliquids led to the creation of a cost-efficient framework? Has it achieved its aim in a cost-efficient manner? What impact has such sustainability system had on the Member States administrations and private sector?
  - Has the RED added to the administrative burden on Member States public authorities and economic operators? Or on the contrary - has such burden been reduced (e.g. compared to previous EU legislation in the area of renewables Directives 2001/77/EC and Directives 2003/30/EC)? Have Member States reporting obligation requirements



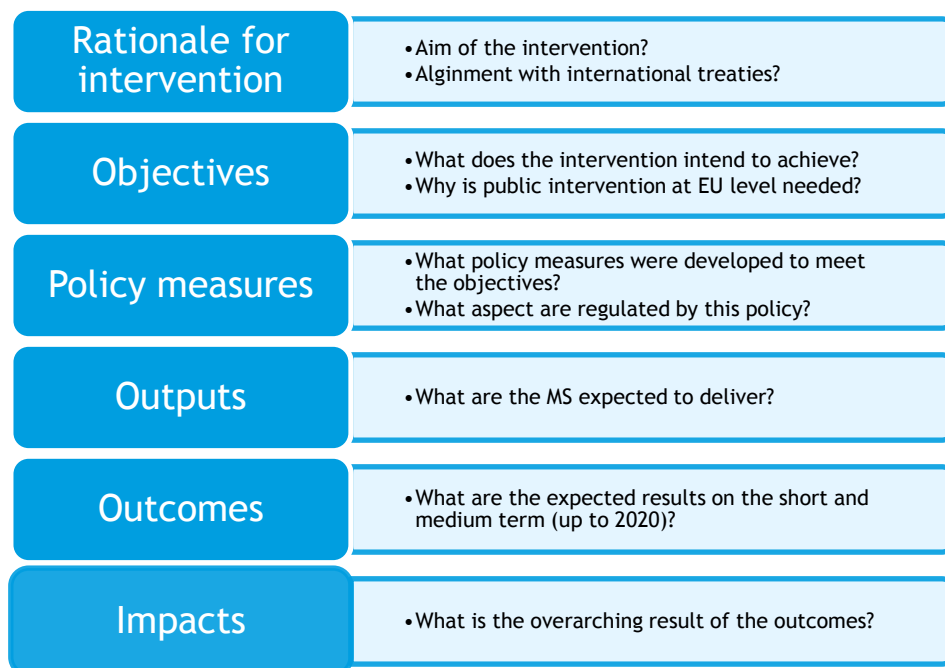
become more efficient, or on the contrary - has the reporting burden increased?

Note that the objective of this study is not a detailed evaluation of effects of the RED, or of the effectiveness and efficiency of regional or national support schemes and policies. The main aim is to evaluate the directive itself.

### 1.3 The RED's intervention logic

When analysing the intervention logic of a policy there are different levels on which key questions need to be answered, see Table 1.

Figure 1 Analysis of the RED intervention's logic



In Annex A these questions are addressed level per level.

Here we limit ourselves to a short description of the different entities used. The rationale for the RED is defined in the first recital of the RED as:

- increased use of renewable energy is together with energy savings and increased energy efficiency an important part of the package of measures needed to reduce greenhouse gas emissions;
- promotion of security of energy supply;
- promotion of technical development and innovation;
- promotion of employment and regional development, especially in rural and isolated areas.

From the more visionary rationale concrete objectives are derived. In Table 1 the different policy objectives are linked to articles of the RED (policy measures).

Table 1 Policy objective and corresponding article of the RED

Policy measures	Article of the RED
Mandatory national overall targets for 2020	3
Mandatory national targets for renewable energy in transport: 10% in 2020	3
National renewable energy action plans	4
Statistical transfers between Member States	6-12
Admin. procedures, regulations and codes	13
Information and training	14
Guarantees of origin of electricity, heating and cooling produced from renewable energy sources	15
Access to and operation of the grids	16
Sustainability criteria for biofuels and bioliquids	17-19, 21
Reporting by the Member States	22-23

Looking at the next steps of the intervention logic: outputs are the direct results of the articles of the RED. These outputs then lead to outcomes, i.e. the expected effects on the short and medium term of the implementation of the Renewable Energy Directive (RED). All the outcomes together have impacts on different aspects of society. These impacts are ideally in line with the rationale of the RED. See Table 2 for an overview of the key outputs, outcomes and impacts of the various measures of the RED.

Table 2 Relation between measures, outputs, outcomes and impacts

Policy measures	Art	Outputs	Outcomes	Impacts
Mandatory national overall targets for 2020	3	National targets, supported by national policies to reach these targets.	Relative certainty to investors and other stakeholders. Support to the development of a market for RES.	In 2020 20% of the EU energy consumption is produced from renewable energy sources.
Mandatory national overall targets for renewable energy in transport: 10% in 2020	3			
National renewable energy action plans	3, 4	National Renewable Action plan supported by eligible measures.	Transparency. Possibility for monitoring by national or EU authorities.	Promotion of security of energy supply.
Statistical transfers between Member States	6-12	Guidelines and preconditions for cooperation.	More resource and cost-efficient ways to meet the objectives.	Promotion of technical development and innovation.
Admin. procedures, regulations and codes	13	Development of clear procedures, administrative responsibilities and technical standards for the effective implementation of RES. Building regulations which support the development of RES in new buildings and during major renovations.	Streamlined, non-discriminatory and transparent authorisation, certification and licensing procedures. Increased use of RES in new and existing, private and public buildings.	Promotion of employment and regional development, especially in rural and isolated areas.
Information and training	14	Dispersion of information on training, certification and support schemes. Certification schemes for RES available in each MS.	SMEs are qualified and certified ambassadors for equipment for local generation of renewable energy. Customers make informed choice for (local) generation	



Policy measures	Art	Outputs	Outcomes	Impacts
Guarantees of origin (GO) of electricity, heating and cooling produced from renewable energy sources	15	Development of appropriate mechanisms for the accurate reliable and fraud resistant issuance transfer and cancellation of GO.	Final customers make informed choices on energy consumption based on robust proof of the origin of the energy consumed. Trade of GOs as an independent commodity across the EU.	
Access to and operation of the grids	16	Grid access.	More resource and cost-efficient ways to comply due to lower capital investment costs and improved business cases.	
Sustainability criteria for biofuels and bioliquids	17-19, 21	European wide accepted certification schemes for the feedstock used for producing biofuels and bioliquids.	Minimal level of sustainability of biofuel use for transport, respectively bioliquids use in electricity is guaranteed.	
Reporting by the Member States	22-23	Progress reports per MS, with comparable data.	Ability for MS and the EC to monitor progress against NREAP targets and potentially take action. Ability to compare performance across the EU.	

#### 1.4 Main evaluation framework

In the evaluation framework the key questions which need to be explored are identified. We first derive a more general framework, which will then form the basis for more detailed evaluation frameworks and guidelines for the articles and the case studies.

The evaluation framework is structured across the following categories:

- **Relevance:** The extent an intervention is relevant in respect to needs, problems and issues identified.
- **Effectiveness:** This relates to the impacts of the articles, both positive and negative, as well as potentially unforeseen impacts. It will help identify the added value of the RED (compared to no EU intervention) as well as get an overview of what factors hinder or enhance the positive impacts of the RED (incl. the administrative burden).
- **Efficiency:** Essentially relates to the costs involved in the implementation of the article and whether the measures involved are the best approach and use of resources.
- **Added value:** What is the added value of the RED as a whole, and of its provisions?
- **Lessons:** This category aims to draw from the preceding analysis in order to identify how the RED may be improved in terms of providing stronger provisions. For example, how could the provisions be improved to reduce implementation barriers or administrative cost to stakeholders or government authorities, whilst still meeting the overall goals?



An important aspect of this evaluation - and in fact, of any policy evaluation - is the question what would have happened without this regulation. Clearly, many Member States had renewable energy policies in place before the RED came into force. Without the RED, these would certainly be continued, modified, enhanced, etcetera, as many Member States have their own reasons to promote renewable energy sources, as part of their climate change policies, to improve energy security or industry policy. A rigorous policy evaluation will need to keep this in mind, and aims to distinguish between ‘autonomous’ developments and the added value of the regulation.

These general evaluation objectives can be translated into a number of concrete questions that this evaluation aims to answer - for the RED as a whole, and for the various provisions.

Table 3 Overall questions for all articles

<b>Category</b>	<b>Key questions to investigate</b>
<b>Relevance</b>	<ul style="list-style-type: none"> <li>- To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<ul style="list-style-type: none"> <li>- What effects (impacts) have been obtained following the implementation of the article?</li> <li>- Have these effects contributed to the achievement of the article?</li> <li>- Have there been unforeseen impacts (positive or negative)?</li> <li>- Which factors have hindered the achievements of the article objective?</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>- Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?</li> <li>- Are the selected mechanisms the most cost-efficient way to achieve the targets?</li> <li>- Could the same results have been achieved with less funding/lower cost?</li> <li>- Is effort involved appropriate in terms or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?</li> </ul>
<b>Added value</b>	<ul style="list-style-type: none"> <li>- To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?</li> <li>- Would the results have been achieved without the RED/article, i.e. without EU intervention?</li> <li>- Are there alternative measures/improvements which could have lead to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>- What key lessons can be learned from the experience of implementing the article so far?</li> <li>- What improvements may help to increase the effectiveness of the measures in place under this article?</li> </ul>

Based on these general evaluation categories and questions, a more detailed framework and ‘questionnaire’ was developed for the specific articles of the RED. This can be found in Annex B.





## 1.5 Structure of this report

The scope of the evaluation has a number of dimensions which need to be considered:

- **Evaluation aspects:** the aim is to assess the:
  - effectiveness;
  - efficiency;
  - relevance; and
  - added value of the RED.
- **Geographical scope:** the RED defines both EU level and Member State objectives and targets, the evaluation should therefore assess the various evaluation aspects both for the EU as a whole and for the various Member States<sup>5</sup>. This is addressed by focussing the main article assessment on EU level, the six country case studies provide a much more detailed Member State view on the directive.
- **Topical area:** the RED consists of a number of articles (or groupings of articles) covering different policy areas, sectors and types of instruments, each group will be assessed individually.

All three dimensions are equally relevant. For example, it may well be that a provision of the RED proves to be very effective, efficient and relevant in some countries, but not in others. What can then be concluded about the effectiveness and efficiency of that provision for the EU as a whole? Could it be improved to be equally useful in all Member States? Or is the current provision justified and correct, as the administrative effort is deemed to be low and it does not create any barriers to the Member States in meeting their objectives?

In order to cover all three dimensions, this project and report are structured as follows:

1. First, the various articles are evaluated, assessing the various evaluation aspects across the EU for each article group (Chapter 2). Significant data gaps are identified.
2. Second, an in-depth analysis is carried out for six countries: Bulgaria, Estonia, Germany, Poland, Spain and Sweden (Section 3). These countries were selected to cover the diversity of political opinions and geographical regions of the EU.
3. The outcome of these assessments are then combined into an overall evaluation of the RED (Chapter 4). This high level synthesis looks at the overall results and findings regarding the regulatory fitness of the RED, and identifies and assesses EU level actions and policy options to resolve the key issues that were identified.

Conclusions and recommendations then follow in Chapter 5.

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<sup>5</sup> The various provisions may well lead to different effects in different Members States, depending on political, economical and cultural circumstances - what might be a very effective tool in one country might not be effective in another.





# 2 Summary of the article assessments

## 2.1 Introduction

In this study, each of the RED's articles was assessed at EU level in terms of:

- **Relevance** i.e. the extent to which an intervention is relevant in respect to the needs, challenges and issues identified with regards to renewable energy policy and priorities in the EU.
- **Effectiveness**. This relates to the impacts of the articles, both positive and negative, as well as potentially unforeseen impacts. It will help to identify the added value of the RED (compared to no EU intervention) as well as to get an overview of what factors hinder or enhance the positive impacts of the RED (incl. the administrative burden).
- **Efficiency** which relates to the costs involved in the implementation of the article and whether the measures involved are the best approach and use of resources.
- **Added value** of EU level intervention through the RED as opposed to individual, MS level approaches.

For each article a detailed assessment report was drafted, **which can be found in Annex C**.

The following contains a summary of **key findings and lessons** from these reports, to identify how the RED may be improved both in terms of accelerating the implementation of the measures and their effectiveness. For example, how could the articles' provisions be altered in order to reduce implementation barriers or administrative costs to stakeholders or government authorities, whilst still meeting the overall goals?

The assessment provides an overview of the current situation in Europe based on available reports and research, and on a short selection of interviews with stakeholders. Where information gaps exist they are identified in each article's section.

Further analysis of these results can be found in Chapter 4.

## 2.2 Article 3: Targets and measures

### Effectiveness

- Judging from progress to date, the RED appears to have contributed to intensify renewable energy development in most MS. It is widely agreed that the legally binding renewable targets at the EU level for all MS, backed by indicative interim targets, have strengthened national action, even if experience in some MS demonstrates that targets may also be used to limit RES deployment up to the national target only.
- As progress to date shows and based on historical trends, the targets appear to be achievable. However, stop-and-go policies and underperformance of both the heat & cooling sector and the transport sector are currently jeopardising this objective. Further measures will be needed at MS level to stay on the trajectory and for the targets to be achieved.



- Concerning the setting of the targets, using GDP per capita as a factor to lower renewable targets (compared to their RES potential) in countries with limited economic strength has proved to be a reasonable method for maintaining political and societal support in these countries.
- The 10% minimum target for renewable energy in the transport sector has proved controversial from the beginning. Despite the mandatory sustainability criteria implemented by the Directive, concerns over the sustainability and the actual GHG emission reductions achieved by first generation biofuels raise doubts as to the transport target's effectiveness and endanger target achievement.

### Efficiency

- Mandatory RES targets and adequate support schemes have contributed to driving down technology costs for RES technologies. In doing so, the RED has successfully addressed market failure in the field of innovation, which is essential in order to achieve ambitious emissions reductions in the long term. Moreover, binding national targets backed by indicative interim targets contribute to a clear and reliable RED framework whose implementation in the MS arguably has a positive effect on the administrative burden of public authorities and private stakeholders.

### Added value

- There is a strong argument for the added value of mandatory national RES targets since former experience with indicative targets indicates that without binding targets substantial RES deployment would have remained limited to few MS and sectors. Moreover, stakeholders confirm that mandatory national targets contribute to a clear policy framework that creates investor's security, lead to greater discipline in implementing the RED and make it much more difficult to deviate from the planned trajectory. This applies to the national overall targets and, as a matter of principle, also to the transport target. The added value of the indicative interim targets consists in ensuring that measures to achieve the national targets are introduced timely, and in allowing a continuing assessment whether MS are on track.

### Conclusions and recommendations

Mandatory national RES targets are an effective means for RES deployment, particularly in MS with low RES ambition. In order to stay on the trajectory and achieve the targets, further measures should be accompanied by a close monitoring, which may also require MS to specify their plans for the coming years regarding policy measures and RES developments (e.g. via modifying the MS progress reporting obligation of Art. 22). Concerns on the sustainability of the transport target can only be addressed by a speedy EU level decision regarding the ILUC proposal, followed by speedy implementation at MS level. This decision should be sufficiently robust to improve the sustainability of the biofuels that count towards the target, and provide longer term certainty about these policies, to restore the confidence of investors and other stakeholders. Moreover, a clear and well-defined outlook for the expected growth of RES in transport beyond 2020 should be provided, in line with the Transport White Paper. Robust and effective long-term sustainability criteria for biofuels and bioliquids should be integrated in the post-2020 policy framework, and more weight should be given to reducing energy demand in transport.



## 2.3 Article 4: National Renewable Energy Action Plans

### Effectiveness

- The forecast documents and NREAPs provide a comprehensive overview of the Member States' plans and policy measures, thus successfully increasing the transparency and clarity on how MS intend to meet the RED targets and provisions and allowing monitoring of progress by the Commission and others.
- The NREAPs, and especially the indicative trajectories that MS were required to include in their NREAPs, have proven to be a useful means for the Commission to monitor progress towards the 2020 targets. Up-to-date progress monitoring is, however, hampered by the time lag of statistical data: the 2013 EC progress report only had actual data up to 2010 available.
- The NREAPs also have the potential to improve transparency of MS plans and measures for investors and other stakeholders. However, this requires plans to be reliable and concrete. As the implementation of MS policies and the uptake of the various renewable energy technologies are found to deviate from the plans in many countries, this effect may be limited in practice.
- The NREAPs become outdated over time as policies and circumstances change, and updates are only required after two years of slow progress. The biennial progress reports partly fill this gap, but they do not specifically require MS to present the planned measures aiming at increasing the share of RES.

### Efficiency

- The main costs created by this article are due to the administrative burden it places on the MS' public authorities. This burden is, however, limited, assuming that the MS would have to make plans and decide on measures to meet the targets, irrespective of whether they have had to submit actions plans.
- Quantitative data on the administrative burden are not available. However, there is no indication that the requirements of this article are inappropriately high, compared to the potential benefits described above.

### Added value

- Article 4 has contributed to the transparency of MS's plans and measures related to the RED. It has also enabled the Commission and other stakeholders to monitor progress over time, and compare the actual progress with the plans outlined in the NREAPs.
- The NREAPs increased transparency of the measures and of the expected demand for the various renewable energy options throughout the EU, which may have considerable added value for investors. On the other hand, however, the deviations from the plans reduce the reliability of the market outlook provided. The added value of the NREAPs on investor certainty is therefore difficult to specify.

### Conclusions and recommendations

- Article 4 has proven to be a useful means to compile an overview of MS plans and measures. The quantitative information provided in the NREAPs provides a good basis for the monitoring of progress towards the 2020 targets. The more qualitative information on policies and measures is less easy to compile and assess, partly due to the less homogeneous and sometimes incomplete and inconsistent reporting.



- Up-to-date monitoring of progress against the indicative trajectories is hampered by the delay in which statistical data become available.

## 2.4 Articles 6-12: Cooperation mechanisms

### Effectiveness

- Although the ultimate rationale to use cooperation mechanisms is to exploit renewable energy resources in the most cost-efficient way, the vast majority of MS have indicated that they intend to reach their national targets with their own support schemes, thus considering the use of RES cooperation primarily as an alternative instrument for target achievement as foreseen in Art. 3(3) RED.
- Concerning the ultimate goal to achieve cost-efficiency, the effectiveness of the cooperation mechanisms is very limited to date, with only one project between Sweden and Norway realised so far. Concerning the objective of securing the achievement of the 2020 national RES targets, however, it is too early to assess whether Art. 6-12 RED are effective, since potential activities are likely to take place in the run-up to 2020. The development so far indicates that MS that expect to underachieve or exceed their target domestically are interested in using the cooperation mechanisms to this end and have taken steps to implement the necessary domestic requirements and to contact other MS. Moreover, the new guidelines on state aid for environmental protection and energy 2014-2020 may incite MS to use cooperation mechanisms in order to gain experience with a view to future common auctioning systems.
- The limited use of cooperation mechanisms so far may be due to:
  - a general preference to achieve the targets domestically (and retain benefits locally);
  - uncertainty about the need to back RES domestic achievement with cooperation mechanisms in order to reach the targets;
  - uncertainty about quantifiable costs and benefits, and design options;
  - insufficient interconnection capacities between MS or MS and third countries, and legal barriers;
  - uncertainty about the continuity of the EU framework beyond 2020 as a decisive investment condition for joint projects and joint support schemes.

### Efficiency

- Concerning cost-efficiency at MS level, quantitative assessment suggests that importing countries in particular may gain strongly from cost savings if strong RES cooperation is pursued, since support expenditures could be reduced substantially. Limited stakeholder feedback suggests that the administrative burden associated with the cooperation mechanisms is appropriate.

### Added value

- The joint project between Sweden and Norway that was envisaged years before the RED cooperation mechanisms would probably have also materialised without Art. 6-12 RED, since it was not primarily based on target achievement, but on other considerations such as cost efficiency. However, in most cases, MS' involvement with cooperation mechanisms are driven by target achievement and framed by RED measures and would not have been considered if the RED did not exist.

## Conclusions and recommendations

On the political level, a reliable long-term framework for RES would be a key driver for an increased use of cooperation mechanisms of the RED. Having RES national targets for 2030 would be a precondition for effectively applying cooperation mechanisms beyond 2020. Especially the development of joint projects and joint support schemes is unlikely without strong incentives to cooperate beyond 2020. As the Council conclusions on the 2030 climate and energy policy framework do not foresee national RES targets, much will depend on whether the Governance 2030, and especially the part on fostering regional cooperation, will be able to provide comparable incentives. If national target achievement is no longer the main incentive for using the cooperation mechanisms, it would become even more important to demonstrate the long-term cost-efficiency benefits of cooperation. Moreover, further information, analysis and guidance, in particular on design options and cost-benefits measurements methods may help address the barriers to more cooperation mentioned above and speed up the implementation process.

## 2.5 Article 13: Administrative procedures, RES in buildings, heating

### Effectiveness

- Overall, progress in removing the administrative barriers is still limited and slow across the EU and administrative procedures continue to present a challenge for investors and developers by delaying RES projects by many months or even years (for example, in Italy, France and Cyprus large RES projects can take up to seven years to get permits (Fouquet and Sharick 2011)). Our analysis shows that only 2 out of the 27 assessed MS seem to have high quality administrative procedures in place. This conclusion is supported by a number of studies<sup>6</sup>.
- Most MS are rated poorly by Fraunhofer ISI and Vienna University of Technology (2011), Ecofys et al. (2013) and Fouquet and Sharick (2011) on the quality of the administrative procedures in place, based on a range of criteria such as decision time or the presence of a one-stop-shop.
- In the majority of MS, administrative procedures are lengthy and cause delays for project developers because of complex licensing procedures, unclear administrative responsibilities, multiple bodies involved, municipalities involved without clear rules, lack of one-stop-shops.
- With regards to technical specifications, this was not found to be a significant barrier to the deployment of RES overall.
- As for RES in buildings, it appears that only few countries have renewable energy requirements in building regulations. Many others still have to implement the Article 13(4) of the Renewable Energy Directive. The ENTRANZE project team recently carried out a systematic review of all MS and assessed whether or not MS have put in place provisions to comply with Article 13(4) which requires that building codes set minimum standards for the amount of renewable energy produced on site. However, the final report concluded that ‘only few countries have

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<sup>6</sup> See: Ecofys and IEEP, 2013. Analysis of Member State RED implementation Final Report (Task 2), European Commission, 2013. Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Renewable energy progress report. {SWD(2013) 102 final}. Brussels, Fouquet, D., Sharick, A., 2011. Meeting the Renewable Energy Mandate in 2020: Policy Recommendations & Best Practices from the EU Member State National Action Plans. REPAP 2020 Project, Fraunhofer ISI and Vienna University of Technology, 2011. Assessment of NREAPs. Karlsruhe, Fraunhofer ISI and Vienna University of Technology, 2010. Renewable Energy Industry Roadmap for Finland. Karlsruhe.





renewable energy requirements in building regulations, many other having still to implement the Article 13(4) of the Renewable Energy Directive (EEG et al., 2014).

- On all aspects of Article 13, given its still patchy application and the lack of research, it is difficult at this stage to assess the additional impacts from the RED in terms of effectiveness.
- In order to improve the effectiveness of this article, the following key barriers would need to be addressed: a lack of awareness and knowledge of the RED and the administrative and technological issues around renewable energy at the local level; the lack of ‘quality One Stop Shopping’ in many Member States; complex and/or drawn-out granting and licensing procedures; municipal sector involvement without clear rules drafted at national level.

### **Efficiency**

- The different elements of Article 13 have different implications for the administrative burden on MS e.g. enforcing minimum requirements for new and existing buildings regarding renewable energy technologies adds to the administrative burden as it requires building inspections by experts.
- There is currently a lack of data on the cost-efficiency of Article 13 measures. In addition, in view of the diverse levels of implementation across Member States the administrative burden and associated costs are likely to vary widely.

### **Added value**

- There is added value in EU intervention in this area in order to enable knowledge sharing across MS and to help develop a more unified market for renewable energy.
- This added value could be further enhanced through the creation of a central body at national level for authorisation in order to streamline administrative procedures.

### **Conclusions and recommendations**

- The degree to which Article 13 has been implemented by MS varies significantly. Some MS have made good progress whereas others are still at the beginning. For example, Austria and Lithuania have demonstrated a relatively high and low quality of administrative procedures, respectively. In Austria, public buildings need to take an exemplary role including the ‘widest possible use of renewable energy sources’. In Lithuania, public buildings (new or subject to major renovation) are required to meet minimum renewable energy requirements for buildings.
- With regard to administrative procedures, the measures in place on-the-ground do not necessarily reflect the stated objectives of the administrative system. For example, the fact that a one-stop-shop for administrative issues exists does not necessarily mean that the actual requirements are automatically less burdensome. For example, although Austria has one single agency responsible for authorisations, certification and licensing procedures associated with renewable energy projects (i.e. a one-stop-shop), lengthy procedures have still been flagged by stakeholders as an issue.
- There is limited evidence on whether the technical specifications used by MS have improved as a result of the RED. The most recent analysis concludes that overall technical specifications were not found to be a major issue and did not constitute a significant barrier.
- Few MS have renewable energy system requirements in buildings written into building codes. For the MS that do, requirements vary by building type





- (e.g. new builds only), RES technology (e.g. renewable heat technologies only in Luxembourg) and compliance thresholds (buildings >1,000 m<sup>2</sup> to install solar thermal in Wallonia, Belgium, for example).
- In most MS, some provisions are in place stressing the need for public buildings to be exemplars in terms of the RES use. However, in most cases on-site renewable energy will only be integrated when major renovation works take place, which would occur very rarely.
  - There are avenues to explore in order to increase the effectiveness of the article such as an exchange forum for industry and Member States; more guidance from the Commission on the specific steps that Member States can take to improve local planning processes; the creation of a public benchmarking tool that would allow MS to compare their own procedure against other MS' (e.g. monitoring of lead times per technology, number of administrative bodies involved); and more capacity building of the public administrations involved.

## 2.6 Article 14: Information, certification, training

### Effectiveness

- Data from 2012 suggest that certification schemes or equivalent qualification schemes for installers had not been implemented in all Member States, but more recent data are not available. Certification in photovoltaics is more widespread, while renewable heat schemes slightly lags behind, especially with regards to shallow geothermal energy, possibly due to the different market development stages of these technologies.
- According to the analysis of the '2020 Keep on Track!' project on deviations and barriers of further RES deployment, a lack of appropriate training still constitutes a barrier to the diffusion of renewable heat and/or electricity technologies in several Member States although certification/qualification schemes have been introduced to various degrees. Reasons include:
  - a lack of incentives for installers to participate in the certification/qualification schemes;
  - a lack of control and quality assurance from public authorities;
  - poor understanding of the benefits and potential of certain renewable technologies by installers.
- The mutual recognition of certificates between different Member States presents a challenge considering the different criteria (e.g. the requirement for audit only in some countries) or even the duration and content of the required training in the different Member States.

### Efficiency

- The obligation to introduce a certification scheme or an equivalent qualification scheme according to Article 14 added administrative burden, at least to those countries without such schemes in place before.
- Article 14 encouraged a cost-efficient approach to introduce the certification or equivalent qualification schemes, since they can build on existing national structures and networks. Furthermore, European Commission funded projects like QualiCert developed key success criteria for the successful design and implementation of these schemes which were fed into the European and national stakeholder associations to serve as guidance for the schemes' design.
- In some cases, however, certification schemes seem to be overly complex and costly, as stakeholders reported in the UK.



- A large burden for participation is the amount of time needed for completion. Often the training can be carried out extra occupationally, thus not causing costs from lost working time. Nevertheless, due to high work load installers are often not able to devote to training. Furthermore, participation is mostly fee-based.

### **Added value**

- The implementation of Article 14 RED at a national level introduces a ‘common denominator’ amongst EU Member States which, in theory, should allow mutual recognition. Annex IV of Article 14 leaves, however, much leeway to Member States, is in some instances rather vague, and is not always properly enforced. The resulting differences in certification or qualification systems make mutual recognition challenging.
- Experience shows that in many Member States only a small share of installers has used the offered opportunities. This indicates that the current approach, which does not make certification or qualification obligatory, might have been too lenient.

### **Conclusions and recommendations**

- For various reasons a lack of appropriate training still constitutes a barrier to the diffusion of renewable heat and/or electricity technologies in several Member States and participation in existing certification/qualification schemes remains low in various Member States. Mutual recognition of certification/qualifications is challenging, as there are substantial differences between the systems in the Member States.
- To increase participation, incentives for installers need to be improved. Member States could be required to initiate awareness campaigns targeted at consumers, the publication of lists of qualified installers could be mandatory. It may also be beneficial to connect eligibility for support schemes or warranties to equipment or insurances with an obligatory installation by a certified installer. Such obligations must not, however, result in impeding installers to offer their services in other MS, and would thus magnify the challenge of mutual recognition and the need for harmonisation of skill levels.
- For upcoming installers, another possibility would be to directly oblige them to obtain the appropriate qualification as part of the vocational training.
- To improve on mutual recognition Annex IV could be formulated more precisely to reduce the leeway for Member States, e.g. regarding duration of training and frequency of refreshers seminars. This would, however, cause system adaptation costs in many countries and increase administrative burden. The introduction of a standardised test for all European installers as part of national certification or qualification (including country-specific elements) could also benefit the harmonisation of training standards and would be a rather cost-efficient option without too much interference into the national systems.

## **2.7 Article 15: Guarantees of origin**

### **Effectiveness**

- All MS now have some sort of RES GO system in place with competent bodies assigned for issuing, transferring and cancelling GOs. The use of GOs for heating and cooling remains limited as RED does not set a mandatory requirement regarding their issuance.



- Guarantees of Origin are used for three main purposes: fuel mix disclosure i.e. to prove how the energy was produced and ensure transparency of the energy statistics produced and of the information provided to final consumers; to determine eligibility for national support schemes - it is up to Member States to decide whether they want to combine GOs and support schemes; as a traded commodity between MS.
- Almost all countries use GOs for consumer disclosure purposes and most recognize GOs from other countries and allow trade, albeit with different conditions.
- The number of GOs issued, traded and transferred has been increasing sharply between 2010 and 2013 but the trade in GOs remains limited due to barriers to the trade and transfer of GOs based on the fact that not all Member States are members of the Association of Issuing Bodies (AIB) and use a system compliant with the European Energy Certificate System (EECS), which means that GOs from some Member States are refused by others<sup>7</sup>.
- At this stage there is no specific research which isolates and quantifies the impact that GOs have had on the level of investment in renewable energy at EU or MS level.
- GOs have proved to be useful tools to reduce fraud and inaccuracies. The effectiveness of the systems in place to avoid inaccuracy and double-counting has clearly improved significantly since the first version of the Directive (2001) and even since 2009. The majority of countries are now compliant with the EECS and have systems in place to check the validity of the information supplied by GOs. However, there still remain differences in the comprehensiveness of these procedures and therefore their likely effectiveness.
- The effectiveness of GOs as a tradable commodity which can support investment in RES across Europe is less clear. The exclusion of GO use as a compliance means for meeting national targets reduces their effectiveness in supporting investment across the EU, because it places the emphasis on domestic (national) measures irrespective of the opportunity for cheaper investment elsewhere.

### Efficiency

- The costs of a Guarantee of Origin regime include the development and operation costs of a registry as well as costs of plant registration and audits and transaction costs for participants.
- Implementing article 15 of the 2009 Directive will have involved additional costs for public authorities in order to meet the new mandatory requirements it included. However, in most countries the system will build on: the existing GO system if one was implemented in response to the 2001 Directive; or using an existing body as the responsible authority and allocating it these additional responsibilities in order to limit additional costs.
- Overall the administrative burden does seem reasonable, although in practice it will depend on how MS implement the system. The system costs associated with fraud and double-counting avoidance also need to be viewed in the context of the risks and costs of fraud and double-counting itself. These costs can be minimised through a standardisation of GOs across Europe.

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<sup>7</sup> The AIB operates an inter-registry telecommunications hub to facilitate the international exchange of certificates, the EECS provides a standard framework for creating and transferring certificates.



- Ultimately the cost efficiency of the system will not only depend on the implementation and operation costs but also on the volume of GOs issued and traded: the more GOs are issued the higher the economies of scale achieved and therefore the efficiency of the system.
- There is no available overview of the costs placed on producers by the various MS systems at this point.
- The continued standardisation of the GO system at EU level - following the Best Practice Recommendations formulated by RE-DISS I and any further recommendations from RE-DISS II - seems to be the best way to maximise the potential benefits from this Article.

### **Added value**

- The article is not directly related to other EU initiatives but GOs might be considered useful tools as part of the objective for a single internal energy market set out in the 2009 Energy Market Directives. Specifically, the role of GOs in supporting fuel mix disclosure helps facilitate consumer choice and supplier competition, both of which are encouraged by the 2009 Energy Market Directives.
- The 2009 RED introduced improvements in the minimum requirements originally set out in the 2001 Directive. Without further intervention at EU level the situation would likely have remained unchanged since 2001 with a fragmented system as opposed to the more standardised (although still not unified) process currently in place.
- The added value of this article in terms of cost-efficiency is limited by the need for individual MS to meet their renewable targets and the separation between GOs and the underlying commodity they related to (i.e. energy).
- It is also limited by the presence of other tracking systems in some MS along with GOs which can create confusion and duplication.

### **Conclusions and recommendations**

The main conclusions with regards to GOs so far are that:

- They represent a generally effective tool for auditing purposes and that there is value in having a consistent approach at EU level. This consistency reduces barriers to investment (because the market has confidence in the integrity of the GOs across a standardised system) and transaction costs (because of the efficiency of common rules). The role of the Association of Issuing Bodies (AIB) and use of a system compliant with the European Energy Certificate System (EECS) is important in underpinning the integrity of GOs as internationally traded commodities.
- They could also be a useful tool for creating a voluntary, consumer-driven market for renewables. The consumer buying a green tariff supply backed up by GOs can be confident that the corresponding renewable electricity has only been accounted for once in green supply agreements. However, the decoupling of the electricity and GOs weakens this benefits since a consumer cannot directly attribute his or her electricity to a particular renewable source (or indeed any renewable source).
- Despite progress in implementation, improvements are still needed in order to achieve a consistent system across Europe.
- GO trade is still in its infancy and it is as yet unclear whether it will have net positive impacts on RES deployment at EU level and, consequently on MS ability of reaching their targets. There is a potential for conflict between EU level and country level benefits from the mainstream use of GOs should it happen. This is because the exclusion of GO use as a compliance means for meeting national targets places the emphasis on domestic (national) measures irrespective of the opportunity for cheaper investment elsewhere.



- It is important that all MS continue to move towards a GO system based on the European Energy Certificate System (EECS) operated by the Association of Issuing Bodies (AIB). Joining AIB and the EECS can provide guidance for MSs on developing a system which is compliant with others across Europe, and will facilitate trade.
- Separating GOs from the energy system itself decreases transparency since the consumer cannot associate their electricity with a renewable source. This can reduce the effectiveness of this article as a means to encourage the voluntary market in green electricity supplies.
- It is worth investigating the possible extension of the use of GOs beyond RES-E and high-efficient cogeneration (HE cogeneration) to all types of power generation i.e. including electricity from fossil and nuclear generation. This would help support the tracking and auditing on non-renewable supplies and underpin the integrity of the supply mix disclosure statements that inform consumer choices concerning these generation types.

Finally, the overall future effectiveness of GOs will be improved by continuity of the RED beyond 2020 (and communicating that continuity), especially to avoid uncertainty in the GO market as we approach 2020.

## 2.8 Article 16: Grid access and operation

### Effectiveness

- According to the national progress reports most of the measures listed under Article 16 are implemented, in place or planned in the EU MS. These measures are necessary to ensure the access to the grid for renewable energy sources. According to comprehensive studies, the availability of the article is quite helpful, but burdens and barriers are still present. The main identified challenges to achieving all article objectives are for instance ‘lengthy procedures or delays, lack of grid capacity, complex procedures and a weak legal position of plant operators’.
- With respect to grid connection, stakeholders were critical about the duration and complexity of the process and requirements from network operators. In some cases even the lack of grid capacity was mentioned. Regarding grid access it was indicated that there were inter alia no priority access and curtailment and even discrimination of RES.
- However, it should be noted that the studies referred to indicating national challenges are mostly from 2012. More recent studies are not available. Consequently, it cannot be evaluated whether the mentioned (and perceived) burdens are still valid. In particular, there is no European overview of which specific regulation may not be effective in which country.
- The need for investment, both in distribution and transmission grids, is identified by most of the MS. However, public national investment schedules on transmission and distribution networks are not available. While transmission system operators set out their needs in ten year national plans, distribution grid companies are less transparent regarding upcoming infrastructure requirements. An interaction in the investment planning process between TSOs and DSOs would increase the efficiency and effectiveness of the investments. However, this highly depends on the quantitative balance between TSOs and DSOs.
- In addition, due to the fundamental change of the energy system by integrating decentralised RES, the whole planning process should consider switching from a top-down planning to an integrated process, where TSOs also consider the grid expansions on the DSO level.



- Smart technologies have a positive impact on the integration of renewable sources into the grid. However, the benefits are not estimated on a European level. Detailed studies about the benefits and investment saving possibilities through the use of smart technologies in combination with the implementation of renewables energies, like in Germany, are rarely available. Most of the Member States highlight the general benefits of smart technologies. Nevertheless, the determination of facets and depth of these technologies is not targeted, since the optimal combination of these smart technologies is highly linked to for example grid topologies or company strategies. Furthermore, it is also critically discussed if the benefits of a full rollout of smart meters can actually be determined, since the investment needs for the integration of RES do not significantly depend on this rollout. Furthermore, the benefits of these smart meters are seen to be controversial regarding the economic benefits and the conditions to be assumed for a benefit assessment.

### **Efficiency**

- With the implementation of the RED, all national grid access conditions were reviewed and adjusted according the needs to cover the objectives and needs of Article 16. The level of changes will have, of course, deviated between the different MS, since the status of grid access conditions for renewable energies will have differed in Europe at that point. For instance, in Germany most of the required changes were already implemented before the RED came into force. In France it was stated that the implementation of the RED has significantly improved grid access conditions i.e. the costs are shared between the generator and the network operator. Each producer has to pay the grid access in proportion to its maximal power. This measure integrated RES much better into the market.
- The RED is ensuring a transparent and legitimate integration of RES into the grid, but the integration of RES into the market is not covered by this directive. However, this should also be ensured in any way to integrate and to make use of renewable energies also in a cost efficient manner.
- The implementation of the RED will have created administrative burdens in any way through the required changes and adjustments in procedures and processes for the impacted parties at least for some time at the beginning. Since for example, national binding and immediate grid promises for renewable energies will have increased the costs in the grid sector due to the increased grid access applications and the obligation to have sufficient grid capacities available. But the overall assessment of these administrative burdens is not possible based on the available sources, since for instance positive impacts on the wholesale market through the availability of less expensive energy sources needs to be considered in the same way as increased benefits through the predictable grid access application procedures through this article. Nevertheless actual data of the overall assessment on administrative burdens and benefits is not publically available. However, there is no indication that the requirements of this article are inappropriately high, compared to the potential to be considered benefits aforementioned.

### **Added value**

- The obligation for a transparent and non-discriminatory access to monopolistic infrastructures is essential and therefore represents the base for increasing the participation of any grid users. Therefore this article allows and gives the minimum requirement for RES participation in the gas or electricity market through a grid connection.





- Availability of information about burdens and challenges is required to improve the development of regimes. A European survey could be conducted to identify the precise challenges in each country. The findings could support this article and provide a good start to improve and target the efforts.
- The technical integration of RES is very important and should always consider the market behaviour. However, the integration of RES requires far more flexibility of the grid. This additional flexibility can in principle be achieved by various alternatives, where stakeholders indicate that any technology should be treated equally and a centralised preselection of specific technologies by National Regulatory Authorities should be avoided. The selection of the optimal technology should rather be done by the market participants. As an example, ex-ante specifications like in Article 16.1 regarding storages should be avoided.
- Article 16(3) and (5) are very important for the success of integration of RES. However, as it has not been evaluated with a European standardised approach it is hardly possible to judge the real added value.
- Negative grid tariffs as they exist for example in Germany are highly questionable (linked to Article 16.8). The historical reason for these tariffs was for instance in Germany the avoided network utilization of higher voltage levels. However, the validity of this has to be analysed and assessed in view of the latest development of the energy markets. In particular, it has to be analysed whether this non-utilisation is sustainable or whether the capacity may be required to back-up the fluctuating availability of RES.

### **Conclusions/Recommendations**

- Article 16 has been or will be implemented across Europe by 2014. However, the real changes and impacts on market conditions for RES are not clear as there has not been a recent European wide survey.
- Transparent and frequent reports about the challenges of implementing Article 16 might provide further feedback and opportunities to improve measures and actions and resolve current issues and address future needs. Since this kind of information is currently not publically available it is difficult to assess the impact of these provisions on the real improvements in each country. A European survey could fill this gap.
- Burdens and challenges were identified by several reports and studies, but the range of available solutions to deal with the burdens and challenges was rather wide. Consequently, the chosen measures to implement the article may differ between the individual countries and may depend on the regulatory and legal framework, tax regime, etc.
- The implementation of RES may cause significant network investments. These may be reduced by the usage of smart technologies, as some studies showed.

## **2.9 Article 17-19 and 21(b): RES in transport, biofuels and bioliquids sustainability**

### **Effectiveness**

- The sustainability criteria as laid down in Article 17-19 have been effective in the prevention of the direct environmental impacts of biofuel production, although originally the Directive lacked proper regulation of the indirect effects of biofuel production allowing total GHG emissions of certain biofuels to be higher than conventional fuels. It is noted that the sustainability criteria prevent cultivation of crops for biofuel production in



vulnerable areas, but the criteria do not regulate direct impacts as water pollution by waste water, social impacts, etc. Therefore not all direct impacts are covered. In the EU, other legislation covers the prevention of such local impacts (see also Art. 17(6)), but whether effective safeguards are in place for feedstock from countries outside the EU is currently unknown and not addressed in most MS reports.

- Articles 17-19 effectively target the biomass applications with the highest risk for negative environmental effects, i.e. biofuels and bioliquids. Whether or not to introduce sustainability criteria for solid biomass is currently left to the Member States, providing the opportunity to first develop suitable criteria and gain experience with these requirements on national level. This can be seen as an effective step-by-step approach, although it is criticised by some stakeholders that would have preferred binding criteria also for solid biomass.
- The mass balance system economic operators are required to use for verification of compliance with the sustainability criteria (Article 18(1)) is broadly regarded to be an effective and efficient methodology.
- Article 21(2) has proved to be a strong driver for the consumption of biofuels and waste and residues. Actual volumes are still limited EU-wide, but are increasing as more MS are implementing this measure. It can be noted, however, that the double counting has mainly promoted biofuels from used cooking oil and animal fat, while it does not provide a strong incentive for the use of more advanced biofuels, such as ligno-cellulosic ethanol. In addition, the double counting may have a negative impact on actually achieved GHG savings (and security of supply benefits) of the RES transport target of Article 3 as it reduces the actual share of RES in transport. This effect has not yet been quantified.

### Efficiency

- The costs and administrative burden generated by Articles 17-19, 21 are mainly related to the development of a mass balance chain of custody. Because this system is in place for the first time, the administrative burden has been high for all actors in the first years of implementation.
- The recognised voluntary schemes and default values for GHG emission calculation limit the administrative burden and cost for economic operators, and, as mentioned above, the mass balance system is generally considered to be an efficient methodology. The efforts of economic operators to prove compliance are seen as reasonable and proportional. However, compliance cost might still result in an overall increase of biofuel prices.
- The differences in implementation between Member States have resulted in higher administrative burden for economic operators active in more than one country, because different (reporting) requirements have to be met in different Member States. This also includes different interpretations of non-EU level defined definitions, like the definition of waste and residues.
- The sustainability criteria are also included in the Fuel Quality Directive (FQD), which contributes to the level of harmonisation between legislation throughout the EU. However, the targets and incentives are not harmonised. For example, double counting is not included in the FQD and the RED sets a target for the fuels in terms of a RES share whereas the FQD in terms of CO<sub>2</sub> intensity of the fuels. Stakeholders thus need to optimise their operations to meet the requirements of both directives simultaneously, increasing the complexity of their operational choices. For example, it may well be that the RED transport target could best (i.e. most economically) be met with a relatively large share of biofuels from waste and residues due to the double counting of Article 21(2), whereas





the FQD target could best be met by a higher share of (cheaper) biofuels from food crops with low carbon intensity.

### Added value

- Although voluntary initiatives would probably have continued, the RED led to the harmonisation of voluntary certification systems at European level and a much larger volume of sustainable biofuels in a shorter time period than would have been the case without any obligatory sustainability criteria at the EU level. In 2013, a total of 86.5% of the EU's biofuel consumption was certified sustainable.
- It is difficult to specifically assess the added value and impacts of the sustainability criteria of Article 17, as a detailed assessment of their impacts has not yet been carried out. When assessing the added value of the minimum level of GHG savings defined in Article 17(2), it may have so far been limited, as there are sufficient biomass sources that can meet these requirements and the minimum level is relatively low (35%) until 2017. However, this level will increase in the coming years and effects may become more significant in the future. Data from the UK illustrate the potential for improvement in this respect: average GHG savings have increased between 2008 and 2012, from 46 to 66% respectively. It is not clear, however, to what extent this was due to sustainability criteria or whether other drivers played a role.
- The added value of these articles depends on whether they have mainly led to a shift in biomass application or if they have actually led to actions that reduce the environmental impact. It might be, for example, that the EU biofuels are now produced from sources that are indeed sustainable but that would otherwise be used for food production or for biofuels outside the EU, which are not regulated in a similar way. This type of effects have not yet been assessed.
- The lack of a clear definition of waste and residues in the RED might hinder the implementation of the waste hierarchy as included in the Waste Framework Directive. The Communication from the Commission on the Practical Implementation of the EU Biofuels and Bioliquids Sustainability Scheme and on Counting Rules for Biofuels (2010) and the ILUC proposal of 2012 attempted to define waste, residues and co-products, but still leave too much uncertainty.

### Conclusions and recommendations

- The RED has proven the feasibility of obligatory sustainability criteria at the EU level. This 'test case' showed the scope can be extended to other applications of biomass as well.
- Sustainability criteria are especially helpful in safeguarding a minimum level of sustainability. However, other policy incentives are required to promote innovation in the production of advanced biofuels.
- Clear guidelines on definitions leaving no room for different interpretations will benefit the level of harmonisation and as a result will increase efficiency.
- Provisions that include the option to modify the existing regulation during the duration of the regulation result in uncertainties, which hampers investments and innovations in the market. This can be concluded from the effects of Article 19.6, which states that the Commission shall review the impact of indirect land-use change (ILUC) on greenhouse gas emissions, address ways to minimise that impact and, if appropriate, submit a proposal containing a concrete methodology for emissions from carbon



stock changes caused by ILUC<sup>8</sup>. The related decision making process has been delayed, while the potential impacts of the ILUC decision on the future biofuels market in the EU can be significant. As a result, longer term MS policies are not yet decided on in many countries, and investments in R&D and biofuels production capacities have been put on hold as long as the uncertainties remain. This potentially impacts effectiveness and efficiency of this specific provision and of meeting the transport target of Article 3.

## 2.10 Article 22 and 23: Reporting

### Effectiveness

- All Member States' progress reports set out the measures taken or planned at national level to promote the growth of energy from renewable sources as required by Article 22(1)(a).
- The majority of Member States have limited the scope of information providing strictly what is required within the data tables. There are still areas of weaknesses in the reporting such as information relating to administrative reforms; limited evidence on the impact of increased biofuel production on land use patterns.
- There are also questions not currently asked by the template which could provide useful information, such as evidence to answer the evaluation question regarding the monitoring of progress. For instance, the template does not ask how the progress on each measure will be monitored or whether the MS has had to set up new data collection systems and processes.
- The Commission report on renewable energy progress (2013)<sup>9</sup> is the product of having MS level data ready for analysis and interpretation at the EU level. This has allowed the Commission to state '*an impression is gained of a generally solid initial start at EU level but with slower than expected removal of key barriers to renewable energy growth*'. This level of reporting allows reflection on priorities at the EU level and for key messages to be directed back to MS that are not performing as well as others.

### Efficiency

- Increased administrative costs can be assumed as Member States need to report their progress to the Commission on the promotion and use of energy from renewable sources every two years.
- However, the use of a uniform template should reduce the administrative burden.

### Added value

- In completing the template using comparable data across all MS, there is considerable value in being able to analyse all MS data and measures relating to RED implementation.
- There are many initiatives and analyses that are based on the data reported under Article 22. These include the Eurostat data on energy from renewable sources<sup>10</sup> and linkages with NREAPS produced under the

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<sup>8</sup> Please refer to the RED for the exact wording.

<sup>9</sup> Renewable energy progress report, COM(2013).

<sup>10</sup> [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Energy\\_from\\_renewable\\_sources](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Energy_from_renewable_sources)



- requirements of Article 4 (e.g. DG ENER recently published a report on the Integration of Renewable Energy in Europe<sup>11</sup>).
- It is unlikely that this level of national data reporting would have occurred across all MS without Article 22.
  - There are many benefits to be drawn from implementation of Article 22. Without the requirement for transparent reporting and the subsequent monitoring of progress, the measures and results would not have been as well understood across all MS, and the data would have been less accessible on an EU level.
  - The progress reports published by the Commission are of clear added value to the process of ongoing-monitoring of MS progress. The reports pull together vital data on an EU level, and support the transparent communication of a large volume of data to the benefit of all MS including both policy makers and researchers.

### Conclusions and recommendations

- As the first two sets of MS reports (2011 and 2013) have shown, the level of reporting compliance has increased, potentially with familiarity with the template, and given time for each MS to set up data collection systems and processes. The lesson here is that MS do not necessarily collate their data in the same manner as required by the template, and so time is needed to allow for higher quality of reporting.
- The template could improve on the guidance for reporting measures regarding ‘targeted groups’ and ‘expected results’ to improve the consistency of reporting between MS. There was a higher degree of interpretation of meaning to these two table headings across MS than for any other table in the template.
- To address the comments from the Commission report<sup>12</sup> on MS’ progress regarding missing information on administrative reforms, a potential solution is to improve the guidance given to MS regarding the expectations for this information. MS reports should also undergo a review and approval process to ensure that progress reports are submitted with all sections completed.
- An additional requirement could be for MS to report on the expected costs of each reported measure, in order to assess value for money against expected results.

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<sup>11</sup> DG Energy (2014) Integration of Renewable Energy in Europe, [http://ec.europa.eu/energy/renewables/doc/201406\\_report\\_renewables\\_integration\\_europe.pdf](http://ec.europa.eu/energy/renewables/doc/201406_report_renewables_integration_europe.pdf)

<sup>12</sup> Renewable energy progress report, COM(2013) 175 final.





# 3 Summary of the country case studies

## 3.1 Introduction

Six EU Member States (Bulgaria, Estonia, Germany, Poland, Spain and Sweden) were analysed on their handling of and attitudes towards the RED, especially focusing on the effectiveness, efficiency and the added value of its articles. These case studies therefore cover old and new, large and small MS as well as MS with different starting points in RES deployment and have been selected upon consultation with the client.

In general between four and five (and up to eight) targeted face-to-face or phone interviews were undertaken per country with relevant stakeholders, covering possibly national policy-makers, regulators, utilities, industry associations, research centres and consumer organisations and thus reflecting the full diversity of those potentially affected by the RED. In some cases, however, due to various reasons, such as (pending elections), it was not possible to interview partners from all stakeholder groups.

The interview questionnaires were developed on the basis of the main evaluation framework and adapted according to the gaps detected in the articles' assessments. A selection of questions was sent to the interview partners based on their expertise and willingness to answer the respective questions. Interviews in general have been limited to a maximum of one hour.

The following analysis is mainly based on the results of the interviews with stakeholders in the respective countries. In cases where interview partners were not available or not willing to answer the questions, prominent national sources were consulted for answering the questions. In this way, additional and recent data is provided, in many cases helping to fill gaps within the articles' assessments. Last but not least this approach helped obtaining practitioners' understanding of impacts, effectiveness and further issues identified within the evaluation framework described.

For each country a case study was drafted, which can be found in Annex C to Annex J.

The following contains a **summary of key findings** from these country reports, identifying the interview partners' view on the EU's role and the RED contribution in promoting RES in their country, their impression about general impacts on administrative burden in the context of REFIT as well as recommendations to address remaining barriers to RES deployment on national as well as on EU level.

Further analysis of these results can be found in Chapter 4.



## 3.2 Bulgaria

### 3.2.1 EU's role and the RED contribution in promoting RE

The RED and mandatory targets provided an incentive for quicker and more systematic promotion of RES in Bulgaria. Several regulations, including relevant administrative bodies were redesigned in order to harmonise the approach with the requirements of the Directive. Consequently this produced a boom in the uptake of RES in the country. The main effect of the Directive was felt during the period when the targets were to be achieved and the government was showing determination to do so. After the achievement of the 2020 national RES targets, however, most of the support schemes have been put on hold, which, in effect, has discouraged further investments in RES. Therefore, if the state support for RES is to be re-established long term targets are required at European level.

Despite the implementation of the RED, grid capacity limitations could not be overcome. The security of the energy system was challenged and thus limitations to grid access had to be imposed indirectly.

In addition, the cost to the economy and the final consumer have been underestimated, misunderstood or misrepresented, which has created an overall negative public opinion.

Finally, the sustainability criteria and the commitment towards the transport target are discussed and seen as uncertain, which confuses the market as well as potential investors.

Overall it could be claimed that a lot of the RES development would not have been achieved without the RED, which was seen to contribute to the promotion and support of RES in Bulgaria.

### 3.2.2 General impacts on administrative burden in the context of REFIT

The implementation of the RED resulted in efforts to optimise the bureaucratic system and created a more transparent and efficient administrative system. The accuracy and transparency of information increased as well.

Several attempts to simplify the administrative procedures were made and the process was simplified particularly for small operators. However, overall, the administrative burden for economic operators remains significant. Bulgaria has still only partly privatised the energy sector and thus the complications around ownership and investment decisions remain complex.

Limited administrative capacity is still a key issue. Some of the key administrative bodies are understaffed or tend not to retain qualified employees, which results in administrative services lacking in continuity, quality and efficiency, and limits cross-governmental cooperation.

### 3.2.3 Recommendations to address remaining barriers to RES deployment

Long term European strategy and MS obligations would be essential for further state support of RES in Bulgaria.

RES policy and objectives should be seen in the context of overall economic development and the European energy market.

Long term European policy with clear objectives and targets as well as stable criteria and simplified interstate trade of surpluses would encourage long term state policy and implementation.



The overall development and state of the energy market and infrastructure as well as the level of economic development are particularly important in the case of Bulgaria.

### **3.3 Estonia**

#### **3.3.1 EU's role and the RED contribution in promoting RE**

Estonia has achieved the target for energy from RES as set out in the RED already in 2011.

While the RED set higher national RES targets than those previously stipulated in the national legislation and strategic documents, no further incentives were created in order to achieve RED targets. This suggests that the current share of RES in energy would therefore likely have been achieved without the RED. Even with the RED implementation, grid capacity limitations and the continuing prevalence of administrative burden on RES economic operators have not been overcome. Little has been done since the adoption of the RED to streamline the planning and approval procedures and improve grid access conditions for RES economic operators.

The RED has, however, created an enabling environment for cooperation mechanisms that the country has actively started exploring; legislation has been drafted to create a legal basis for cooperation mechanisms and the country has actively started to seek opportunities for statistical transfers with other EU Member States.

With regards to transport, the situation is different as Estonia had previously done little to encourage RES uptake and legislation was drafted specifically in order to meet the 10% RES target in the transport sector. The RED provided a mandatory incentive for the country to promote RES in the transport sector. It is, however, doubtful whether this target will be achieved or provides the most cost-efficient approach as Estonia does not have any biofuel production capacities.

The sustainability criteria stipulated in the RED have formally been transposed into Estonian legislation. However, as there is no mandatory requirement to sell biofuels on the Estonian market, the suppliers do not declare biofuels to the customs. As the sustainability criteria are not enforced at the moment, no useful conclusions can be drawn on the effectiveness of the sustainability criteria. Some small progress has been made as legislation has now been drafted to introduce the mandatory requirement to supply biofuels and also the mechanism to verify compliance with the sustainability criteria.

#### **3.3.2 Impacts on administrative burden in the context of REFIT**

Overall, the RED has not directly resulted in cost reductions of RES deployment in Estonia. However, some indirect cost reduction may occur in the long term through the binding targets of the RED and its legislative framework as it enables the mass development of RES technologies and the achievement of economies of scale.

The administrative burden of RED-related planning and reporting is not seen as excessive overall. The RED added an obligation to compile the NREAP and biannual reports, however, most of the NREAP requirements would have likely been covered in the context of different strategic documents. It was identified that some aspects (e.g. market overview of bioenergy) are, however,



specifically compiled for the biannual progress reports, which would not have been compiled otherwise.

Some increase of costs can be seen in implementing the 10% RES target in the transport sector. In order to implement the target, the Government has prepared a draft legislation to introduce a mandatory obligation to supply biofuels in the market. This would entail some administrative burden for public authorities to verify and enforce the sustainability criteria. The additional reporting only entails minimal additional reporting requirements for the fuel suppliers, although it may lead to other compliance costs (e.g. tank upgrade).

### **3.3.3 Recommendations to address the remaining barriers to the deployment of RE**

Some financial, administrative and political barriers to the continued deployment of RES still remain in Estonia. These include the absence of a willingness to exceed the 2020 target; the excessive costs placed on consumers in order to secure new grid connections; and concerns about the competitiveness of the country's oil shale industry.

The mandatory targets are an important tool to address these barriers and limit their ability to slow down investment in RES. However, if they are not set properly, they can also limit ambition.

The stakeholders also highlighted that the separate responsibilities of the Commission DGs mean that RED goals are not necessarily pursued in the most consistent or efficient way: for example when DG Competition takes over two years to process State Aid applications for RES subsidies, this hinders the deployment of RES under the RED.

## **3.4 Germany**

### **3.4.1 EU's role and the RED contribution in promoting RE**

In general, all interview partners consented that the RED played and still plays an important role in promoting RES in Germany. This role, however, has been more political in nature in the sense that there is support of the ongoing efforts at national level as most of the RED provisions did not lead to changes in the German legal system.

The mandatory targets in combination with monitoring through the NREAP and the progress reports secured the implementation of the planned measures as scheduled.

Some interviewed partners highlighted that the RED probably has resulted in cost reductions of RES deployment, compared with no EU level action, as EU-wide joined efforts lead to a reduction of the costs for the necessary energy system transformation as well as a decrease of RES technology costs due to its EU-wide coverage.

### **3.4.2 General impacts on administrative burden in the context of REFIT**

The RED's impact on the administrative burden in Germany is estimated to be quite low by the interviewed stakeholders. RES support instruments already existed and only had to be adapted to a minor degree (mainly regarding the Guarantees of Origin and an improvement of grid access). Interview partners even mentioned an example where the administrative burden decreased due



to RED implementation (clarification of information requirements under Article 16 RED).

As most of the statistical information has to be collected anyway for the national monitoring, the reporting duties under the RED are not seen as excessively burdensome in Germany.

### **3.4.3 Recommendations to address remaining barriers to RES deployment**

All interview partners concordantly asked not to reform the RED before 2020 as this probably could lead to a new set of problems at present and thus to a further decrease of investor security. Still remaining technical and administrative barriers are less relevant in comparison to a fundamental uncertainty that could result out of changes to the political and legal framework. Politics in the biofuels sector were mentioned as an example for such a process leading to high uncertainty and a decline in investments.

The German Renewable Energy Federation BEE pointed out that the Council Conclusions on 2030 Climate and Energy Policy Framework of 23 October 2014 (European Council 2014) lacks in ambition and is also still very vague especially with regard to governance questions. Taking into account the positive experiences gained with the combination of mandatory targets and the obligation to prepare and - if necessary to meet the targets - revise NREAPs, the EU should stick to this governance structure. The European Commission should gather all efforts to save as much of the NREAP as possible by continuing to fully enforce the 2020 RES and Energy Efficiency objectives and by proposing a similar structure for the post-2020 period (BEE, 2014).

The introduction of auctioning systems for determining the future RES support levels under the EEG also resulting from the intervention of the EU institutions and especially DG Competition is seen very critically by BEE. Auctioning will further deteriorate the level playing field for RES producers in Germany (and in Europe), probably leading to a decline of small regional and local RES production with the result of a decrease in public acceptance towards RES expansion (BEE 2014).

## **3.5 Poland**

### **3.5.1 EU's role and the RED contribution in promoting RE**

Overall, the RED was effective in introducing mandatory targets at MS level. Indeed, the main source of added value from the RED is in setting mandatory RES targets and reporting and monitoring requirements for progress towards achievement of these targets. RED requirements have helped to define intermediate targets and have pushed the implementation of measures which would have otherwise been delayed without a Directive. All stakeholders were in agreement that without the mandatory targets, the level of effort undertaken to support RES deployment would not have been as high.

However, the effectiveness of the detailed provisions set out in the Articles varies. For instance, the priority access to the grid for RES must be balanced in practice with the priority of ensuring the safety and security of the energy system. Other provisions, such as cooperation mechanisms seem to have been of limited value so far for a country, like Poland, that is on track to achieve its target.

The RED also has other shortcomings with regard to how it addresses the issues of sustainability and environmental protection. Co-firing, for example, is seen as a shortcut that, while allowed under the Directive, has questionable RES credentials. Indeed, the fact that co-firing is eligible under the ETS and that biomass has somewhat arbitrarily been accorded an emission factor of zero has provided an additional incentive to shift to biomass under the RED. As a result, power producers co-firing biomass do not need to invest in new - more sustainable - technology: they are able to use fewer ETS allowances for compliance, can generate certificates of origin which are tradable, are able to earn extra money from both sources, and can fulfil their RES target. This has locked in the use of biomass under the RED objectives, instead of stimulating investment in new technologies and R&D - arguably the biggest failure of the RED in Poland. This was eventually tackled by the Government when they prohibited the use of quality wood, but this should have been addressed from the start. Similar concerns are associated with the use of biofuels and biocomponents from food feed-stocks. The sustainability of these fuels, even if they are certified, is questionable, especially as stakeholders are aware that the demand for imported biofuels in the EU negatively impacts tropical forests.

The role of the RED in the wider context of the EU's mitigation efforts is well understood by policy-makers and other stakeholders, including the link with emissions trading and emission reduction targets. On the other hand, the connection between EU policy on RES and on energy efficiency is less direct, although it is acknowledged on a theoretical level by stakeholders. They indicated that the two relevant Directives and their requirements must be implemented independently, as they created two streams of reporting and two separate goals.

### **3.5.2 General impacts on administrative burden in the context of REFIT**

The administrative burden of RED-related planning and reporting is not seen as excessive overall. While it added NREAP and biannual reporting to otherwise existing internal reporting obligations, similar reporting requirements would have been required in order to monitor the implementation of the government energy policy until 2030 (Prime Minister's Office 2009).

However, aside from requirements to streamline and simplify procedures, the RED also added a layer of administrative red tape and, as a result, the administrative burden of several Articles, especially related to certification of installers, certification of biofuels and issuance of GOs, is perceived as unjustifiable, considering the results obtained through deployment of these measures.

The benefits of installers' certification are not clear. The requirements for certification could therefore be reviewed in order to assess their effectiveness.

With regards to biofuels, the sustainability criteria for imported fuels are viewed with scepticism and generally undermine the sustainability of the renewable energy in fuel goals.

The benefits of Article 15 RED on GOs have so far been unclear for Poland: they are valuable in terms of the information they provide, but the burden related to the issuance and fraud prevention is seen as excessive. It required setting up a database, and the involvement of a number of entities for the issuance and confirmation of data. This Article may make more sense in countries that do not use green certificates, but in Poland, green certificates

could have easily fulfilled the same role. However, GOs could have a future in Poland once the current support system is replaced with a new system based on auctioning. This requires that the Parliament adopts appropriate provisions in the draft law on RES, which is now under consideration.

### 3.5.3 Recommendations to address remaining barriers to RES deployment

There are political barriers to accelerating the continued deployment of RES in Poland: the absence of an ambition to exceed the 2020 target; concerns about the safety of the energy system, which is a key priority of the energy policy; excessive costs for voters; concerns about compounding poverty and social exclusion by increasing the cost of energy; and concerns about competitiveness of industry. Interviewees argued that before considering any increase of the RES target the specific circumstances of Poland, such as its reliance on coal as a prerequisite of energy security and the slow uptake of micro-installations related to low incomes but also to the low level of public concerns regarding climate change, should be taken into account. The concerns about the competitiveness of industry are exacerbated by negative examples of rising energy costs and loss of competitiveness in a neighbouring country (Germany), where companies such as BASF increasingly invest outside the country, such as in the US, citing high energy costs at home.

In principle, all interviewees agreed that mandatory targets were an important tool in addressing barriers and help to retain investment in RES - even if they also set upper limits to ambition.

Financial barriers also exist; in particular, the higher costs of RES equipment, which limits investment in micro-generation or RES electricity. TSO and DSOs cite high costs of grid and network expansions as another financial barrier. There is also a paradox linked to the potential rise of micro-generation as it would require investment in the expansion of the system despite reduced revenues. This issue should be addressed as a systemic problem.

The mandatory targets should therefore be accompanied by effective support systems, as stated by representatives of RES producers. However, as pointed out by the grid operator representatives, the security of the grid and the entire strategy for delivering future energy supply must be revisited before any long term measures are implemented. Support systems, as pointed out by PIMOT<sup>13</sup>, should be stable and long term, but any adverse effects must be envisaged and duly taken into account at the system-design stage. Indeed, some measures can sometimes have unintended side-effects, which may not be entirely environmentally friendly or sustainable (e.g. co-firing, food feedstock for biofuels). Such practices should be identified early on and weeded out, if necessary, at EU level.

Finally, as concluded by the Supreme Chamber of Control, more support should be targeted towards R&D of new technologies, rather than for supporting investors, especially if investors already receive support for major RES projects via grants.

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<sup>13</sup> PIMOT being the Polish Institute of Automotive Industry.



## 3.6 Spain

### 3.6.1 EU's role and the RED contribution in promoting RE

According to most respondents, the RED is generally perceived to have had limited impact on the Spanish energy policy as several of the fundamental elements were already (largely) embedded by the time that the RED came into force. This was in particular the case for the targets set for RES and Spain appeared to be well on track given the indicative trajectory set out in the RED. In recent years the rise of the so-called tariff deficit has, however, driven a series of adjustments in legislation, regulation and the support mechanisms. Though Spain has been largely on track until recently, several respondents point to the recent decline in electricity demand as an important aspect in this respect, and are sceptical about the future of RES in Spain. This has resulted in a general sense of scepticism with regard to the future development of RES in Spain, as investment climate and investor confidence has deteriorated significantly. Hence, even as the RED targets and the indicative trajectory may provide for an incentive in the foreseeable future, restoration of investor confidence is commonly viewed as an important barrier among the interview partners.

### 3.6.2 General impacts on administrative burden in the context of REFIT

None of the respondents has explicitly pointed to excessive administrative burden involved with the implementation of any of the Articles in the RED. The main comment in this respect relates to the administrative burden involved with renewable electricity project development, which is believed to be considerable.

### 3.6.3 Recommendations to address remaining barriers to RES deployment

Several barriers were reported to be perceived as critical in Spain. The relatively low level of interconnection capacity between Spain and other MS/third countries to enable better integration of RES, and allowing the sale of electricity abroad in case of excess wind or sun is widely perceived to be a critical barrier. Furthermore, regulatory changes that create uncertainty and investment risk are stated to be detrimental to the investment climate. External costs that are not internalised further render RES non-competitive in equal terms. Finally lengthy processes for permitting and inadequate regulatory arrangements are believed to impose relatively significant barriers for RES-e in Spain. For example, grid connection imposes delays and is hampered by a lack of transparency on responsibilities with regard to construction and/or reinforcement of the network. Also the RED itself is stated to leave too much room for interpretation. In addition, the indicative trajectory is stated to be too skewed, being somewhat flat at start, and too steep at end.

Recommendations relate to a variety of aspects covered in this document. With regard to the binding targets, differing views emerge. Several comments refer to the need for binding targets for RES at MS level, rather than an overall EU target. Others worry about accountability in case of an overall EU target. In addition the recent proposal for a 27% EU-wide target is believed to underestimate the urgency of RES deployment and feared to disregard the need to incentivize biofuel deployment in the transport sector. Further, more aggressive enforcement with regard to compliance, 'good practice' in energy policy design and tighter monitoring on the basis of NREAPS would add to the effectiveness. In contrast however, several respondents believe the starting point is different now so it is time to move to a more market-driven framework, rather than paternalistic targets as explicit targets show to have very strong side effects. Others point out that a more market-driven approach



would require existing subsidization of fossil fuels to be phased out as well. On a related note, the development of a stable and effective market for carbon emissions is considered to offer an important pillar for the incentivisation of RES. Also, market integration through facilitation of the participation of REs in ancillary services is recommended.

Some interview partners highlight the necessity of the internalisation of all costs incurred by all technologies in order to allow RES to compete on equal terms. Another interview partner agrees that the real debate should be on the incorporation of external costs of energy, and the recent EC document on external costs provides a good starting point.

One respondent points to the political will at Member State level to support RES deployment as a key requirement that is lacking in the current situation. Public awareness on benefits should therefore be embedded on the basis of energy security, job creating and economic growth. Here it is mentioned that also at EU level, opportunities to do so are missed, and reference is made to the energy security document stated to cover diversification only as far as fossil fuels are concerned.

Also harmonisation of regulation at MS level is suggested as an important element of future regulation on the EU level. With reference to the recent turn in Spanish regulation, continuation of priority access for RES is stated to be a critical element in support of RES-e deployment. One respondent refers to the lack of coordination between differing administrative levels in Spain and suggests a mandatory one-stop-shop that would allow RES deployment in particular including alignment of interests of the administrations involved as well.

## **3.7 Sweden**

### **3.7.1 EU's role and the RED contribution in promoting RE**

Overall, the RED has helped put in place concrete RES goals and targets in Sweden. However, Sweden already had a very active RES sector (aside from transport) prior to the implementation of the RED and so it is challenging to attribute the growth in RES since 2009 directly to the RED.

Concerns were raised by stakeholders as to what the overall goals of RES and RED are at an EU level. Stakeholders believe that the overall goal of the EU is (or should be) to reduce carbon emissions. In order to achieve this, a number of supplementary and more specific measures have been established such as wider EU level energy efficiency targets (outside of the RED) and RES goals.

Stakeholders felt that the current RED targets are not driving the most cost effective RES development across the EU. Germany was cited as an example of a country where consumers are paying a high price for RES. Potentially, Sweden could, for example, be generating more RES at a lower cost if there was sufficient demand. The EU ETS rather than setting RES targets, was viewed as a better means of stimulating investment in renewable energy whilst mitigating CO<sub>2</sub> emissions. At present the RES targets at an EU level are having the impact of reducing the carbon price under EU ETS. This in turn is undermining the investor attractiveness of investing in RES.

### 3.7.2 General impacts on administrative burden in the context of REFIT

Discussions with stakeholders in particular the Swedish Energy Agency highlighted a number of areas where the administrative burden associated with meeting the RED obligations could be improved. These include:

- Reducing the mandatory requirements associated with Article 14 RED which covers Information and Training. Sweden regards itself as having a mature and well established renewable energy sector, imposing additional requirements on installers in particular is viewed as an unnecessary burden.
- Improving the guidance to Member States surrounding reporting under Article 22 RED to ensure that it is clear what the end goal and purpose of each question is to the European Commission. This will allow Member States to ensure that they are placing proportionate effort against the questions which have the highest importance to the Commission. In addition for specific questions (i.e. question 10) ensuring that a standard methodology exists in order to simplify the reporting burden and make the results more meaningful to the Commission.

Otherwise it is clear that added value is being obtained through Article 22 RED reports. Clearer and more robust procedures are being used by MS such as Sweden to determine the amount of renewable energy than would otherwise have been the case.

### 3.7.3 Recommendations to address remaining barriers to RES deployment

To date Sweden has been successful in promoting and establishing renewable energy on a cost effective basis with minimal additional cost to the consumer. Sweden's goals in developing RES have been to facilitate the renewable sector while ensuring that this is developed in a cost effective manner. Renewable incentive schemes in other MS were not necessarily viewed as being the optimum approach for this.

The main barriers identified during the course of the interviews focused upon EU level decisions with respect to the RED. No specific market barriers or policies within Sweden were seen by stakeholders as hampering the deployment of RES. Specific niche areas of the energy sector were highlighted as requiring actions to reduce barriers and stimulate the market. These are:

- treatment of biogas for biomethane grid injection across international borders;
- the sustainability reporting requirements associated with specific waste feedstock derived heating oils.

One of the key disappointments raised by stakeholders was the failure of the cooperation mechanism at an EU level. This is seen by stakeholders as representing an opportunity for Sweden and the EU to deploy increased levels of renewable electricity in a more cost effective manner than can be achieved purely by operating on a MS level. Sweden would have liked to have seen the cooperation mechanism not being an 'Opt-in' approach that is voluntary. For example, the cost of developing wind power in Sweden is relatively low compared to many neighboring countries in Europe. Through cooperation over a larger region the potential increases for more cost effective projects to be developed (i.e. utilising the most attractive wind, solar or biomass locations) for the supply of RES.



Finally, stakeholders highlighted that greater emphasis was required at an EU level on not just increasing the RES production but the subsequent market impact. How can the transmission grids be improved for example, as this infrastructure has longer lead times than RES projects.







# 4 Synthesis

## 4.1 Introduction

This chapter brings together the findings of the separate article assessments and country case studies, aiming to:

- evaluate the provisions of the RED on EU level;
- identify best practices;
- identify key issues and barriers.

Table 4 was derived in Section 1.3 and provides the main issues to assess in this chapter. Have these expected outputs and outcomes been achieved effectively and efficiently? Are the various provisions indeed relevant, and in line with the objectives of the RED?

Table 4 RED intervention logic relation between measures, outputs, outcomes and impacts

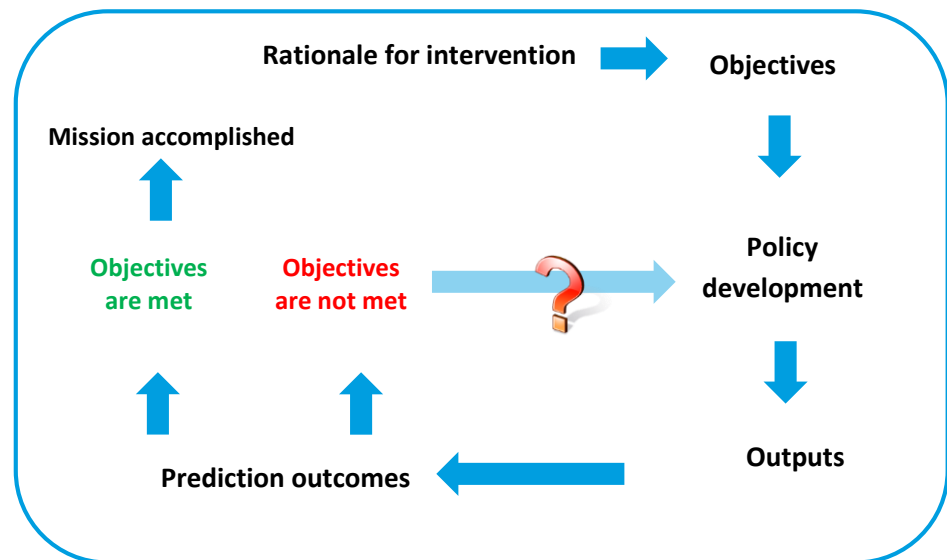
Policy measures	Art	Outputs	Outcomes	Impacts
Mandatory national overall targets for 2020	3	National targets, supported by national policies to reach these targets.	Relative certainty to investors and other stakeholders. Support to the development of a market for RES.	In 2020 20% of all the energy generated in the whole of Europe is generated based on renewable energy sources.  Promotion of security of energy supply.
Mandatory national overall targets for renewable energy in transport: 10% in 2020	3			
National renewable energy action plans	3, 4	National Renewable Action plan supported by eligible measures.	Transparency. Possibility for monitoring by national or EU authorities.	Promotion of technical development and innovation.
Statistical transfers between Member States	6-12	Guidelines and preconditions for cooperation.	More resource and cost-efficient ways to meet the objectives.	Promotion of employment and regional development, especially in rural and isolated areas.
Admin. procedures, regulations and codes	13	Development of clear procedures, administrative responsibilities and technical standards for the effective implementation of RES. Building regulations which support the development of RES in new buildings and during major renovations.	Streamlined, non-discriminatory and transparent authorisation, certification and licensing procedures. Increased use of RES in new and existing, private and public buildings.	

Policy measures	Art	Outputs	Outcomes	Impacts
Information and training	14	Dispersion of information on training, certification and support schemes. Certification schemes for RES available in each MS	SMEs are qualified and certified ambassadors for equipment for local generation of renewable energy. Customers make informed choice for (local) generation of renewable energy.	
Guarantees of origin (GO) of electricity, heating and cooling produced from renewable energy sources	15	Development of appropriate mechanisms for the accurate reliable and fraud resistant issuance transfer and cancellation of GO.	Final customers make informed choice on energy consumption based on robust proof of the origin of the energy consumed. Trade of GOs as an independent commodity across the EU.	
Access to and operation of the grids	16	Grid access.	More resource and cost-efficient ways to comply due to lower capital investment cost and improved business case.	
Sustainability criteria for biofuels and bioliquids	17-19, 21	European wide accepted certification schemes for biomass.	Minimal level of sustainability of biomass use for transport and electricity is guaranteed.	
Reporting by the Member States	22-23	Progress reports per MS, with comparable data.	Ability for MS and the EC to monitor progress against NREAP targets and potentially take action. Ability to compare performance across the EU.	

Once these questions have been addressed, best practices can be identified as well as key issues and implementation barriers that reduce the effectiveness and efficiency of the various provisions. What provisions could be improved? Are there barriers to reaching the objectives of the RED that are not yet addressed appropriately? The next step is then to assess options to improve the EU policy, in order to resolve the issues and barriers that were identified.



Figure 2 Outline of this evaluation



## 4.2 The regulatory fitness of the RED provisions

Ideally the RED provisions are all relevant to the main objectives and expected outcomes of the RED, and contribute to achieving these efficiently and effectively.

### 4.2.1 Relevance

Regarding relevance, the main question is to what extent the objectives of the various articles are relevant to the needs of the EU energy and climate change policy. In this context, the main aims of the RED are to reduce greenhouse gas emissions and at the same time promote the security of energy supply, technical development and innovation and employment and regional development.

As it was concluded in both the article assessments and case studies, progress to date confirms that the RED has contributed to intensify renewable energy development in most MS. Furthermore, the expected outcomes of the various Articles, as shown in Table 4, can all be deemed relevant to this objective.

The potential positive contributions of the increased RES deployment on the main aims of the Directive, i.e. on reducing greenhouse gas emissions, promoting security of supply, etc., were assessed by the Commission in the 2008 Impact Analysis of the 2020 Climate Objectives (SEC(2008) 85) as well as in the Energy Roadmap 2050 (COM(2011) 885/2). An analysis of the actual effects was recently published by the European Environment Agency (EEA)<sup>14</sup>. This report finds that since 2005, the increased deployment of RES in the EU has resulted in:

- approximately 388 Mton of gross avoided CO<sub>2</sub> emissions at EU level in 2013, a reduction of about 8% compared to a case without an increase of RES use;
- a reduction of about 7% of fossil fuels consumption in the EU in 2012 (mainly coal and gas), thus increasing security of supply;

<sup>14</sup> Renewable energy in Europe - approximated recent growth and knock-on effects; EEA Technical report, No 1/2015.

- positive effects on primary energy consumption in the EU, which is estimated to have reduced by 2% in 2012 due to increased RES deployment.

Positive impacts of RES on employment in the EU were confirmed in the EmployRES-II study published by Fraunhofer<sup>15</sup>, which concluded that the current economic benefits of the RES sector are substantial and expected to grow further in the coming years, with increasing RES deployment.

#### 4.2.2 Effectiveness and efficiency

The following tables provide a first assessment of the effectiveness and efficiency of the various provisions of the RED. Table 5 shows the main conclusions regarding effectiveness: are the provisions likely to contribute effectively to meeting the 2020 target? Table 6 contains a similar overview of the main findings on efficiency.

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<sup>15</sup> Employment and growth effects of sustainable energies in the European Union, Fraunhofer ISI, Ecofys, Energy Economics Group, Rütter + Partner Socioeconomic Research + Consulting, Société Européenne d'Économie, Karlsruhe, August 2014.



**Table 5 Effectiveness: Overview of whether the RED articles have achieved the expected outcomes**

Article	Effective?	Positive contributions	Key issues
<p>3: Targets and measures</p>	<p>Yes, to some extent.</p>	<p>Mandatory targets appear to be more effective than indicative targets only.</p> <p>Impact in some (frontrunner) MS perhaps limited, but effects of both the overall and the transport target on many MS, typically those with low RES deployment and investments, significant. Mandatory targets backed by indicative interim targets create investor’s security and emphasize the importance of the topic to the EU.</p> <p>Differentiation of overall RES targets between MS proved effective and broadly considered to be fair.</p> <p>Targets have contributed to drive down cost for RES technology, and open up more markets in the EU, facilitating further growth of the sector.</p> <p>MS level targets allow quantitative monitoring and analysis by EU and others.</p>	<p>The 10% target for the transport sector is still controversial; concerns about the sustainability and GHG benefits of the transport target are barrier for policy makers and investors.</p> <p>Investor certainty still depends strongly on MS implementation and policy stability.</p> <p>Monitoring and adequate EU intervention is hampered by the non-linear growth path followed by many MS, which makes it difficult to assess in advance whether the targets will be met.</p> <p>Some MS have met their target already and stop support, suggesting the targets limit rather than strengthen ambitions.</p> <p>Policy changes, sometimes even retroactive, in various MS jeopardise the targets and significantly impact investor security and project profitability.</p> <p>Overachieving targets is not rewarded, as long as cooperation mechanisms are not used. This hampers RES growth in various MS that have already met their target.</p> <p>The possible amount of a penalty resulting from an infringement procedure is not known in advance.</p> <p>Lack of EU level sustainability criteria for solid biomass leads to concerns about the overall benefits of the RES target in some countries.</p>
<p>4: NREAPs</p>	<p>Yes.</p>	<p>EU-wide transparency of plans and policy measures.</p> <p>Indicative trajectories useful tool to monitor progress.</p>	<p>NREAPs become outdated over time. This complicates the monitoring of more qualitative information on policies and measures.</p> <p>Limited involvement of stakeholders and public debate in MS policy making, limited public awareness of plans.</p>

Article	Effective?	Positive contributions	Key issues
6-12: Cooperation mechanism	Very limited to date, as far as the ultimate goal to achieve cost-efficiency is concerned; concerning the goal to achieve the 2020 targets, it is too early to draw definite conclusions.	Potential benefits may be significant in the longer term, and various MS are starting to explore the possibilities. Potential step forward towards European energy union.	Actual effects so far limited, only one project realised so far that probably would have materialised also without these articles. Various barriers to cooperation may exist: preference for national RES production, uncertainty about need for these mechanisms to meet the target, uncertainty about cost and cost distribution, benefits and design options, insufficient interconnector capacities and legal barriers, uncertainty about the 2030 framework.
13: Administrative procedures, RES in buildings, heating	Too early to draw conclusions, due to limited implementation in MS and lack of data.	Some MS have made good progress. There is added value in EU intervention in the area of administrative procedures, to enable knowledge sharing across MS and help develop a more unified market for renewable energy.	Most MS are still rated poorly on the quality of the administrative procedures in place. Administrative procedures continue to present a challenge for investors and developers. Key barriers: a lack of awareness and knowledge of the RED and the administrative and technological issues around RES at the local level; the lack of 'Quality One-Stop-Shopping' in many Member States; complex and/or drawn-out granting and licensing procedures; municipal sector involvement without clear rules at national level. RES in buildings: many still have to implement Article 13(4). Few MS have RES requirements in buildings written into building codes.
14: Information, certification, training	Limited so far for various reasons.	Certification and qualification schemes have been introduced to various degrees, with certification in photovoltaics most progressed. The intended outcomes still considered to be relevant.	By 2012, implementation was delayed in many MS, but up-to-date data is lacking. Training is still lacking in several MS, for various reasons: lack of incentives for installers, lack of control from public authorities, poor understanding of benefits and potential of certain RES technologies by installers. Mutual recognition of certificates between MS still challenging, due to different criteria, different training content and duration, etc.

Article	Effective?	Positive contributions	Key issues
<p>15: Guarantees of origin</p>	<p>Yes, to some extent.</p>	<p>GOs have proved to enhance transparency on renewable energy generation and to be a useful tool to reduce fraud and inaccuracies. The systems in place to avoid inaccuracy and double-counting have improved.</p> <p>Systems throughout the EU have become more standardised. GOs are a useful tool for creating a voluntary, consumer-driven market for RES.</p>	<p>There are still barriers to trade and transfer of GOs as not all Member States are members of AIB and use a system compliant with EECs.</p> <p>There remain differences in the comprehensiveness of procedures and the use of GOs.</p> <p>The effectiveness of GOs as a tradable commodity is limited by their separation from the underlying commodity (i.e. energy produced).</p> <p>The presence of other tracking systems in some MS along with GOs can create confusion and duplication.</p>
<p>16: Grid access and operation</p>	<p>– Yes, to some extent.</p>	<ul style="list-style-type: none"> <li>– Priority grid access is seen as a key provision that supports RES deployment.</li> <li>– Member State implementation is progressing.</li> <li>– Article implementation highlights further relevant burdens and challenges, which slow down the connection of RES.</li> </ul>	<ul style="list-style-type: none"> <li>– A public national investment schedule is not yet available in many cases, level of coordination is uncertain.</li> <li>– Grid capacity issues not yet overcome in all MS. As a result, priority grid access can sometimes interfere with the safety and security of the energy system.</li> <li>– Benefits of smart grids may be significant, but not yet assessed on EU level and in many MS.</li> <li>– Transparent and tracked information about national challenges and actions are not available in same detail and structure for all MS.</li> <li>– Compensation in case of curtailment is necessary, and would guarantee that risk premiums of producers can stand on a low level.</li> <li>– MS addressed the need for investments in both distribution and transmission grids through the high RES shares over the next years.</li> <li>– The coordination between TSOs and DSOs is essential, but the success is linked to the right quantitative balance between TSOs and DSOs.</li> </ul>

Article	Effective?	Positive contributions	Key issues
17-19, 21: RES in transport, biofuels and bioliquid sustainability	<ul style="list-style-type: none"> <li>- Yes, to some extent.</li> </ul>	<ul style="list-style-type: none"> <li>- Direct environmental impacts of biofuels and bioliquid production have been limited.</li> <li>- Steep learning curve with this type of policies.</li> <li>- Harmonisation of voluntary certification systems at the European level and certification of a much larger volume of biofuels in a relatively short time period has been achieved.</li> </ul>	<ul style="list-style-type: none"> <li>- Indirect effects not yet included, limiting the sustainability benefits of these provisions.</li> <li>- The delay in ILUC decision making may provide a barrier to meeting the 10% RES target in transport of Art. 3.</li> <li>- Double counting (Art. 21(2)) still not implemented in several MS, and definition of waste differs between MS despite efforts of the Commission to harmonise.</li> <li>- Limited incentive for more advanced biofuels production processes or for exceeding the minimum sustainability criteria by other means.</li> <li>- Binding sustainability criteria for solid biomass are lacking, some MS have no or limited national safeguards against unsustainable biomass in place.</li> </ul>
22-23: Reporting	Yes.	<p>The progress reports provide a regular overview of the measures taken or planned at national level, and allow the Commission and other stakeholders to monitor overall progress. It is unlikely that this level of national data reporting would have occurred otherwise.</p> <p>The effectiveness (incl. quality of the reports and data) was found to improve over time as MS bring their procedures and data monitoring in line with the progress report template.</p>	<p>A number of areas of weakness in the reporting such as information relating to administrative reforms and evidence on the impact of increased biofuel production on land use patterns. Questions not currently asked by the template could provide useful information, such as how the progress on each measure will be monitored or whether the MS has had to set up new data collection systems and processes.</p>



**Table 6** Overview of the efficiency of the various RED provisions

Article	Efficient?	Positive	Key issues
3: Targets and measures	Yes, to some extent.	Targets and support schemes have contributed to driving down technology costs for RES technologies and successfully addressed market failure in the field of innovation, which is essential in order to achieve ambitious emissions reductions in the long term. Binding national targets backed by indicative interim targets contribute to a clear and reliable RED framework whose implementation in the MS arguably has a positive effect on the administrative burden of public authorities and private stakeholders.	Efficiency benefits mainly related to the overall RES-target. Transport target less efficient due to effectiveness issues identified above, and limited innovation benefits.
4: NREAPs	Yes.	Additional administrative burden incurred by this article is limited.	-
6-12: Cooperation mechanism	Concerning target achievement, probably to some extent, but too early for more definite conclusions. Concerning cost-efficiency as ultimate goal, not effective to date (see above on effectiveness).	Administrative burden appears to be appropriate. Quantitative assessment suggests that RES importing countries in particular may gain strongly from cost savings if strong RES cooperation is pursued, since support expenditures could be reduced substantially.	Limited use of this mechanism may reduce actual benefits, and therefore also the efficiency. See the barriers identified in the previous table. Mechanism is rather considered as a complementary means to securing target achievement than as means to enhance cost-efficiency.
13: Administrative procedures, RES in buildings, heating	Insufficient data to assess the cost-efficiency of this article.	In view of the diverse levels of implementation across Member States the administrative burden and associated costs are likely to vary widely.	Data on administrative burden are lacking, and are expected to vary between the different elements of Article 13. The administrative burden and associated costs are likely to vary widely between MS as well due to the diverse levels of implementation. RES in buildings: There is limited evidence on whether the technical specifications constitute a significant barrier, nor whether they have improved as a result of the RED.
14: Information, certification, training	Probably yes, but insufficient data for a more definite conclusion.	This provision adds administrative burden for countries that did not have an appropriate certification scheme in place before, but it is expected to result in a cost-efficient approach to certification. Supporting projects such as QualiCert were helpful to reduce costs.	In some cases, certification schemes seem to be overly complex and costly. Time needed for training is costly, can be a barrier to participation due to high work load of installers. In some MS, stakeholders question whether the administrative burden of training and certification of installers is worth the effort, and conclude this area is best left to the MS.

Article	Efficient?	Positive	Key issues
15: Guarantees of origin	Probably yes.	The administrative burden seems reasonable, in view of the potential benefits, regarding reduction of fraud and double-counting, and potential cost reductions due to standardisation of procedures. EU-wide standardisation reduces barriers to investment as well as transaction cost.	Data on administrative costs are lacking. In some MS, stakeholders question whether the administrative burden of GOs is worth the effort.
16: Grid access and operation	Insufficient data to assess efficiency of this article.	The RED is ensuring a transparent and legitimate integration of RES into the grid.	The retroactive measurement of administrative burdens through the RED is challenging, but it can be expected that the implementation of rules like an auction process or documentation requires on all sides investments and new processes. The integration of RES into the market (improving cost effectiveness) is not covered.
17-19, 21: RES in transport, Biofuels and bioliquid sustainability	Probably yes.	Administrative burdens have been high for all actors in the first years of implementation to set up the system, but efforts of economic operators to prove compliance are seen as reasonable and proportional. The recognised voluntary schemes and default values for GHG emission calculation have limited the administrative burden and cost for economic operators.	The delay in ILUC decision making may increase cost of meeting the 10% RES transport target of Art. 3. Differences in implementation between MS have resulted in a higher administrative burden for economic operators active in more than one country. This also includes different interpretations of non-EU level defined definitions (e.g. waste and residues). In some MS, stakeholders question whether the administrative burden of these provisions is worth the effort, also in view of potential risks of fraud.
22-23: Reporting	Probably yes.	Administrative costs can be assumed to have increased but are considered reasonable, compared to the benefits.	Some stakeholders report that the administrative burden can be reduced, e.g. by providing more guidance on the purpose of each question, and providing a standard methodology where possible.

### 4.2.3 Added value

As can be concluded from the previous paragraphs, the increased deployment of RES in the EU is seen to have a range of positive effects on an EU-wide level, and the RED as a whole has contributed to this increase. Furthermore, for all provisions a specific added value could be identified and confirmed, with the exception of Articles 6-12, the Cooperation Mechanisms, which have significant potential added value but not yet a demonstrable effect at this point in time. The added value of these Articles is, however, expected to increase in the coming years.

The added value of both the RED as a whole and of specific provisions was found to vary between MS, typically depending on whether or not a MS would have implemented the various policies and measures also without EU intervention and on the progress achieved so far.

### 4.2.4 Conclusions

Overall, it can be concluded that:

- All articles are **relevant** for the objectives of the RED, and can have a clear **added value**. The increased deployment of RES has reduced the EU's greenhouse gas emissions, improved security of supply and created additional employment.
- A number of provisions are found to be **both effective and efficient**:
  - Article 3: Targets and measures;
  - Article 4: NREAPs;
  - Articles 17-19, 21(b): RES in transport, biofuels and bioliquid sustainability and double counting;
  - Articles 22-23: Reporting.

Most of these provisions still have potential for further improvement, though. This is especially the case for the transport target in Article 3 and Articles 17-19, where both the effectiveness and efficiency can be significantly improved if indirect effects are reduced or prevented and the EU level decision making on the ILUC proposal is sped up.

- The effectiveness and efficiency of the remaining provisions **can not yet be thoroughly assessed**, for various reasons, namely lack of data, delays in MS implementation or limited use of the provisions so far. These are:
  - Article 6-12: Cooperation mechanism;
  - Article 13: Administrative procedures, RES in buildings, heating;
  - Article 14: Information, certification, training;
  - Article 15: Guarantees of origin;
  - Article 16: Grid access and operation.

*Articles 6-12* have been only used in one occasion so far:

There is little doubt that these mechanisms could have significant added value once they are used more and it is quite possible that MS will start to apply the cooperation mechanism closer to 2020. Especially the use of the joint project mechanism strongly depends on having a reliable long-term framework for RES beyond 2020 that includes a continuation of these provisions.

Achieving the full potential of *Article 13* proves to be quite challenging and complex, as progress in removing administrative procedures continues to present a challenge in many MS. This article requires involvement and action of many stakeholders and government (national and local) authorities as well as the development and implementation of processes



and procedures. Some MS have made good progress but others are still at the beginning.

The findings regarding *Article 14* are somewhat similar: the article is relevant and it has the potential to facilitate a more coherent market for RES throughout the EU, but implementation is delayed in many MS and a number of barriers and issues can be identified.

*Article 15* has a number of positive effects (e.g. improving transparency, reducing fraud and double counting) and there is value in having a consistent approach at EU level. This consistency reduces barriers to investment (because the market has confidence in the integrity of the GOs across a standardised system) as well as transaction costs (because of the efficiency of common rules)...

The effectiveness and efficiency of *Article 16* is difficult to assess thoroughly, in part because of a lack of data and an often non-transparent process, but also because increasing grid capacity is a long-term effort, with many more issues to consider besides renewable energy growth. Priority grid access is, however, considered by many to be a key element of RES policy.

- Actual data on added value, effects and administrative cost are often lacking. In some cases, especially where (potential) benefits are significant, a qualitative assessment of effectiveness and efficiency can still be made. A more quantitative assessment would require a much more detailed and in-depth study of the effects and cost supported by MS actual monitoring and reporting on the administrative efforts needed for the various provisions (which would in itself increase the administrative costs associated with this directive).
- Some provisions have relatively high administrative costs in the first years of the RED, as processes and procedures have to be designed and put in place. Once these are operational, administrative cost for operation of the system are likely to be much lower and the benefits increase. This is the case for Articles 13 to 19, but also for the monitoring and reporting requirements of Articles 4 and 22-23.
- Some provisions could be identified, namely Articles 13 and 14, where both the effectiveness and the administrative costs vary significantly between MS.

### 4.3 Best practices

From this analysis, a number of best practices can be derived. What type of provisions work best, and what can be concluded from that? This may then contribute to the identification of possible solutions to key issues that were identified with other provisions.

Note that as this study focusses on the RED regulation itself and not on the Member State implementation as such, this section focusses on best practices related to the RED provisions itself, not to Member State implementation and policy measures.

Looking at the key findings from both article assessments and country case studies, the following best practices can be identified.

**1. Provisions are most effective and efficient if they are both mandatory and well defined**

Looking at what the articles that are generally found to be both effective and efficient have in common, it can be concluded that they are all mandatory and specific: the targets and measures (Art. 3), the obligation to submit a NREAP (Art. 4), the priority or guaranteed access to the grid (Art. 16.2.b), the biofuels sustainability criteria (Art. 17-19, 21)<sup>16</sup> and the reporting obligations of Art. 22-23. These are all example of provisions that include specific and well defined definitions, as well as equally clear obligations.

Notably, many of the key issues identified with these articles are related to specific parts in these articles that are less well defined. For example, the lack of a specific definition of waste and residues was found to reduce the effectiveness of Art. 21(2).

Likewise, some articles that could not yet be found to be effective and efficient have in common that they are less well defined and/or do not contain a specific obligation to MS. The guidelines for certification and qualification are not always sufficiently concrete in Art. 14, and a number of provisions of Art. 13 leave room for interpretation by the MS.

A notable advantage of these mandatory and well defined provisions is that progress can be effectively monitored and reported, and implementation is found to progress relatively well without too much delays due to political debate about interpretation or definitions.

**2. Provisions that set targets and regulations that can be achieved by the higher level (e.g. national) authorities are likely to be more effective and efficient than provisions that require specific actions at lower level**

The most successful provisions of the RED require action and involvement of the governments at national level and only a limited number of other stakeholders.

Some MS struggle with Article 13 due to a lack of awareness and knowledge at the municipal level at which this article needs to be implemented. It is further hindered by the fact that the EU is unable to effect change in the local planning system of MS.

In case of Article 14, for example, installers need to participate in certification schemes and training. Meeting these goals is hampered by a lack of incentives and poor understanding of the aims and objectives at that level. This shows that articles that involve actions at regional or city level, or from a large number of stakeholders require more thought to allow for an effective and efficient implementation. It may not be fair, however, to simply conclude that these types of provisions are superfluous and inefficient by definition. If effective realisation at this level is realised this does potentially speed up the realisation of the objectives of the RED.

**3. Provisions are most effective and efficient if the relevant rules and regulations are set from the beginning (or soon after) and stable during the duration of the regulation**

The sustainability criteria (Art. 17-19) demonstrate the potential negative impact of leaving uncertainties in the directive. The market needs a stable and clear long term outlook, especially in a policy driven market such as biofuels. The uncertainties regarding when and how ILUC is included in the sustainability criteria is found to hamper meeting the 10% transport target effectively and efficiently, as Member States wait for these decisions before putting in place longer term policies, and biofuel producers, car

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<sup>16</sup> With the exception of the ILUC provision in art. 19.4.

manufactures and other investors remain uncertain about the profitability of investments in R&D and new production capacity.

#### 4. EU level involvement in sustainability certification of specific commodities can be effective

The biofuels and bioliquids sustainability criteria (Art. 17-19) have demonstrated that EU level certification systems (voluntary schemes) can be very effective and an efficient means to reduce environmental impacts of the feedstock used. The process developed is market driven, efficient (as it reduce administrative cost at both MS and industry level) and ensures EU-wide harmonisation of the market.

### 4.4 Key issues: could they be resolved by EU-intervention?

A number of key issues and barriers could be identified for each of the RED articles analyses, as shown in tables Table 5 and Table 6. Resolving these can further improve the effectiveness, efficiency and added value of the RED as a whole, and of the individual provisions.

This section aims to identify potential solutions to address these key issues and remove the barriers, where the following solution categories can be distinguished:

- Some of these issues may best be resolved on **MS level**, there is no need for EU intervention.
- Some issues might also best be resolved on MS level but the EU might facilitate this by **identifying and communicating best practices in policy measures and implementation** from across the EU, to allow other MS to learn from these.
- Some may benefit from additional or different (modified) **guidelines** by the Commission.
- Other issues may best be addressed by **changing the regulation** on EU level.

This study focusses on options for interventions on EU level. The first category, solutions that do not need EU intervention, is outside the scope.

As the issues and barriers are typically very specific for each article, they will each be discussed in the following<sup>17</sup>.

Note that the aim of this section is to make an overview of the potential solutions for issues. The section does not contain an assessment of these options and the lists are not intended to indicate preferences or priorities. The overview is based on suggestions and recommendations found during the literature review, on the suggestions for improvements made by the stakeholders during the interviews, and suggestions from the experts in the project team.

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<sup>17</sup> The key issues identified earlier are repeated here for clarity.



#### 4.4.1 Article 3: Targets and measures

##### Key issues

- The 10% target for the transport sector is still controversial; concerns about the sustainability and GHG benefits of the transport target are a barrier for policy makers and investors.
- Investor certainty still depends strongly on MS implementation and policy stability.
- Monitoring and adequate EU intervention is hampered by the non-linear growth path followed by many MS, which makes it difficult to assess in advance whether the targets will be met.
- Some MS have met their target already and stop support, suggesting the targets limit rather than strengthen ambitions.
- Policy changes, sometimes even retroactive, in various MS jeopardise the targets and significantly impact investor security and project profitability.
- Overachieving targets is not rewarded, as long as cooperation mechanisms are not used. This hampers RES growth in various MS that have already met their target.
- The possible amount of a penalty resulting from an infringement procedure is not known in advance.
- Lack of EU level sustainability criteria for solid biomass leads to concerns about the overall benefits of the RES target in some countries.
- Efficiency benefits are mainly related to the overall RES target. The transport target is less efficient due to the effectiveness issues identified above, and limited innovation benefits.

##### Potential solutions

- Close monitoring of MS progress in the coming years. Monitor not only RES growth and policy implementation in the previous years but also require MS to specify their plans for the coming years regarding policy measures and RES developments (e.g. via modifying the MS progress reporting obligation of Art. 22).
- A speedy EU level decision regarding the ILUC proposal, followed by speedy implementation at MS level. This decision should be sufficiently robust to improve the sustainability of the biofuels that count towards the target, and provide longer term certainty about these policies, to restore the confidence of investors and other stakeholders.
- Provide a clear and well-defined outlook for the expected growth of RES in transport beyond 2020, in line with the Transport White Paper. Ensure that robust and effective long-term sustainability criteria for biofuels and bioliquids are integrated in the post-2020 policy framework. Put more weight on reducing energy demand in transport as an alternative and potentially more cost effective means to reduce GHG emissions and fossil fuel use in the sector.
- Enhance investments in advanced and low or no-ILUC risk biofuels with subtargets that increase over time.
- Investor security in the transport fuels and biofuels sector could be improved by adding separate minimum targets for petrol and diesel fuels.
- Ensure a more linear growth path, e.g. by including binding intermediate targets as in the Effort-Sharing Decision, or by providing incentives to MS that achieve this.
- Provide incentives for overachieving targets, for example by offering financial benefits (e.g. from the ETS revenues, R&D funding, etc.), by strengthening the role of the cooperation mechanisms (e.g. by making their use obligatory in case of underachievement, or by setting effective penalties for not meeting targets).





- Include a provision in the regulation that specifies the penalties for not meeting targets.

#### 4.4.2 Article 4: NREAPs

##### Key issues

- NREAPs become outdated over time. This complicates the monitoring of more qualitative information on policies and measures.
- Limited involvement of stakeholders and public debate in MS policy making, limited public awareness of plans.

##### Potential solutions

- Expand the requirements of the progress reports (Art. 22-23), to ensure that these encompass all relevant changes in policies, measures and targets since the NREAPs were submitted.
- Require the MS to indicate in the progress reports how they score compared to the plans and projections in the NREAP and explain the differences. When explaining the differences between realisation and projection in the NREAP they should distinguish between deviations from the projections caused by internal parameters (such as the speed of implementation of a specific policy) and external parameters (such as the price for fossil fuels).
- Require MS to submit an updated NREAP every four years, adhering to the same requirements set to the first NREAPs.
- Set up a more interactive planning process, for example comparable to the European semester system.

#### 4.4.3 Article 6-12: Cooperation mechanism

##### Key issues

- Mechanism is rather considered as a complementary means to securing target achievement than as means to enhance cost-efficiency. With only one project realised so far, Articles 6-12 have not proven effective as far as the objective of cost-efficiency is concerned. Concerning the objective of target achievement, cooperation may speed up shortly before 2020, so it is too early to assess effectiveness.
- Various barriers to cooperation may exist (preference for national RES production, uncertainty about cost, benefits and legal barriers, uncertainty about the 2030 framework).
- Limited use of this mechanism may reduce actual benefits, and therefore also the efficiency.

##### Potential solutions

- The EU should provide certainty over the 2030 framework. Mandatory national targets beyond 2020 or some other form of effective governance, in combination with continuation of the cooperation mechanism, would provide a favourable basis for joint projects, since target achievement appears to be the MS' main interest in cooperation mechanisms so far.
- Moreover, the EU may provide for more information and guidance in order to address barriers, e.g. on design options and cost-benefits measurement methods.
- Learn from the ongoing cooperation project between Norway and Sweden, ensure other MS are aware of potential benefits and of the process to arrive at a successful cooperation.
- Oblige the use of these mechanisms in certain situations, for example if MS fail to meet interim targets.





#### 4.4.4 Article 13: Administrative procedures, RES in buildings, heating

##### Key issues

- Key barriers: a lack of awareness and knowledge at the local level; the lack of ‘Quality One-Stop-Shopping’ in many Member States; complex and/or drawn-out granting and licensing procedures; municipal sector involvement without clear rules.
- RES in buildings: many still have to implement Article 13(4). There is limited evidence on whether the technical specifications constitute a significant barrier, nor whether they have improved as a result of the RED.
- Few MS have RES requirements in buildings written into building codes.
- The administrative burden and associated costs are likely to vary widely due to the diverse levels of implementation in the MS.
- The administrative and planning systems are very diverse across the EU and decisions about RES are usually made at the local level. While some MS have made good progress with streamlining their procedures other MS have done very little so far.
- Social acceptance of RES is a significant barrier in many MS and the localised nature of the planning process can be affected by this through reluctance of municipalities to grant planning permission and slowing down the processes due to appeals from the community.
- This article should be regarded in line with implementation of RES within the framework of the EPBD. To meet the requirements of this article it is sufficient if RES are mentioned in the implementation of the EPBD on the national level.

##### Potential solutions

- Provide information on the characteristics of quality One-stop-shopping to help MS to translate this to their situation on the municipal level. Note that even if there is no ‘one-stop-shop’ permitting procedures can be very lean even though several administrations must be involved like for instance in Ireland (Ecorys 2010).
- A public benchmarking tool could allow MS to assess their own procedures and compare them against those of other MS in order to learn from those who perform well.
- The second half of Article 13 overlaps with the EPBD. Since the EPBD is the main EU regulation targeting the sustainability of construction including the use of RES this part of Article 13 might be abolished.
- Organise an exchange forum for industry and Member States to facilitate learning and best practices exchange.
- Provide more guidance from the Commission on the specific steps that Member States can take to improve local planning processes;
- Create a public benchmarking tool that allows MS to compare their own procedure against other MS’ (e.g. monitoring of lead times per technology, number of administrative bodies involved).
- Make the requirements more specific, e.g. by defining the maximum duration of administrative procedures for RES permits (distinguishing between different technologies).



#### 4.4.5 Article 14: Information, certification, training

##### Key issues

- By 2012, implementation was delayed in many MS, but up-to-date data is lacking.
- Training is still lacking in several MS, for various reasons: lack of incentives for installers, lack of control from public authorities, poor understanding of benefits and potential of certain RES technologies by installers.
- Mutual recognition of certificates between MS still challenging, due to different criteria, different training content and duration, etc.
- In some cases, certification schemes seem to be overly complex and costly.
- Time needed for training is costly, can be a barrier to participation due to high work load of installers.
- In some MS, stakeholders question whether the administrative burden of training and certification of installers is worth the effort, and conclude this area is best left to the MS.

##### Potential solutions

- To encourage training and certification Member States could run awareness campaigns among consumers about the existence and benefits of certificates, and make relevant information more easily accessible.
- Eligibility for subsidies could be made conditional on installations by certified installers. Also a link to warranties of equipment or insurances could be considered. Such obligations must not, however, result in impeding installers to offer their services in other MS, and would thus magnify the challenge of mutual recognition and the need for harmonisation of skill levels.
- Upcoming installers could be obliged to obtain certification or qualification. The qualification could form an obligatory part of vocational training.
- The guidelines for certification or qualification training should be more specific as to the depth and length of training. However, this should take into account past and ongoing efforts in MS, as some already have well organised certification and training in place.
- As soon as a European norm has been developed this should be recognised by all Member States.

#### 4.4.6 Article 15: Guarantees of origin

##### Key issues

- There are still barriers to trade and transfer of GOs as not all Member States are members of AIB and use a system compliant with EECS.
- There remain differences in the comprehensiveness of procedures and the use of GOs.
- The effectiveness of GOs as a tradable commodity is limited by their separation from the underlying commodity (i.e. energy produced).
- The presence of other tracking systems in some MS along with GOs can create confusion and duplication.
- Data on administrative cost are lacking.
- In some MS, stakeholders question whether the administrative burden of GOs is worth the effort.

### Potential solutions

- Only allow the GO to be sold in connection with the energy stream it is connected to abolish the disconnection between energy generation and GO.
- Continue to stress the importance of MS to move towards a GO system based on the European Energy Certificate System (EECS) operated by the Association of Issuing Bodies (AIB).
- The continued standardisation of the GO system at EU level - following the Best Practice Recommendations formulated by RE-DISS I and any further recommendations from RE-DISS II<sup>18</sup> seems to be the best way to maximise the potential benefits from this article. They include: extending the use of GOs for all types of power generation; streamlining the use of tracking mechanisms at MS level; clarifying the relation between their support schemes and the tracking systems used for purposes of disclosure.
- Link the different MS databases and/or create one common register which would reduce costs and be a decisive step in establishing a truly single market at EU level.
- Establish clear criteria for the recognition of imported GOs, including the accepted electronic interfaces for import and the required data format and content of the GOs.
- Investigate the possible extension of the use of GOs beyond RES-E and high-efficient cogeneration (HE cogeneration) to all types of power generation i.e. including electricity from fossil and nuclear generation.
- Early communication of continuity of the GO system beyond 2020 is important as otherwise, they will lose credibility and the market will gradually taper off.

#### 4.4.7 Article 16: Grid access and operation

##### Key issues

- A public national investment schedule is not yet available in many cases, level of coordination is uncertain.
- Grid capacity issues not yet overcome in all MS. As a result, priority grid access can sometimes interfere with the safety and security of the energy system.
- Benefits of smart grids may be significant, but have not yet been assessed on EU level and in many MS.
- Transparent information about national challenges and actions is not available in the same detail and structure for all MS.
- Compensation in case of curtailment is necessary and would guarantee that risk premiums of producers can remain at a low level.
- The retroactive measurement of administrative burdens through the RED is challenging, but it can be expected that the implementation of rules like an auction process or documentation requires investments from all stakeholders and new processes.
- The integration of RES into the market (improving cost effectiveness) is not covered.

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<sup>18</sup> RE-DISS I and II stand for Reliable Disclosure Systems for Europe Phase I and Phase II, projects partly funded by Intelligent Energy Europe.



### Potential solutions

- Assess overlap with other EU level grid regulation. The implemented EU regulation should always guarantee that RES grid access is transparent and free from discrimination.
- Each MS should commission a study assessing the benefits of smart grids on distribution grid level. In case of net social-economic benefits the national authorities should consider sufficient incentives to use those smart technologies.
- The Commission should require an overview of challenges and planned actions on a national level of each MS as part of the NREAP and progress reports.
- Some of the provisions can be made more specific to enable better monitoring, reporting and enforcement, for example, by setting specific deadlines.
- Transparent and regular reports about challenges faced by the implementation of Article 16 might provide further feedback and opportunities to steer measures and actions to solve the identified issues and adapt the (post 2020) provisions to future needs.
- The reporting about burdens and challenges might be improved. The existence of burdens and challenges is acknowledged by several reports and studies, but the range of results differ and therefore the options to improve the article and their measures.
- Due to the necessity of network investments, triggered significantly by the development of RES, it is reasonable to allow and coordinate the usage of smart technologies to reduce the investment needs.
- Recognise the importance of further development of the DSO level and smart grids to the further growth of RES at local level.
- In the post-2020 policy, the provisions should be adapted to the current context and become more detailed, so that they take into account the increased shares of RES and address the resulting increased requirements to facilitate RES, to integrate it in the system and to adapt the grid accordingly.

#### 4.4.8 Article 17-19, 21: RES in transport, biofuels and bioliquid sustainability

##### Key issues

- Indirect effects not yet included, limiting the sustainability benefits of these provisions. The delay in ILUC decision making may provide a barrier to meeting the 10% target of Art. 3.
- Not all direct environmental impacts are covered, e.g. water pollution by waste water.
- Double counting (Art. 21(2)) still not implemented in several MS, and definition of waste differs between MS despite efforts of the Commission to harmonise.
- Limited incentive for more advanced biofuels production processes or for exceeding the minimum sustainability criteria by other means.
- Obligatory sustainability criteria for solid biomass are lacking, some MS have no or limited national safeguards against unsustainable biomass in place.
- The delay in ILUC decision making may increase cost of meeting the 10% transport target of Art. 3.
- Differences in implementation between MS have resulted in a higher administrative burden for economic operators active in more than one country. This also includes different interpretations of non-EU level defined definitions (e.g. waste and residues).



- In some MS, stakeholders question whether the administrative burden of these provisions is worth the effort, also in view of potential risks of fraud.

### Potential solutions

- A speedy EU level decision regarding the ILUC proposal, followed by speedy implementation at MS level. This decision should be sufficiently robust to improve the sustainability of the biofuels that count towards the target, and provide longer term certainty about these policies, to restore the confidence of investors and other stakeholders.
- A common definition of what type of biofuel sources should be counted double in Art. 21(2). This could be implemented in combination with the ILUC decision, as is currently proposed. Ensure that this list of biofuel sources is robust, and does not cause any undesired (direct or indirect) effects.
- Increase the incentives for more advanced biofuels production processes, e.g.:
  - Via a post-2020 framework for the sustainability criteria for biofuels, incl. for example a phasing out of biofuels that compete with the food sector and/or have a high risk of significant ILUC effects.
  - Define subtargets on EU level or encourage MS to set a minimum level for advanced biofuels, in the ILUC regulation and post-2020 policy.
  - Encourage industries by awarding significant prices to the first consortium that is able to realise large scale production of advanced biofuels under a certain price per volume and an even higher price for the first consortium that is able to realise advanced biofuels for an even lower price. This is the method widely applied in the VS to realise this type of developments. The required budget could be raised by reducing strongly the number of CO<sub>2</sub> certificates and selling a part of that back to the market (CCAP, 2013<sup>19</sup>).
  - Review the sustainability criteria, and add or modify provisions if necessary (e.g. add a criterion on waste water quality).
  - Add obligatory sustainability criteria for solid biomass.

#### 4.4.9 Article 22-23: Reporting

##### Key issues

- A number of areas of weakness in the reporting such as information relating to administrative reforms and evidence on the impact of increased biofuel production on land use patterns.
- Questions not currently asked by the template could provide useful information, such as how the progress on each measure will be monitored or whether the MS has had to set up new data collection systems and processes.
- Some stakeholders report that the administrative burden can be reduced, e.g. by providing more guidance on the purpose of each question, and providing a standard methodology where possible.

##### Potential solutions

- The template could be enhanced by clarifying the questions where necessary, and by requiring more information, e.g. on progress monitoring and on expected cost of measures.
- For progress monitoring, the measures table should include a column on how progress against each measure will be monitored, the frequency and

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<sup>19</sup> The New Deal: An Enlightened Industrial Policy for the EU through Structural EU-Emissions Trading System Reform, February 2013 | Tomas Wyns director CCAP Europe.



format of monitoring, and how this will be reported and evaluated.

This should give a much deeper understanding of how MS plan to track their progress against each reported measure, and provide potential areas of knowledge exchange across similar measures or approaches.

- On the expected cost of measures, an additional column could be added to the measures table, requiring MS to give an estimated cost for each measure identified. Again, this could provide a learning opportunity for MS with similar measures but differing cost estimates.
- To address the comments from the Commission report<sup>20</sup> on MS' progress regarding missing information on administrative reforms, a potential solution is to improve the guidance given to MS regarding the expectations for this information. MS reports should also undergo a review and approval process to ensure that progress reports are submitted with all sections completed.

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<sup>20</sup> Renewable energy progress report, COM(2013) 175 final.



# 5 Conclusions and recommendations

## 5.1 Conclusions

### 5.1.1 Regulatory fitness

- All articles are relevant for the objectives of the RED, and can have a clear added value. Overall, administrative costs related to the RED seem reasonable.
- A number of provisions are found to be both effective and efficient:
  - Article 3: Targets and measures;
  - Article 4: NREAPs;
  - Articles 17-19, 21(b): RES in transport, biofuels and bioliquid sustainability and double counting;
  - Articles 22-23: Reporting.
- Most of these provisions still have potential for further improvement, though. This is especially the case for Articles 17-19 where the effectiveness can be significantly improved if indirect effects are included and the EU level decision making on the ILUC proposal is sped up.
- The effectiveness and efficiency of the remaining provisions cannot yet be thoroughly assessed, for various reasons, namely lack of data, delays in MS implementation or limited use of the provisions so far. These are:
  - Article 6-12: Cooperation mechanism;
  - Article 13: Administrative procedures, RES in buildings, heating;
  - Article 14: Information, certification, training;
  - Article 15: Guarantees of origin;
  - Article 16: Grid access and operation.
- When assessing effectiveness and efficiency of provisions, it is important to distinguish between long term and short term. Typically, benefits increase over time<sup>21</sup>, whereas a number of provisions were identified where administrative costs are relatively high in the beginning, but reduce significantly over time.
- This is typically the case if processes and procedures need to be developed to fully implement the provision. Once operational, the administrative costs reduce. Examples are the biofuels and bioliquids sustainability criteria (Articles 17-19) and the various procedures that are to be set up for Articles 13 and 14.
- Administrative costs are typically not monitored and reported by the MS, neither for the RED as a whole nor for the individual provisions. This makes a quantitative assessment in the context of REFIT difficult. A qualitative assessment is, however, feasible, for the provisions that are successfully implemented and in use.
- Assessing the effect and added value of the various provisions is not always straightforward, as this requires well-founded assumptions of what would have happened without the RED.
  - All provisions have a demonstrable effect, perhaps with the exception of Articles 6-12 (cooperation mechanisms) at this point in time.

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<sup>21</sup> Even quite abruptly at some point in time, as may be the case with the cooperation mechanisms, closer to 2020.





- For some provisions, this effect is clear and well-defined. For example, it is safe to assume that an EU-wide biofuels sustainability criteria system would not have been in place now without the RED, and that the MS would not report on their RES progress as they now do without Articles 22-23.
  - For the overall RES target it is more difficult to draw clear conclusions at this stage, before knowing whether the 2020 targets will actually be met. Nevertheless, having a binding target in place appears to be justified in view of providing relative certainty to investors as well as confirm the overall importance of meeting the target to the EU's climate policies, security of energy supply, employment and regional development. In particular, with rising deployment costs, binding targets force MS to improve their allocation of resources instead of simply lowering their renewable energy deployment ambitions. These effects are, however, difficult to quantify.
- Even though the specific contribution of the RED to the RES developments in the EU can not be quantified with certainty, the deployment of RES has increased significantly in the past decade, as shares have increased from 8.7% in gross final consumption in 2005 to approximately 14.9% in 2013. This has reduced greenhouse gas emissions in the EU by about 8% in 2013 (388 Mton CO<sub>2</sub>, compared to the RES production level in 2005) and has had a positive net effect on employment.

### 5.1.2 The RED's contribution to Renewable Energy deployment on EU level

- The RED is seen by most stakeholders as a key contributor to EU-wide renewable energy deployment, in particular:
- the mandatory targets are an important driver to RES policies and investments in many MS;
  - the planning, monitoring and reporting obligations have enabled quantitative analyses and transparency;
  - the grid access and operation provisions are crucial to RES growth in many MS;
  - the biofuels sustainability criteria effectively reduce direct impacts of the biofuels used in most of the EU.
- The resulting EU-scale energy system transformation is therefore more cost efficient than a transformation on a smaller scale. Two different drivers for cost reduction can be identified:
- a Larger scale deployment of renewable energy technologies leads to cost reductions and technological innovation due to learning curves, larger R&D budgets, etc.
  - b Neighbouring countries can cooperate to achieve a more cost effective energy system. Harmonisation and optimisation of policies and regulations helps in this respect, and more gains can be made by using the cooperation mechanisms of the RED, e.g. joint projects - tools not yet used by most MS, but with longer term potential.
- In various MS, implementation of the RED resulted in efforts to optimise the bureaucratic system and create a more transparent and efficient administrative system.
- A number of issues and potential solutions were identified for all articles of the RED - they all have the potential for further improvements.
- Nevertheless, as stable policies are key to investor security and therefore to the effective and efficient achievement of the 2020 targets, it may be concluded that as a matter of principle, the current provisions should not be modified (i.e. improved). Remaining technical and administrative barriers are less relevant in comparison to the uncertainty that could result from changes to the political and legal framework.





- Meeting the mandatory transport target effectively and efficiently is hampered by the delay in the ILUC decision making process. Many MS biofuels policies for the coming years still need to be decided on, as the governments wait for the EU level decision, hampering investments in the biofuels sector as the demand and market outlook is not yet clear.
- Continuation of the various RED provisions in the post 2020 climate and energy policy package can be seen to be key to the effectiveness and efficiency of these provisions in the coming years. A quantitative outlook on renewable energy growth beyond 2020 in the various MS in all sectors, as well as clarity regarding the role of the cooperation mechanisms after 2020 can provide a boost to both investments and cross-border cooperation.
- From this RED mid term review, a number of best practices were identified:
  - provisions are most effective and efficient if they are both mandatory and well defined;
  - provisions that set targets and regulations that can be achieved by the higher level (e.g. national) authorities are likely to be more effective and efficient than provisions that require specific actions at lower level;
  - provisions are most effective and efficient if the relevant rules and regulations are set from the beginning (or soon after) and stable during the duration of the regulation;
  - EU level involvement in sustainability certification of specific commodities can be effective.

Therefore, EU level renewable energy policy is most effective and efficient when mandatory, stable and well defined, and when it addresses national level actions and policies. This allows progress to be monitored and both MS and EU level governance.

- Harmonisation of regulation at MS level is an important element of the RED, namely of Articles 13, 14, 15 and 17-19. The effects of Articles 13 and 14 have been limited so far, and stakeholders' expectations of their potential varies. Full implementation of these articles in all MS will take time, so it is too early to assess their value at this point. There is less doubt about the value of harmonisation of guarantees of origin (Art. 15) and biofuels sustainability criteria (Art. 17-19).
- Some barriers to RES deployment are technical, such as limited grid capacity which leads to concerns about safety and security. Political will in MS is also crucial, but more difficult to address. Raising public awareness of benefits (energy security, job creation, economic growth, etc.) can help in this respect, at both MS and EU level.
- RES deployment in the EU is not only affected by the RED, but also by a range of other EU policies, notably the State Aid guidelines, the European Emission Trading System (ETS), the Fuel Quality Directive (FQD), energy infrastructure policies such as the trans-European energy networks (TEN-E) regulation and guidelines, policies related to fossil fuels and any potential future regulations and guidelines on issues such as energy storage, capacity markets, energy taxation, etc. They all have an impact on RES deployment and growth, and on the effectiveness and cost of the RED provisions and their national implementation. Likewise, in many cases the RED affects these policies as well. Streamlining and adapting these policies over time to take into account RES growth throughout the EU can therefore be an important contribution to further effective and efficient RES deployment.



### 5.1.3 Effectiveness and efficiency of provisions may vary significantly throughout the EU

- Some provisions may have little added value in some MS, but a significant effect in others.
  - for example, RES capacity would probably have increased in Germany and Denmark at this rate also without an EU target, whereas in MS with low renewable energy ambitions, the RED can be considered to be a key driver in RES capacity development;
  - these provisions may therefore still have a significant impact on an EU level, on capacity building throughout the EU, furthering the EU internal market, regional development and/or harmonisation of processes, even though their impact on the 2020 EU level target may be small.
- In some MS, the mandatory target was seen to limit ambition rather than be a driver for continued and stable RES support. For example, Bulgaria stopped support for new RES projects after already meeting its 2020 target recently and the Estonian government is planning to reduce support for the same reason.
- Administrative cost of some provisions, namely Articles 13 and 14 and to a lesser extent also Article 15, vary between MS, mainly due to differences in implementation and starting point.
- It is sometimes difficult for stakeholders or the public to distinguish whether issues such as administrative burden or cost of RES policies is due to the RED or rather due to the MS' implementation of the RED. Stakeholders sometimes seem to blame the EU for issues that are actually due to MS policies, which could be resolved successfully by MS themselves. To ensure continued support of these EU policies throughout the EU, it can therefore help to clarify this difference, to highlight best practices in MS policies and to illustrate the benefits of EU level policies (e.g. cost efficiency, job creation and economic growth, GHG reduction, etc.).

### 5.1.4 The importance of post-2020 climate and energy policy

- The effectiveness and efficiency of almost all the RED provisions can be enhanced by putting a stable post-2020 policy in place that includes a continuation of these measures as well as a clear governance system. This conclusion holds for all provisions, with the possible exception of Articles 4 (NREAPs) and Articles 22-23 (reporting):
  - a stable longer term outlook will enhance investor certainty as well as increase the incentive for stakeholders and government authorities (including the many local and regional governments involved in, for example, Articles 13 and 14) to put in the effort needed;
  - the initial effort and cost of setting up the procedures and processes is then offset by much more long term and therefore overall higher benefits.
- A range of issues with the current RED provisions were identified in this study, and compiled in Section 4.4. Together with the best practices given above, these can be valuable learning points for the 2030 climate and policy package. Potential solutions to the issues were identified, however, without assessing in detail which actions to take, as this was outside the scope of this study.
- The mandatory transport target is a key driver for biofuels deployment in various MS. There are fears that discontinuation of that target after 2020 will lead to a strong decline again, resulting in significant investor insecurity in these countries.
- The cooperation mechanisms have significant potential for cost reduction of RES growth in the EU, but have rarely been used so far. Cooperation



over a larger region allows more cost effective projects to be developed for the supply of RES, for example utilizing the most attractive wind, solar or biomass locations. Strengthening the role of these mechanisms in the 2030 framework could thus help to reduce cost and increase RES investments and capacity, both at EU and MS level.

- As RES is often utility-driven and decentralised, the 2030 framework could do more to recognise the role and benefit of small producers, as well as related DSO regulation.

## 5.2 Recommendations

### 5.2.1 General recommendations

- Despite the issues identified above, it is recommended not to make any changes to the RED provisions before 2020. As this mid term review concludes that overall, the RED proves to be effective and efficient, it can be considered to be best to maintain policy stability, which is key to investor security and therefore to both meeting the 2020 targets and future efficient RES growth.
- As an exception to the rule, in order to facilitate meeting the 10% transport target in 2020 effectively and efficiently, the indirect land use change (ILUC) proposal related to Art. 19.6 should be decided on as quickly as possible.
- A number of provisions could benefit from additional guidelines from the Commission, see the more detailed recommendations in the following paragraph.
- It is further recommended to decide on the longer term framework for renewable energy regulation in the EU well before 2020, to provide clarity on market outlook and on continuation of the current RED provisions beyond 2020. This framework can take the learning points from the RED, both the best practices as well as key issues identified in this study. It should also be adapted to changing circumstances, such as higher shares of RES and cost reductions. This would ensure a seamless and efficient transition from the 2020 to the 2030 policy package, which will strengthen the current regulation and support, and encourage investments in RES throughout the EU.
- Key elements of any post-2020 RES framework should be the following:
  - a clear governance structure, based on well defined targets and objectives, and effective monitoring and reporting;
  - stable policies, to enhance stakeholder and investor security in all sectors involved (energy producers and providers in electricity, heat and transport sectors, infrastructure stakeholders on the various grid levels and consumers);
  - increase the value of cross border cooperation, for example via joint projects and other cooperation mechanisms;
  - continuation of grid access and operation provisions;
  - continuation of biofuels sustainability criteria, preferably with criteria for solid biomass added.
- Continue to ensure effective alignment of the various EU regulations that affect RES deployment, notably State Aid guidelines, the Emission Trading System (ETS), the Fuel Quality Directive (FQD), energy infrastructure policies such as the trans-European energy networks (TEN-E) regulation and guidelines, policies related to fossil fuels and any potential future regulations and guidelines on issues such as energy storage, capacity markets, energy taxation, etc. These regulations affect each other, and



- can thus create either barriers or support to effective and efficient RES deployment in the EU.
- It is recommended to continue efforts to raise public awareness of the overall importance and benefit of RES regulation and inform the public about objectives and benefits (including energy security, job creation and economic growth). Public and political support is a crucial prerequisite to efficient RES policies and deployment at MS level.
  - Continue close monitoring of progress towards the targets and objectives of the RED. Because of the non-linear growth path expected in many MS, this may be quite challenging in the coming years.

## 5.2.2 Specific recommendations per article/topic

### Article 3: Targets and measures

- Closely monitor MS progress in the coming years, and speed up the ILUC decision making process to support the 10% transport target.
- The binding MS targets have proven to be an important driver for RES deployment in many MS, and can be seen to provide a clear governance system as well as a quantitative market outlook. If this approach is discontinued after 2020, provisions that achieve these effects by other means should be put in place.
- If the current approach of a separate RES target for transport is discontinued after 2020, other options to support RES, enhance investor security and encourage innovations in that sector should be assessed. These are likely to be crucial prerequisites to reducing transport sector GHG emissions in the future, in line with the Transport White Paper (COM(2011) 144 final) and the Energy Roadmap 2050 (COM(2011) 885/2).
- Regarding post-2020 regulation, assess potential options to encourage and reward front runners in the EU.

### Article 4: NREAPs

- Continue efforts to enhance the transparency of MS policies and targets beyond 2020. This could include requiring NREAPs for that period, taking lessons about the current NREAPs into account, and making sure that MS progress reports also provide up-to-date information about policy progress and modifications to earlier plans.
- Assess options to improve stakeholder involvement and public debate at MS level. Potential options might be to add an obligatory consultation process at MS level, or to use a more interactive planning approach using the European semester as an example.

### Article 6-12: Cooperation mechanisms

- Strengthen the role of these mechanisms in the post-2020 policy framework, not just as a means to meet a target but also to reduce RES deployment cost and to seize opportunities for cross-border cooperation. This should be decided on as early as possible, as this may have a positive effect on the use of these articles already before 2020.
- Consider providing more information and guidance on these provisions to address any barriers that MS perceive. Learn from the ongoing cooperation project between Norway and Sweden.

### Article 13: Administrative procedures, RES in buildings, heating

- Provide more guidance on the characteristics of quality one-stop-shopping to help MS translate this provision to their situation on the municipal level.
- Facilitate learning and best practice exchange, for example, by providing a public benchmarking tool or by organising a forum for industry and MS.

- Continue to monitor progress. Implementation of this article takes time, more specific conclusions on effectiveness and efficiency can be drawn as implementation progresses in the coming years.
- In the 2030 regulation, consider making the requirements of these provisions more specific and measurable, for example, by defining the maximum duration of administrative procedures for RES permits (distinguishing between different technologies).
- Given limited evidence that RES in buildings is being taken up for building codes, and that public sector RES in buildings is mostly limited to refurbishment works, it would seem that further work is needed if the Commission wishes to prioritise the implementation of RES in buildings.

#### **Article 14: Information, certification, training**

- The guidelines for certification or qualification could be made more specific, for example defining the depth and length of training. These should acknowledge and take into account past and ongoing efforts in MS, as some already have well organised certification and training in place that might be tailored to the specific MS' situation.
- Continue to monitor progress. Implementation of this article takes time; it will become easier to draw more specific conclusions on effectiveness and efficiency as implementation progresses in the coming years.
- This provision could also benefit from more specific and measurable requirements in the 2030 regulations.

#### **Article 15: Guarantees of origin**

- Continue to stress the importance of MS to move towards a GO system based on the European Energy Certificate System (EECS) operated by the Association of Issuing Bodies (AIB). Also, continue to monitor progress, to ensure full implementation of this article throughout the EU.
- Assess the option to link GOs to the actual energy stream, after 2020.
- Assess the benefits of following the Best Practice Recommendations formulated by RE-DISS I and any further recommendations from RE-DISS II<sup>22</sup>. These include: extending the use of GOs for all types of power generation; streamlining the use of tracking mechanisms at MS level; clarifying the relation between support schemes and the tracking systems used for purposes of disclosure.
- Investigate the possible extension of the use of GOs beyond RES-E and high-efficient cogeneration to all types of power generation i.e. including electricity from fossil and nuclear generation.

#### **Article 16: Grid access and operation**

- Improve the understanding of actions taken, challenges and barriers to RES related grid access and operation at MS level. This could be a basis for further improvements of EU level regulations and guidelines for the period beyond 2020.
- Recognise the importance of further development at the DSO level and smart grids to the further growth of RES at local level. Assess whether specific EU level action would be justified, for example, to facilitate or coordinate the use of smart technologies to reduce investment costs.
- Increase the coordination between TSO and DSO investments as long as the quantitative balance between both is allowing this.
- Continue efforts to ensure that the transmission grids and interconnection are ready for the increasing shares of RES. As their lead times are typically

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<sup>22</sup> RE-DISS I and II stand for Reliable Disclosure Systems for Europe Phase I and Phase II, projects partly funded by Intelligent Energy Europe.



longer than that of RES project developments, MS need to be encouraged to identify and resolve potential issues well in advance.

- Aim to set more specific targets and deadlines in post-2020 RES related grid regulation, to facilitate monitoring of progress and overall governance.

### **Article 17-19, 21: RES in transport, biofuels and bioliquid sustainability**

- Aim for a speedy EU level decision regarding the ILUC proposal, followed by speedy implementation at MS level. This decision should be sufficiently robust to improve the sustainability of the biofuels that count towards the target, and provide longer term certainty about these policies, to restore the confidence of investors and other stakeholders.
- At the same time, decide on a common definition of what type of biofuel sources should be counted as double in Art. 21(2). Ensure this definition is robust and does not cause any undesired (direct or indirect) effects that may call for further modifications in the near future.
- For the 2030 energy and climate framework, consider options to encourage investments and R&D into advanced biofuels processes. Also, review the current sustainability criteria and reporting requirements in detail, and address any remaining issues in the 2030 regulation.

### **Article 22-23: Reporting**

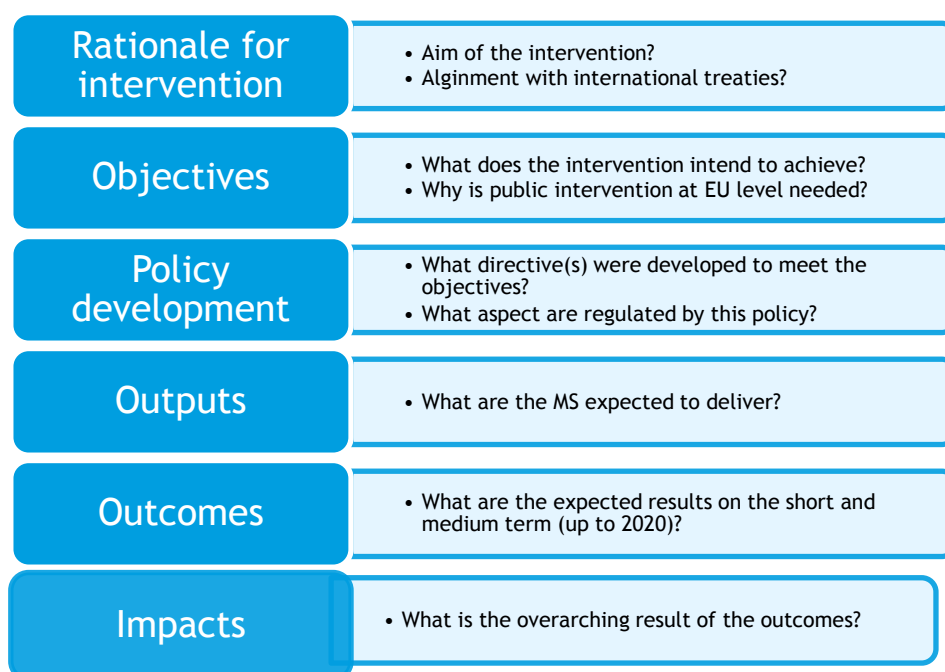
- The progress report template could be enhanced by clarifying questions where necessary, and by requiring more information, for example on progress monitoring (how will progress against each measure be monitored and evaluated) and on expected cost of each measure (to allow mutual comparison).
- Consider arranging a review and approval process, to ensure that progress reports that are submitted contain the required information and that all questions are understood correctly.

# Annex A The RED's intervention logic

In this Annex, a coherent framework is developed that guides the evaluation, with the main objectives of the study in mind. This framework aims to ensure that the main evaluation questions are addressed, at the right level of detail. This provides the methodological background of the evaluation. It first addresses the RED's intervention logic, which provides an overview of the objectives and expected outputs and outcomes of the various article groups. A high level evaluation framework is then set up, from which more detailed frameworks for the article and case study assessment were derived.

When analysing the intervention logic of a policy there are different levels on which key questions need to be answered, see Figure 3. We will answer these questions level per level, starting with the first level 'rationale for intervention'.

Figure 3 Graphical representation of the analysis of the intervention's logic



In the ideal case impacts are in line with the rationale for intervention and meet the objectives. If on the basis of the outputs it is estimated that the outcomes are not in line with the objectives the Commission may issue recommendations. In addition changes may be suggested for improvement of the policy.

### *Rationale for intervention*

At this level the following questions have to be answered:

- What is the aim of the intervention?
- Is it aligned with government objectives?



The aim of the intervention is fourfold as described in the first recital of the RED:

- increased use of renewable energy is together with energy savings and increased energy efficiency an important part of the package of measures needed to reduce greenhouse gas emissions;
- promotion of security of energy supply;
- promotion of technical development and innovation;
- promotion of employment and regional development, especially in rural and isolated areas.

The first point is necessary to comply with the Kyoto Protocol to the United Nations Framework Convention on Climate Change, and with further Community and international greenhouse gas emission reduction commitments beyond 2012. The three other points, all relate to the economic development of the European Union and the potential of the Member States to prosper on the longer term. These aspects are well in line with government objectives.

### *Objectives of the RED*

At this level the following questions have to be answered:

- What does the intervention intend to achieve?
- Why is public intervention at the EU level needed to address it?

The objectives of the RED are a fair and adequate allocation of the overall 20% renewable energy goal of the European Union to individual Member States and a 10% target for energy from renewable sources in transport for each Member State.

The preamble of the RED provides four key reasons why public intervention at the European level is needed to address these objectives:

- For a fair and adequate allocation of the Communities 20% renewable energy goal at the level of individual Member States it is necessary to take differences in starting point and renewable energy potential (including the potential the height of the GDP offers) between Member States into account (recital 15). This fair and adequate allocation therefore requires a coordinated action on EU level.
- The 10% target for energy from renewable sources in transport is set at the same level for each Member State. Since it is both likely and desirable that the Community meets this target through a combination of domestic production and imports, the Commission should monitor the supply of the Community market for biofuels, and should, as appropriate, propose relevant measures to achieve a balanced approach between domestic production and imports, taking into account, inter alia, the development of multilateral and bilateral trade negotiations, environmental, social and economic considerations, and the security of energy supply (recital 16).

This balanced approach requires a coordinated action on EU level:

- Joint projects between Member States and third countries that create opportunities for reducing the costs of achieving the targets of the RED are to be supported (recital 35-38). This requires coordination on the EU level to prevent double counting.
- The achievement of the objectives of this Directive requires that the Community dedicates a significant amount of financial resources to research and development in relation to renewable energy technologies (recital 22). This requires an agreement on EU level on the definition of renewable energy technologies and the required innovation.





### *Policy development*

The way for the Commission to meet objectives is to develop and issue policies. The relevant tool for implementing the policy is the development of the Renewable Energy Directive (Directive 2009/28/EC Of the European Parliament and of the council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC).

This directive has 29 articles and 6 annexes in which the following main aspects are regulated:

#### **Article 3: Mandatory national overall targets and national targets for renewable energy in transport in 2020**

This article covers three aspects:

- mandatory national overall targets for 2020;
- mandatory national overall targets for renewable energy in transport: 10% in 2020;
- the obligation to Member States to develop effective national policies to ensure that the national renewable energy objectives are reached.

#### **Article 4: National renewable energy action plans**

- The obligation for each Member State to develop a national renewable energy action plan.

#### **Article 6-12: Statistical transfers between Member States**

- Measures that allow for international cooperation to reach the renewable energy objectives in a more cost effective manner (both within the European Union and with third countries).

#### **Article 13: Administrative procedures, regulations and codes**

- The Member States are obliged to make sure that:
  - the necessary administrative procedures to implement RES are in place;
  - that these procedures are as effective and aligned as possible in order to ensure that they do not create unnecessary barriers towards reaching the goals of the RED;
  - the ultimate goal is the development of quality one stop shopping for all administrative procedures, regulations and codes related to RES.

#### **Article 14: Information and training**

- An obligation for each Member State to:
  - disperse information on renewable energy generation to the stakeholders, including information on support measures, net benefits and certification schemes;
  - development of certification schemes for RES if they are not already available.

#### **Article 15: Guarantees of origin of electricity, heating and cooling produced from renewable energy sources**

- The obligation for each MS to make sure that appropriate mechanisms for the accurate, reliable and fraud resistant issuance, transfer and cancellation of GO is realised.

### Article 16: Access to and operation of the grids

- An obligation for each Member State to facilitate access to and operation of the grids to allow for secure operation of the electricity system with further development of electricity production from renewable energy sources.

### Article 17-19, 21: Sustainability criteria for biofuels and bioliquids

- Measures to ensure that the use of biomass as a source of renewable energy for transport and electricity is sustainable. These measures include:
  - an obligation for each Member State to ensure compliance with sustainability criteria for biofuels and bioliquids;
  - the obligation of the Commission to study whether other energy application of biomass require similar measures as biofuels and bioliquids and the obligation of the Commission to periodically report to the European Parliament and the Council on a number of issues.

### Article 22-23: Reporting by the Member States

- obligation to the MS to report periodically the progress in meeting the compliance to the RED, using prescribed measures to calculate;
- the reported data.

Table 7 Policy objective and corresponding article of the RED

Type of Measure	Article of the RED
Mandatory national overall targets for 2020	3
Mandatory national targets for renewable energy in transport: 10% in 2020	3
National renewable energy action e plans	4
Statistical transfers between Member States	6-12
Admin. procedures, regulations and codes	13
Information and training	14
Guarantees of origin of electricity, heating and cooling produced from renewable energy sources	15
Access to and operation of the grids	16
Sustainability criteria for biofuels and bioliquids	17-19, 21
Reporting by the Member States	22-23

### *Outputs, Outcomes and Impacts*

Outputs are the direct results of the policy development, in this case the Renewable Energy Directive. These outputs then lead to outcomes, i.e. the expected effects on the short and medium term of the implementation of the Renewable Energy Directive (RED). All the outcomes together have impacts on different aspects of society. These impacts are ideally in line with the Rationale of the RED.

An overview of the key measures and their expected outputs, outcomes and impacts of the RED is provided in Table 1. An elaboration of this intervention logic can be found in the following paragraphs.



## Annex B Main evaluation framework

In the evaluation framework the key questions which need to be explored are identified. We first derive a more general framework, which will then form the basis for more detailed evaluation frameworks and guidelines for the articles and the case studies.

The evaluation framework is structured across the following categories:

- **Relevance:** The extent an intervention is relevant in respect to needs, problems and issues identified.
- **Effectiveness:** This relates to the impacts of the articles, both positive and negative, as well as potentially unforeseen impacts. It will help identify the added value of the RED (compared to no EU intervention) as well as get an overview of what factors hinder or enhance the positive impacts of the RED (incl. the administrative burden).
- **Efficiency:** Essentially relates to the costs involved in the implementation of the article and whether the measures involved are the best approach and use of resources.
- **Added value:** What is the added value of the RED as a whole, and of its provisions?
- **Lessons:** This category aims to draw from the preceding analysis in order to identify how the RED may be improved both in terms of accelerating the implementation of the measures and their effectiveness. For example, how could the provisions be improved to reduce implementation barriers or administrative cost to stakeholders or government authorities, whilst still meeting the overall goals?

An important aspect of this evaluation - and in fact, of any policy evaluation - is the question what would have happened without this directive. Clearly, many Member States had renewable energy policies in place before the RED came into force. Without the RED, these would certainly be continued, modified, enhanced, etcetera, as many Member States have their own reasons to promote renewable energy sources, as part of their climate change policies, to improve energy security or industry policy. A rigorous policy evaluation will need to keep this in mind, and aims to distinguish between 'autonomous' developments and the added value of the directive.

These general evaluation objectives can be translated into a number of concrete questions that this evaluation aims to answer - for the RED as a whole, and for the various provisions.

Table 8 contains the key questions regarding relevance, effectiveness, efficiency, added value and lessons, for each article or article group assessed in this report. They are based on the general evaluation framework derived in Section 1.4, but focus on the specifics of the various articles.

Table 8 Additional article specific questions

<b>Art. 3</b>	<b>Targets and measures</b>
<b>Relevance</b>	– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?
<b>Effectiveness</b>	– What have the impacts of the binding national targets been in enhancing the deployment of RES in the EU? – Are the targets felt to be achievable? – Was the basis on which they were set appropriate? – Was the transport target appropriate taking into account possible negative impacts for climate change (indirect land use)? – Have there been unforeseen impacts (positive or negative)?
<b>Efficiency</b>	– Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?
<b>Added value</b>	– To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them? – Would the results have been achieved without the RED/article, i.e. without EU intervention?
<b>Lessons</b>	– Remark: Especially with regards to how the targets are set and the use of binding targets?
<b>Art. 4</b>	<b>National Renewable Energy Action Plans</b>
<b>Relevance</b>	– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?
<b>Effectiveness</b>	– Have NREAPs been successful in increasing transparency and clarity regarding MS plans and measures? – As a result, have they helped to reduce uncertainties for investors in renewable energy and foster RES deployment and research in this field? – Have they helped bring RES higher up the policy-making agenda at local, regional and national levels? – If the NREAP was revised, has it proved to be a helpful procedure? Why? – Is the template clear enough to ensure MS provide the information required? – Are NREAP an effective means for the Commission to evaluate the adequacy of the measures in accordance with Article 3(2)? – What does the reference scenario assume with regards to policy measures and deployment of RES in the Member State without the RES? – Have there been unforeseen impacts (positive or negative)?
<b>Efficiency</b>	– Since the NREAPs were notified, the economical, technical and political environment has changed. Has this article been a barrier to the MS' flexibility to adapt to new circumstances? – Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? – Is effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?
<b>Added value</b>	– Would the results have been achieved without the RED/article, i.e. without EU intervention?
<b>Lessons</b>	– What key lessons can be learned from the experience of implementing the article so far? – What improvements may help to increase the effectiveness of the measures in place under this article?

Art. 6-12	Cooperation
<b>Relevance</b>	<ul style="list-style-type: none"> <li>– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<ul style="list-style-type: none"> <li>– Did the cooperation mechanisms prove effective in contributing to reach the national targets?</li> <li>– Have they had any unforeseen (positive or negative) impacts on the MS?</li> <li>– Which factors have hindered the achievements of the article objective?</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>– Has the article added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?</li> <li>– Are the cooperation mechanisms the most cost-efficient way to achieve the targets? How is this determined?</li> </ul>
<b>Added value</b>	<ul style="list-style-type: none"> <li>– To what extent is the article complementary to other EU initiatives?</li> <li>– Would the impacts from the article have been achieved without the RED/article, i.e. without EU intervention?</li> <li>– Are there alternative measures/improvements which could have led to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>– What key lessons can be learned from the experience of implementing the article so far?</li> <li>– What improvements may help to increase the effectiveness of the measures in place under this article?</li> <li>– What could be done in order to increase their use, how could they be improved?</li> </ul>

Art. 13	Administrative procedures, RES in buildings, heating
<b>Relevance</b>	<ul style="list-style-type: none"> <li>– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<p><b>Authorisation, certification and licensing procedures:</b></p> <ul style="list-style-type: none"> <li>– Has the article led to better planning and streamlining of the approval and licensing procedures for RES producers at national and local level?</li> <li>– Would this have occurred without the RED?</li> <li>– What is the response time measured in months from the moment the application is submitted to the moment the answer is received? What is the time spent for awaiting the results from complaints processes?</li> <li>– Are these procedures expedited at the right admin level? Are they proportionate, transparent and consistent?</li> <li>– Are the respective responsibilities of national, regional and local administrative bodies clearly coordinated and defined?</li> <li>– Has a simplified authorisation procedure been adopted for smaller projects?</li> </ul> <p><b>Technical specifications:</b></p> <ul style="list-style-type: none"> <li>– Are the technical specifications which must be met by renewable energy equipment and systems in order to benefit from support schemes more clearly defined and better understood by the industry? Are they consistent?</li> </ul> <p><b>Streamlining deployment of RE:</b></p> <ul style="list-style-type: none"> <li>– What have been the impacts of the measures on facilitating the use of electricity, heating and cooling from RES sources in new developments?</li> <li>– Are the changes to building regulations and codes successful in increasing RES investment and reducing energy consumption?</li> <li>– Has the public sector taken on a lead role in using RES in their buildings?</li> </ul> <p><b>General evaluation questions:</b></p> <ul style="list-style-type: none"> <li>– What effects (impacts) have been obtained following the implementation of the article?</li> <li>– Have these effects contributed to the achievement of the article?</li> <li>– Have there been unforeseen impacts (positive or negative)?</li> <li>– Which factors have hindered the achievements of the article objective?</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>– Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? Is the effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?</li> <li>– Are the selected mechanisms the most cost-efficient way to achieve the targets?</li> <li>– Could the same results have been achieved with less funding/lower cost?</li> </ul>



<b>Art. 13</b>	<b>Administrative procedures, RES in buildings, heating</b>
<b>Added value</b>	<ul style="list-style-type: none"> <li>– To what extent is the article complementary to other EU initiatives in the field and has synergies with them?</li> <li>– Would the results have been achieved without the RED/article, i.e. without EU intervention?</li> <li>– Are there alternative measures/improvements which could have led to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>– What key lessons can be learned from the experience of implementing the article so far?</li> <li>– What improvements may help to increase the effectiveness of the measures in place under this article?</li> </ul>

<b>Art. 14</b>	<b>Information, certification, training</b>
<b>Relevance</b>	<ul style="list-style-type: none"> <li>– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<ul style="list-style-type: none"> <li>– Have the measures under this article encouraged the uptake of RES? Which barriers have they addressed that existed before the RED?</li> <li>– Have the provisions under Article 14 been sufficiently clear and specific to encourage effective trainings and certification schemes? Have they ensured that the information provided (on support measures, on certification, on costs and benefits) not only easily accessible but also transparent, regularly updated and relevant to the need of those who use it?</li> <li>– Have the criteria for certification schemes laid down in Annex IV proven appropriate? Have they encouraged the mutual recognition of certification across MS?</li> <li>– What is the administrative burden placed by certification schemes and training as required by Article 14 on installers and supervisory institutions?</li> <li>– What other effects (impacts) have been obtained following the implementation of the article?</li> <li>– Have there been unforeseen impacts (positive or negative)?</li> <li>– Which factors have hindered the achievements of the article's objective?</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>– Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?</li> <li>– Is effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?</li> <li>– Are the selected mechanisms the most cost-efficient way to achieve the targets?</li> <li>– Could the same results have been achieved with less funding/lower cost?</li> </ul>
<b>Added value</b>	<ul style="list-style-type: none"> <li>– To what extent is the article complementary to other EU initiatives in the field and has synergies with them?</li> <li>– Would the results have been achieved without the RED/article, i.e. without EU intervention?</li> <li>– Are there alternative measures/improvements which could have led to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>– What key lessons can be learned from the experience of implementing the article so far?</li> <li>– What improvements may help to increase the effectiveness of the measures in place under this article?</li> </ul>

<b>Art. 15</b>	<b>Guarantees of origin</b>
<b>Relevance</b>	<ul style="list-style-type: none"> <li>– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<ul style="list-style-type: none"> <li>– How is the information from GOs used and how does it influence Renewable Energy policy and investment at supplier and public sector level?</li> <li>– How effective are the systems used in terms of auditing, fraud, inaccuracy and the potential for multiple accounting?</li> <li>– What is the administrative burden placed by GOs on suppliers and on the supervisory institution? Is it appropriate?</li> <li>– Are GOs from other MS recognised? Are GOs from this MS recognised by other MS?</li> <li>– Have these effects contributed to the achievement of the article?</li> <li>– Have there been unforeseen impacts (positive or negative)?</li> <li>– Which factors have hindered the achievements of the article objective?</li> </ul>



<b>Art. 15</b>	<b>Guarantees of origin</b>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>– Are the systems implemented by the MS the most cost-efficient way to deliver Art. 14 objectives?</li> <li>– Are there other measures which could accelerate the deployment of GOs?</li> <li>– Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?</li> <li>– Is effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?</li> </ul>
<b>Added value</b>	<ul style="list-style-type: none"> <li>– To what extent is the article complementary to other EU initiatives in the field and has synergies with them?</li> <li>– Would the results have been achieved without the RED/article, i.e. without EU intervention?</li> <li>– Are there alternative measures/improvements which could have led to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>– What key lessons can be learned from the experience of implementing the article so far?</li> <li>– What improvements may help to increase the effectiveness of the measures in place under this article?</li> </ul>

<b>Art. 16</b>	<b>Grid access and operation</b>
<b>Relevance</b>	<ul style="list-style-type: none"> <li>– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<ul style="list-style-type: none"> <li>– Has the national implementation of the RED effectively improved the grid access conditions for renewable electricity?</li> <li>– Has the RED implementation facilitated in growth in the RES market?</li> <li>– Has an additional need for infrastructure investment due to higher RES amounts been identified? If yes, has the government introduced additional steps in order to address it?</li> <li>– Are transmission and distribution grid planning aligned with each other to integrate the renewable energies?</li> <li>– How beneficial is the increase of smart technologies in the distribution grid to integrate renewable energies on a national level? Is it necessary to have it identical in all facets and depth in all grids?</li> <li>– What other effects (impacts) have resulted from the implementation of the article? Have there been unforeseen impacts (positive or negative)?</li> <li>– Have these effects contributed to the achievement of the article?</li> <li>– Which factors have hindered the achievements of the article objective?</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>– Does the RED implementation lead to changes in the grid access conditions for the renewable energies?</li> <li>– Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? Is effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?</li> <li>– Are the selected mechanisms the most cost-efficient way to achieve the targets?</li> <li>– Could the same results have been achieved with less funding/lower cost?</li> </ul>
<b>Added value</b>	<ul style="list-style-type: none"> <li>– To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?</li> <li>– Would the results have been achieved without the RED/article, i.e. without EU intervention?</li> <li>– Are there alternative measures/improvements which could have led to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>– Have administrative procedures increased the implementation process of (inter)national projects and collaboration?</li> <li>– Have technical constraints been identified to the introduction of renewable energies? If yes, have steps been taken by the government in order to address it?</li> <li>– What key lessons can be learned from the experience of implementing the article so far?</li> <li>– What improvements may help to increase the effectiveness of the measures in place under this article?</li> </ul>



<b>Art. 17-19</b>	<b>Biofuels and bioliqid sustainability criteria</b>
<b>Relevance</b>	<ul style="list-style-type: none"> <li>– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<ul style="list-style-type: none"> <li>– How are sustainability criteria enforced, checked and audited?</li> <li>– Have they been effective in protecting biodiversity and land with high carbon stock and ensuring the sustainability of biofuels production?</li> <li>– Are the right criteria and methods used? Are they reviewed regularly enough?</li> <li>– Is the level of information required appropriate?</li> <li>– Have these articles promoted the use of biofuels from non-food feedstock (as defined in the article)?</li> <li>– Have they promoted innovation?</li> <li>– What other effects (impacts) have resulted from the implementation of the article? Have there been unforeseen impacts (positive or negative)?</li> <li>– Have these effects contributed to the achievement of the article?</li> <li>– Which factors have hindered the achievements of the article objective?</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>– Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced ? Is effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?</li> <li>– Are the selected mechanisms the most cost-efficient way to achieve the targets?</li> <li>– Could the same results have been achieved with less funding/lower cost?</li> </ul>
<b>Added value</b>	<ul style="list-style-type: none"> <li>– To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?</li> <li>– Would the results have been achieved without the RED/article, i.e. without EU intervention?</li> <li>– Are there alternative measures/improvements which could have led to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>– What key lessons can be learned from the experience of implementing the article so far?</li> <li>– What improvements may help to increase the effectiveness of the measures in place under this article?</li> </ul>

<b>Art. 22-23</b>	<b>Reporting</b>
<b>Relevance</b>	<ul style="list-style-type: none"> <li>– To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?</li> </ul>
<b>Effectiveness</b>	<ul style="list-style-type: none"> <li>– Are the measures clearly set out as well as how progress will be monitored?</li> <li>– Is the information provided in the progress reports robust, comprehensive and consistent?</li> <li>– Has the template provided sufficient guidance to deliver consistent progress reports across all MS?</li> <li>– Have new data collection systems and processes been needed?</li> <li>– Has it added to the MS' administrative burden?</li> <li>– Has it had other negative or positive impacts (e.g. the new data helps to better understand impacts and inform national policy)?</li> <li>– What is the value of EU level reporting?</li> </ul>
<b>Efficiency</b>	<ul style="list-style-type: none"> <li>– Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced ? Is effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?</li> <li>– Are the selected mechanisms the most cost-efficient way to achieve the targets?</li> <li>– Could the same results have been achieved with less funding/lower cost?</li> </ul>
<b>Added value</b>	<ul style="list-style-type: none"> <li>– To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?</li> <li>– Would the results have been achieved without the RED/article, i.e. without EU intervention?</li> <li>– Are there alternative measures/improvements which could have led to the same results?</li> </ul>
<b>Lessons</b>	<ul style="list-style-type: none"> <li>– What key lessons can be learned from the experience of implementing the article so far?</li> <li>– What improvements may help to increase the effectiveness of the measures in place under this article?</li> </ul>



# Annex C Article assessments

## C.1 Article 3: Targets and measures

### C.1.1 Article presentation

Directive 2009/28/EC is part of a package of energy and climate legislation adopted in 2009 in order to achieve the EU's commitment to reduce greenhouse gas emissions, to increase the use of renewable energy, and to increase energy efficiency, by 20% in 2020.

In order to deliver these EU level objectives, Art. 3 of the RED sets mandatory national targets in part A of Annex I. In order to reach these targets, MS may apply inter alia support schemes and cooperation measures between different MS and with third countries. Such measures shall also ensure that the indicative trajectory in part B of Annex I is achieved.

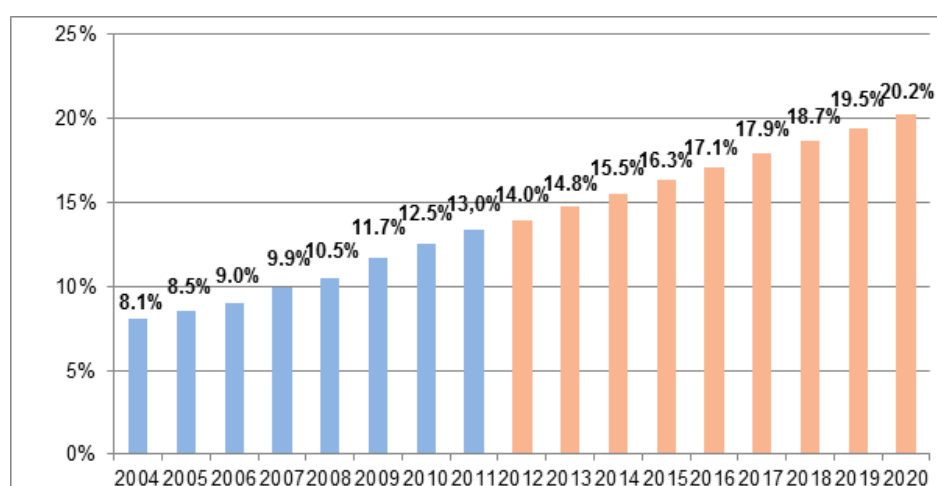
In addition to their individual national overall targets, MS have to reach a 10% target of renewable energy in the transport sector, as this is the sector in which energy consumption was forecast to grow most rapidly in the coming years (Howes, 2010).

### C.1.2 Effectiveness

#### *What have the impacts of the binding national targets been in enhancing the deployment of RES in the EU?*

Under Directive 2009/28/EC, renewable energy grew strongly. While it provided only 9.8% of gross inland energy consumption in 2010 (Eurostat, 2013a) - thus missing the 2010 target of 12% -, its share of gross final energy consumption was 13% in 2011, thus overachieving the EU's interim 2011/2012 target of 10.7% (EEA, 2013). Moreover, an extrapolation of the annual average growth rate of 8.9% between 2004 and 2011 up to 2020 indicates that the target could be slightly overachieved if the current trend continues (see Figure 4).

Figure 4 Progress towards 2020 renewable energy target



Source: Eurostat 2013b (2004 to 2011), post-2011 projection by Ecologic Institute linear extrapolation based on historical trend 2004-2011.

The most recent data show a RES share in 2012 of 14.1% (Eurostat, 2014a), compared to a planned share of 12.87% according to the NREAPs (EUFORES et al., 2014). These data correspond to the Commission's progress report of 2013 showing that the EU as a whole is on its trajectory towards the 2020 targets (Commission, 2013).

Thus, judging from progress to date, the RED appears to have contributed to intensify renewable energy development in the MS (Ecologic Institute, 2014). More particularly, it is widely agreed that the legally binding renewable targets at the EU level for all MS have strengthened national action. Regarding Bulgaria for example, it is reported that the mandatory targets increased the level of ambition and provided an incentive for a more coherent approach (Bulgarian case-study, Annex E). The impact of the RED and its legally binding renewable energy targets on the growth of renewable energy is acknowledged by the Commission's progress report of 2013 (Commission, 2013). Without the legally binding nature of the target, it would have remained at the discretion of MS to meet their renewable energy ambitions or to lower them in order to save costs; arguably, expansion of renewable energies would have continued to be driven by a small number of MS and sectors only (Ecologic Institute, 2014; Ecofys, 2013). In any case, the mandatory targets together with support schemes have provided long-term visibility and security to investors, which has been crucial for pulling niche technologies onto the mass market; the importance of investor's security resulting from binding targets is also stressed by stakeholders interviewed for the case studies (German case-study, Annex G; Polish case-study, Annex H; Estonian case-study, Annex F).

Moreover, the indicative interim targets are contributing to the effectiveness of the binding national targets, as Art. 3 (2) of the RED requires MS to introduce measures effectively designed to ensure that the trajectory is reached. Thus, any deviation from the trajectory should not be by design and national plans must determine that a credible growth path will be established for reaching the national target (Howes, 2010). In addition, the interim targets allow a continuing assessment whether MS are on track.

On the other hand, in some cases Article 3 and the NREAP served as a justification for limiting RES deployment ambitions in the electricity sector. In Bulgaria support measures for new RES installations no longer apply since the overall national target has been achieved (Bulgarian case-study, Annex E); in the Czech Republic, support stopped once the PV capacities planned for 2020 were reached; in Estonia, the Government plans to reduce RES support since the country has already achieved its overall national target (Estonian case-study, Annex F).

Most of these findings also apply to the mandatory 10% transport target. In particular, stakeholder stressed that the mandatory target was decisive for the deployment of RES in this cost-intensive sector (German case-study, Annex G; Estonian case-study, Annex F). However, particularities concerning biofuels as the primary means to achieve this additional target require a separate evaluation of its effectiveness (see the analysis further on in this section).

#### ***Are the targets felt to be achievable?***

As progress to date shows and based on historical trends (see Figure 4), the targets appear to be achievable. This is also reflected in the forecast documents, the NREAPs, and the progress reports of MS.

However, continued progress cannot be seen as given, taking into account that the RED's indicative trajectory of renewables expansion becomes increasingly

steep towards 2020. Mainly due to the economic crisis, many national reforms implemented in recent years have been disruptive and had a negative impact on the investment climate, leading to slower growth in the RES share over the last two years than the necessary average growth rate of 4.7% between 2011 and 2020 to achieve the 2020 target (EUFORES et al., 2014, Ecologic Institute, 2014). The non-planned reductions in support were especially widespread in the case of PV. For examples, the Czech Republic and Bulgaria imposed ex-post taxes on FIT revenues, whereas Romania has deferred the allocation of a certain share of green certificates to 2017/2018. As in the cases mentioned above as examples of Article 3 serving as a justification for support reductions, these policy corrections were responses to the steeply rising cost of RES-E support, due to the quick deployment of highly subsidised RES-E production. Similar development could also be observed in other MS e.g. Germany, Spain and Greece. In Spain, the so-called tariff deficit running up to € 25.5 billion lead to retroactive changes to support schemes in early 2013 that created an unstable economic environment for investments and severely compromised progress towards the 2020 targets (Spanish case-study, Annex I).

RES development in the different sectors confirms the general tendency:

- Renewable electricity growth rates in 2011-2012 are still on track; in 2012, 12 MS were above their NREAP target, whereas 16 MS stayed below, a result slightly worse than in 2011 (13 above and 14 below)(EUFORES et al., 2014).
- In contrast, the renewable heat and cooling growth rate in 2011-2012 has been slightly too low; 23 MS were on track as in 2011, and 5 MS underachieved (Ireland, Portugal, Latvia, France, and the Netherlands, EUFORES et al., 2014).
- For the renewable transport sector, which is the only sector with a separate RES target, the growth rate in 2011-2012 was lower than the necessary annual growth rate to achieve the 2020 10% target; only 8 MS met or exceeded their 2012 NREAP target, and 20 missed the target (EUFORES et al., 2014). While this may also be due to a change in the counting method towards the target in 2011, the drop in the share in 2013 is mostly due to concerns on the sustainability of first-generation biofuels (see the biofuels analysis further on).

As a consequence, stop-and-go policies, disruptive changes, and underperformance of both the heat & cooling sector and the transport sector are currently jeopardising the achievement of the 2020 targets. According to the EU Tracking Roadmap 2014, under current support frameworks and related parameters, only a RES share of 17.8% appears feasible at EU 27 level (without Croatia). This aligns with the Commission's 2013 progress report which emphasises that some MS need to undertake additional efforts to reach the 2020 targets and that in addition, due to the economic crisis and a slow removal of barriers to renewable energy growth, further measures will be needed at MS level to stay on the trajectory and for the targets to be achieved (Commission, 2013). That finding is also supported by the EEA (EEA, 2013) and EurObserv'er Report (EurObserv'er, 2012).

According to the EU Tracking Roadmap 2014, if adequate national renewable policies are improved accordingly and in time, all MS still have the possibility to achieve their 2020 RES targets, and the EU RES share in 2020 could reach 21% (EUFORES et al., 2014). Thus, the RES targets still appear to be achievable.

***Was the basis on which they were set appropriate?***

The national renewable energy targets of Art. 3 (1) and Annex I part A were calculated according to Art. 5-11 RED on the basis of the resource potential of the MS on the one hand and their GDP, i.e. their ability to exploit their potential, on the other hand. This weighting was combined with an ‘early starter bonus’ for MS that had achieved reasonable growth in recent years (Howes, 2010).

In spite of criticism that some of the national targets had been set too generously (see German case-study, Annex G), using GDP per capita as a factor to lower renewable targets (compared to their RES potential) in countries with limited economic strength proved to be a reasonable method. Experiences from the eastern part of the EU suggest that support mechanisms in poorer countries can trigger admirable renewable growth but the political and societal willingness of these countries to accept mounting costs is very limited. Developing investment activity and renewable production often resulted in growing fears of skyrocketing subsidy costs. Sudden cuts of and retrospective changes in support schemes followed, trying to ease the financial burden on electricity consumers and on state budgets.

Experiences from countries with the lowest GDP per capita seem to support this argument: Bulgaria, when experiencing a sudden increase of investment activity, introduced a moratorium on renewable plants support and passed a 20% tax on PV installations. In spite of all these measures, the country has by far outperformed its interim renewable targets (Bulgarian case-study, Annex E). Similarly, concerns about overcompensation led Romania to suspend and withhold green certificates, and other ongoing modifications of the support system. Intentional delays in the implementation of future support systems and the resulting lack of long-term strategy (with adequate allocation of financial means) in other Central and Eastern European countries (Poland, Hungary) seem to prove the same argument: lowering renewable targets in countries with limited economic and financial abilities was a reasonable decision. Regarding Poland, including GDP per capita for target setting was considered by policy makers as an expression of the solidarity principle in EU policy, and used to demonstrate to voters the overall value of EU membership (Polish case-study, Annex H).

Estonia is another example highlighting the importance of including the ability to pay (GDP per capita) in the RES target setting. This country, with a GDP per capita well below the EU average in 2009, was allotted one of the least challenging RES target: increasing the share of renewable energy from 22.7% in 2009 to 25% by 2020. With its fast growing renewable electricity generation Estonia is referred to as one of the best performing countries within the EU, being on track to reach and even outperform its relatively modest RES target. The country (as other Baltic states) experienced remarkable economic growth after 2009 (with almost 6% per annum well above EU average) which helped maintain the burden on electricity consumers to a tolerable level. However, as mentioned above, the Government plans to reduce the current level of support considered too burdensome for the consumers (Estonian case-study, Annex F).

Countries with GDP per capita well above EU average (and with more ambitious renewable growth targets) have mixed experiences. Several of them (Austria, Denmark, Sweden) perform well, surpassing the interim targets and seem to have no difficulties with reaching their future RES-E-target (see for example Swedish case-study, Annex J). On the other hand, two countries ranked among those with the highest GDP per capita (the Netherlands experiencing several changes in support system and facing NIMBY resistance, and Ireland) missed their interim targets and are struggling to accelerate



renewable growth. Ireland has rather ambitious 2020 targets with a challenging increase from 5.1% in 2009 to 16% in 2020. It has performed well in terms of renewable electricity generation but it is struggling to keep the pace necessary to achieve the target in the longer run.

Bearing in mind the different endowment of the MS with renewable resources and the initial level of deployment (in 2009) it is difficult to draw any clear conclusion on the appropriateness of setting higher RES target for richer countries. Furthermore, the impact of the shrinking baseline of the target value (gross final consumption) affected the various MS at different levels.

A more specific criticism raised in relation to target setting is that the RED allowed co-firing biomass in coal-firing plants to be counted towards the RES target, since this cheap method sets no incentive for modernisation and innovation (Polish case-study, Annex H; German case-study, Annex G).

In contrast to the RES national overall targets, the targets in the transport sector were not set individually, but comprise a fixed 10% target for all MS. By doing so, however, the overall national resource potential and GDP were indirectly taken into account. The main argument for setting a specific target for the transport sector was that it is a rapidly growing sector, with the lowest fuel diversification and thus the least flexibility to achieve GHG emissions reductions and to reduce its exposure to supply shock risks (Howes, 2010). Adopting a uniform target was in line with the 5.75% indicative target of the 2003 biofuels directive, and took into account that a European market for biofuels (as the dominant form of RES available to the transport sector) exists and national resource potential is not relevant (Howes, 2010), even if biofuels policies and incentives differ strongly between MS so that, in practice, fuel suppliers still need to have different strategies for different countries. Whether the basis for the transport target was appropriate depends primarily on whether the possible negative impacts on climate change and the environment, such as indirect land use (ILUC), were taken into account to a sufficient extent; this is analysed below.

***Was the transport target appropriate, taking into account possible negative impacts on climate change and the environment, in particular through indirect land use? Is it likely to be achieved?***

#### **Target setting**

Compared to the national overall targets of the RED, the 10% minimum target for renewable energy in the transport sector (Art. 3 (4) RED) has proved controversial from the beginning. Many studies questioned the potential of biofuels to reduce GHG emissions, although most of the studies dealing with life-cycle analysis of biofuels did not take land conversion and indirect effects into account, which resulted in positive carbon balances in most cases (Hirschl et al., 2012). Equally, many scientists criticised the binding 10% target in the transport sector and the obligatory blending rate in EU biofuel policies as being ineffective for climate protection. However, only one study demanded that the transport target be suspended, as did numerous NGOs who were also concerned about social issues such as the influence of biofuel production on food prices and labour conditions. As a result, the biofuel-related impact assessments suffered from having a limited scientific basis. Furthermore, clear warnings from the scientific community were published relatively late in the decision-making process, which may explain why they did not get through to policy-makers (Hirschl et al., 2012).

With respect to the responsiveness of EU policy-makers to this limited scientific results, the European Parliament has been most receptive to

scientific risk analysis, while the Commission and the Council mainly defended the original proposal; in the negotiations between the three European institutions on the final text of the RED, specifications, additional reporting requirements and a general review in 2014 were added to the Commission's proposal as a compromise with the European Parliament asking for stricter sustainability criteria (Hirschl et al., 2012).

In conclusion, despite the mandatory sustainability criteria implemented by the Directive, concerns over the sustainability and the actual GHG emission reductions achieved by first generation biofuels raise doubts as to the transport target's effectiveness (Ecologic Institute, 2014). Although the discussion on the sustainability of biofuels is still ongoing, it seems safe to conclude that, from today's perspective, there are at least strong doubts that the transport target was set in an appropriate way. For example, the UK Committee on Climate Change, an independent expert body established under the UK Climate Change Act to advise the government on emissions targets and to report to parliament on progress made in reducing GHG emissions, took up the results of a review on the indirect effects of biofuel production of 2008 and advised the UK government that the 10% target could not be achieved in a sustainable way and should be lowered to 8%, unless new evidence shows that it can be achieved sustainably (Committee on Climate Change, 2011).

### **Target achievability**

Turning to the development of biofuels after the adoption of the RED, the average RES share in transport fuel consumption across the EU was 5.1% in 2012 (Eurostat, 2014b). The growth rate in 2011-2012 was lower than the necessary annual growth rate to achieve the 2020 10% target; only 8 MS met or exceeded their 2012 NREAP target, and 20 missed the target. However, whereas until 2010, all biofuels counted towards the target, as of 2011, only biofuels and bioliquids compliant with the sustainability criteria of Art. 17 and 18 RED may do so, which led to a drop in the share (EUFORES et al., 2014).

According to the Commission's progress report in 2013, the prognosis for biofuels is that the slight surplus over the planned trajectory currently observed will decline and result in a deficit, unless further measures are taken. According to a projection of 2014 by the Joint Research Centre, the European Commission's in-house science service, the EU is likely to achieve only 8.7% renewable energy in transport by 2020 without further measures (JRC, 2014).

In addition, the concerns mentioned above about the sustainability of the transport target led the Commission to propose an amendment to that target, limiting the share of first generation biofuels to a maximum of 5% and incentivising greater use of non-food feedstock to contribute towards the target (Commission, 2012). While the European Parliament voted in favour of a maximum share of 6% and a 2.5% target for advanced biofuels in September 2013, the European Energy Ministers on 13 June 2014 proposed a limit of 7% for first generation biofuels, with a non binding incorporation target for advanced second- and third-generation biofuel of 0.5% (Council, 2014). According to EurObserv'er, these political discussions which have been on-going for almost two years are largely to blame for the slowdown and in 2013, the drop in EU biofuel consumption to 4.7% (for a similar stakeholder view see German case-study, Annex G). The MS have taken national, politically uncoordinated stances on their incorporation rates of second-generation biofuel development as a result of the delays in adopting a new EU directive with clearly defined targets. In particular, the decline in biofuel consumption in 2013 is essentially due to the development in Spain, where the government decided in February





2013 to reduce its incorporation target from 6.5% to 4.1% in 2014 (EurObserv'er, 2014). Biofuel consumption also declined to a lesser extent in Germany, due to the government's decision to abolish the tax exemptions enjoyed by the biodiesel sector from 2013 onwards. In contrast, UK, Sweden and Denmark significantly increased their incorporation rates in 2013, with Sweden reaching 11% up from 8.5% in 2012 (EurObserv'er, 2014).

Overall, the development in biofuel consumption has shown a continuous increase since the existence of quantified (indicative) targets in the Biofuel Directive 2003/30/EC (EurObserv'er, 2014). However, the recent political discussions about the ability of the RED to actually reach GHG emission reductions in a sustainable way, picking up warnings by scientists even before the adoption of the RED, obviously affect its effectiveness concerning the achievement of the transport target. This may change again as soon as the 2020 transport target is amended. However, the main problem is that while blending in more advanced biofuels has the potential to have a major impact on achieving this target in a sustainable way, switching to low ILUC risk feedstock is expected to be limited by feedstock availability; thus, according to the JRC projection, neither the amendment proposals of the Commission and of the Parliament, nor the draft proposal of the Council of 2013 (the precursor of the 2014 proposal) would manage to compensate for lower use of first generation biofuels and achieve the target (JRC, 2014). Moreover, greater reliance on advanced feedstock with higher GHG savings clearly requires additional measures for the target to be reached (Commission, 2013). Whether such additional measures will actually be implemented is likely to depend to a large extent on whether biofuels will get support beyond 2020, since, contrary to wind and solar energy, biofuel technology has not yet demonstrated the potential for cost-reductions to the point of reaching marketability.

***Have there been unforeseen impacts (positive or negative)?***

As mentioned above, there have been unforeseen negative impacts concerning investment conditions during the financial crisis, whereas the negative impacts related to the effectiveness of the transport target could possibly have been foreseen to some extent before the RED was adopted.

### **C.1.3 Efficiency**

***Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?***

It would be a rather abstract exercise to evaluate the impact of the RES targets on the administrative burden on MS public authorities and economic stakeholders. It may be presumed that, to the extent that binding national RES targets have prompted MS to introduce additional support measures to meet these targets, overall, the administrative burden has increased. However, more exact findings would require an analysis of the support systems introduced by MS; such an exercise is, however, beyond the scope of this study. On the other hand, stakeholders from the public sector in Germany indicate that the implementation of the RED framework, that clearly defines the information and data delivery duties of all RES actors, in national law led to a reduction of the administrative costs on public authorities, as well as of the costs of private stakeholders (German case-study, Annex G). Accordingly, the mandatory national targets as essential components of a clear and reliable RED framework may have contributed to reducing the administrative burden. This would apply to the indicative interim targets as well that, on the one hand, appear to increase the administrative burden of monitoring the development of RES deployment to some extent, but on the other hand may



reduce this administrative burden in providing a clear trajectory in order to achieve the national target.

Neither shall this report analyse the general cost efficiency of the RED. However, it is safe to conclude that mandatory targets and adequate support schemes have, by creating the world's biggest market for modern renewable energy technologies, contributed to driving down technology costs for wind, solar and biomass technologies and heat pumps. This is acknowledged by stakeholder of various countries (see German case-study, Annex G; Bulgarian case-study, Annex E; Estonian case-study, Annex F, Swedish case-study, Annex J). In achieving this, although at high abatement costs per tonne of GHG emission reduction compared to other climate mitigation measures, the RED has successfully addressed market failure in the field of innovation (second market failure, see below at C.1.4), which is essential in order to achieve ambitious emission reductions in the long term (Ecologic Institute, 2014).

Concerning the transport target, it certainly reduces MS' flexibility in determining their shares for the sectors, which appears to undermine a cost-efficient approach to developing RES. For example, cost-efficiency concerns have been raised at the governmental level in Estonia, where all biofuels have to be imported (Estonian case-study, Annex F). However, it was already mentioned above that transport is a rapidly growing sector, but has the lowest fuel diversification and thus the least flexibility to achieve GHG emissions reductions and to reduce its exposure to supply shock risks. Thus, without a minimum target for this specific sector, there would have been no incentive to invest in this most cost-intensive, but nevertheless crucial sector. According to a stakeholder, the investments initiated by the RED lead to a continuous reduction of production costs resulting in declining costs of biofuels in absolute terms (German case-study, Annex G). Thus, similarly to the national overall targets, the RED transport target has successfully addressed market failure in order to achieve ambitious emission reductions in the long term, although sustainability concerns endanger the actual achievement of emission reductions.

#### C.1.4 Added value

##### *To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?*

RES target compliance is linked to energy demand and as such to European energy efficiency legislation, in particular the indicative efficiency targets of the Energy Efficiency Directive 2012/27/EC. The energy saved reduces the baseline for RES targets and is thus a substitute for additional RES deployment. However, stakeholder stressed that the instruction to MS in Article 3 (1) RED to promote and encourage energy efficiency and energy saving did not have any noticeable impact in national policy (German case-study, Annex G; Polish case-study, Annex H).

Moreover, RES targets are complementary to the targets of the EU ETS as they aim at reducing GHG emissions as well as diversifying Europe's energy supply by substituting fossil fuels and driving technical innovation that could not be incentivised to the same extent by the EU ETS (Howes, 2010; Görlach, 2014). The risk that GHG emissions savings in the RES sector are compensated by additional emissions under the EU ETS was taken into account when fixing the EU-wide cap.





The transport target is additional and complementary to the GHG reduction targets for transport fuels in the Fuels Quota Directive 2009/30/EC (FQD) that requires in the first place that all fuel suppliers must meet a 6% reduction by 2020 in the GHG intensity of petrol, diesel and biofuels used for transport. Target compliance according to the FQD contributes to target achievement under the RED, thus providing for synergies between both directives. Moreover, vehicle emission reduction targets are important factors for energy demand in the transport sector (JRC, 2014).

***Would the results have been achieved without the RED i.e. without EU intervention?***

The experience with the indicative targets of Directive 2001/77/EC - slow progress and lack of action by MS over the years - suggested that the indicative nature of the targets actually weakened them. In light of this experience, binding targets were included in Directive 2009/28/EC in order to ensure confidence and encourage investments (Howes, 2010). As a result renewable energy deployment intensified and led to an overachievement of the EU's first interim target 2011/2012. Thus, it cannot be assumed that the resulting progress in deploying renewable energy would have been achieved without the binding national targets set in the RED. There is therefore a strong argument for the added value of mandatory national RES targets. Moreover, stakeholders confirm that mandatory national targets contribute to a clear policy framework that creates investor's security (Polish case-study, Annex H; Estonian case-study, Annex F). Furthermore, they emphasise that binding targets, backed by interim targets, lead to greater discipline in implementing the RED (Polish case-study, Annex H). Finally, binding national targets make it much more difficult to deviate from the planned trajectory (German case-study, Annex G). All this applies both to the national overall targets and, as a matter of principle, also to the transport target. Concerning the latter, a stakeholder stresses that the current results would not have been achieved without the mandatory transport target, since such a target would not have been imposed at the national level (German case-study, Annex G). The added value of the indicative interim targets consists in ensuring that measures to achieve the national targets are introduced timely, and in allowing a continuing assessment whether MS are on track.

### **C.1.5 Conclusions and recommendations**

Judging from progress to date, the RED appears to have contributed to intensify renewable energy development in the MS. It is widely agreed that the legally binding renewable targets at the EU level for all MS have strengthened national action, even if experience in some MS demonstrates that targets may also be used to limit RES deployment beyond the national target and the corresponding NREAP. Thus, there is a strong argument for the added value of mandatory national RES targets. Moreover, stakeholders confirm that mandatory national targets, backed by interim targets, contribute to a clear policy framework that creates investor's security, lead to greater discipline in implementing the RED and make it much more difficult to deviate from the planned trajectory. This applies both to the national overall targets and, as a matter of principle, also to the transport target.

Based on historical trends, the targets appear to be achievable. However, stop-and-go policies, disruptive changes, and underperformance of both the heat & cooling sector and the transport sector are currently jeopardising this objective. Some MS need to undertake additional efforts to reach the 2020 targets and in addition, due to the economic crisis and a slow removal of barriers to renewable energy growth, further measures will be needed at MS level to stay on the trajectory and achieve the targets. This should be

accompanied by a close monitoring of MS progress in the coming years. Such a monitoring may not only be limited to RES growth and policy implementation in the previous years but also require MS to specify their plans for the coming years regarding policy measures and RES developments (e.g. via modifying the MS progress reporting obligation of Art. 22).

Concerning the setting of the targets, using GDP per capita as a factor to lower renewable targets (compared to their RES potential) in countries with limited economic strength, proved to be a reasonable method to maintain political and societal support in these countries. On the other hand, it is difficult to draw any clear conclusion on the appropriateness of placing a higher burden on richer countries.

Compared to the national overall targets of the RED, the 10% minimum target for renewable energy in the transport sector has proved controversial from the beginning. Despite the mandatory sustainability criteria implemented by the Directive, concerns over the sustainability and the actual GHG emission reductions achieved by first generation biofuels raise doubts as to the transport target's effectiveness; in addition, they endanger target achievement due, inter alia, to uncoordinated MS implementation policies. These concerns can only be addressed by a speedy EU level decision regarding the ILUC proposal, followed by speedy implementation at MS level. This decision should be sufficiently robust to improve the sustainability of the biofuels that count towards the target, and provide longer term certainty about these policies, to restore the confidence of investors and other stakeholders. Moreover, a clear and well-defined outlook for the expected growth of RES in transport beyond 2020 should be provided, in line with the Transport White Paper. Robust and effective long-term sustainability criteria for biofuels and bioliquids should be integrated in the post-2020 policy framework, and more weight should be given to reducing energy demand in transport.

#### **C.1.6 Data/information gaps**

As opposed to MS support systems and other means to achieve the RED targets, there are only few sources dealing with the RED targets themselves. In particular, there is very sparse literature assessing the appropriateness of the target setting. There is almost no information on the administrative burden concerning the RED targets.

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## C.2 Article 4: National Renewable Energy Action Plans

### C.2.1 Article presentation and relevance

Article 4, together with Annex VI of the RED, aims to ensure that the Member States have a transparent plan agreed on how to meet their national targets, and to provide the necessary information for the Commission to monitor the progress towards the RED targets and the implementation of the various provisions.



This includes the following:

- having sub-targets in place i.e. indicative trajectories for the share of renewable energy in electricity, heating and cooling, and transport in order to trace a path towards the achievement of the final mandatory targets, which allow the European Commission and Parliament to track progress;
- the policies that have been or are planned to be implemented;
- any plans to use statistical transfers between MS and joint support schemes.

To ensure the NREAPs and forecast documents are uniform and comparable, and contain the information needed to meet the objectives, the article contains a number of provisions that describe the information that should be included, or ensure that the Commission adopted a template at a certain date.

Article 4 sets out the general requirements and timeline for the NREAPs and Annex VI specifies the minimum requirements for the harmonised template which was adopted by the Commission adopted the template for the National Renewable Energy Action Plans (NREAPs) in June 2009 (2009/548/EC).

## C.2.2 Effectiveness

### *Have NREAPs been successful in increasing transparency and clarity regarding MS' plans and measures?*

There has been some delay in the publication of the NREAPs but by January 2011, the NREAPs of the then 27 MS had been published (2011 ECN RE projections NREAPs full report)<sup>23</sup>.

The EC evaluated the plans, assessing their completeness and credibility, and the European Environment Agency (EEA) commissioned a study to compile the data from the MS into an overview report and database. This further improved the accessibility of the data, increased transparency and aided in the monitoring process. It should be noted, though, that the EEA reports focus on the data only (figures and tables), and do not provide an overview of the more qualitative parts of the plans, such as grid access regulations, guarantees of origin regulations, implementation of biofuel and bioliquid sustainability schemes, etc.

Overall, however, the forecast documents and NREAPs provide a comprehensive overview of the Member States' plans and policy measures, thus successfully increasing the transparency and clarity on how MS intent to meet the RED targets and provisions. It can be assumed that without this obligation in place, each MS would still make their own plans regarding the implementation of renewable energy. However, these plans would then be for national purposes only, and the information they would provide would differ significantly between countries.

In combination with the progress reports of the MS, the sectoral targets (Art. 4(1)) for the share of energy from renewable sources consumed in transport, electricity and heating and cooling, and the indicative trajectories for the growth of renewable energy use in each sector between 2010 and 2020 have proven an effective means for the Commission (and others, see for example the reports by the IEE funded programme '2020 Keep on Track') to monitor progress over time. It has to be emphasised that, as national sectoral

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<sup>23</sup> One month after the deadline for submitting the NREAPs, 31 July 2010, only 14 Member States had their NREAPs published on the EU's transparency website.



targets are not required by Art. 3, their inclusion in the NREAPs provides for an additional means to assess progress, in a much more differentiated way than the overall targets. In the 2013 Renewable Energy Progress report (COM(2013) 175) and its associated Commission Staff Working Document, the Commission notes, however, that progress monitoring is hampered by significant time lag in the publication of national statistics (e.g. in that 2013 report, the latest available data were from 2010).

As the NREAPs also provide an overview of plans and measures, they enabled the Commission to carry out a more qualitative assessment of policy implementation progress, supported by a modelling-based analysis. This analysis has proved useful as it led to less optimistic conclusions regarding the likelihood of meeting the 2020 targets than the 2010 statistical data suggest, indicating that progress was slower than anticipated in the years after 2010<sup>24</sup>.

***Have NREAPs helped to reduce uncertainties for investors in renewable energy and foster RES deployment and research in this field?***

The NREAPs have the potential to improve transparency of MS' plans and measures for investors and other stakeholders. This type of clarity can be a crucial prerequisite for investors and other stakeholders to take the actions necessary to meet the targets of the RED.

This effect is difficult to quantify and has not yet been studied, but it seems safe to say that the more reliable and concrete the plans are, the higher the positive effect on investments will be given that a stable policy context is a key factor in investment decisions. Indeed, the negative impact of worries about policy support for renewable energy could be seen throughout the globe in recent years, as a recent study on investments in renewable energy (UNEP, 2014) concludes: *Looking at the reasons for the decline in overall investment in 2013, worries about future policy support for renewables delayed investment decisions in countries such as the US, Germany, India, the UK, France, Sweden, Romania and Poland. In some other countries, such as Spain and Bulgaria, retroactive subsidy cuts for existing projects almost killed off investment entirely.*

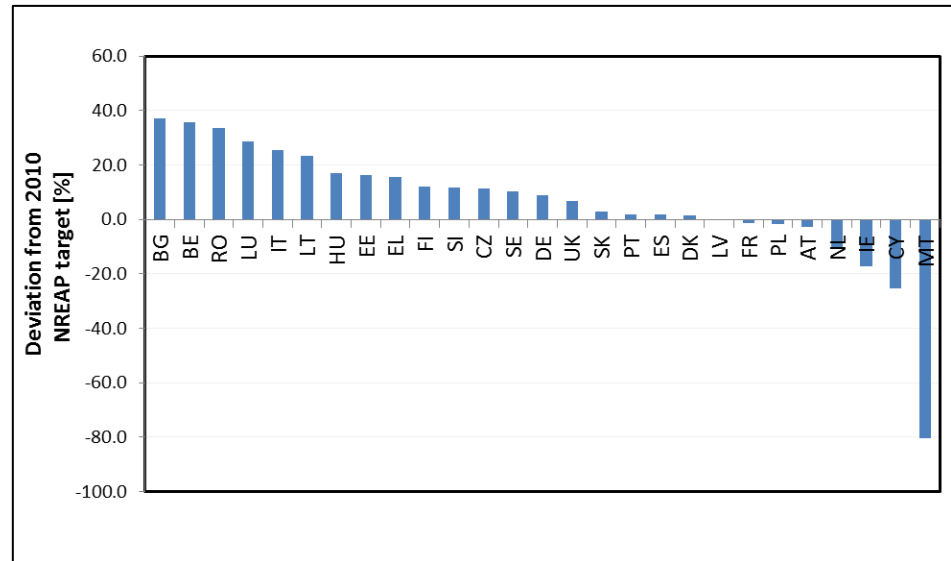
The 2013 RED progress report (COM(2013) 175), however, concludes that the implementation of actual MS policies deviates from the measures in the NREAPs in many countries, as does the expected uptake of the various renewable energy technologies. Figure 5 illustrates this with an overview of the deviations from the 2010 planned renewable share; more detailed information on deviations and implementation delays can be found in (2013 EC COM 175 Working document on RE progress) and (Ecofys, 2013). As the effectiveness of the NREAPs ultimately depends on the actual implementation of the policies and measures, this reduces the effectiveness of the NREAPs: announcements alone will not secure investments. These deviations are also likely to have a detrimental effect on investments in the longer term, as stakeholders will estimate the risks of regulatory changes to remain relative high.

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<sup>24</sup> The effectiveness of the progress reports is discussed further in the section on Articles 22 and 23.



Figure 5 Deviations from 2010 planned renewable shares



Source: 2013 EC COM 175 Working document on RE progress.

***Have NREAPs helped bring RES higher up the policy-making agenda at local, regional and national levels?***

This cannot be answered at this stage but may be explored through the interviews. There is also further opportunity to investigate this question at country level through the case studies.

***If the NREAP was revised, has it proved to be a helpful procedure? Why?***

As policies are typically quite dynamic, and economic, technical and political circumstances vary over time, many MS have deviated from their plans since they were first issued. While countries can voluntarily submit new NREAPs, there is currently only an obligation to amend the plans if progress falls below the indicative targets over a two-year period. As a result, only a few MS supplied supplementary information or submitted updated NREAPs over time.

This creates the risk that action plans may become outdated over time: it will take two years of slow progress before the Commission can require an amended NREAP, and there is no requirement to update the NREAP if the policy measures and strategy is adapted, but the indicative targets are still met.

This potential issue is partly resolved by Article 22: in the biennial progress reports MS are obliged to report deviations regarding the introduction or functioning of support schemes and other measures, and any developments in the measures set out in the NREAP. This should allow the Commission to get an up-to-date overview of the status of these measures, every two years. However, the requirements of the progress reports as given in Art. 22 focus on reporting progress, both regarding renewable energy uptake, policy introduction and functioning, and a number of other parameters. They do not require MS to explicitly report on deviations from the NREAPs, nor do they require reporting on any changes of the plans (e.g. policy measures or indicative trajectories) for the coming years.





***Is the template clear enough to ensure MS provide the information required?***

The template for the NREAPs, as given in Annex VI of the RED and then further elaborated on in (2009/548/EC) is quite clear and complete. However, not all MS provided the information required in the template (Ecofys, 2013) identified a number of data gaps in the NREAPs, for example regarding the split between onshore and offshore wind, or they only reported expected total biomass use without differentiation between the sub-categories solid biomass, biogas and bioliquids. This is explored further in the assessment of Articles 22-23.

***Are NREAPs an effective means for the Commission to evaluate the adequacy of the measures in accordance with Article 3(2)?***

The NREAPs, and especially the indicative trajectories that MS were required to include in their NREAPs, have proven to be a useful means for the Commission to monitor progress towards the 2020 targets. They form the basis for the quantitative part of European Commission's RE progress report (2013 EC COM 175); progress of the more qualitative parts of the NREAPs was not explicitly evaluated in this report. For example, the 2013 RE progress report does not provide an overview of the MS' plans regarding information and training (Art. 14), or biofuels support policies. Ecofys (2013) provides an overview of progress of policy implementation, but also concludes that the information on policies and measures, both in the NREAPs and in the progress reports, was incomplete and in some cases inconsistent.

***What does the reference scenario assume with regards to policy measures and deployment of RE in the Member State without the RES?***

As a reference it is assumed that if the RED were not in place, each Member States would still make their plans regarding the implementation of renewable energy. These plans would then be for national purposes only, and the information they would provide would differ significantly between countries.

***Have there been unforeseen impacts (positive or negative)?***

There is no indication that Article 4 has led to unforeseen impacts, neither positive or negative.

### **C.2.3 Efficiency**

***Since the NREAPs were published, the economical, technical and political environment has changed. Has this article been a barrier to the MS' flexibility to adapt to new circumstances?***

There are no indications that the provisions of Article 4 have hampered the MS' progress towards their targets by impeding their ability to adapt to changing circumstances. As can be seen from the 2013 comparison of progress reports and NREAPs, many MS have deviated from the plans and measures originally set out in the NREAPs, some of them exceeding the expectations of their NREAP.

***Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?***

Looking at the cost of the provisions in Article 4, the main costs are due to the administrative burden on the MS public authorities.

This burden is limited, assuming that the MS would have to make plans and identify measures to meet the targets, irrespective of whether they have to submit actions plans to the Commission.



***Is the level of effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?***

For some MS, the template for the NREAPs provided by the Commission (2009/548/EC) was likely to be more detailed than what they would have drafted for national use only. This has resulted partly in more effort from the MS and in some cases the MS decided not to report some of the required data.

Actual data on the administrative burden are not available. However, there is no indication that the requirements of this article are inappropriately high, compared to the potential benefits described above.

#### **C.2.4 Added value**

***Would the results have been achieved without the RED/article, i.e. without EU intervention?***

Article 4 has clearly contributed to the transparency of MS' plans and measures related to the RED. It has also enabled the Commission (and others) to monitor progress over time, and compare the actual progress with the plans outlined in the NREAPs. Together with the progress reports (Art. 22), the NREAPs also enable the Commission to carry out a qualitative assessment of actual progress (of policy implementation, technology development, etc.) versus plan.

Without this EU intervention, many MS would have devised RES strategies on their own, as was the case before the RED came into force. Article 4 made this obligatory for all MS and required a level of detail that not all MS would have achieved otherwise. It is difficult to estimate and quantify this effect without further analysis, though, including a prognosis of how MS plans would have developed without Art. 4.

The added value of Article 4 regarding investor certainty is difficult to specify. The NREAPs increased transparency of the measures and of the expected demand for the various renewable energy technologies. On the other hand, however, actual implementation deviated from the plans, thereby reducing the reliability of the market outlook provided in the NREAPs. As the RES market and policies are inherently dynamic, this issue is difficult to resolve.

#### **C.2.5 Conclusions and recommendations**

Article 4 and the associated NREAP template have proven to be a useful means to compile an overview of MS plans and measures. The quantitative information provided in the NREAPs provides a useful basis for the monitoring of progress towards the 2020 targets, as the 2013 progress reports and supporting documents illustrate.

The more qualitative information on policies and measures is less easy to compile and assess, partly due to the less homogeneous and sometimes incomplete and inconsistent reporting (Ecofys, 2013).

The deviations between NREAPs and actual policy implementation and RES trajectories are partly due to changing (economical and political) circumstances. This seems to be unavoidable, as the NREAPs had to be submitted in 2010, and circumstances will inevitably change in a decade. This causes the NREAPs to become outdated over time. The progress reports (Art. 22) partly solve this issue, as they aim to provide updated data on plans and progress, but they do not include updates of all data required by the NREAPs.

In order to ensure continued transparency of the plans and measures in the MS, it may be advisable to bring the progress reports in line with the NREAPs, to ensure that MS provide a full update of the information provided in the NREAP. Alternatively, the requirement to submit an updated NREAP may be adapted, for example to require updated NREAPs every x years, or if the MS has decided on new policies or a new (renewable) energy strategy. This would have to be considered against the additional administrative burden generated.

### **C.2.6 Data/information gaps**

- Administrative burden (cost, man-days) of writing the NREAPs, assuming that the most of the plans itself would have to be made anyway, for national purposes.
- How do public authorities perceive the requirement for the NREAPs and the associated template? Any suggestions for improvements?
- Have the NREAPs contributed to bring RES higher up the policy-making agenda at local, regional and national levels?
- Have the NREAPs contributed to RES related investments? Do the various stakeholders perceive this information to be useful for their strategic (investment) decisions?
- There is a delay of about two years before monitoring data regarding actual RES production and use become available on EU level. This means that an assessment of deviations from the MS plans is likewise delayed, as is the response of the EU. This may create a risk that targets will not be met, or that an ineffective implementation of policies is continued longer than would be desirable. Do MS or stakeholders consider this to be a barrier to the effectiveness and efficiency of the RED?

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### C.3 Articles 6-12: Cooperation mechanism

#### C.3.1 Article presentation and relevance

Early analysis by the Commission suggested that the need to seek out cheaper RES in other MS will rise and should be encouraged on grounds of cost-efficiency (Howes, 2010; Commission, 2008). Furthermore, the mandatory national targets in Art. 3 RED do not necessarily correlate with the MS's RES potentials (see the assessment of Art. 3 RED). For these reasons, Art. 3 section 3 lit. b of the RED enables MS to reach their national targets by cooperating with other MS and third countries with higher RES potential or lower production costs, thus allowing a cross-financing between MS for the achievement of the EU target. With Art. 6-12 RED, Directive 2009/28/EC provides the legal framework for the use of such cooperation mechanisms, aimed on the one hand at increasing economic efficiency of their RES target achievement, optimising RES resource utilisation and contributing to the internal energy market (Ecofys, 2014), on the other hand providing MS with additional means to achieve their RES targets.

#### C.3.2 Effectiveness

##### *Did the cooperation mechanisms prove effective in contributing to reach the national targets?*

Although the ultimate rationale to use cooperation mechanisms is to exploit renewable energy resources in the most cost-efficient way, the vast majority of MS have indicated that they intend to reach their national targets with their own support schemes, as indicated in the forecast documents, NREAPs, and progress reports. For example, Germany stated in its NREAP that it will achieve its 2020 target through national measures and was therefore not depending on using the cooperation mechanisms (German case-study, Annex G). Accordingly, so far the main reason for MS to consider the use of RES cooperation is in relation to 2020 target achievement (Ecofys, 2014). MS with a potential domestic deficit in 2020 such as the Netherlands and Luxembourg are the ones that explore cooperation with other MS most actively as potential buyers. Other countries, like the UK, intend to achieve their target with domestic projects but still consider the use of cooperation mechanisms to secure target achievement (Ecofys, 2014). Similarly, for the period after 2020, Germany expects that it will need to import renewable energy and has indicated interest in testing cooperation mechanisms before 2020 (NREAP). Countries that are expecting a domestic surplus in 2020 are potential sellers and see the benefits of cooperation mechanisms in being able to partly cover the costs of their excess RES production. This is notably the case of Italy and Denmark (Ecofys, 2014), but also of Estonia (Estonian case-study, Annex F).

In spite of these considerations, cooperation mechanisms have been used in only one case so far: the joint Tradable Green Certificates (TGC) system between Norway and Sweden, operating since 1 January 2012. This joint certificate scheme extended the electricity certificate scheme operated by Sweden since 2003 to Norway, thereby replacing the former investment support for wind farms in the latter country. The primary objective of this



cooperation is not to achieve the RED targets but to increase investment, sector growth and deliver renewable energy in a cost-efficient way (Swedish case-study, Annex J). The target for the joint market is to increase electricity production based on RES in Sweden and Norway by 26.4 TWh from 2012 to 2020, i.e. an additional electricity production of 13.2 TWh per country. The eligibility period is limited to 15 years. Electricity produced by plants included in the common electricity certificate market will be equally divided between the two parties (Ecofys, 2014).

As the exact location of new RES-E units within the joint territory of the two countries is decided by the investors based on lowest cost, the resource potential was assessed during the negotiation of the joint support system. The Nordic Working Group for Renewable Energy commissioned a study that analysed the effect of various cooperation scenarios among the four Nordic countries (Greenstream, 2010). The modelling revealed that Norway and Sweden have considerable wind potential that needs to be exploited in order to reach an ambitious target and that the cost of wind in Norway is lower than in Sweden: 80 TWh of wind energy can be generated for € 100 in the former but only 30 TWh in the latter. Therefore, in a joint support scheme, Norway was expected to experience an increased level of investment in wind. In addition, Norway has more hydro potential than Sweden which in turn is more endowed with biomass reserves.

However, the initial expectations regarding the location of future units failed to materialise. During 2012, RES-E plants producing 3.2 TWh/year entered the electricity certificate system: the majority (2.8 TWh) in Sweden and only 0.4 TWh in Norway. As far as new wind capacities are concerned, between 2012 and 2013 1,570 MW capacity was built in Sweden and only 276 MW in Norway (EWEA, 2014). Consequently, Norway did not enjoy any of the expected industrial and employment benefits associated with new power units.

The scheme favours the cheapest type of production, regardless of physical location but the costs include elements that are country specific. Lower taxes and more favourable depreciation rules attracted investment to Sweden, despite the better natural endowment in Norway for wind generation. Under Swedish tax law most of the value of wind turbines depreciates in the first five years. In Norway write-off time for turbines can be as long as 17 years<sup>25</sup>.

Further factors in location choices are the quicker licence procedures and better grid conditions in Sweden, as well as the familiarity of Swedish developers and investors with the scheme rules due to their previous experience with this scheme (Swedish case-study, Annex J). With decreasing power prices, the range of economically viable projects narrows down and cost differentials due to regulatory differences in the two countries, such as tax rules, become decisive in location decisions.

In sum, the driving force behind wind developments' location choices in the Swedish-Norwegian joint support scheme so far was not the different natural endowment but the different investment environment. As a result, the cost-saving potential of the joint scheme has been altered and Norwegian consumers are financing Swedish renewable projects, which could lower the

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<sup>25</sup> <http://www.renewableenergyworld.com/rea/news/article/2014/09/norway-may-miss-out-on-6-billion-wind-power-boom>



social acceptance of the scheme in Norway (see also Swedish case-study, Annex J).

The most integrated initiative to use cooperation mechanisms is a planned joint project between UK and Ireland consisting in exporting onshore and offshore power up to 5 GW from Ireland to the UK. In a Memorandum of Understanding of January 2013, both countries committed to a programme of work with a view to signing an intergovernmental agreement on energy trading. For the UK, aside from ensuring the achievement of the 2020 target, the scheme's other benefits would include: improved interconnection; increased amount of green power in the electricity mix; and reduced costs for UK end consumers of electricity. Meanwhile, Ireland is chiefly driven by employment opportunities and interconnection benefits. However, due to regulatory framework issues and technical issues, it is still uncertain whether cooperation will finally be implemented (Ecofys, 2014). In April 2014, the Irish government has reportedly confirmed that the plans would not go ahead before 2020.<sup>26</sup>

Estonia has started negotiations with Luxemburg on statistical transfers in order to sell its expected RES surplus, and developed draft legislation to put in place the legal basis for statistical transfers with other MS. According to a case study on statistical transfer between both countries done by Ecofys, such cooperation may allow Estonia to recover RES support costs, which could be used for further RES deployment in Estonia. However, stakeholders criticise that the draft legislation does not provide for such an incentive (Estonian case-study, Annex F).

Other countries have also enacted domestic legislation transposing the RED to enable the use of cooperation mechanisms when appropriate, for example Italy, Poland (Polish case-study, Annex H), Bulgaria (Bulgarian case-study, Annex E) and Spain (Spanish case-study, Annex I). The Netherlands plan to open its support schemes to foreign projects (Ecofys, 2014). According to interviews led by the Ecofys consortium, other MS have explored the potential use of cooperation mechanism over the past years, mostly without concrete results. For example, stakeholders reported that Germany had discussed and initiated joint projects with several MS, but no agreements could be reached on the repartition of costs and benefits (German case-study, Annex G). According to Swedish stakeholders, the use of cooperation mechanisms by Sweden on a larger level failed due to the lack of compatibility of the current range of support schemes across the EU, for example in relation to Germany (Swedish case-study, Annex J).

***Have cooperation mechanisms had any unforeseen (positive or negative) impacts on the MS?***

The economic crisis resulted in cuts of RES support in many MS, and thus unfavourable investment conditions. This has a direct impact on target achievement with domestic measures, and indirectly on the importance of cooperation mechanisms to help reach the targets.

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<sup>26</sup> Ireland-UK wind farm export plans shelved, 15 April 2014.  
<http://www.businessgreen.com/bg/analysis/2339719/ireland-uk-wind-farm-export-plans-shelved>



### ***Which factors have hindered the achievements of the article's objectives?***

Several barriers have been mentioned as hindering the use of cooperation mechanisms:

- Uncertainty with regards to the continuity of the EU framework beyond 2020. The interest in cooperation mechanisms is closely linked to the discussion on the 2030 targets. Especially the development of joint projects and joint support schemes will depend on the 2030 targets definition, since without strong incentives to cooperate beyond 2020 such long-term joint endeavours and investments are unlikely to happen (Ecofys, 2014). This is confirmed by a stakeholder who considers that the Council conclusions on the 2030 climate and energy policy framework fail to provide such incentives (German case-study, Annex G).
- Public acceptance to fund projects outside the country and the foregone local benefits or, conversely the selling of cheap RES development options that would increase the cost of target compliance in case of future more stringent targets (post 2020 era).
- Technical barriers including uncertainty on RES domestic achievement, quantifiable costs and benefits, and design options. In addition to MS experiences mentioned above, stakeholders from Spain and Estonia regard insufficient interconnection capacities as a main barrier to cooperation (Spanish case-study, Annex I; Estonian case-study, Annex F; regarding Portugal see Unteutsch/Lindenberger, 2014).
- Legal barriers such as potential incompatibilities of cooperation mechanisms with national and EU legislation (Ecofys, 2014, see also Fraunhofer ISI, 2011; Unteutsch/Lindenberger, 2014).
- More generally, Swedish stakeholders claim that the use of cooperation mechanisms was flawed from the beginning due to its being voluntary, instead of requiring a certain percentage per MS of renewable energy from such mechanisms (Swedish case-study, Annex J).

To sum up, the effectiveness of the cooperation mechanisms is very low to date, with only one project realised so far. Concerning the ultimate objective of cooperation mechanisms to achieve cost-efficiency, this means that Art. 6-12 cannot be considered to be effective to date. Concerning the objective of securing the achievement of the 2020 national RES targets, however, it is too early to assess whether Art. 6-12 RED are effective in securing the achievement of the 2020 national RES targets, since potential activities are likely to take place in the run-up to 2020. Developments so far indicate that MS that expect to miss or exceed their target domestically are interested in using the cooperation mechanisms and have taken tentative first steps to implement the necessary domestic requirements.

### **C.3.3 Efficiency**

#### ***Has the article added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced?***

In research, efficiency is only addressed in terms of a theoretical cost-benefit balance at EU and MS level (Ecofys, 2014), not concerning the administrative burden at MS level. According to the study done by Ecofys on statistical transfer between Estonia and Luxembourg, direct costs associated with cooperation mechanisms are support and transaction costs, the latter being rather minor (see Estonian case-study, Annex F).

In the case of the Swedish-Norwegian joint support scheme, two new bodies have been set up to administer the system: the Council and the Committee. The Council consists of representatives from the Norwegian Ministry of Petroleum and Energy and the Swedish Ministry of Enterprise, Energy and





Communications. The task of the Council is to facilitate planning and the implementation of progress reviews. The Committee consists of representatives from the Swedish Energy Agency and NVE. The Committee monitors and discuss the design and implementation of the regulatory framework for allocating electricity certificates (Annual report, 2012).

Polish stakeholders indicate that requirements for the use of cooperation mechanisms such as the conclusion of an international agreement, the approval of the Minister of Economy, and the notification of the European Commission about the scope and outcome of cooperation mechanisms place additional burden on public authorities, but are considered necessary safeguards to ensure that national targets are met through these mechanisms (Polish case-study, Annex H). Also stakeholders from Sweden consider the administrative burden of complying with the RED requirements for cooperation mechanisms, for example reporting obligations, not significant and appropriate (Swedish case-study, Annex J).

***Are the cooperation mechanisms the most cost-efficient way to achieve the targets? How is this determined?***

There seems to be consensus in academic literature that cooperation in RES in general may yield substantial cost savings (Unteutsch/Lindenberger, 2014). Concerning the cooperation mechanisms of the RED, quantitative assessment led by the Ecofys consortium suggests that, in particular, countries importing renewable energy may gain strongly from cost savings if strong RES cooperation is pursued, since support expenditures could be reduced substantially. The highest savings could be reached in Latvia, Poland, France, UK and the Netherlands (Ecofys, 2014). Statistical transfers could be particularly suited to address cost-efficient fulfilment of the RES targets. For example, the envisaged statistical transfer from Estonia to Luxembourg would not involve additional support costs and reduce existing Estonian support costs (Estonian case-study, Annex F). Joint support schemes provide for the highest degree of cost-efficiency, but require deep cooperation between MS with similar conditions (Ecofys, 2014).

### **C.3.4 Added value**

***To what extent is the article complementary to other EU initiatives?***

As far as joint projects between MS and third countries (Art. 9-10 RED) are concerned, the cooperation mechanisms are complementary to the Mediterranean Solar Plan that aims at developing 20 GW of RES production capacities, and achieving significant energy savings around the Mediterranean by 2020, thus addressing both supply and demand. The plan is one of the major projects of the Union for the Mediterranean (UfM), launched in Paris on 13 July 2008 (Union for the Mediterranean, 2012). According to recital 39 of the RED, the RED intends to facilitate the development of such projects by allowing MS to take into account in their national targets a limited amount of electricity produced by such projects during the construction of the interconnections to EU territory.

***Would the impacts from the article have been achieved without the RED/article, i.e. without EU intervention?***

As to date cooperation mechanisms have not been used but for one case, there are almost no impacts from Art. 6-12 RED. However, as stated above, the development so far indicates that MS that expect to underachieve or exceed their target domestically are interested in using the cooperation mechanisms to this end; they have initiated or completed the implementation of the necessary domestic requirements, and some of them have contacted other MS.



This impact would clearly not have been achieved without the incentive of the RED to use cooperation for target achievement. This is confirmed by stakeholders (Bulgarian case-study, Annex E; Estonian case-study, Annex F; Polish case-study, Annex H). On the other hand, in spite of this additional incentive, cost efficiency considerations have not led to the use of cooperation mechanisms so far, except for the joint project between Sweden and Norway which was already being envisaged years before the cooperation mechanisms were included in the Renewable Energy Directive.

***Are there alternative measures/improvements which could have led to the same results?***

First MS activities to use cooperation mechanisms for target achievement are intrinsically linked to the existing RED measures. On the other hand, the joint project between Sweden and Norway that was envisaged years before the RED cooperation mechanisms would probably have also materialised without Art. 6-12 RED or any other particular EU incentive, since it was not primarily based on target achievement, but on other considerations such as cost efficiency (Swedish case-study, Annex J).

### **C.3.5 Conclusions and recommendations**

Although the ultimate rationale to use cooperation mechanisms is to exploit renewable energy resources in the most cost-efficient way, the vast majority of MS have indicated that they intend to reach their national targets with their own support schemes, thus considering the use of RES cooperation primarily as an alternative instrument for target achievement as foreseen in Art. 3(3) RED.

As mentioned previously, so far the cooperation mechanisms have only been used in one case: the joint Tradable Green Certificates (TGC) system between Norway and Sweden. In this particular case, the initial expectation that both parties would experience an increased level of investment in wind power did not materialise as better investment conditions in Sweden proved more relevant than the good natural conditions and lower costs in Norway. As a result, Norwegian consumers are financing Swedish renewable projects, which could lower the social acceptance of the scheme in Norway.

The limited use of cooperation mechanisms so far may be due to:

- a general preference to achieve the targets domestically (and retain benefits locally);
- uncertainty about the need to back RES domestic achievement with cooperation mechanisms in order to reach the targets;
- uncertainty about quantifiable costs and benefits, and design options;
- insufficient interconnection capacities between MS or MS and third countries, and legal barriers;
- uncertainty about the continuity of the EU framework beyond 2020 as a decisive investment condition for joint projects and joint support schemes.

In sum, the effectiveness of the cooperation mechanisms is very low to date, with only one project realised so far. Concerning the ultimate objective of cooperation mechanisms to achieve cost-efficiency, this means that Art. 6-12 cannot be considered to be effective to date. Concerning the objective of securing the achievement of the 2020 national RES targets, however, it is too early to assess whether Art. 6-12 RED are effective in securing the achievement of the 2020 national RES targets, since potential activities are likely to take place in the run-up to 2020. The development so far indicates that MS that expect to underachieve or exceed their target domestically are interested in using the cooperation mechanisms to this end and have taken initial steps to implement the necessary domestic requirements.



***What improvements may help to increase the effectiveness of the measures in place under this article?***

Improvements concerning the cooperation mechanisms have been proposed by (Ecofys, 2014). As MS mentioned political, technical and legal barriers as obstacles for further application of these mechanisms (see above under effectiveness), any quest for improvements has to address and remedy these key obstacles. Ecofys (2014) assessed the barriers according to their impact and the difficulty to implement appropriate remedies.

One key barrier, the uncertainty about the need to back RES domestic achievement with cooperation mechanisms in order to reach the targets, will disappear as soon as MS know more exactly about potential deviations from their targets; at this moment, incentives to engage in cooperation will significantly increase. However, using the cooperation mechanisms will need preparation; while statistical transfers are suitable for filling short-term gaps, joint projects require a higher degree of cooperation and preparation, and joint support schemes provide for the highest degree of cooperation and preparation. Moreover, MS that do achieve their target but do not overachieve it have no incentive to use cooperation mechanisms for target achievement (German case-study, Annex G; Polish case-study, Annex H). However, according to some stakeholders, the new guidelines on state aid for environmental protection and energy 2014-2020, that as a general rule will oblige MS to grant RES subsidies in a competitive bidding process open to all generators producing electricity from renewable energy in the EU (European Commission, 2014), may have an impact on the use of cooperation mechanisms; MS may be more willing to use these mechanisms in order to gain experience with a view to future common auctioning systems (German case-study, Annex G; similarly Estonian case-study, Annex F). According to stakeholders from Sweden, (such) harmonisation would ensure a level playing field for cost-efficient renewable to develop as a pre-condition for more cooperation (Swedish case-study, Annex J).

According to Ecofys (2014), most key barriers that currently delay the application of cooperation mechanisms and hinder their acceptance could already be addressed through better availability of know-how and solutions negotiated between the MS interested in cooperating, e.g. opt-out clauses in cooperation agreements to address uncertain developments such as target achievement.

In order to enhance this knowhow and propose possible approaches and solutions, the Commission issued guidance on the use of renewable energy cooperation mechanisms in November 2013 (Commission, 2013). MS welcomed this guidance and asked for further information on design options and cost-benefits measurement methods (Ecofys, 2014). Improved guidance, and generally facilitation of cooperation between MS by the Commission, is also recommended by a Swedish stakeholder (Swedish case-study, Annex J). As one step in this direction, based on this guidance document and other sources like literature findings and interviews with MS, (Ecofys, 2014) presented quantitative and qualitative analysis to assist MS in cooperation mechanism designs (in chapter 4 of their report). Moreover, chapter 5 of their report shows options how the costs and benefits of cooperation mechanisms can be measured and allocated, while chapter 6 provides information on the cost-saving potential of cooperation. Since that analysis aims at proposing options for a variety of cooperation forms, main findings cannot be presented here. In sum, further information, analysis and guidance, in particular on design options and cost-benefit measurement methods may help address the barriers to more cooperation under Art. 6-12 of the RED, speed up the implementation process and improve public acceptance. Further support on the political level is recommended hereafter.

***What could be done in order to increase their use, how could they be improved?***

On the political level, a reliable long-term framework for RES with 2030 national targets would be a key condition for an increased use of the cooperation mechanisms of the RED. In particular, the development of joint projects and joint support schemes will depend on the 2030 targets definition, since without strong incentives to cooperate beyond 2020 such long-term joint endeavours and investments are unlikely (Ecofys, 2014). As the Council conclusions on the 2030 climate and energy policy framework do not foresee national RES targets, much will depend on whether the Governance 2030, and especially the part on fostering regional cooperation, will be able to provide comparable incentives. If target achievement is no longer the main incentive for using the cooperation mechanisms, it would become even more important to demonstrate the long-term cost-efficiency benefits of cooperation.

**C.3.6 Data/information gaps**

As to date cooperation mechanisms have not been used but in one case, there is very limited information available concerning the effectiveness and cost-efficiency of these mechanisms, and their potential administrative burden.

**C.3.7 Sources**

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Tom Howes

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**Unteutsch and Lindenberger, 2014**

Michaela Unteutsch, Dietmar Lindenberger

Promotion of Electricity from Renewable Energy in Europe Post 2020 - The Economic Benefits of Cooperation

In: Zeitschrift für Energiewirtschaft, (2014); p. 47-64

**C.4 Article 13: Administrative procedures, RES in buildings, heating**

**C.4.1 Article presentation and relevance**

Article 13 makes provisions for administrative procedures, regulation and codes regarding the authorisation, certification and licensing procedures relevant to renewable energy production, transmission and distribution. This includes the procedures themselves as well as minimum standards to be considered in terms of technical specifications. The Article also defines actions to promote renewable energy technologies in buildings. The specific provisions set out in the article are presented below.

*Authorisation, certification and licensing procedures:*

- The Directive stipulates that the procedures for authorisation, certification and licensing need to be proportionate and necessary. This applies to procedures regarding: plants and associated transmission and distribution; network infrastructures for the production of electricity, heating or cooling from renewable energy sources; and the transformation of biomass into biofuels or other energy products.

The Article sets out a number of steps to achieve this:



- MS need to define clear administrative responsibilities regarding the procedures for authorisation, certification and licensing (including spatial planning) across all organisations involved. Furthermore, timetables need to be clearly defined.
- Sufficient information needs to be made available on the procedures in place.
- MS need to streamline administrative procedures.
- Non-discriminatory and transparent rules need to be implemented.
- MS need to ensure administrative charges are transparent and cost-related.
- Simplified and less burdensome authorisation procedures for smaller projects and decentralised devices need to be put in place.

#### *Technical specifications*

MS need to define technical specifications that must be met by renewable energy equipment and systems in order to benefit from support schemes. Where European standards exist the technical specifications should refer to those standards. MS should not prescribe where the certification takes place.

#### *Recommendation to install equipment and systems for use of renewable sources*

MS shall recommend to all actors involved to ensure equipment and systems are installed for the use of energy from renewable sources and for district heating and cooling when planning, designing, building and renovating industrial or residential areas.

#### *Use buildings regulations and codes to promote renewable energy technologies*

MS shall make provisions in their building regulations and codes for increasing the share of renewable energy. This needs to be achieved by setting minimum levels for renewable energy for new buildings and existing buildings subject to major renovation. Alternatively, this requirement can be fulfilled by using district heating and cooling provided that a large proportion of the energy is produced from renewable energy sources.

#### *Exemplary role of public buildings*

MS shall ensure that public buildings play an exemplary role in the promotion of renewable energy.

#### *Promote renewable energy heating and cooling systems via building regulations and codes*

MS shall promote renewable energy heating and cooling systems via building regulations and codes. Standards developed at national- or Community level should be used.

For biomass MS shall promote technologies with a conversion efficiency of >85% for residential and commercial and >70% for industrial applications. Heat pumps should fulfil the minimum requirements of eco-labelling established in Commission Decision 2007/742/EC.

Solar thermal technologies should comply with EU minimum standards where they exist.



*To what extent are the objectives of the article relevant to the needs of the EU energy and climate change policy, or other needs, problems or issues which are identified?*

Poor administrative procedures can significantly slow down the uptake of renewable energy in the EU. Having a system in place that is robust and streamlined is paramount for achieving a much more rapid increase in renewable energy generation.

## C.4.2 Effectiveness

### a Authorisation, certification and licensing procedures

***Has the article led to better planning and streamlining of the approval and licensing procedures for RES producers at national and local level?***

A number of studies have explored the administrative procedures in place for the renewable energy sector across Europe.

The European Commission's recent progress report on renewable energy at EU level concluded that 'progress in removing the administrative barriers is still limited and slow' (European Commission 2013). This confirmed earlier findings by Fraunhofer ISI and Vienna University of Technology (2011) that 'the strongest deficits exist in the field of administrative procedures and spatial planning'. This research assessed 21 NREAPs and provided a quality rating for each MS assessed. The evaluation criteria included: presence of a one-stop shop scheme; lead times; exemptions of authorisation for small scale installations; and cost-related fees.

Fouquet and Sharick (2011) also undertook a high level review of the administrative procedures in place assessing criteria such as lead times, complexity of procedures, and number of permits required.

Ecofys et al. (2013) produced so far the most extensive review and judged the quality of administrative procedures by a number of criteria such as:

- Is there a 'One Stop Shop'?
- How many permits are required?
- Is there an online application for permits?
- Is there a maximum time limit for procedures?
- Do applicants get automatic permission?
- Is there a facilitated procedure for small scale installations?
- Are suitable geographic sites identified automatically?
- Is there an automatic entry into financial support schemes?

The detailed results of this study are provided in Annex D.

Finally, focusing on biofuels only, another study by Ecofys and IEEP (2013) rated MS against a number of criteria on effectiveness and the administrative burden. The criteria included: need to report to more than one administrative body; need to report more than the minimum requirements; and multiple ways to demonstrate compliance.

Table 9 summarises the quality rating allocated to administrative procedures in all MS by the various studies reviewed.



Table 9 Overview of assessment of quality of administrative procedures

Member State	Fraunhofer ISI and Vienna University of Technology 2011	Ecofys et al. 2013	Fouquet and Sharick 2011	Ecofys and IEEP 2013	Overall assessment
Austria	high	low	high	medium	high
Belgium	medium	medium	low	medium	medium
Bulgaria	low	low	low	low	low
Croatia	not assessed	not assessed	not assessed	not assessed	not assessed
Cyprus	low	medium	low	medium	low
Czech rep	low	low	low	medium	low
Denmark	high	medium	high	high	high
Estonia	not assessed	low	not assessed	medium	low
Finland	low	low	low	medium	low
France	low	low	low	medium	low
Germany	high	medium	medium	medium	medium
Greece	medium	low	not assessed	medium	medium
Hungary	not assessed	medium	not assessed	low	medium
Ireland	medium	low	not assessed	medium	medium
Italy	low	medium	low	medium	low
Latvia	low	low	low	medium	low
Lithuania	low	low	low	low	low
Luxembourg	not assessed	low	not assessed	not assessed	low
Malta	low	low	low	medium	low
Netherlands	not assessed	medium	not assessed	medium	medium
Poland	not assessed	low	low	not assessed	low
Portugal	low	medium	low	medium	low
Romania	low	low	low	medium	low
Slovakia	not assessed	low	not assessed	medium	low
Slovenia	low	low	low	not assessed	low
Spain	medium	low	medium	high	medium
Sweden	high	medium	low	medium	medium
UK	medium	low	low	medium	medium

Source: Based on Fraunhofer ISI and Vienna University of Technology (2011), Ecofys et al. (2013) and Fouquet and Sharick (2011).

The assessment showed that only 2 out of the 27 assessed MS seem to have high quality administrative procedures in place. More than half were rated low. Note that the various studies used different criteria, were conducted at different times and focused in some instances on a limited number of countries or subsectors. However, overall the studies are more or less consistent regarding the quality ratings except for Austria, Spain and Sweden where we found high as well as low ratings.

***Would this have occurred without the RED?***

It is impossible to determine whether any improvements in authorisation, certification and licensing procedures are the result of the RED based on existing reports. This would require further analysis and establishing of a counterfactual. Further research should evaluate the trends in MS prior to the implementation of the Directive and compare the situation after the Directive came into force. If the situation in MS changed significantly one would need to qualitatively assess (e.g. through expert interviews and extensive document



analysis) whether or not the observed changes were the result of the RED or not.

***What is the response time measured in months from the moment the application is submitted to the moment the answer is received?***

Due to the different types of applications related to RES projects there is no unique answer to this question.

One way of regulating the length of the response time to get permission for RES projects is to put in place maximum time periods that needs to be followed by the administrative bodies. Ecofys et al. (2013) found that: 21 MS have put in place maximum time periods for administrative procedures as part of the authorisation process. However, the maximum time period differs significantly amongst MS with the Czech Republic setting the maximum at 6 years and Malta at 4 weeks only.

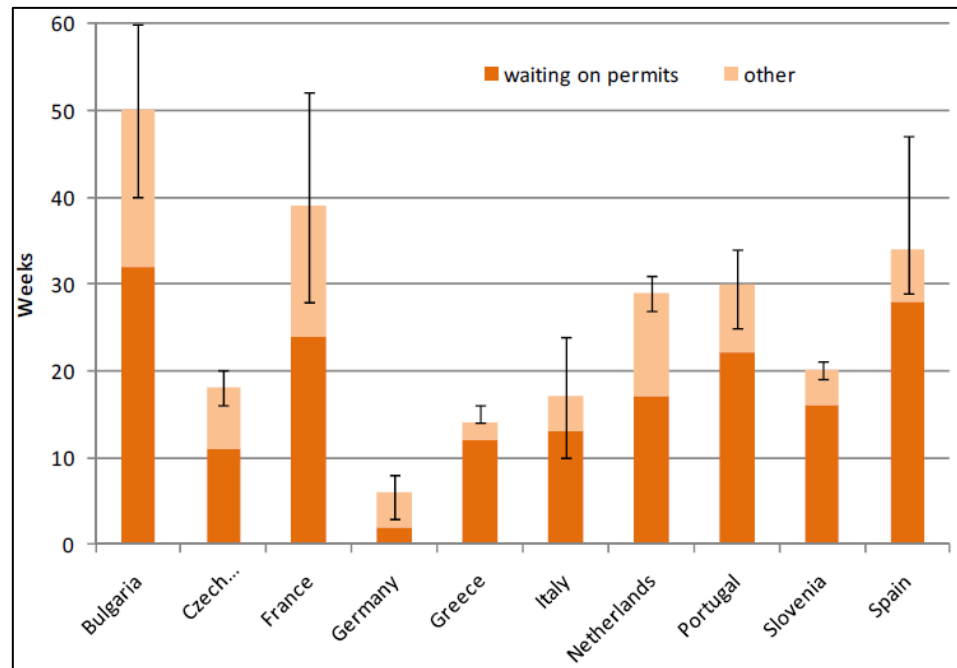
As a result, lead times for RES developments (from inception of the project, through obtaining planning permission, to completion of the infrastructure) differ significantly across Europe. In Denmark they are less than 50 weeks. In Slovenia, Cyprus and France project permitting processes can take up to 2, 4, and 6 years, respectively. Onshore wind in Germany can take 3-7 months for permitting as compared to less than 5 weeks in Denmark. In Italy, France and Cyprus RES projects can take up to seven years to get permits (Fouquet and Sharick 2011). The lead times will depend on a wide range of factors, beyond the planning process, including the technology considered, community acceptance and finance availability.

Overall however, Ecorys (2010) identified lengthy procedures in the majority of the EU Member States, among them Austria, Bulgaria, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Slovenia, Spain and Sweden.

Looking at small scale projects in the PV industry, in the best performing country (Germany), authorisation procedures represent less than 40% of the total time needed to realise the project. However, in nearly all other countries, this proportion exceeds 60% and even often ranges between 70 and 90%.



Figure 6 Time needed to develop small-scale roof-top PV projects in selected EU countries



Source: PV Legal (2010).

Project developers have credibly argued that public entities were responsible for delays e.g. due to very complex licensing procedures, unclear administrative responsibilities, multiple bodies involved, municipalities involved without clear rules, lack of one-stop-shops.

***What is the time spent awaiting for the results from complaints processes?***

No information has been identified on complaints procedures and waiting times.

***Are these procedures expedited at the right admin level? Are they proportionate, transparent and consistent?***

Ecorys (2010) found that an excessive number of authorities are involved in permitting procedures. This was the case in Belgium, Cyprus, Estonia, Finland, Hungary, Ireland, Italy, Latvia, Luxembourg, Poland, Romania, Slovenia, Spain and Sweden. For example, in Cyprus, Slovakia and Italy, dozens of different public offices must give their approval, leading to waiting times of several years.

However, the more recent study by Ecofys et al. (2013) identified 9 MS with a 'one-stop-shop' for authorisation including Italy and Hungary previously flagged as having an excessive number of authorities involved in the Ecorys report.

There does not seem to be a straightforward solution at this stage. In some cases, even if there is no 'one-stop-shop', permitting procedures can be very lean even though several administrations must be involved like for instance in Ireland (Ecorys 2010). On the other hand, the presence of a 'one-stop-shop' does not automatically prove that efficient procedures are in place. For instance, in Italy a single authorization procedure exists in theory. However, in actual fact, the central agency must obtain authorisations from up to 50 administrative bodies. In contrast, the German system is generally considered very effective and can be classified as best practice.





Inconsistent and unpredictable patterns of application of regulations and laws have been raised as an issue in previous studies (Ecorys, 2010).

Regarding spatial planning, 18 MS were rated poorly in the Ecorys (2010) study particularly because a lot of powers were allocated to local planners who may have a preference for avoiding renewable energy projects in their areas.

***Has a simplified authorisation procedure been adopted for smaller projects?***

21 MS have specific, streamlined procedures for small scale projects. In some countries and for some technologies, no permit is necessary. For instance, Austria does not require small scale projects to go through the administrative procedures for authorisation. This means that small-scale roof-top PV projects do not require planning application or giving notice to the planning authorities in Austria. Similar dispositions are in place in the Netherlands for small rooftop PVs.

**b Technical specifications**

***Are the technical specifications which must be met by renewable energy equipment and systems in order to benefit from support schemes more clearly defined and better understood by the industry? Are they consistent?***

The evidence on whether the technical specifications used by MS have improved as a result of the RED is thin. The most detailed assessment so far is an analysis by Ecorys (2010) which concluded that overall the issue of technical specifications was not found to be a major issue and did not constitute a significant barrier.

There are, however, examples where technical specifications were an issue, including:

- The application of national and/or regional on top of European specifications (e.g. French certification is necessary to obtain a 10-year insurance; in the Czech Republic a certificate of compliance is required).
- A lack of efficiency standards or criteria, even when preferred by the sector (e.g. efficiency of on-shore wind turbines in the Netherlands).
- Benchmarks that may be too strict, such as the 5% primary energy savings for green CHP as compared with the reference in Belgium.
- Registration on specific lists (usually managed by the energy agency or environmental authorities) is required in order to be eligible for subsidies.
- Pending a further elaboration of sustainability criteria, biomass plants in e.g. the Netherlands using primary vegetable oils and fats, fatty acids and glycerine are not eligible for exploitation subsidies (this is an example of full blockage).

The Ecorys (2010) report indicated that most authorities do apply European standards where they exist.

**c Streamlining deployment of RES in buildings**

***What have been the impacts of the measures on facilitating the use of electricity, heating and cooling from RES sources in new developments?***

The ENTRANZE project team recently carried out a systematic review of all MS and assessed whether or not MS have put in place provisions to comply with Article 13(4) which requires that building codes set minimum standards for the amount of renewable energy produced on site.



However, the final report concluded that ‘only few countries have renewable energy requirements in building regulations, many others having still to implement the Article 13(4) of the Renewable Energy Directive (EEG et al., 2014).

Table 10 shows which MS have already implemented such provisions and which MS have not.

**Table 10** Requirements in building codes to install renewable energy

Austria	None
Belgium	Requirement in Wallonia for buildings >1,000 m <sup>2</sup> to install solar thermal
Bulgaria	None
Croatia	None
Cyprus	Requirement for all new buildings to install solar thermal and RES-E
Czech Republic	Plans to introduce requirement for all new buildings to install renewable energy technologies in 2015
Denmark	Requirement for all new and renovated buildings with hot water consumption of more than 2,000 litres per day to install solar thermal
Estonia	None
Finland	Energy produced and consumed using renewable energy sources counts only 50% towards the total energy consumption
France	None
Germany	Requirement for all new buildings to install renewable energy technologies
Greece	None
Hungary	Recommendations for buildings >1,000 m <sup>2</sup> to install on-site energy supply
Ireland	Requirement for all new buildings to install renewable energy technologies
Italy	Requirement for all new buildings and buildings >1,000 m <sup>2</sup> to install renewable energy technologies to cover 35% of thermal energy from the beginning of 2014 rising to 50% in 2017 and to install RES-E with a capacity of 1 kW for every 65 m <sup>2</sup> up to the end of 2016 rising to 1 kW for every 50 m <sup>2</sup> by 2017
Latvia	Recommendation for buildings >1,000 m <sup>2</sup> to evaluate the possibility to install renewable energy technologies
Lithuania	None
Luxembourg	Requirement for all new buildings to install renewable heat technologies
Malta	None
Netherlands	None
Poland	None
Portugal	Requirement for all new buildings to install solar thermal when suitable solar exposure
Romania	None
Slovakia	Obligation to consider possibility of using renewable energy in new buildings >1,000 m <sup>2</sup>
Slovenia	Requirement for all new buildings and in case of major renovations to install solar thermal or other renewable heat technologies
Spain	Requirement for all new buildings to install renewable energy technologies including 30-70% of hot water to be provided by solar thermal
Sweden	None
UK	Local Councils may set minimum requirements for new buildings to use specified amount of renewable energy

Source: EEG et al. (2014).



***Are the changes to building regulations and codes successful in increasing RES investment?***

We are not aware of any data allowing for a quantitative assessment in terms of the impact of Article 13(4) on the overall take-up of renewable energy. Given the importance of other policy instruments such as feed-in tariffs such an analysis would need to account for policy overlaps and attribute the uptake of renewable energy technologies to different policy instruments.

***Has the public sector taken on a lead role in using RES in their buildings?***

In most MS, some provisions are in place stressing the need for public buildings to be exemplars in terms of the RES use. However, analysis by Ecorys et al. (2010) points out that overall a very small percentage of public buildings is likely to use on-site-renewable energy. This is because RES use in public buildings would only be integrated when major renovation works take place, which would occur very rarely.

Table 11 provides examples of public sector buildings taking an exemplary role in the national responses to the RED. In some cases the information relies on NREAPs and may not be up-to-date.

**Table 11** Examples for public sector taking exemplary role

Austria	Public buildings need to take exemplary role in terms of a preferably energy-efficient management of the buildings used by them, including the ‘widest possible use of renewable energy sources’.
Belgium	Public energy service company is in charge of achieving and financing energy saving projects in public buildings. The company also develops photovoltaic panels on public buildings. In new built public buildings in the Brussels Capital region of Belgium a 30% proportion of green energy has to be integrated in the consumption of the building. Public authorities are ‘encouraged to do so’, so it is not clear if this is a mandatory rule. The Walloon region provides financial support for public bodies to install renewable energy installations.
Bulgaria	No specific provisions.
Croatia	No specific provisions.
Cyprus	Incentives for photovoltaic installations on the roofs of government buildings. This incentive applies mainly to schools and military camps. The target is that 50% of these buildings acquire photovoltaic installations.
Czech Republic	No specific provisions - all new building and any building over 1,000 m <sup>2</sup> undergoing a major refurbishment has to be subject to a renewable energy use assessment.
Denmark	No specific provisions.
Estonia	Under the Green Investment Scheme renewable energy technologies in public buildings are supported. Under this scheme a total of 540 public buildings will be renovated.
Finland	According to the Ministry of the Environment, minimum requirements for buildings concerning RES use will be introduced in building regulations by the end of 2014.
France	No specific programme for new public buildings but all new buildings need to be energy positive by 2020. Existing public buildings are required to reduce greenhouse gas emissions by 50% by 2018, which involves the need of an increased use of renewable energy.
Germany	Germany put in place minimum requirements regarding renewable energy use for public buildings. Germany has also decided that all new public buildings of the Federal Government from 2012 have to be constructed in line with the nZEB standard.



Greece	From 2019 onwards, all public buildings should be almost zero-energy buildings.
Hungary	No specific provisions.
Ireland	Ireland combines the regulations for energy demand with a requirement for renewables to meet energy demand.
Italy	Public buildings need to exceed the provisions for renewable energy in new buildings by 10%.
Latvia	Ministry of Economics was supposed to incorporate the required measures in construction policy guidelines by 2012.
Lithuania	Public buildings (new or subject to major renovation) are required to meet minimum renewable energy requirements for buildings.
Luxembourg	No specific provisions.
Malta	No specific provisions.
Netherlands	Government buildings should be nearly-zero-energy-buildings as of 2018 when subject of major renovations or newly build, following the EPBD.
Poland	No specific provisions.
Portugal	New buildings owned or used by public authorities shall be 'nearly zero-energy buildings' when certified after 31 December 2018. A 'nearly zero-energy building' means that the building has a high energy performance and energy needs are largely provided by renewable sources, mainly produced on site or nearby.
Romania	No specific provisions.
Slovakia	No specific provisions.
Slovenia	Regarding RES, the electricity produced by RES is given priority over electricity from conventional sources when bought in the public sector (either 40% or 100% of the electricity must be RES-E).
Spain	No specific provisions.
Sweden	No specific provisions.
UK	Through the policy Greening Government Commitments government departments are encouraged to increase the amount of renewable energy they use.

Source: [www.res-legal.eu](http://www.res-legal.eu) and NREAPs.

#### d Impacts of the articles

##### ***What effects (impacts) have resulted from the implementation of the article?***

Some MS have improved the administrative procedures and introduced requirements for new and existing buildings (when subject to major renovation) to use renewable energy. However, it is not possible to conclude that those changes are the direct result of the RED as some MS would have introduced similar changes anyway. The analysis above shows that many MS are still far behind when it comes to fully implementing Article 13.

##### ***Have there been unforeseen impacts (positive or negative)?***

There have been little unforeseen impacts in general. The pace at which Article 13 is implemented may have been slower than originally anticipated.

##### ***Which factors have hindered the achievements of the article's objective?***

Given the high number of MS with poor administrative procedures as indicated above, the European Commission's progress report published in 2013 identified the following concerns (European Commission 2013):

- slow progress regarding online applications;
- administrative time;
- limits for planning and permitting decisions; and
- lack of transparent approval processes.



The report also stresses that the availability of a single administrative body for dealing with renewable energy project authorizations and assistance to applicants is still limited. Only Greece and Portugal reported newly introduced 'one-stop-shop-agencies' since the plans were published; a few Member States had them in place before for some technologies (e.g. wind) or in some parts of the country (e.g. in Germany or in Sweden). Only Denmark, Italy and the Netherlands have a single permit system for all projects. These concerns are particularly acute in the heating and cooling sector, where the disparate nature of the different possible technologies hinders the development of uniform administrative approaches.

A study by Fouquet and Sharick (2011) found the following barriers:

- Environmental Impact Assessments (EIAs) that are being used, in some cases, as a deterrent to RES project development;
- lack of awareness and knowledge at the local level that could be overcome through best practices and lessons learned exchanges;
- lack of 'quality One Stop Shopping' in many Member States;
- lack of tools to accelerate procedures, specifically on low voltage grid level and distributed renewable energy generation;
- complex and/or drawn-out granting and licensing procedures;
- municipal sector involvement with regards to the application of planning laws to decide whether or not permission is granted without clear rules at national level.

Another study by PV Legal (2010) concluded that in the case of PV the following issues were also significant: lengthy procedures (15 MS); too many authorities involved (14 MS); lack of experience of civil servants (11 MS); inhomogeneous application of the law (8 MS); unclear administrative framework (8 MS). Since publication of the study the number of PV installations has increased significantly and the picture is likely to have changed. However, the European Commission's progress report published in 2013 suggests that many of those issues are unresolved.

As seen above, the ability of the EU Directive to be translated into tangible impacts at local level is limited by the specific features of the local planning and administrative system in place in each country, on which the EU has little influence. In addition, social acceptance of RES is also a significant barrier in many MS and the localised nature of the planning process can be affected by this through reluctance of municipalities to grant planning permission and slowing down the processes due to appeals from the community. This potentially slows down the whole process. Research by Rebel Group Advisory BV et al. (2011) shows that involving communities in the process early on and sharing the benefits of those projects has a positive impact on the speed at which RES projects can be implemented.

### C.4.3 Efficiency

***Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? Is the effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?***

The different elements of Article 13 have different implications for the administrative burden on MS e.g. enforcing minimum requirements for new and existing buildings regarding renewable energy technologies adds to the administrative burden. It depends on the Member State whether or not the overall administrative burden increases or decreases as a result of



implementing Article 13. There is insufficient data to analyse the matter with a higher degree of granularity.

***Are the selected mechanisms the most cost-efficient way to achieve the targets?***

Introducing streamlined administrative procedures in MS will lower the overall cost both to industry and the administrative bodies themselves so in this sense the approach supported by Article 13 are a cost-efficient approach. However, in practice this will depend on the way in which the provision is implemented and as presented previously this differs significantly amongst MS.

***Could the same results have been achieved with less funding/lower cost?***

Given that most MS still have relatively poor procedures in place it is likely that the same results (authorisation of projects) could have been achieved at lower cost. However, there is insufficient data to do further analysis.

Regarding the requirements to develop technical standards and promote RES projects in buildings there is a lack of data on costs that would allow for a robust analysis.

**C.4.4 Added value**

***To what extent is the article complementary to other EU initiatives in the field and has synergies with them?***

Simplifying and speeding up administrative procedures for energy transmission infrastructure has been addressed at European level through the regulation on guidelines for trans-European infrastructure which defines responsibilities for coordinating and overseeing the permit granting process, sets minimum standards for transparency and public participation and fixes the maximum allowed duration of the permit granting process.

The provisions in Article 13 complement the efforts on cross-country renewable projects as part of the RED's cooperation mechanisms such as joint projects and joint support schemes.

In addition, the building regulations mentioned in Article 13 show large similarities with the provisions made in the Energy Performance of Buildings Directive (EPBD). Table 12 shows several 'overlaps' between both Directives. Although the articles are not 100% similar, they do show large overlaps and can be interpreted as contradicting. Not only on the regulation level, but also in the actual implementation of specific projects in the MS.

Table 12 RED vs EPBD

RED	EPBD
2012 - Lead role for new and renovated public buildings (Art. 13(5))	2018 - New public buildings are nearly-zero-energy buildings (Art. 9(1))
2015 - New and renovated buildings comply with minimum standards for RES (Art. 13(4))	2020 - All new buildings are nearly-zero-energy buildings (Art. 9(1))
Minimum technical requirements for heating and cooling technologies (Art. 13(6))	System requirements for the overall energy performance for heating and cooling systems (Art. 8(1))



***Would the results have been achieved without the RED/article, i.e. without EU intervention?***

It is impossible to determine whether any improvements are the result of the RED. This would require further analysis and establishing of a counterfactual.

***Are there alternative measures/improvements which could have led to the same results?***

A central European body for authorisation might be an option but this is unlikely to be feasible. Alternatively, setting up a European body to help streamline procedures across MS whilst leaving the authorisation itself to MS would be another option. This idea has, for example, been suggested by Fouquet and Sharick (2011) as well as the European Commission (2013).

#### **C.4.5 Conclusions and recommendations**

***What key lessons can be learned from the experience of implementing the article so far?***

The degree to which Article 13 has been implemented by MS varies significantly. Some MS have made good progress whereas others are still at the beginning. With regard to administrative procedures, the on-the-ground requirements are not necessarily reflected in high level representation of the administrative system. For example, the fact that a one-stop-shop for administrative issues exists does not necessarily imply that the actual requirements are automatically less burdensome. Only some MS have implemented Article 13(4) and this is an important area where further progress is needed.

***What improvements may help to increase the effectiveness of the measures in place under this article?***

The effectiveness of Article 13 is not directly the result of the design of the article itself but is largely the result of the (lack of) implementation by lower level governments (e.g. municipalities).

Capacity building of the public administrations involved (more staff, training of the internal staff, easier acquisition of necessary external expertise) would help improve existing procedures.

Fouquet and Sharick (2011) suggest an exchange forum for industry and Member States. This roundtable could meet on a biannual basis in order to tackle and overcome planning and grid/demand-side management problems.

The European Commission could provide more guidance and specific steps that Member States can take to improve local planning processes. They also suggest a public benchmarking tool that would allow MS to compare their own procedure against other MS'.

A requirement for obligatory time limits would speed up procedures.

#### **C.4.6 Data/information gaps**

There are data gaps regarding the impact of the RED on the administrative procedures in MS and whether or not it has influenced the development of those. Similarly, there is no data that can be used to assess the impact of the RED on technical standards and streamlining RES projects in buildings (including public sector buildings).



## C.4.7 Sources

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G. Wright

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In: Underwater Technology, Vol. 32, no.1 (2014); 39-50

### C.5 Article 14: Information, certification, training

#### C.5.1 Article presentation and relevance

Article 14 establishes obligations for Member States to provide information on support measures and on the costs and benefits of renewable energy systems, and to establish certification systems or equivalent qualification schemes for installers of small-scale renewable energy systems (biomass boilers and stoves, solar photovoltaic and solar thermal systems, shallow geothermal systems and heat pumps) by 31 December 2012. Annex IV of the RED sets out a list of criteria that these certification or equivalent qualification systems shall fulfil. Accordingly, installers shall undergo an accredited training program in order to receive certification (to assess knowledge about RES and installation skills by third party and to assess maintenance as well) or qualification (officially recognised degrees from accredited training organisations). Annex IV provides a relatively detailed list of topics that the training programmes should cover, including not only the technical, maintenance and safety aspects of installations but also knowledge of available subsidies. Article 14 also compels Member States to recognise certificates awarded by other Member States on the basis of the criteria in Annex IV.

The lack of skilled personnel has been named as a considerable hurdle for the roll out of renewable energy technologies, especially when it comes to small-scale installations (European Commission 2008). The installation of the RES technologies is a complex task but only few Member States had certification or equivalent qualification schemes in place before the introduction of the RED. Poor installations cause higher maintenance costs and energy losses, which in turn has a negative impact on the willingness of consumers to undertake the relatively high initial investment into small-scale renewable energy technologies (EUFORES et al., 2014). In addition, poor maintenance by contractors has been identified as an obstacle to the uptake of renewable energy technologies as consumers fear that repairs to failing equipment would be delayed (Ecorys 2010, 68).

Ensuring that installers do have the necessary technical capacity to deliver reliable installations and ensure proper maintenance can therefore significantly raise consumer confidence and increase the quality of RES installations. At the same time, Member States need to prevent unreasonable burden for installers. Especially for small companies, certification and regular training requirements could potentially imply proportionally high costs.

#### C.5.2 Effectiveness

***Have the measures under this Article encouraged the uptake of RES? Which barriers have they addressed that existed before the RED?***

The introduction of certification schemes or equivalent qualification schemes in accordance to Annex IV of Article 14 should allow installers to highlight their skills and expertise in the field and result in increased consumer confidence in the installers' work.



Article 14 has triggered the introduction of certification or equivalent qualification schemes, as can be concluded by the ongoing introduction processes, but progress has been delayed. A 2010 study by Ecorys revealed that in roughly half of the Member States, a certifying body for one or several renewable energy technologies was missing. In some countries, nationally recognised certification bodies or schemes were completely absent, such as the Netherlands, Greece and the Czech Republic. Connected to these shortcomings, the study also indicates a lack of sufficient training in many Member States: 67% of respondents to a questionnaire conducted in the context of the study noted that the level of training in their respective Member State was insufficient. This barrier, however, was limited to small scale installations (Ecorys, 2010).

A study by the CA RES project shows that there have only been slight improvements by 2012. Following Article 14, certification schemes or equivalent qualification schemes in accordance with Annex IV criteria should have been available by 31 December 2012. In that year, certification systems had been established in 20-50% of the Member States, with varying degrees between the technologies (see Table 13). In 25-45% of the Member States, the process was still ongoing and still 25 to 35% of the Member States had not started an installer certification process.

As Table 13 shows, certification in PV is most progressed, while renewable heat rather lags behind, especially shallow geothermal energy. Hence, in the year of the deadline set by the RED for the establishment of certification or qualification systems, there were still significant gaps (CA RES n.d.). However, no data are available on the status of implementation across Member States as of 31 December 2012 or after.

Table 13 Approximate status of Member States regarding introduction of certification of installers in 2012 (CA RES n.d.)

	Not started	On going	Ready
PV	25%	25%	50%
Biomass Boilers and Stoves	30%	35%	35%
Solar Thermal	30%	30%	40%
Heat Pumps	30%	30%	40%
Shallow Geothermal	35%	45%	20%

The '2020 Keep on Track!' project 2013/2014 report on deviations and barriers to further RES deployment showed that a lack of appropriate training still constituted a major barrier to the diffusion of renewable heat and/or electricity technologies in several Member States, such as Germany, UK, Italy, Hungary, Ireland and Romania. This is not only due to still missing certification or qualification schemes: although the UK was identified by Ecorys in 2010 as a best practice example with several certification bodies for RES installers (Ecorys 2010), a lack of skilled workforce is named as a main barrier to RES technology installations in the UK in 2014 (Eclareon and Fraunhofer, 2014). Other barriers to developing the necessary professional expertise across Member States include: a lack of incentives for installers to participate in the certification schemes; a lack of control from public authorities; considerable participation costs; and poor understanding of the benefits and potential of certain renewable technologies (Eclareon and Fraunhofer, 2014).

As a result installers still often lack the technical expertise to install and maintain renewable energy technologies and often cannot warrant their efficient operation. There is also a lack of knowledge on benefits and support schemes on the side of the installers and therefore renewable energies are often not recommended. This means that renewable energy uptake and acceptance is potentially hindered.

On the other hand, insufficient certification and training are not amongst the main barriers to renewable energy deployment as can be seen from the example of small-scale renewable heating and cooling (see Figure 7 and Figure 8).

***Have the provisions under Article 14 been sufficiently clear and specific to encourage effective trainings and certification schemes?***

There is no recent Europe-wide data available on the roll out of certification or equivalent qualification systems and to what extent they have respected the Annex IV criteria, nor on mutual recognition of certification systems. Without this data it is also difficult to determine which effect Article 14 had. However, from the country case studies it became visible that the Article 14 provisions were assessed to be sufficiently clear and specific to encourage the introduction of certification or qualification schemes where no comparable system had been introduced before. Countries with existing qualification systems on the other hand could use the article details to assess whether the existing systems already fulfil all requirements.

The question of effectiveness of the introduced schemes could not be answered for all countries, since the introduction in most of the case study countries was carried out very recently. For Germany and Sweden, the effectiveness of the Article was rather negligible, as both countries already had specialised qualification in place when the RED was introduced (German case-study, Annex G; Swedish case-study, Annex J).

***Have they ensured that the information provided (on support measures, on certification, on costs and benefits) is not only easily accessible but also transparent, regularly updated and relevant to the need of those who use it?***

The experience from the case study countries shows that in some countries official information on support measures, costs and benefits had already been provided at the time Article 14 was implemented. In other countries, these tasks were carried out by the renewable energy industry and relating associations, not driven by the RED but out of own interest, including information provision to secondary and high school students, and training for other interested people. The impact of the RED was assessed rather low in the country examples. However, data for a Europe-wide assessment is lacking and therefore a general statement can hardly be made.

Nevertheless, the '2020 Keep on Track!' report on deviations and barriers 2013/2014 (Eclareon and Fraunhofer, 2014) mentions poor understanding of the benefits and potential of certain renewable technologies on the side of the installers, as well as a lack of knowledge on support schemes as a barrier to renewable energy expansion. However, it can be debated whether this can be addressed by general information or rather within certification or qualification schemes.

***Have the criteria for certification or equivalent qualification schemes laid down in Annex IV proven appropriate? Have they encouraged the mutual recognition of certification across MS?***

Triggered by the requirement of Article 14 for MS to mutually recognise each other's certification schemes, a few projects have been started which aim at harmonising certification schemes across Member States, even beyond the

minimum criteria established in Annex IV. Such schemes include QualiCert, PVTRIN, install+RES, Build Up Skills or the CA RES project. However, the QualiCert project also underlined that ‘mutual recognition of certificates between different Member States constitutes an enormous challenge, considering the different criteria (e.g. the requirement for audit only in some countries) or even the duration and content of the required training.’ (EREC 2011, 10). This might indicate that either (1) not all Member States have adhered to the criteria set out in Annex IV, or (2) the criteria listed in Annex IV are not specific or comprehensive enough to facilitate a sufficient degree of harmonisation across Member States. Annex IV sets general rules regarding the content of training including both a practical and theoretical part, as well as regarding certain abilities a certified/qualified installer should have gained. However, the guidelines still leave much room for interpretation and are at times rather vaguely formulated. For example, the guidelines state that the certification processes ‘shall be transparent and clearly defined’, without giving further specification on what this implies. Also, detailed training and examination regulations are introduced nationally and therefore differ substantially, even though fulfilling Annex IV provisions. Detailed contents, length of training, examination focuses, evaluation standards or frequency of refreshers seminars are very much up to each country. All this leaves much leeway to the Member States and could possibly explain the wide variation of training schemes across Member States. This is on the one hand part of the approach to be able to build on existing national structures but leads on the other hand to different quality levels, making mutual recognition difficult.

Furthermore, the point was raised that Article 14 does not include country specific characteristics in terms of technology application. For example, heating systems in Northern countries are likely to be much more complex than in the South, which should be mirrored in relating training systems. A single minimum training standard of RES installers in Europe might therefore be inefficient and impractical.

***What other effects (impacts) have been generated following the implementation of the article?***

There were no other effects identified within the case studies.

***Have there been unforeseen impacts (positive or negative)?***

There were no unforeseen impacts reported in the case studies.

***Which factors have hindered the achievements of the article’s objective?***

The ‘2020 Keep on Track!’ project highlights that information and training still present barriers to renewable heating and cooling (compare Figure 7 and Figure 8). However, their influence can be considered as small in comparison to other barriers.

Figure 7 Reported Barriers for renewable energies in heating and cooling in the EU (Eclareon and Fraunhofer, 2014)

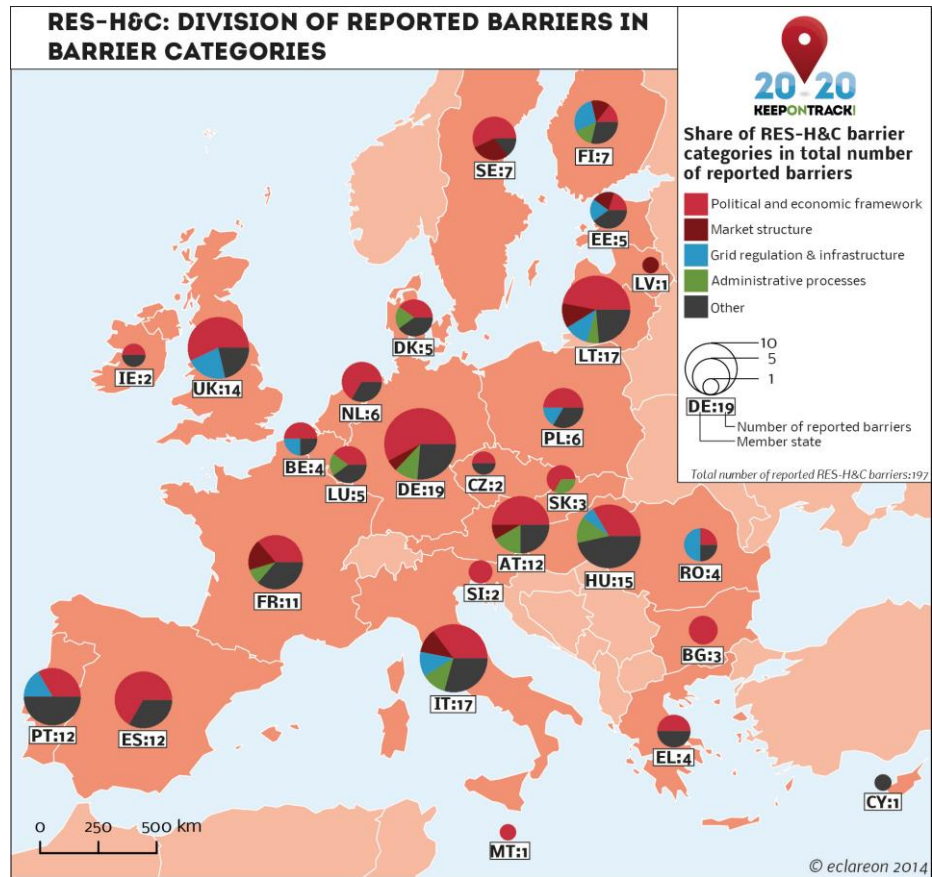
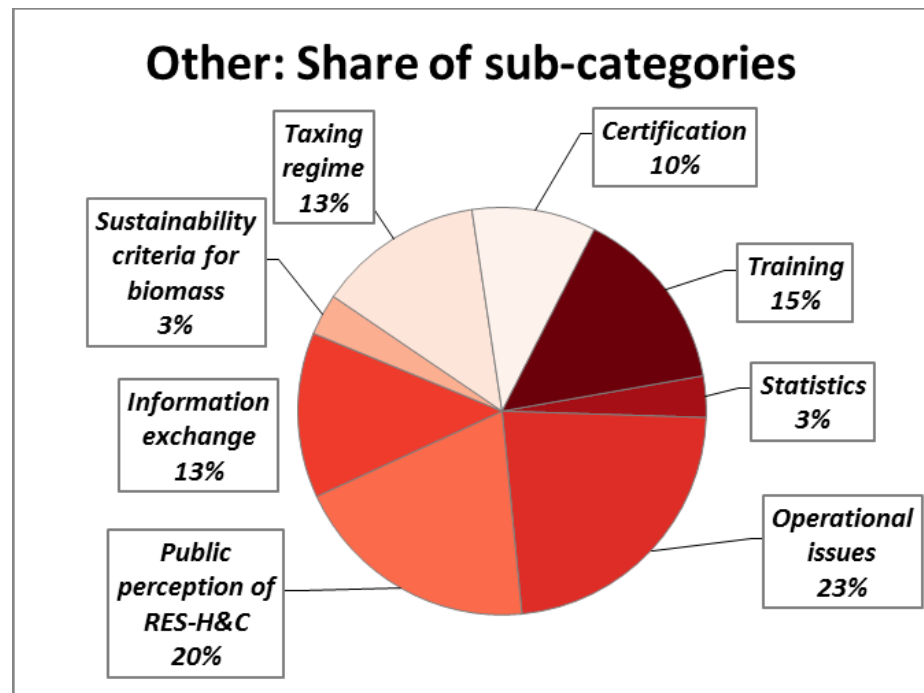


Figure 8 Division of the category 'Other' in Figure 4



Source: Eclareon and Fraunhofer (2014).

An important barrier to the uptake of certification schemes is the lack of compliance control on the part of public authorities. In Italy this has been reported as one of the reasons for sometimes low standards of renewable heating installations: 'One of the main causes of this barrier has been identified in the lack of control in buildings by central and local authorities. Stakeholders indicated that because of this lack of control, no actual reward is in place for installers that invest time and resources in training and therefore an incentive to undertake such activities is lacking.' (Eclareon and Fraunhofer, 2014). Especially in the case of small-scale renewable heat installations, a 'black market' has developed with many unspecialised installers operating (Eclareon and Fraunhofer, 2014). Participation in certification systems is mainly voluntary and incentives for participation are lacking. In some cases, certification schemes also seem to be overly complex and costly. This is explored in more detail in the 'Efficiency' section.

In addition, as mentioned previously, a poor understanding of the benefits and potential of certain renewable technologies prevails on the side of the installers and the consumers and inhibits their deployment: 'For example it is often claimed that there is not enough solar resource in the UK in order to make it a worthwhile investment (this applies to solar thermal and PV). Although this is not the case, such statements and beliefs may adversely affect deployment of renewable technologies.' (Eclareon and Fraunhofer, 2014).



### C.5.3 Efficiency

***What is the administrative burden placed by certification schemes and training as required by Article 14 on installers and supervisory institutions?***

National authorities may be subject to administrative burden through additional work load and administrative costs as certification bodies have to be founded or existing certification bodies be trained. Accreditation bodies need to accredit training organisations and certification bodies. Training and examination regulations need to be developed and kept up-to-date. A quantification of the effort could not be made.

Depending on the respective scheme design and/or national authorities, RES installers furthermore face the costs of carrying out/participating in the training programme, as these are mostly fee-based. RES installers also have opportunity costs of working time lost. On the market they compete with installers not participating in training and thus lower costs or with installers from other Member States with lower certification/qualification costs. Often the training can be carried out extra occupationally, thus not causing costs from lost working time. Nevertheless, installers are currently facing a high work load and often do not find the time to devote to training.

***Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? Is the effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?***

Before the introduction of the RED, some Member States had already introduced certification or equivalent qualification systems for small-scale renewable energy technologies, while others had not. Thus, the obligation to introduce a scheme added administrative burden at least to those countries without such schemes in place.

In some cases, certification schemes seem to be overly complex and costly, as stakeholders reported in the UK: ‘For many in the industry, however, the high cost and complexity of the MCS (Microgeneration Certification Scheme), however, are perceived as significant barriers, acting as a dis-incentive for many small installation companies or sole traders willing to enter the UK renewables market and may ultimately prevent the scheme from working effectively and achieving its aim.’ (Eclareon and Fraunhofer, 2014).

***Are the selected mechanisms the most cost-efficient way to achieve the targets?***

With the RED, the EU opted against establishing a single EU-wide certification or equivalent qualification scheme for installers of small-scale RES. Annex IV of the RED sets out a list of criteria that the certification or equivalent qualification systems shall fulfil. This aims at ensuring a minimum standard to be met by installers, as well as at enhancing the comparability of systems across Member States, while still leaving flexibility to Member States. The approach allows Member States to use and build on their existing schemes where these are well established while pushing other Member States to establish or improve such schemes. This ensures that the systems are being introduced in a cost-efficient and effective way, since they can build on existing national structures and networks. European Commission funded projects like QualiCert furthermore developed key success criteria for the successful design and implementation of these schemes, which were fed into the European and national stakeholder associations to serve as inspiration for the scheme design.



***Could the same results have been achieved with less funding/lower cost?***

Since there has been very little information on concrete administrative burden and implementation costs it is difficult to make an estimate at this point.

#### **C.5.4 Added value**

***To what extent is the article complementary to other EU initiatives in the field and has synergies with them?***

No other EU initiatives of this type could be identified.

***Would the results have been achieved without the RED/article, i.e. without EU intervention?***

Before the introduction of Article 14 RED the European Union was ‘[...] characterised by a heterogeneous set of certification (or equivalent qualification) schemes for small-scale RES systems, which vary significantly in terms of structure, compulsoriness, actors involved and cost. Moreover, most of these schemes are relatively new and still in the process of being adjusted to evolving market needs. In this context, the implementation of Article 14 of the RES Directive at a national level is of utmost importance in order to guarantee the set-up of a ‘common denominator’ amongst EU Member States which would allow mutual recognition.’ (EREC, 2011, 56). However, in many countries the certification or qualification standards were only developed and introduced very recently and therefore the effect of the article is still to be experienced in many Member States. Also, the added value of certification is difficult to assess, given that it is not a prerequisite for registering economic activity in this field. In some countries existing systems already covered the provisions from Article 14, thus EU intervention would not have been necessary. Still, harmonisation of national certification or qualification would have been very unlikely to happen without the initiative of the European Commission. The Article 14 RED was therefore a crucial first step to move into a more coherent single market for RES with comparable quality standards and free movement of labour.

***Are there alternative measures/improvements which could have led to the same results?***

The EU opted against making certification or qualification obligatory for installers. The approach of the RED is to make information on these schemes publicly available. Member States may also publish lists with certified/qualified installers. This can create pressure on the demand side, if consumers are well informed about their existence and advantages. However, only few Member States have made available such lists and often these are difficult to find. More generally, experience shows that in many MS only a small share of installers has sought certification. This indicates that the current approach of the RED might have been too lenient. One can think of several approaches to enhance the use of certification or qualification schemes in EU Member States. To create increased pressure on the demand side, Member States could be required to initiate campaigns to make consumers aware of certification/qualification schemes. Member States could also be obliged (and not just allowed) to make the lists of certified/qualified installers publicly available. Ecorys (2010) propose to make access to support systems conditional on the use of certified/qualified installers. A similar approach could also be used for warranties to equipment or insurances. Such obligations must not, however, result in impeding installers to offer their services in other MS, and would thus magnify the challenge of mutual recognition and the need for harmonisation of skill levels.



For becoming installers, the approach to directly oblige them to obtain appropriate certification or qualification as part of their vocational training could be possible.

Nevertheless, the problem of different quality levels between the Member States and mutual recognition would persist. Providing more specific training and examination regulations could ensure a higher standard of installations and increase the coherence across Member States. On the other hand this would reduce leeway for Member States and could lead to costly system adaptations. The introduction of a standardised test for all European installers as part of national certification/qualification (including country-specific elements) could also benefit the harmonisation of training standards and would be a quite cost-efficient way to guarantee a Europe-wide minimum standard while keeping intervention into national systems low.

### C.5.5 Conclusions and recommendations

#### ***What key lessons can be learned from the experience of implementing the article so far?***

The roll-out of the certification/qualification schemes takes longer than intended, and only a share of installers chooses to take part in those.

An important barrier to the uptake of certification schemes is the lack of compliance control in many Member States, and in some cases, the fact that they seem to be overly complex and costly. In addition, information on the benefits and potential of certain renewable technologies seems to lack on the side of the installers. Finally, mutual recognition of certificates is challenging, as there are substantial differences between the support systems in the Member States, e.g. regarding the duration and content of the required training.

#### ***What improvements may help to increase the effectiveness of the measures in place under this article?***

Member States could be required to initiate campaigns to make consumers aware of the implemented certification/qualification schemes. Member States could also be obliged (and not just allowed) to make the lists of qualified installers publicly available.

Proposals to make access to support schemes or warranties to equipment or insurances systems conditional on the use of certified/qualified installers could increase participation in certification/qualification. Such obligations must not, however, result in impeding installers to offer their services in other MS, and would thus magnify the challenge of mutual recognition and the need for harmonisation of skill levels. For becoming installers, the approach to directly oblige them to obtain appropriate certification or qualification as part of their vocational training could be possible. Nevertheless, the problem of different quality levels between the Member States and mutual recognition would persist.

To improve harmonisation of training standards, Article 14 Annex IV could include more detailed training and examination regulations. Also the introduction of a standardised test for all European installers as part of national certification/qualification (including country-specific elements) could be beneficial.

### C.5.6 Data/information gaps

- No information on side effects and limited info on factors that hindered achievement.
- No information on implementation costs for training/certification schemes on a meta study level and on country case study level. Very limited



- information on administrative burden for installers from the country assessments.
- No literature on complementarity with other initiatives or alternative measures.

## C.5.7 Sources

### CA RES (n.d.)

Working Group 5 - Information and Training

[http://www.ca-res.eu/fileadmin/cares/public/Reports/WG\\_Summaries/CA\\_RES\\_WG5\\_publication.pdf](http://www.ca-res.eu/fileadmin/cares/public/Reports/WG_Summaries/CA_RES_WG5_publication.pdf)

### Ecorys, 2010

Assessment of non-cost barriers to renewable energy growth in EU Member States

Rotterdam : AEON and Ecorys, 2010

### EC, 2008

SEC(2008) 85 Vol. II, Commission Staff Working Document, Annex to the Impact Assessment, Document accompanying the Package of Implementation measures for the EU's objectives on climate change and renewable energy for 2020

Brussels : European Commission (EC), 2008

### Eclareon and Fraunhofer, 2014

2020 Keep on Track! project - Analysis of Deviations and Barriers 2013/2014

S.l. : Eclareon and Fraunhofer ISI, 2014

### EREC, 2011

QualiCert Manual - A common approach for certification or equivalent qualification of installers of small-scale renewable energy systems in buildings

Brussels : European Renewable Energy Council (EREC), 2011

### EUFORES, Eclareon, Fraunhofer ISI, TU Wien, 2014

EU Tracking Roadmap 2014 - Keeping Track of Renewable Energy Targets Towards 2020 (2020 Keep on Track! project)

Brussels : European Forum for Renewable Energy Sources (EUFORES), 2014

### PVTRIN, 2013

Development of a roadmap for the adoption and implementation of the certification scheme across Europe

Brussels : Intelligent Energy Europe, 2013

## C.6 Article 15: Guarantees of origin

### C.6.1 Article presentation and relevance

Article 15 describes the rules for the introduction of Guarantees of Origin (GO) in terms of regulations, information required and auditing.

#### Definition and role of Guarantees of Origin

In Art 15 of the RED a GO is defined as 'an electronic document that has the sole function of providing proof to a final customer that a given share or quantity of energy was produced from renewable sources.' GOs are the tool used by Member States (MS) to ensure that the origin of electricity produced from RES sources can be guaranteed in accordance with objective, transparent and non-discriminatory criteria.



A GO must specify:

- a The energy source from which the energy was produced and the start and end dates of production.
- b Whether it relates to electricity, heating or cooling.
- c The identity, location, type and capacity of the installation where the energy was produced.
- d Whether and to what extent the installation has benefited from investment support, whether and to what extent the unit of energy has benefited in any other way from a national support scheme, and the type of support scheme.
- e The date on which the installation became operational. And
- f The date and country of issue and a unique identification number.

GOs equate to 1MWh and may be traded between EU Member States. Indeed, the RED states that MS shall recognise GOs issued by other MS. A MS may refuse to recognise a GO only when it has well-founded doubts about its accuracy, reliability or veracity. The Member State shall notify the Commission of such a refusal and its justification.

### **Administration of GOs**

Guarantees of Origin are issued by MS in response to a request from a producer of electricity from renewable energy sources. They may also be issued by MS in response to a request from producers of heating and cooling from renewable energy sources.

The RED requires that Member States appoint a competent national body to oversee the issue, transfer, cancellation and regulation of GOs. These national bodies are required to establish a web-based national register of GOs and develop an accurate, reliable and fraud-resistant system for issuing, revoking, transferring GOs and ensuring no double counting occurs. The designated competent bodies shall have non-overlapping geographical responsibilities, and be independent of production, trade and supply activities.

Any use of a GO shall take place within 12 months of production of the corresponding energy unit. A guarantee of origin shall be cancelled once it has been used. Several Member States' issuing bodies are organised under the Association of Issuing Bodies.

### **Counting GOs**

MS may provide that no support be granted to a producer when that producer receives a GO for the same production of energy from renewable sources.

The amount of energy from renewable sources corresponding to GOs transferred by an electricity supplier to a third party shall be deducted from the share of energy from renewable sources in its energy mix for the purposes of Article 3(6) of Directive 2003/54/EC.

Where energy suppliers market energy from renewable sources to consumers with a reference to environmental or other benefits of energy from renewable sources, Member States may require those energy suppliers to make available, in summary form, information on the amount or share of energy from renewable sources that comes from installations or increased capacity that became operational after 25 June 2009. This may be done by using GOs.



### **Link with other articles**

The GOs shall have no function in terms of a Member State's compliance with Article 3. Transfers of GOs, separately or together with the physical transfer of energy, shall have no effect on the decision of MS to use statistical transfers, joint projects or joint support schemes for target compliance or on the calculation of the gross final consumption of energy from renewable sources in accordance with Article 5.3.

### **Relevance**

Art. 15 establishes the obligation upon MS to ensure that the origin of electricity produced from renewable energy sources can be guaranteed, this obligation is achieved through the issuance of GO. The immediate purpose of such guarantees, and therefore of GOs, is to serve as proof to the final customer of the share or quantity of energy from renewable sources in an energy supplier's energy mix.

### **C.6.2 Effectiveness**

The effectiveness of Article 15 depends on the extent to which it is implemented across Member States and how. Table 14 summarises the key features of the GO systems in Member States based on information supplied in the latest national progress reports and 2014 RE-DISS country reports.



Table 14 Guarantees of Origin systems in Europe

Member State	Competent body	Coverage	Transferrability	EECS member	No. GOs issued 2013 (m)*	No. GOs net trade balance (exports - imports) 2013 (m)*
Austria	Energie-Control Austria	Electricity	Yes	✓	13.0	-5.9
Belgium (Walloon)	CWAPE	Electricity and CHP	Yes	✓	1.4	-9.1
Belgium (Flanders)	VREG	Electricity and CHP	Yes	✓	4.6	-17.7
Belgium (Brussels)	BRUGEL	Electricity and CHP	Yes	✓	n/a	-3.0
Bulgaria	Sustainable Energy Development Agency	Electricity and CHP	Yes	✗	n/a	n/a
Croatia	HROTE	Electricity and CHP (to be implemented)	Not yet	Planned	n/a	n/a
Cyprus	Cyprus Energy Regulatory Authority	Electricity and CHP	Yes	✗	0.2	n/a
Czech Republic	OTE	Electricity	Only imports. Exports not allowed until full disclosure system is implemented	✓	n/a	0
Denmark	Energinet.dk	Electricity and CHP	Yes	✓	12.8	+7.1
Estonia	Elering AS	Electricity and CHP	Yes (applied for)	Soon	n/a	n/a
Finland	Fingrid	Electricity and CHP	Yes	✓	18.5	-2.5
France	Powernext			✓	18.2	+6.6
Germany	German Federal Environment Agency (UBA)	Electricity	Yes	✗	27.3	-64.4
Greece	Hellenic Electricity Market Operator (LAGIE)	n/a	n/a	n/a	n/a	n/a
Hungary	MEKH	Electricity, heating and cooling	Yes	✗	0	
Ireland	SEMO	Electricity	Yes	✗	n/a	
Italy	GSE			✓	30.4	-0.5
Latvia	Ministry of Economics	Electricity and CHP	Yes	✗	3.6	n/a
Lithuania	AB Litgrid	Electricity, heating and cooling	Yes	✗	n/a	n/a
Luxemburg	Luxemburg Institute of Regulation (ILR)	Electricity and CHP	Yes	✓	0.4 (2012)	-1.7 (2012)
Malta	Malta Resources Authority	n/a	n/a	n/a	n/a	n/a
Netherlands	CertiQ	Electricity, heating and cooling	Yes	✓	11.3	-33.5
Poland	Energy Regulatory Office	Electricity	Yes	✗	n/a	n/a
Portugal	REN	Electricity, heating and cooling		✓	0.2	+0.09



Member State	Competent body	Coverage	Transferrability	EECS member	No. GOs issued 2013 (m)*	No. GOs net trade balance (exports - imports) 2013 (m)*
Romania	National Regulation Authority for Energy	Electricity	n/a	n/a	None in 2011 and 2012	n/a
Slovakia	Office for the Regulation of Network Industries	Electricity	n/a	n/a	n/a	n/a
Slovenia	Javna agencija RS za energija (AGEN-RG)	Electricity	Yes	✓	n/a	
Spain	National Energy Commission	Electricity & high efficiency cogeneration	n/a	✓	1.0	+0.4
Sweden	Sweden Energy Agency (monitoring authority) and Svenska Krafnat (account keeping authority)	Electricity & CHP	Yes	× (but there is a separate EECS issuing body, Grexel)	18.3	-5.1
UK	Ofgem	Electricity & CHP (but no electronic register for the latter)	Yes	×	n/a	n/a

As illustrated before, although significant progress has been made since the Directive was introduced there are still varying levels of implementation across Member States in terms of coverage, system features and extent to which GOs are issued and traded.

The RE-DISS II baseline report (2014) found that all MS have some sort of RES-GO system in place with competent bodies assigned for issuing, transferring and cancelling GOs, although not all meet the requirements of the RES Directive:

- 21 out of 25 MS<sup>27</sup> had a RES-GO system in place and operational, with legislation in place and a competent body assigned for the issuing, transferring and cancelling GO.
- In the remaining 4 MS, there was a RES-GO system ‘almost in line’ with the Directive. The reasons for this incomplete alignment were diverse: there was a registry but no RES-GO had yet been issued (Estonia); RES-GO are still issued based on the 2001 directive (Luxemburg); GOs are issued for internal use but they are not cancelled (Poland); the system has been created in law but is not yet operational (Portugal).

In terms of CHP-GO:

- 17 out of the 25 MS have a CHP-GO system in place that is operational.
- 7 MS have an ‘almost in line’ CHP-GO system in place. This can be for various reasons: the implementation of the CHP-GO system is unclear (Bulgaria); the system has been created in law but is not operational (Estonia and Sweden); there is no registry available for CHP-GO (Italy and Portugal); CHP-GO can be issued but they do not cover all information required by Directive 2012/27/EC (Estonia, Finland, Italy, Luxemburg and Switzerland).
- 2 MS do not have a CHP-GO system in place (Czech Republic, Ireland).

While the implementation of Article 15 is well advanced across the EU for electricity, the use of GOs for heating and cooling remains limited: only 4 MS have implemented legislation that creates a system for the issuing, transferring and cancellation of H/C-GO (Hungary, Lithuania, Portugal and the Netherlands) and these systems are not operational at the moment.

#### ***How is the information from GOs used?***

Guarantees of Origin can be used for three main purposes:

- For fuel mix disclosure i.e. to prove how the energy was produced and ensure transparency of the energy statistics produced and of the information provided to final consumers. This is the fundamental reason for GOs and their main use, as laid down by the Directive. It is worth noting that in some countries, like Germany, GOs can only be used for disclosure purposes for non-supported renewable energy.
- To determine eligibility for national support schemes. It is up to Member States to decide whether they want to combine GOs and support schemes. For instance, in the Czech Republic GOs are used to authenticate the right to exemption from the electricity tax; in Bulgaria they are used as proof of eligibility for receiving the Feed-in-Tariff; and in the Netherland they are used as proof of eligibility for the SDE subsidy in support of sustainable energy. On the other hand other countries specifically state that GOs and support schemes cannot be combined.
- Finally, it can be used as a separate traded commodity from the energy generated within and between other MS.

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<sup>27</sup> No information is available for Malta, Romania and Slovakia.



Almost all countries use GOs for disclosure purposes and most recognize GOs from other countries and allow trade, albeit with different conditions.

### ***How does it influence Renewable Energy policy and investment at supplier and public sector level?***

The underlying rationale for the article is that the GO system can influence RES policy and investment in Europe in the following ways:

- by serving as means to improve the quality of the information provided;
- by favouring the market of renewable energy sources, thus: a) helping to the reduction of greenhouse gas emissions, and b) positively impacting regional and local markets, in particular regarding medium-sized enterprises and independent energy producers;
- by improving transparency on the market and helping consumers make more informed decisions on energy use i.e. decisions based on criteria other than price such as energy source;
- by supporting (or possibly hindering) national support schemes depending on the system in place in the Member State.

### **GO transferability**

GO transferability enables the trade of GOs between MS, separately from the underlying commodity (i.e. electricity, heating and cooling) and therefore can encourage investment in RES projects across Europe.

Brokers involved in the trade of GOs such as EEX<sup>28</sup> argue that standardized trading in Guarantees of Origin supports the market integration of renewable energies and creates new marketing opportunities for plant operators by: bundling liquidity and non-discriminatory access to a large number of traders from all over Europe; by providing full price transparency and creating a reference price for GOs.

However, the 2008 IA of the ‘Package of Implementation measures for the EU’s objectives on climate change and renewable energy for 2020’ (European Commission, 2008) identified some potential risks related to the trade of GOs if it were to happen on a large scale:

- If renewable energy producers can export their GOs, the benefits of renewable energy production are being exported while the costs (through grid planning and development) have to be borne within the Member State. Therefore, there could be a disincentive for grid planning and investment through leakage of benefits while keeping the costs within borders - a disincentive that in practice could mean a substantial risk to renewable energy deployment at national level.
- Trading also means that there is less certainty of where future renewable energy will be developed (as it might be outside the Member State), so that planning becomes more difficult.

These concerns are supported by anecdotal evidence from the Netherlands. Recent research by Ekoenergy<sup>29</sup> found that a lot of the green electricity currently sold in the country originates from Norwegian hydropower (i.e. the electricity seller uses Norwegian Guarantees of Origin to prove the greenness of the electricity he sells). Such purchases do not lead to new investments in sustainable electricity power in the Netherlands.

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<sup>28</sup> <http://www.eex.com/en/products/power/guarantees-of-origins/overview>

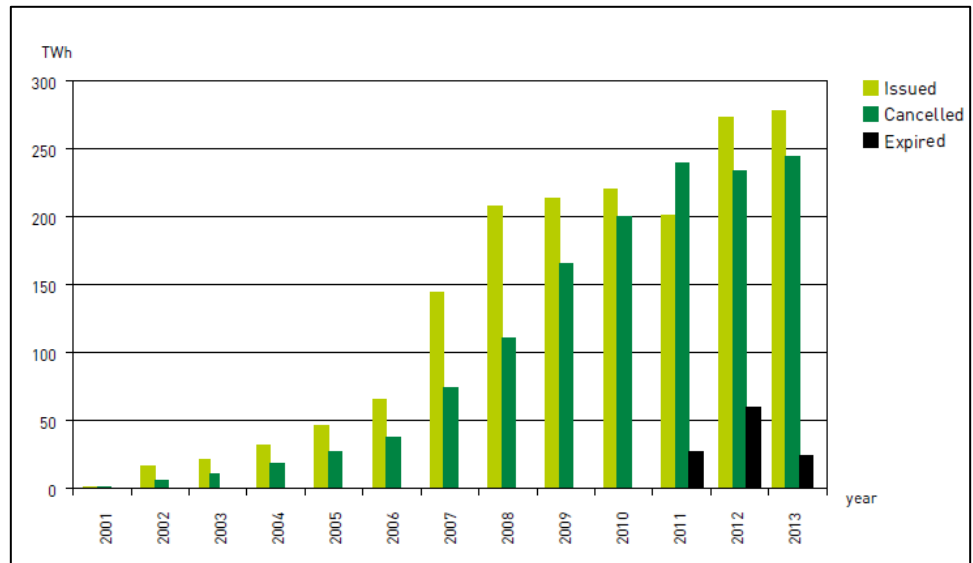
<sup>29</sup> <http://www.ekoenergy.org/guarantees-of-origin-making-a-difference/>



In recognition of these potential risks, the RED has allowed the MS discretion on the extent to which GO trade is allowed. Another factor limiting these risks is the fact that there are other reasons for MS to favour national investment over the use of GOs: the need to achieve the national targets under Article 3; security of supply; national CO<sub>2</sub> emission reductions; and support for new economic activities.

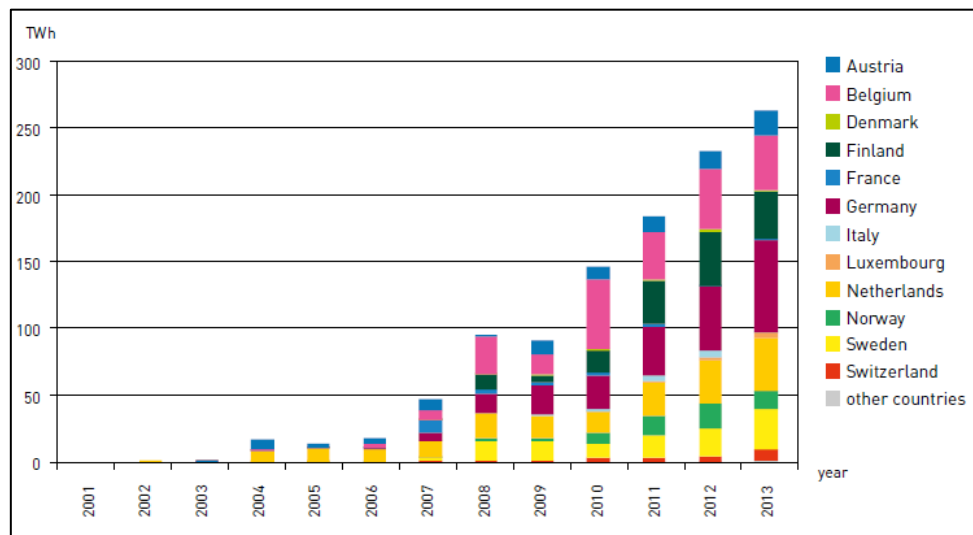
Finally, while the number of GOs issued and traded has increased steadily since the launch of the Directive (see charts below), trade still remains limited.

Figure 9 Total certificates issued and cancelled



Source: ABI, RECS International (2013) Annual Report.

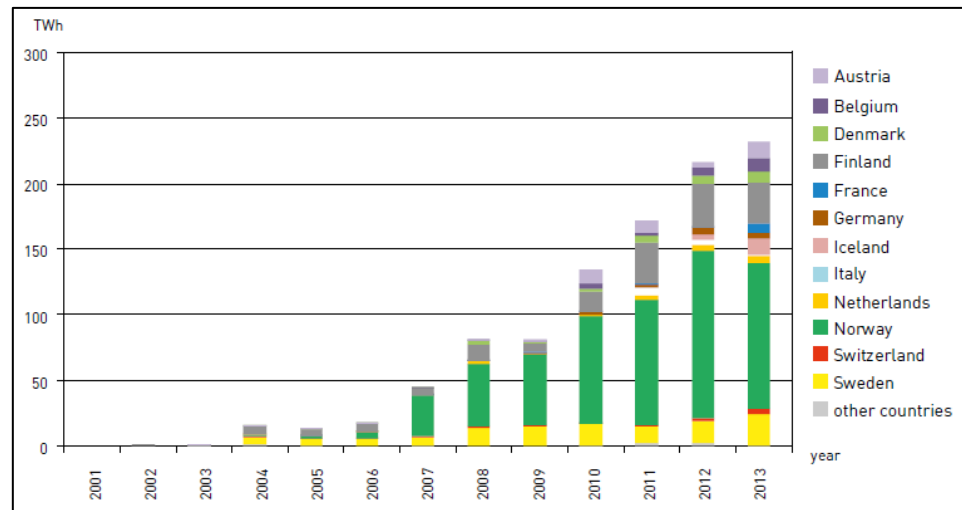
Figure 10 Total certificates imported



Source: ABI, RECS International (2013) Annual Report.



Figure 11 Total certificates exported



Source: ABI, RECS International (2013) Annual Report.

The main barriers to the trade and transfer of GOs are: the fact that not all Member States are members of AIB and use a system compliant with EECS; and that GOs from some Member States are still refused by other MS. As a result, GOs have a very low although diverse market value depending on technologies and countries.

### Relation with and impact on support schemes

The Directive leaves discretion to Member States in terms of the level and pace of GOs' transferability and their relation to national support schemes, which allows MS to continue to manage these schemes in view of fostering renewable energy technology development within their national territory.

Generally, there is a diversity of approach across MS although the majority seem to allow GOs and support schemes to be combined. Those who do so include: Bulgaria as mentioned previously; Austria although only GOs from non-supported plants can be traded internationally; the Czech Republic, Denmark and Finland amongst others.

Ecofys (2013) suggested that there seemed to be a relation between the advanced nature of a system and the role GOs play in the national support scheme i.e. the use of GOs in support systems tends to be a feature of the more advanced systems. The authors draw out examples from Sweden, Germany and the Netherlands, where GOs are linked to advanced support schemes for RES so as to prevent fraud and over-compensation, and compare this with the example of Italy where the role of GOs is not linked to any support scheme, and therefore the risk of double-counting is higher.

### Conclusions

At this stage there is no specific research which isolates and quantifies the impact of GOs on investment in renewable energy at EU or MS level. The growing trade in GOs suggests there is some demand for this commodity and as the market becomes more standardised it may continue to grow and have a more noticeable effect on investment decisions. However, the net impact on RES investment and its geographical distribution is difficult to foresee given the separation between the energy created and the GO as a commodity.



***How effective are the systems used in terms of preventing fraud, inaccuracy and the potential for multiple accounting?***

All MS recognise the need to have a robust and fraud-resistant system and sustained efforts have been made by the EU to monitor the GO system and identify where improvements might be made.

In 2009 the E-track project reviewed tracking systems in Europe: Phase I investigated the feasibility of a harmonised standard for tracking electricity generation attributes in Europe; Phase II of the project continued the process of harmonisation of tracking systems across Europe, including the new Guarantees of Origin for high efficient co-generation (HE-CHP-E). It found high levels of variations across Europe.

Between 2010 and 2012, the RE-DISS I project was launched, aiming at improving the reliability and accuracy of the information given to electricity consumers regarding the origin of the electricity they are consuming. It resulted in best practice recommendations (BPR) to address issues of double counting, loss of disclosure information, lack of transparency for consumers, leakage of attributes and/or arbitrage and unintended market barriers.

The BPRs cover the following aspects of the GO implementation: the '12 Month Lifetime Rule' for GO; usage of EECS; issuing of GO for different energy sources and generation technologies; GO as the unique 'tracking certificate'; recognition of GOs; disclosure Schemes and other Reliable Tracking Systems; calculation of Residual Mixes; Contract Based Tracking; timing for disclosure; further recommendations. Each recommendation has been assigned a priority score. The detailed list is available in the final report for RE-DISS I by the Öko-Institut (2012).

The implementation of these recommendations has resulted in significant improvements in several MS (RE-DISS I, 2012). However, despite these improvements, shortfalls in coordination and implementation of related policies still remained and the RE-DISS II project was launched in 2013 both to monitor progress against RE-DISS I recommendations and to continue to explore areas for improvement.

The baseline report for RE-DISS II was published in 2014 and is based on data collected from MS between January and May 2014. As such it provides the most recent analysis of the situation in Europe with regards to the GO system.

It shows that progress has been made on the recommendations of RE-DISS I and as a result, the effectiveness of the systems in place to avoid inaccuracy and double-counting have clearly improved significantly since the first version of the Directive (2001) and even since 2009. The majority of countries are now compliant with the EECS and have systems in place to check the validity of the information supplied by GOs. However, there still remain differences in the comprehensiveness of these procedures and therefore their likely effectiveness.

National progress reports provide some additional information on the approach adopted by MS and they vary: some countries implement on the spot, surprise inspections by government agencies (e.g. Bulgaria, Cyprus, Germany or Lithuania); the Netherlands impose an annual audit obligation and in Denmark the obligation not to use a GO twice is a contractual one; in Flanders, all installations with more than 200kW installed capacity have to undergo an ex-ante inspection before GO can be issued for the respective electricity production in order to ensure the correctness of the data, and plants above

1 MW have to submit a renewed inspection report every two years. Finally, some countries will apply fines or other sanctions in case of non-compliance.

However, while the national progress reports provide partial information on the systems in place for enforcement and checks, they do not provide any analysis of the extent to which these systems are actually used and what issues they might have encountered.

### C.6.3 Efficiency

***What is the administrative burden placed by GOs on suppliers and on the supervisory institution? Is it appropriate?***

The costs of a Guarantee of Origin regime include the development and operation costs of a registry as well as costs of plant registration and audits and transaction costs for participants.

#### **Administrative burden on public authorities**

The E-track project, published in 2009, summarised the cost drivers of systems such as those used for GOs as follows.

Table 15 Cost drivers for tracking systems - system level

Cost drivers for system development and implementation	Cost drivers for system operation and adaptation
Setting up organisation structures	Governance of overall system
Composing detailed system specifications	Operation and maintenance of the system
Software development/development of a registry	User support
Collection of initial data input	Further development of the system to adapt to user needs and policy development
Testing of registry	
Organisation of data input	
Development of interfaces between registries	
Composing information material for users	
Training of market actors	

Source: Final report from E-TRACK project.

Table 16 Cost drivers for tracking systems - operational level

Cost drivers for tracking systems - operational level	
<i>Issuing aspects</i>	<i>Transfer aspects</i>
Certification and auditing of plants	Handling of information (certificate) transfer
Collection of plant master data	Usage and redemption aspects
Collection of generation data	Conversion of data into format for final use (e.g. disclosure)
Verification of input data	Verification of output data
	Calculation of residual mix

Source: Final report from E-TRACK project.





The E-TRACK project estimated the system development and implementation costs and operational costs from 7 different national guarantees of origin and support scheme registries (European Commission, 2008). It found a large range in the system costs of existing tracking schemes with implementation costs between € 100,000 and € 1.3 mill, and annual operating costs between € 50,000 and € 600,000 per year. It seems that the wide variation in system costs is related to the different levels of policy integration of GOs. Schemes used solely for the purpose of disclosure are cheaper than schemes used for managing support schemes, which have more stringent requirements.

These estimates relate to GO systems in place prior to the 2009 Directive. The implementation of article 15 of the 2009 Directive will have involved additional costs in order to meet the new mandatory requirements it included. However, in most countries the system will build on:

- The existing GO system if one was implemented in response to the 2001 Directive. Or
- Using an existing body as the responsible authority and allocating it these additional responsibilities. In many MS the issuing body has some previous experience of similar activities so it is likely that these countries had the capacity and resources already in place.

The 2008 Impact Assessment (European Commission, 2008) estimated that compared to the value of physical energy, which currently is in the range of 45 to 55 €/MWh, the expected costs for tracking would equate to between 0,008% to 0,05%. While this is now outdated, it provides some idea of the relative scale of costs placed on public authorities.

Overall the administrative burden does seem reasonable, although in practice it will depend on how MS implement the system. The cost of the system also needs to be viewed in the context of the risks associated with not having it, especially with regards to fraud and double-counting, and therefore of the benefits of a standardisation of GOs across Europe.

Ultimately the cost efficiency of the system will not only depend on the implementation and operation costs but also on the volume of GOs issued and traded: the more GOs are issued the higher the economies of scale achieved and therefore the efficiency of the system. So in countries like Cyprus or Portugal where the number of GOs issued was relatively small, the administrative burden may still appear high at this point.

### **Administrative burden on energy producers**

The administrative burden on energy suppliers combines: the cost of collecting and supplying the necessary information to apply for the GO; the cost of registration and certification of the plant if this is required; the issuance cost of the GO by the relevant national authority.

There is no available overview of the costs placed on producers by the various MS systems at this point. However, according to Ecofys (2013), whether the GOs are issued free of charge differs across MS without a clear rationale as to why some charge for the service and others do not. Even advanced systems such as in Ireland, Lithuania or Sweden, do not necessarily apply a direct fee on users to finance the system, but costs can be recovered through other ways. Further, when looking at the fees that are charged in the countries where the GOs are not free, it turns out that most of the time, there is a fee for getting an account in the system, a fee for registering a plant and fees for the respective activities performed. In the context of other requirements of the Directive, one might question whether those fees are cost-related as is required by art. 13(2) e).

***Are the systems implemented by the MS the most cost-efficient way to deliver Art. 15 objectives?***

The general approach defined by Article 15 seems an efficient way to ensure a harmonised approach to GOs to create a single European market for this commodity.

As mentioned earlier, there are, however, still some differences across MS so there may be potential in some to improve the cost-efficiency of the system. For instance:

- Joining AIB and the EECs can provide guidance for MS on developing a system which is compliant with others across Europe and to facilitate trade.
- In some MS, there may be some potential to streamline procedures. For instance, in Poland the applications are first sent for verification to the electricity distribution/transmission system operator who then submits it to the President of the Energy Regulation Office. This could be an additional administrative layer.
- There is an important trade-off between increasing the issuing frequency and the cost of operating the system - the higher the frequency the higher the cost of operating the system. On the other hand, a more frequent issuance has the advantage of allowing shorter transfer periods.

On the other hand, in many MS the issuing body has some previous experience of similar activities, which would be a cost-efficient approach to administering GOs.

***Are there other measures which could accelerate the deployment of GOs?***

The continued standardisation of the GO system at EU level - following the Best Practice Recommendations formulated by RE-DISS I and any further recommendations from RE-DISS II) seems to be the best way to maximise the potential benefits from this Article.

This would ultimately offer the potential to link different databases and/or create one common register which would reduce costs and be a decisive step in establishing a truly single market at EU level for guarantees of origin.

#### **C.6.4 Added value**

***To what extent is the article complementary to other EU initiatives in the field and has synergies with them?***

The article is not directly related to other EU initiatives but GOs might be considered useful tools as part of the objective for a single internal energy market set out in the 2009 Energy Market Directives. Creating a genuine internal market for energy is one of the European Union's (EU's) priority objectives. The existence of a competitive internal energy market is a strategic instrument in terms both of giving European consumers a choice between different companies supplying gas and electricity at reasonable prices, and of making the market accessible for all suppliers, especially the smallest and those investing in renewable forms of energy.

***Would the results have been achieved without the RED/article, i.e. without EU intervention?***

The Guarantee of Origin regime was originally created by Directive 2001/77/EC. It established certain minimum requirements but their use was voluntary thereby leaving the majority of design features to each Member State. As a result, the GO systems implemented in the Member States had very different formats.



The 2009 RED introduced improvements in the minimum requirements, for example national issuing agencies need to keep a registry and the GOs are required to be of standard size.

Without further intervention at EU level the situation would likely have remained unchanged since 2001 with a fragmented system as opposed to the more standardised (although still not unified) process currently in place.

This may not be a problem if GOs were only to be used for national purposes but enabling trade at EU level was identified as a way to support more investment in RES, regardless of geographical location. For this to happen barriers and transaction costs must be removed and this can only be done through a harmonised system with consistent criteria and procedures across MS and such a system would not be achieved without a clear lead at EU level. The exclusion of GO use as a compliance means for meeting national targets reduces their effectiveness in supporting investment across the EU, because it places the emphasis on domestic (national) measures irrespective of the opportunity for cheaper investment elsewhere. Use of GOs as a compliance means at an EU level would theoretically remove the emphasis on national investment, and potentially allow for cost effective comparison of EU-wide investments.

***Are there alternative measures/improvements which could have led to the same results?***

There is no obvious alternative.

## **C.6.5 Conclusions and recommendations**

***What key lessons can be learned from the experience of implementing the article so far?***

The main conclusions with regards to GOs so far are that:

- They represent a generally effective tool for auditing purposes and there is value in having a consistent approach at EU level.
- They could also be a useful tool for creating a voluntary, consumer-driven market for renewables. The consumer buying a green tariff supply backed up by GOs can be confident that the corresponding renewable electricity has only be accounted for once in green supply agreements. However, the decoupling of the electricity and GOs weakens this benefits since a consumer cannot directly attribute his or her electricity to a particular renewable source (or indeed any renewable source).
- Despite progress in implementation, improvements are still needed in order to achieve a consistent system across Europe.
- GO trade is still in its infancy and it is as yet unclear whether it will have net positive impacts on RES deployment at EU level and on MS reaching their targets. There is a potential for conflict between EU level and country level benefits from the mainstream use of GOs should it happen.
- Separating GOs from the energy system itself decreases transparency since the consumer cannot associate their electricity with a renewable source. This can reduce the effectiveness of this article as a means to encourage the voluntary market in green electricity supplies.

***What improvements may help to increase the effectiveness of the measures in place under this article?***

A range of possible improvements have been identified by our research depending on the role of GOs.



In order to continue to improve the effectiveness of *GOs as auditing tools*, the Best Practice Recommendations identified by RE-DISS I provide the latest thinking on the improvements still needed to the GO systems. They are available in the RE-DISS II baseline report (RE-DISS, 2014) and address implementation details for Guarantees of Origin, different issues related to reliable tracking systems, the calculation of Residual Mixes and proposals for the coordination of the processes around disclosure between Member States. Some have been largely implemented but others are still highly relevant. They include:

- Extending the use of GOs beyond RES-E and high-efficient cogeneration (HE cogeneration) to all types of power generation i.e. including electricity from fossil and nuclear generation.
- Streamlining the use of tracking mechanisms at MS level. Most countries do not restrict the accepted tracking mechanisms to GOs and leave the choice as to which tracking mechanisms can be used for disclosure to the market participants. On the one hand, this is in line with the voluntary character of the GOs as defined in the RES and Cogeneration Directives. On the other hand, MS and their regulatory authorities are responsible for the reliability of the disclosure information provided to consumers. This means that any other tracking systems, which have a similar purpose and function as GOs, should be converted to GOs.
- Clarifying the relation between their support schemes (e.g. for RES and HE cogeneration) and the tracking systems used for purposes of disclosure.

Recommendations with regards to auditing and tracking also relate to the use of GOs to inform consumers. There is still room improvement in this area to ensure more detailed and transparent information is provided to consumers about where the energy is coming from e.g. geographically.

In order to improve the effectiveness of *GOs as a tradable commodity*, further efforts are needed in order to establish clear criteria for the recognition of imported GOs, including the accepted electronic interfaces for import and the required data format and content of the GOs. In addition, it is important that all MS continue to move towards a GO system based on the European Energy Certificate System (EECS) operated by the Association of Issuing Bodies (AIB).

Finally, EcoHz argues that the overall future effectiveness of GOs will be improved by continuity of the RED beyond 2020: ‘Early communication of continuity is important as otherwise, Guarantees of Origin will lose credibility and the market will gradually taper off as we are getting closer to 2020’ (EcoHz, 2013).

#### **C.6.6 Data/information gaps**

While there is a reasonable amount of recent information on the implementation and transposition of Article 15 across Member States, there are significant gaps with regards to:

- the quantification of costs;
- evaluating the effectiveness of the systems in place to avoid fraud;
- isolating the impact of GOs on investment in renewable energy;
- assessing the relative importance of GOs traded vs domestic GOs.

## C.6.7 Sources

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### **Fraunhofer ISI and Vienna University of Technology, 2011**

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## C.7 Article 16: Grid access and operation

### C.7.1 Article presentation and relevance

The main purpose of Article 16 can be summarised as the obligation to support the access to and the operation of transmission and distribution grids as well as the development of intelligent networks, storage facilities and electrical systems for renewable energy.

All actions and obligations aim to improve the security of operation and increase the share of RES as well as the exchange between MS. It is mandatory, for instance, to guarantee the transmission and distribution of electricity produced from renewable energies. Furthermore, all rules and actions shall be based on objective, transparent and non-discriminatory criteria, which shall be implemented by each MS.

The available literature for this review was mainly published between 2011 and 2013. Identified topics, challenges and burdens linked to this article are probably still relevant; nevertheless the published allocation of these challenges and burdens to specific countries might have changed since then due to country specific improvements and decisions.

### C.7.2 Effectiveness

***Is this article completely implemented? Has the national implementation of the RED effectively improved the grid access conditions for renewable electricity?***

All MS reported significant progress regarding the implementation of all RED provisions in their latest progress reports. According to these national progress reports, nearly all measures that were included in the National Renewable Energy Actions Plans are in place or planned. Table 17 summarises the status of the implemented measures that bear on in some way to Article 16.

Table 17 Overview about reported status regarding implemented measures related to Article 16

Member State	Implementation status of measures to promote the growth of energy from renewable sources
Austria	Yes all measure are implemented
Belgium	Yes all measure are implemented
Bulgaria	Yes all measure are implemented
Croatia	Yes all measure are implemented
Cyprus	Shall be implemented 2014
Czech Republic	Yes all measure are implemented
Denmark	Yes all measure are implemented
Estonia	Yes all measure are implemented
Finland	Partly implemented measure, for instance rural development programme for mainland Finland 2014-2020 planned
France	Yes all measure are implemented
Greece	All measures are planned, implemented and started partly from 2014 onwards
Hungary	Yes all measure are implemented
Ireland	Partly implemented, some are planned like the offshore process for renewable energy projects
Italy	Yes all measure are implemented
Latvia	Yes all measure are implemented
Lithuanian	Yes all measure are implemented
Luxembourg	Yes all measure are implemented



Member State	Implementation status of measures to promote the growth of energy from renewable sources
Malta	Most of the measures are starting in 2014
Netherlands	Yes all measure are implemented
Poland	Yes all measure are implemented
Portugal	Yes all measure are implemented
Romania	Nearly all of measure are implemented
Slovakia	Most of the measures are starting in 2014
Slovenia	Yes all measure are implemented
Spain	Implemented, mostly active

It should be noted that this document review did not check the targets and objectives of each measure to achieve the European objectives.

It is also necessary to consider that with coming into force of the RED, in some countries (like for instance Germany) no major adjustments in the legislation were necessary, since existing legal conditions and frameworks considered already most of the major and crucial issues of these provisions. For some illustrative countries, e.g. Germany and France, it can be acknowledged that the measures are operational. For example, in Germany energy from RES is preferentially injected. In addition network operators are obliged to connect any RES to their grid, while the connection should be realized in the most economical grid section. The success of the German regulation can be seen in the remarkable increase of RES in recent years.

All in all the national reports show most identified or necessary measures were or are implemented, while just a few are planned or starting from 2014 onwards.

***Has an additional need for infrastructure investment due to higher RES shares been identified? If yes, has the government introduced additional steps in order to address it?***

The sustainable integration of renewable energy requires sufficient grid capacity to transfer and deliver the power to all customers. In order to support the growth of renewable energy, each Member State has recognised the need for further infrastructure investments.

Fraunhofer ISI et al., 2011 came to the conclusion that the correlation is positive between the RES development and the network extension needs: RES growth requires network investments. However, the national network investment needs mainly depend on the quality of prognoses for the RES development as well as the knowledge about the location of these sources. Furthermore, the network investment needs are negatively impacted through the opportunity to curtail RES: these may reduce the immediate investment needs. All in all Fraunhofer ISI concluded that a coordinated approach of network investment planning is necessary. Such coordinated planning would facilitate and secure an efficient and effective integration of RES in the existing network structures.

DG Energy et al. 2012 found that in 19% of the MS, ‘lack of grid capacity’ was the main barrier for RES deployment. In particular, Estonia, Finland, Italy, Netherlands and Poland are expected to be limited by technical constraints to implement further RES. These technical restrictions are mainly triggered by ‘complex or inefficient procedures’ as well as ‘insufficient planning’ procedures to have sufficient grid capacities for the connection of all RES.





In the case of the transmission network each national ‘Ten Years Network Development Plan’ takes into account the expectations regarding renewable energy development. Therefore the transmission networks are expanded and strengthened to guarantee the increasing access of decentralized renewable production.

Based on the available information, it seems that the planning processes for distribution grids are more locally and not nationally coordinated as in case of the transmission system operators (TSO). Furthermore, no detailed public information is available to consider and quantify the investment needs on a national level, except in Germany where the Federal Ministry of Economics and Energy estimated investment requirements to be between € 23bn and € 49bn, depending on the renewable energy development scenario until 2032, and in France. In France the investment needs in the distribution grid were identified. As a consequence, explicit capacities in the substations were reserved to ensure the connection of renewable energies in those areas. In case of the other countries no comparable information could be identified.

***Are transmission and distribution grid planning aligned with each other to integrate the renewable energies?***

Aligning grid planning processes between transmission and distribution system operators is essential since both are impacted by the development of RES. The increasing integration of renewable energies also leads to a switch from the classic top down electricity flow to a more upwards flow. In addition the gas distribution sector is confronted with more and more decentralised production units which use the gas grid for their infeed and transport of the produced gas.

In France the network development plans are developed for each region (S3REnR). These plans reserve capacities for RES on the substations in locations where a high renewable energy potential has been identified. The costs to develop the necessary capacities are shared among the different regions.

Ecorys identified in their study ‘Assessment of non-cost barriers to renewable energy growth’ several challenges and risks which impact the successful and efficient planning of the network infrastructures. Table 18 and Table 19 summarise the key problems identified for the electricity and gas sectors.

**Table 18** Key problems related to national networks and interconnectors

Problems related to national networks:	Comments
Lack of harmonisation of RES and network spatial planning	The planning of new infrastructure by DSOs/TSO and RES policy (including ambitions and RES potential) that affect the pace of penetration and the location of new units is not coordinated.
Coordination between network companies and national regulators	Lack of coordination between actors in the above mentioned issue.
Social opposition	Local social opposition to new infrastructure due to long duration of EIA process, wide eligibility for court appeal, etc.
Non-transparent grid expansion cost sharing	The lack of normative rules for cost sharing and hence individual arrangements between the TSO and the investor.



Problems related to national networks:	Comments
Non-transparent grid capacity allocation	No structured allocation system.
Long authorisation process	Long process sometimes due to land acquisition and expropriation rules.
Lack of 'RES friendly' network elements: smart grids and balancing capacity	The current network cannot integrate all RES applying for grid connection.

Table 19 Key problems related to interconnectors

Problems related to interconnectors (Trans-European Electricity Networks):	Comments
Congestion and inefficient allocation of capacities	
Isolation/limited connection	Due to location
Lack of coordination between TSOs/governments	
Long authorisation procedure	
High investment risk	Reluctance of TSO/DSOs to invest in new network elements due to the lack of reliable info on demand and the location of new RES installations.

Therefore, it is necessary to take into account that the development of RES at a regional level will automatically influence the required grid topology, and both transmission and distribution networks have to assess the best approach to the local development of RES. The information in the progress reports is insufficient to assess whether the planning of both transmission and distribution networks is aligned and coordinated on a same level in all countries.

For instance in Germany TSOs and DSOs interact. However, a detailed planning process for investments between the German TSOs and DSOs is not implemented. In case of the German TSOs the grid planning process considers the DSOs' investment and grid strategy behavior on a high aggregated level. There is no doubt that an interaction in the investment planning process between TSOs and DSOs would increase the efficiency and effectiveness of the investments. However, the efforts needed for this closer cooperation and the potential benefits depend on the quantitative balance between TSOs and DSOs. In case of Germany, the existing grid structure would provide a barrier to such a coordinated approach, since the DSO structure is very fragmented.

In France regional network development plans exist. Each network development plan (S3REnR) is established at a regional level and includes investments in the distribution and transmission network.

As a first step in the case of network planning, transmission as well as distribution system operators should start to consider specific coordinated scenarios, which consider the developments in both the transmission and distribution networks. This coordinated approach would ensure that both distribution and transmission system operators would consider the developments in the other voltage levels and thus the interactions between both networks.



***How beneficial is the increase of smart technologies in the distribution grid to integrate renewable energies on a national level? Is it necessary to have it identical in all facets and depth in all grids?***

The existing literature on the quantified benefits of smart technologies in distribution grids is limited. While many studies highlight the opportunities smart technologies offer to optimize the grid capacities for the connection of RES, no detailed estimates and assessments of national benefits and investment needs are provided yet.

Furthermore, the national progress reports do not give any details about the pros and cons of an increased implementation of smart technologies. Only the Portuguese national progress report stated that smart technologies will have a positive impact on the integration of RES.

The study 'RE: Shaping study reports' (Fraunhofer ISI et al., 2011) further highlights the potential dilemma between a technical and economic optimisation. It is currently often common practice that a network is planned and constructed from a more technical perspective. This technical perspective optimises planning and constructing to the expected in-feed of the maximum power production during a year - even if this maximum situation might only occur during a few hours of each year and most of the time the in-feed of all power units is lower. An economic optimum approach could lead to the conclusion that for instance a curtailment of RES in these hours might increase the economic welfare, since the network investments can be reduced. The usage of smart technologies will also support this economic approach. For instance, demand management through electric cars could lead to a reduction of investment needs in specific areas. This could be economically preferred to strengthening the infrastructure, since this would move (part of) the local demand to specific hours with high in-feed and less other demand.

The study 'Moderne Verteilernetze für Deutschland' provides a first complete national assessment for the German distribution network. Among other things the study analyses and assesses the positive impacts of an increased usage of smart technology. In particular, the study analysed various approaches like power generation management, reactive power management, load management and usage of intelligent network technologies during the planning periods. The quantitative simulation finds the highest advantages in case of a combination of power generation management (up to 3% of the yearly in-feed of RES in congested areas) in combination with smart local network transformers. The combination of both measures reduces the investment requirements by approximately 60% on all network levels until 2032. Due to this, the average annual costs fall by about 20%. These savings could increase further with optimal organisation of power generation management in network planning and transformer expansion strategies. Even if this study was provided for the German market only, the general findings will be valid more widely, and these results and conclusions regarding the combination of a power management in combination with smart (in sense of intelligent) technologies are also transferable to other European distribution grids. However, the potential opportunities and details of these technologies will depend on the local circumstances, since the optimal combination of these smart technologies is highly linked to, for example, grid topologies and company strategies. Furthermore, it is also critically discussed whether the benefits of a full rollout of smart meters are retrievable, since the investment needs for the integration of RES do not significantly depend on this rollout.

The French situation illustrates that the RED supports the research and development of smart technologies as well as the implementation of smart technology pilot projects. These pilot projects will then be used to determine the benefits of the increased utilization of smart technologies.

***Have other effects (impacts) resulted from the implementation of this article? Have there been unforeseen impacts (positive or negative)?***

Based on the available information, there is no indication that Article 16 has led to other or unforeseen impacts in the grid or other sectors. Based on some regulatory expert interviews it can be pointed out that one of the success factors of the German implementation of RES was the compensation in case of curtailment as well as the transparent and specific cost sharing mechanism

***Which factors have hindered the achievements of the article objective?***

According to the report 'Integration of electricity from renewables to the electricity grid and to the electricity market - RES-Integration' (DG Energy et al. 2012 and Ecofys, 2012) several factors and issues could be identified which do or have hindered the achievement of the article objective. According to DG Energy et al. (2012) the following issues were identified:

**Table 20 Key issues in the electricity sector from grid connection perspective**

Grid connection	Comment
Long lead time and complex procedures	Lengthy and expensive process of obtaining connection licence
Too many technical requirements	Especially for small units
Lack of transparency/delays by DSOs	Unjustified delays caused by the network companies and non-transparent decision
Lack of grid capacity/different phase of grid and RES-E development	The connection of power plants and in particular RES depends very often on the local grid situation to ensure the security of supply and operation of the grid. Therefore this issue reflects the fact the existing grid seems to be insufficient to incorporate the additional infeed in a particular region.
Lack of communication, and weak position of RES-E plant operator	Regulators and grid operators are the main bodies involved in the connection process. However, communication might be less clear and require additional rules. This measure therefore assessed the ways and options to communicate the best way to connect the RES.

**Table 21 Key issues in the electricity sector from grid access perspective**

Grid access	Comment
No priority access	No guaranteed or priority access to the grid.
Curtailment	RES-E is curtailed for system security reasons no adequate compensation geothermal technology labelled as non-dispatchable.
Virtual saturation & specification	Reality and virtual grid connection situation leads to inefficiency regarding the operation of grid, since capacities may be are blocked by other power plants.

**Table 22 Key issues in the electricity sector from DSO/TSO perspective**



TSO/DSO related issues	Comment
Denial of connection request	Justified by too many grid connection applications received and reluctance for grid extension.
Discriminatory handling of grid application (cost sharing and connection approval)	Non-transparent cost allocation rules and decision-making on granting the grid licence (favouring companies belonging to the same group).
DSO specific connection rules	No harmonisation among DSOs.
No differentiation between RES-E technologies	
Speculation on connection permits	Connection permits has an intrinsic value as they are scarce and some agents buy them without any intent to invest in RES-E installation, but intend to sell them with a profit margin. This results in extra cost for developers and unpredictable connection supply.
Non-transparent definition of connection point	The definition of the connection point affects who bears the cost.
Non-shallow costs	The connection of RES and grids expansion related to the integration of RES is always linked to increased investment budgets. Therefore this issues highlights the questions what kind of cost sharing approach is used and how is it shared between grid operator and grid connection user among the MS.

In the case of the gas sector, the following issues were identified.

Table 23 Key issues in the gas sector from grid access and DSO/TSO perspective

Grid access	Comments
Regulation	Lack of legal coverage of network connection and access issues.
Information	Lack of clarity and publications on exact - technical - rules of connection and access.
Bureaucracy	Inefficient internal organisation, lack of knowledge on the subject by public servants.

TSO/DSO related issues	Comments
Rejection of connection/access	Network operators may deny access for technical reasons.
Injection requirements	Biogas producers face very strict requirements by grid operators for injecting biogas.
Incentives	Lack of incentives for grid operators to feed biogas into their network.

Further, DG Energy et al. (2012) came to the conclusion that ‘only a few NREAPs recognise the issues (and burdens) as a blockage and address them accordingly’. These issues are still valid in one to two thirds of the MS. The main issues that were identified are for instance ‘lengthy procedures or delays, lack of grid capacity, complex procedures and a weak legal position of plant operators’.

According to the survey of DG Energy et al. 2012, Denmark is the only MS which is not impacted by any barrier regarding the connection of RES. However, and also taking into account the ‘Keep-on-Track! Project’ survey, the authors came to the conclusion that there are still some barriers, which may hinder the successful implementation of RES. Therefore it be reasonable



to review the proposed reporting process to evaluate the implementation of articles to ensure a common monitoring result without any deviations.

The results of the DG Energy et al. (2012) review are summarised for each MS in Table 24.

Table 24 Identified issues regarding the connection of renewable energies

Member State	Main barriers to integration in the grid connection phase
Austria	Distribution of costs. Information policy regarding costs.
Belgium	Missing obligation to connect RES-E installations, except in the framework of the 'Inform & Fit' procedure. Connection can be denied due to insufficient capacities, no obligation to immediately reinforce grid to allow for connection.
Bulgaria	TSO does not connect new RES plants. Capacity limits for RES. Advance payments.
Cyprus	Bureaucracy. Lengthy Grid Connection Procedure.
Czech Republic	Connection moratorium. Supposed lack of grid capacity. Speculation. Envisaged advance payments.
Denmark	No barriers detected.
Estonia	Insufficient grid capacity. Speculation. Testing for wind farms.
Finland	Insufficient grid capacity. Distribution of costs. Speculative grid applications.
France	Costs of grid connection.
Germany	Communication between stakeholders. Lack of transparency. Definition of technical and legal requirements.
Great Britain	Planning consent. Issues linked to the offshore transmission tender process. Issues linked to the charging regime.
Greece	Inefficient administrative procedures. Insufficient special planning.
Hungary	Status of the grid. Capacity saturation and speculation. Unstable policies for wind power.
Ireland	Potential delays for grid connection due to the group processing approach. Potentially higher shallow costs than in other Member States.
Italy	Administrative barriers. Overload of connection requests. Virtual saturation.
Latvia	Insufficient grid capacity. Speculation.
Lithuania	Complicated connection procedure. Legislation not clear. High costs.
Luxembourg	Definition of connection costs.
Malta	Inefficient administrative procedures.



Member State	Main barriers to integration in the grid connection phase
	Insufficient special planning. Competing public interest.
Netherlands	Lack of sufficient grid capacity.
Poland	Insufficient grid capacity. Complicated and not-transparent grid connection process. Unclear regulations concerning the distribution of costs.
Portugal	Complicated and slow licensing procedure related to the Environmental impact. Assessment.
Romania	Virtual saturation. Access to credit. Information management.
Slovakia	Delays during the connection process. Speculation.
Slovenia	Administrative procedures. Long lead times. Enforcement of RES-E procedures' rights.
Spain	Delays introduced by administrative procedures. Heterogeneity of DSO technical requirements.
Sweden	Cost bearing and sharing.

The previous table summarised the need for further national measures to reduce the identified barriers. In addition, it is necessary to implement procedures and reviews to assess the status and the development of each national barrier.

### C.7.3 Efficiency

#### ***Does the RED implementation lead to changes in the grid access conditions for the renewable energies?***

With the implementation of the RED, the national grid access conditions must be reviewed and adapted to cover the objectives and needs formulated in Article 16 of the directive. The level of changes will have differed, of course, between the various MS, since the status of grid access conditions for RES differed in Europe at the time. For instance, in Germany most of the required changes were already implemented before the RED came into force. In case of France, the RED was found to have led to improvements in the grid access conditions. With the specific development plans (S3REnR) the costs are shared fairly. Indeed, each producer has to pay the grid access in proportion to its maximal power.

Of course, the changes were limited in those MS, which already had highly supporting grid access conditions for RES before the RED came into force. However, specific details about the changes or adjustments due to the RED were not available in the available sources.

#### ***Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? Is the effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?***

The implementation of the RED will have created administrative burdens due to the required changes and adjustments in procedures and processes for the impacted parties, at least in the beginning. For example, the provisions will have increased the costs in the grid sector due to the increased grid access provisions and the obligation to have sufficient grid capacities available.





The RED is seen to ensure a transparent and legitimate integration of RES into the grid, but the integration of RES into the market is not covered by this directive. This should also be ensured, to integrate and make use of RES in a cost efficient manner.

The retroactive measurement of administrative burdens through the RED is quite challenging. It can be expected that the implementation of rules such as an auction process or documentation requires investments and new processes by all parties involved, if these were not yet in line with the Directive. Actual data of the overall assessment on administrative burdens and benefits is not publically available. However, there is no indication that the requirements of this article are inappropriately high, compared to the potential benefits.

#### C.7.4 Added value

##### ***To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?***

In general, transparent and free from discrimination access to monopolistic infrastructures is essential for the development of RES, and Article 16 provides the relevant and necessary basis to increase the share of RES in national energy production.

Of course, grid access does not ensure the unburdened development of RES and these provisions are strongly dependant on other articles such as Article 3 or 4 or other incentive systems.

Since the technical integration of RES is very important and should always consider the market behaviour, it is reasonable and supported to ensure these aspects determine the future direction of this directive. It was discussed that the integration of RES requires far more flexibility of the grid, which can be achieved by various alternatives, and it was indicated that any technology should be treated equally. Meaning that storage, as mentioned in Article 16.1, should not be mentioned explicitly. Due to this, the incentives for market driven developments is supported.

Negative grid tariffs, as they exist for instance in the German regime, are highly questionable (linked to Article 16.8). The historical reason for these tariffs was the avoided network utilization of higher voltage levels in Germany. However, the validity of this provision has to be analyzed and assessed in view of the latest developments in the energy markets.

Regarding the implementation of supporting measures (Article 2k) it can be pointed out that all measures should be direct and transparent. In particular indirect support, e.g. via taxes, should be avoided as they are out of control of the energy sector.

Regulatory experts also mentioned that a quota model (Article 2l) was not a feasible alternative as the costs would exceed the benefits associated with it. Similar recommendations were mentioned for the intended tendering process for which the administrative burdens were seen to be rather challenging and the outcome in terms of efficient (lower) support levels was deemed to be rather unrealistic.

##### ***Would the results have been achieved without the RED/article, i.e. without EU intervention?***

The existence of this article is, as mentioned before, necessary and supports the liberalization in the sense of free and transparent network access of the electricity and gas sector.

The identified issues and burdens, which slow the integration of RES down, are still not completely solved with by all measures. But the obligatory conditions of Article 16 go in the right directions and support the reporting of challenges and burdens, which need to be addressed in future review phases of this article. All in all, removing this article would certainly lead to a slower integration of RES and would require more incentives for RES to achieve the same growth rates.

***Are there alternative measures/improvements which could have led to the same results?***

In theory, market access is one of the major challenges of monopolistic infrastructures. The obligation to connect RES without any additional burdens or challenges is, therefore, required and substantial. Any delay or existing burdens will slow down the development of RES integration as it could be seen in some regions in the last few years. The increase of access rules and the obligation to have a transparent access are elementary and needed. Any other or alternative efficient and effective measures are currently not available or proven.

### **C.7.5 Conclusions/recommendations**

According to the latest statistics, the installed capacities of RES increased over the last years. MS with an increasing share of RES identified and stated the need for network investment and highlighted the opportunities and advantages of smart grid technologies. Network investments are not always triggered by RES, but these sources are one of the most relevant parameters, currently and in the coming years.

The implementation of Article 16 is necessary for a transparent and free from discrimination grid access for renewable energies, since this was not always the case in all MS. Nevertheless, various barriers and issues are still present, which slow down the integration of RES and hamper meeting the article's objectives. The main issues are, for instance, 'lengthy procedures or delays, lack of grid capacity, complex procedures and a weak legal position of plant operators'. It should be realised, however, that these barriers are not present in all countries in the same way.

Transparent and frequent reports about the challenges of implementing Article 16 might provide further feedback and opportunities to improve measures and actions and resolve current issues and address future needs. Since this kind of information is currently not publically available it is difficult to assess the impact of these provisions on the real improvements in each country. A European survey could fill this gap.

Burdens and challenges were identified in several reports and studies, but the range of available solutions to deal with these is wide. Consequently, the chosen measures to implement the article may differ between the individual countries and may depend on the regulatory and legal framework, tax regime, etc.

Furthermore, it seems to be reasonable to coordinate in a more comprehensive way the network investment procedure between the transmission and distribution system operators. Of course, any coordinated planning must be practical. One option could be a minimum exchange through the consideration of agreed distribution network developments on the transmission network level, since this facilitates optimisation of interactions between the different voltage levels. In addition, it might reasonable to estimate the possibilities to reduce network investment by introducing further

options to integrate RES. System operators should have the option to use power management or smart technologies, in view of ensuring the overall national objective of the RES share.

#### **C.7.6 Data/information gaps**

- No national information, except Germany, about the investment needs in the distribution grid related to the future growth of RES.
- Explicit information regarding efficiency, lessons learnt and added value of Article 16 is not available.

#### **C.7.7 Sources**

##### **Ecofys et al., 2013**

Renewable energy progress and biofuels sustainability.  
Utrecht : Ecofys, 2013

##### **Eclareon, 2012**

RES integration: final national reports

Available at: <http://www.eclareon.eu/en/res-integration-national-reports>

##### **EC, 2013**

National Progress Reports

Brussels : European Commission, DG Energy, 2013

Available at: <http://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports>

##### **Fraunhofer ISI et al., 2011**

RE-Shaping study reports

Karlsruhe : Fraunhofer ISI, 2011

##### **Ecorys, 2010**

Assessment of non-cost barriers to renewable energy growth in EU Member States

Rotterdam : AEON and Ecorys, 2010

##### **Intelligent Energy Europe, ongoing**

Website Keep-on-Track!

### **C.8 Article 17-19, 21: RES in transport, biofuels and bioliquids sustainability)**

#### **C.8.1 Article presentation and relevance**

Articles 17-19 form a coherent sustainability framework which aims to guarantee the sustainability of biofuels and bioliquids counting towards the 10% transport target and the overall target of the Renewable Energy Directive. These Articles are often referred to as the 'sustainability criteria'. Article 21 is also concerned with biofuels, focussing on customer information (21(1)) and incentivising biofuels produced from wastes, residues, non-food cellulosic material and lingo-cellulosic material (21(2))<sup>30</sup>.

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<sup>30</sup> Note that this double counting does not apply to the overall RES target defined in Art. 3.



Article 17 defines the actual sustainability criteria that should be met. Article 17(2) defines the minimum GHG emission reduction requirements, which become stricter over the years. Article 17(3), (4) and (5) prescribe that biofuels counting towards the target should not be produced from raw material obtained from land with high biodiversity value, land with high carbon stocks or land that was peat land in January 2008.

In Article 18 the Commission has laid down the requirements for the means of compliance and (reporting) responsibilities of the different actors involved. In this way, Article 18 ensures the sustainability criteria are applied and verified in practice.

Article 19 and Annex V describe the calculation methodology for GHG emission reductions which should be followed to prove compliance with Article 17(2).

Whereas the sustainability criteria in these Articles should prevent unsustainable biofuels from contributing towards the target by setting minimum requirements and boundaries, Article 21(2) provides an incentive for biofuels from waste, residues, non-food cellulosic and ligno-cellulosic materials by requiring Member States to double-count these biofuels towards the 10% target, and also apply this double counting in any obligation schemes. This implies Member States can meet the 10% transport target of the RED with half the volume of biofuels in case they solely use biofuels from waste and residues.

The relevance of this coherent sustainability framework can be understood from the first page of the Directive: an important objective of an increase in renewable energy is the reduction of greenhouse gas emissions in order to meet the target under the Kyoto Protocol and other long term international agreements. The large variety in the GHG reduction potential of different types of biofuels (and other sources of RES in transport) means that a higher share of renewable energy in transport does not necessarily result in an equal reduction in GHG emissions. Without any sustainability criteria a higher share for renewable energy might even prove counterproductive, both within the EU and also on a global scale.

## C.8.2 Effectiveness

### *How are sustainability criteria enforced, checked and audited?*

The requirements for verification of compliance with the sustainability criteria of Article 17 are laid down in Article 18. The first paragraph of this Article (18(1)) requires economic operators to use a mass balance system<sup>31</sup> in order to prove the fulfilment of the sustainability criteria in 17(2)-17(5). To date the European Commission has approved 19 voluntary certification schemes<sup>32</sup> which all use a mass balance system in line with the requirements of the RED. These schemes can be used by economic operators to prove compliance.

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<sup>31</sup> In general there are three main supply chain systems that may be used to guarantee the sustainability of biofuels along the supply chain: physical segregation, mass balance and book and claim. In case of physical segregation certified biofuels are not mixed with non-certified biofuels along the entire supply chain. The book and claim approach is a certificate trading system, where certificates are separated from the physical trade in biofuel. The mass balance system allows a mix of certified and non-certified biofuels, but companies are only allowed to sell the same amount of certified biofuel drawn from the mixed biofuels that they originally bought as certified. See also: [http://wwf.panda.org/what\\_we\\_do/footprint/agriculture/palm\\_oil/solutions/responsible\\_purchasing/scorecard2011/supplychains.cfm](http://wwf.panda.org/what_we_do/footprint/agriculture/palm_oil/solutions/responsible_purchasing/scorecard2011/supplychains.cfm)

<sup>32</sup> [http://ec.europa.eu/energy/renewables/biofuels/sustainability\\_schemes\\_en.htm](http://ec.europa.eu/energy/renewables/biofuels/sustainability_schemes_en.htm)



The experiences so far and the effectiveness of the mass balance system have been evaluated by in (Ecofys, 2012). Ecofys finds that compared to alternatives, this system has a number of distinguishing features that contribute to its effectiveness, namely as that it requires a physical link between all stages and it allows materials to be physically mixed. The study does find a number of different approaches regarding, for example, which actors in the chain of custody need to be audited, and identifies a number of other issues and potential improvements to the system, including a number of potential threats to the integrity of the chain of custody. These are, however, being addressed by the stakeholders. Overall, in comparison to alternative systems, the study finds that the mass balance system is seen as the most appropriate system.

***Are the right criteria and methods used? Are they reviewed regularly enough?***

As mentioned above, the mass balance system is broadly regarded to be an effective and cost-efficient methodology.

To assess whether the sustainability criteria itself are the right criteria and use the right methods to guarantee the sustainability of biofuels and bioliquids, we can distinguish the following different aspects of these criteria:

- scope of the application of the criteria;
- environmental aspects included;
- the criteria and definitions.

**Scope of the application of the criteria**

The RED defines the scope of application of the criteria to biofuels (used in transport) and bioliquids (used for electricity and heat). This targets the biomass applications with the highest risk for negative environmental effects, namely use of cultivated (and food commodity) biomass, as is demonstrated by a range of life cycle analyses such as (JEC, 2011) and studies on indirect land use change effects<sup>33</sup>. This approach can thus be considered to be effective, especially considering that these articles are the first obligatory sustainability criteria on this scale in the world.

The scope of application does not include solid biomass utilized for heat and/or power generation, which may also have negative environmental or socio-economic impacts. However, the fact that the sustainability criteria are not mandatory for solid and gaseous biomass (for non-transport applications) does not mean the sustainability aspects of these groups are totally excluded from the scope of the Commission. In Article 17(9), the Commission has laid down its responsibility to report on the ‘requirements for a sustainability scheme for energy uses of biomass, other than biofuels and bioliquids by 31 December 2009’. This report, published in February 2010, concluded to not introduce EU binding criteria for solid and gaseous biomass sources in the electricity, heating and cooling sector, as has been done for the transport sector. Instead of binding criteria the Commission adopted non-binding recommendations to Member States that had already introduced or planned the introduction of national biomass sustainability requirements. (EC, 2010 and EC, 2014). These developments are ongoing in a number of Member States, providing an opportunity to first gain experience with these requirements on a national level, allow for the development of methodologies to address potentially complex issues such as carbon stock changes and indirect effects before including these requirements in future EU regulations as well. Note that some initiatives like the UN Joint Implementation projects

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<sup>33</sup> See, for example, [http://ec.europa.eu/energy/renewables/studies/land\\_use\\_change\\_en.htm](http://ec.europa.eu/energy/renewables/studies/land_use_change_en.htm)



and NTA8080 already require reporting on the indirect effects. Inclusion in future EU regulations can further improve the effectiveness of these articles and ensure that a well-developed and complete regulation can be implemented in the future.

### **Sustainability aspects included**

Requirements on the following environmental aspects are included as mandatory criteria:

- direct GHG emissions;
- biodiversity;
- carbon stocks;
- peatland.

Besides mandatory requirements, the Articles include reporting obligations for soil, water and air protection and social sustainability<sup>34</sup>. However, according to [Ecofys, 2013] the majority of Member States does not fulfil these reporting obligations, because they deem the impact of the production of feedstock for biofuels on water and air quality low due to existing legislation and codes of practice. Only Belgium, Romania and Germany have taken steps to investigate the impact of biofuels on water and air quality.

This approach can overall be considered effective, as it focusses on the regulation of the most relevant negative impacts, whilst taking into account that some impacts may be important in some cases but can not yet be properly defined, monitored and verified.

As mentioned above, the effectiveness of these sustainability criteria is, however, reduced as they only focus on the direct effects caused by biofuel production, and do not regulate on the sustainability risks related to indirect land use change.

### **The criteria and definitions**

#### *GHG reduction requirements*

Article 17(3) prescribes a minimum GHG emission saving of 35% (compared to the fossil fuel reference) and a minimum of 50% for biofuel from existing biofuel installations from 1<sup>st</sup> of January, 2017. With effect from 1 January 2018 the GHG emission savings of biofuels made in installations starting production on or after 1 January 2017 shall be at least 60%. However, the effect of this tightening of the threshold may be limited: based on a study by Ecofys (2013a) it can be concluded that new production capacity starting at this date will be limited, because in 2010 only half of the biofuels production capacity in the EU was used: around 40% of biodiesel production capacity and between 50-60% of bioethanol production capacity. Current capacity will therefore probably be sufficient for the coming years (Ecofys, 2013). Investment into new capacity after 2017 will strongly depend on the outcome of the decision making process concerning the treatment of indirect land use change, as this will determine the future demand for the various types of biofuels.

According to this same study the total estimated greenhouse gas emissions savings from biofuels in the EU in 2010 ranged between 53% and 60% compared to fossil fuels. These estimations do not include the emissions related to indirect land use change and are presented as a range due to the high

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<sup>34</sup> Note that according to Article 17(6) agricultural raw materials cultivated in the Community and used for biofuels shall also be obtained in accordance with certain European legislation including minimum requirements for good agricultural and environmental conditions.



variation in feedstock use and production pathways per type of biofuel. Probably, the minimum requirements could have already been easily met at the start of the implementation of the RED because there were sufficient biomass sources that could pass the threshold to meet demand. This raises the question of the extent to which the sustainability criteria provide sufficient incentives to further improve the current biofuel production chains, and for innovations in biofuel production to move towards more advanced biofuels, like biofuels produced from cellulosic feedstocks, algae, etc.

There could be several explanations for the relatively high average GHG emission reduction compared to the minimum requirement:

- the economically most advantageous biofuels resulted in good (direct) GHG emission savings;
- the double counting of biofuels from waste and residues (art. 21(2));
- the GHG emission reduction target of the FQD;
- the negative public attention for biofuels from food crops in combination with the uncertainty related to the ILUC proposal;

These may all be reasons for fuel suppliers to opt for biofuels with relatively high GHG emission savings.

It should, however, not be concluded that the sustainability criteria did not impact the volume of GHG emissions at all. A post implementation review of the Renewable Fuel Transport Obligation in the United Kingdom, which was already in place before the implementation of the RED, mentions for the first year of implementation of the RTFO (2008) a reduction of GHG emissions (excluding indirect effects) of 46%, increasing to 66% in for year five (2012) of implementation (Dft, 2014)<sup>35</sup>.

As mentioned before, the GHG emission calculation methodology currently does not include indirect effects, like the additional GHG emissions which may occur as result of indirect land use change. Consequently, as various studies have shown, not all biofuels that meet the GHG reduction requirements also result in net emission reductions compared to fossil fuels. Based on the ILUC values as presented in the ILUC proposal, biofuels from oil crops in particular might even result in an increase of GHG emission if indirect land use change emissions are included (EC, 2012). The effectiveness of this requirement could thus be improved if the RED was modified to also reduce ILUC impacts (e.g. with a cap on crop-based biofuels), as is currently being debated. The earlier this is decided on, the more effect it may have, as it will take time to implement any policy modifications in national legislation and through a shift of the biofuels market itself.

Another point of discussion could be the actual replacement of fossil fuel: as result of the double counting 1 GJ of double-counting biofuel counting towards the target only replaces ½ GJ of fossil fuel, because the other ½ GJ consists of an administrative realisation of the target. As result of this the absolute overall GHG emissions savings are limited.

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<sup>35</sup> This effect is even stronger when indirect effects are included: the first year of implementation of the RTFO resulted in a biofuels mix which caused a 5% net increase of GHG emissions, whereas in year five, the review reports a net average GHG reduction (incl. ILUC emissions) of 60%.





### *The definition of biofuels that should be double counted (Art. 21(2))*

Article 21(2) has been the topic of much debate across the EU, for example in the Concerted Action for RES (CA-RES) Working Group 8, as MS consider the definition of the type of biofuels that is double counted not to be clear<sup>36</sup>. This has led to a fragmented situation in the EU, where some feedstocks are counted twice in one country but not in another. The Commission has proposed to address this issue in the 2012 ILUC proposal, including a list of feedstocks to be double or even quadruple counted (Annex IX), but this proposal has not yet been decided on. In an assessment of this list, (E4tech, 2013) concludes that a number of feedstocks on this list might better not be supported, illustrating the inherent complexity of identifying feedstocks with no indirect or other undesired effect.

### ***Have they been effective in protecting biodiversity and land with high carbon stock and ensuring the sustainability of biofuels production?***

In recent years, an increasing amount of the feedstock used to supply the EU biofuels market have demonstrated compliance with the sustainability criteria (EC 2013, RE progress working document). In 2013, a total of 86.5% of the EU's biofuel consumption was certified sustainable (Euroobserver, 2014). It can be assumed that this has indeed had positive effects on the sustainability, although this effect cannot be quantified since the source and environmental impact of the EU's biofuels were not monitored before these criteria came into force.

Ecofys (2013b) concluded the ratio between EU biofuel consumption and globally available certified feedstock in 2010 differed per feedstock: for example, in 2010, the EU soy biodiesel consumption was approximately 5 times higher than the Roundtable Responsible Soy (RTRS) certified soybeans available, whereas for palm oil, there was approximately 5 times more certified palm oil than the EU palm oil demand for biodiesel. This may indicate that these criteria are a stronger driver for sustainability certification schemes in soy than in palm oil production, it does not, however, provide conclusions about the impacts on the various sustainability indicators.

Effectiveness of these articles was furthermore impeded due to delays with the implementation of articles 17-19 and 21(2) in many Member States. Transposition and implementation was still incomplete or incorrect at the time of the 2013 Renewable energy progress report (EC 2013, RE progress, Working Document), and the Commission continues to monitor progress of implementation. Overall, however, it is concluded that the sustainability scheme works effectively in the larger Member States that represent the bulk of the EU's biofuel consumption (note that five Member States, Germany France, UK, Italy and Spain, represent around 70% of the biofuel market).

All sustainability criteria are focussed on the direct effects caused by biofuel production, but the Articles lack the regulation of the sustainability risks related to indirect land use change. This was acknowledged in Art. 19(6) which allows for the GHG calculation methodology to be amended to include this issues. The Commission's report on the impact of indirect land-use change, as announced by this Article, was published by the end of 2010. A proposal with a concrete methodology to include these emissions in the GHG impact calculation (COM(2012) 595 final) was delayed, however, and discussions on this topic are still ongoing. This implies the sustainability of the biofuel feedstock production itself is sufficiently covered and ensured. Because the

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<sup>36</sup> [http://www.ca-res.eu/fileadmin/cares/public/Reports/WG\\_Summaries/CA\\_RES\\_WG8\\_publication.pdf](http://www.ca-res.eu/fileadmin/cares/public/Reports/WG_Summaries/CA_RES_WG8_publication.pdf)



indirect impact of biofuel feedstock is not included in the criteria there is still a risk biofuel feedstock production might result in an increase in GHG emissions rather than reduction of emissions, and a net loss of biodiversity and loss of land with high carbon stock.

Finally, the effectiveness of these articles will depend on whether they have only led to a shift in biomass application or if they have actually reduced the environmental impact. It may well be, for example, that the EU biofuels are now produced from sources that are indeed sustainable but that would otherwise be used for food production, which is not regulated in a similar way, or for biofuels production outside of the EU. This type of indirect effects have not yet been quantified, however.

***Do the articles provide sufficient opportunity for revision of criteria when necessary?***

During the development and since the implementation of the Renewable Energy Directive many studies have been published on the different sustainability implications of biofuel production and EU biofuel policy<sup>37</sup>. Until today no scientific and political consensus has been reached on for example the indirect impacts of biofuel production on land use change, and also the scientific data on direct impacts may progress over time.

Because of changing insights new studies bring to light, it might be advisable to revise the sustainability criteria accordingly. In the Articles the Commission has stated several times the option to propose corrective actions in case evaluation outcomes indicate the need for it. These corrective actions could help to optimise sustainability outcomes, but, on the other hand, they could also significantly increase investment uncertainty. The impact of the ILUC proposal as published in October 2012 and the delay of the decision making process afterwards is a good example of how uncertainty related to corrective actions can negatively affect MS policy progress as well as biofuel investments. The 2014 Biofuels Barometer (Euroserv'er, 2014) reports a decline in EU biofuels consumption between 2012 and 2013, and mainly attributes this to these lengthy discussions.

Therefore, it may be concluded that the directive provides sufficient opportunity to revise the criteria, but that this comes at a price: it creates uncertainties for both investors and Member States. The net effect of this flexibility on the effectiveness of the articles is likely to be positive in the longer term, when the revision of the criteria can be expected to lead to an increase of the GHG reductions and a reduction of other environmental impacts. In the short term, however, these uncertainties rather hamper the developments.

***Have these articles promoted the use of biofuels from non-food feedstock (as defined in the article)?***

With respect to the promotion of the use of biofuels from non-food feedstocks Articles 17-19 do not provide strong incentives for the use of biofuels from waste, residues and other non-food biomass. According to Article 17(1) biofuels and bioliquids from waste and residues need only to fulfil the minimum GHG emission requirements as included in Article 17(2); there is no requirement to use biofuels with higher carbon emission savings. Furthermore, the minimum GHG emission requirement does not provide a strong incentive for the use of biofuels from waste and residues, as there is a range of food-

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<sup>37</sup> See, for example, [http://ec.europa.eu/energy/renewables/studies/land\\_use\\_change\\_en.htm](http://ec.europa.eu/energy/renewables/studies/land_use_change_en.htm) and <http://epthinktank.eu/2014/03/21/indirect-land-use-change-iluc-and-biofuels-in-the-eu/>, for links to relevant studies.



based biofuels that can meet this requirement. Biofuels produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues, do not have to prove compliance with the other sustainability criteria. However, this advantage is too limited to compensate for the investment uncertainty and higher production cost of these biofuels, as it can be seen throughout the EU that these types of biofuels only increase their market shares when tax exemptions or double counting are in place.

The double counting obligation in article 21(2) has the potential to strongly promote the use of biofuels from non-food feedstock, as can be seen in the Netherlands: this country was the first to implement double counting in its biofuels obligation, and now has a total share of 42% of biofuels from waste and residues (mainly used cooking oil, data for 2013, %energy). However, not all Member States have actually implemented this incentive, and the eligibility of particular wastes and residues varies significantly between countries where it has been implemented (E4tech, 2013), resulting in a relatively low share of these biofuels in the EU as a whole. According to Ecofys (2013) only 1.4% of all sustainable biofuels consumed in the EU were produced from waste and residues as defined in Article 21 (2). This equals 0.11% points of the 4.7% of total renewable energy in transport (based on 2010 data).

Although a trend is visible towards an increased use of biofuels from waste and residues (E4tech, 2013), there are several other factors which can explain this increase rather than the sole impact of the requirements of Articles 21(2) and (to a lesser extent) 17-19.

- Green image of companies: without these criteria, some economic operators probably would also have shifted towards biofuels and bioliquids from waste and residues as result of the negative publicity around biofuels from food crops by international researchers and NGOs.
- FQD target: reduction of average GHG emission factor requires absolute reduction of GHG emissions. In contradiction to the RED target the FQD target provides a clear incentive for maximizing GHG reduction.
- The expectation that they would have to shift to these biofuels in the future anyway, in view of the ILUC proposal and debate.

#### ***Have they promoted innovation?***

These articles may be a driver for two different types of innovation:

- Improving the sustainability of biofuels currently on the market. This may happen in different ways, for example by making the production process more energy efficient, by deploying more renewable energy in these processes, or by reducing the emissions during cultivation by using advance agricultural management methods.
- The development of different types of biomass and biofuels, and more advanced production methods. This may include the so-called 2<sup>nd</sup> generation lingo-cellulosic bioethanol production process and gasification processes to produce syndiesel.

As was explained above, these articles have not had much visible effect in this respect. The GHG savings requirements and other sustainability criteria could be met by conventional biofuels, and the double counting of article 21(2) had limited effect so far, and mainly promoted biofuels from used cooking oil and animal fat that could be produced with existing production processes.

The raising of the minimum GHG reduction threshold in 2017 might drive some further innovation of the first kind, as particularly for conventional biofuels, there are a number of feedstocks and production processes where biofuels may not meet that threshold. The second type of innovation is currently driven more by R&D funding and pilot and demonstration projects, and can be

expected to require a stable longer term (post 2020) market outlook to justify the investments needed.

***What other effects (impacts) have resulted from the implementation of the article? Have there been unforeseen impacts (positive or negative)?***

The sustainability criteria in the RED were the first of their kind. They thus resulted in a steep learning curve, requiring effort in the beginning to implement at MS level and set up and optimise the system and processes. This can be seen as an up-front investment from both stakeholders and governments. They also demonstrated the feasibility of this approach which may help the development and implementation of sustainability criteria for other, similar products such as solid biomass for electricity or heating, for materials and chemical production.

Article 21(2) has led to concerns about possible fraud, especially regarding used cooking oil, and measures are taken to prevent this (CARES WG8)(E4tech, 2013). The current regulation is also seen as an incentive to artificially increasing the volumes of UCO in the market. Furthermore, there are concerns about potential negative impacts on other industries which use the same wastes and residues (E4tech, 2013). It is not known, however, how large these effects are.

***Have these effects contributed to the achievement of the article?***

No, not that we are aware of.

***Which factors have hindered the achievements of the article objective?***

The delays in the decision making process related to the ILUC proposal have hampered investments in new production capacity and in innovation. At the same time, these delays have reduced the GHG savings that these criteria could have achieved, as indirect emissions and other indirect environmental effects are not regulated.

Furthermore, the delays in Member State implementation of the provisions have delayed the positive effects that can be achieved by these provisions. This has impacted the GHG savings that were actually achieved, as well as the share of biofuels from waste and residues.

The process of EU approval of the voluntary sustainability criteria has taken several years, and is still ongoing. This has delayed the actual implementation of these criteria in the various Member States and in the EU biofuels market.

The main effect of the double counting of Art. 21(2) has so far been the promotion of biofuels from waste and residues, which is in line with the article objective itself. It must, however, be noted that the increase of biofuels from waste and residue was mainly the result of an increase in biodiesel from UCO and animal fat, already relatively inexpensive and mature routes. It has not had a significant effect in promoting innovation (e.g. research into advanced biofuels processes) or in bringing new types of biofuels onto the market, such as bioethanol from ligno-cellulosic feedstock.

### C.8.3 Efficiency

***Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? Is the effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?***

The sustainability criteria require a system to be in place to check proof of compliance by economic operators. According to Article 18(3) Member States have to take measures to ensure that economic operators provide reliable information to prove the biofuels they buy on the market comply with the sustainability criteria. Due to the decision to make each individual Member State responsible, each Member State had to design and implement a system to oblige economic operators to fulfil the sustainability requirements and to submit information. Because this Directive has been the first worldwide to introduce mandatory sustainability criteria, it must be noted that the administrative burden for all actors involved has been relatively high in the first years of implementation. Only a few Member States, like the United Kingdom, had some experience with voluntary systems focused on the sustainability of biofuels to monitor the impacts of national imposed biofuel obligations.

EC (2013, working document) concludes that the administrative burden on producers is limited. The Articles contain two tools to reduce the administrative burden for economic operators, namely the option to use recognised 'voluntary schemes' or 'bilateral and multilateral agreements' and the option to use 'default values' for calculating the GHG emission savings as laid down in Article 19 (EC, 2010). These appear to have the intended positive effect. The administrative burden of biofuels from waste and residues is also lower compared to biofuels from food crops as they only have to prove compliance with the GHG reduction requirements. Ecofys (2013) concluded that there is a broad consensus amongst stakeholders that this mass balance system is preferred over alternatives (also from perspective of efficiency), with a number of recommendations for improvements.

As was noted in the 2013 RE progress report (EC, 2013), the implementation of the sustainability schemes differs among Member States. This increases the economic burden for biofuels producers that operate in more than one country, as they are faced with different reporting obligations in different MS.

***Are the selected mechanisms the most cost-efficient way to achieve the targets?***

Overall, it can be concluded that the provisions aim to reduce administrative cost where possible, for example by introducing the process of approval of voluntary schemes, and by providing default and typical values for the GHG emissions of a range of biomass/biofuel combinations. Many of the administrative cost are related to implementing the provisions, putting the proper procedures and authorities in place. These can be considered as one-off cost, limiting the operational cost to maintaining the system of monitoring, reporting and verification. Nevertheless, the administrative and reporting requirements to meet EU regulations can result in additional operational costs pushing up EU biofuel prices as opposed to upward pressure from blending mandates. These costs can push up EU prices and the theoretical size of support provided by the mandates (Charles & Wooders, 2011).



### ***Could the same results have been achieved with less funding/lower cost?***

There are a number of issues that could be improved, as mentioned above, such as the lack of an EU level definition and certification of biofuels that are to be double counted (Art. 21(2)). This would improve harmonisation throughout the EU and reduce the administrative effort and thus cost needed to implement this article.

Both the EU and the MS went through a learning curve in the past years, because the RED introduced the world's first legislative mandatory criteria for carbon and sustainability. The mass balance chain of custody had to be developed from scratch and address issues such as: double-claiming; different timeframes; dealing with carry-over; start of supply chain in the case of waste and residues; schemes going beyond the EU sustainability criteria etcetera. In some cases, more guidance from the EU might have reduced implementation cost but teething problems could hardly be avoided when developing a new type of policy.

The time needed to further develop and implement the various provisions, both on EU level (e.g. approval of voluntary schemes, ILUC methodology) and at MS level (e.g. transposition of the various provisions) both had some negative impacts on the cost effectiveness of the provisions. For example, the costs of proving compliance was higher than necessary in the beginning as actors had to be audited multiple times for the chains of custody of multiply voluntary schemes as result of the differences between the different approved voluntary schemes. Reporting obligations may still differ between countries, increasing compliance cost for producers.

The delay in the ILUC decisions create significant uncertainty in the biofuels market. When the policy revisions will be decided on, there will be relatively little time to develop the production capacity and technology needed to meet the 10% target within the new boundary conditions. This may result in a less optimal market and fuel mix in 2020, compared to the case if the decision was made earlier - although the benefits of a well thought-out policy may outweigh the cost of late implementation.

## **C.8.4 Added value**

### ***To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?***

The Articles 17-19 are not only included as requirements in the Renewable Energy Directive, but also in the Fuel Quality Directive (FQD, directive 2009/30/EC). The FQD obliges fuel suppliers to reduce the average GHG emission factor (well-to-wheel) of fuels applied in road transport. It also requires any biofuels counting towards the FQD target to comply with the same set of sustainability criteria as laid down in the RED. The two directives also share the same GHG calculation methodology for biofuels and are thus well aligned in this respect. However, a number of differences in design might result in a rather complex interaction. Within the RED the actual emission reduction is not important, as long as the minimum requirements are met. On the contrary, the FQD provides an incentive to use biofuels with the highest possible emission reduction because this directly contributes to the realisation of the target. Also, the FQD does not include a double-counting mechanism; biofuels from non-food feedstock are promoted more indirectly through their relatively large GHG savings. In the past years, the 10% target in the RED has been the main driver for biofuels policy throughout the EU, but it is likely that the FQD will become more pressing in the second half of the decade as the FQD target of a 6% reduction in the average emission factor of transport fuels

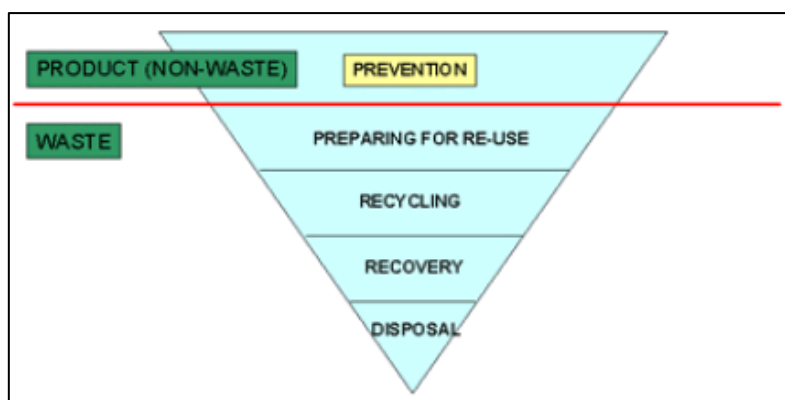




by 2020 gets closer. This effect is likely to be enhanced if the share of double counting (or even quadruple counting) biofuels is increased. The most optimal fuels mix to meet the RED target may then not be sufficient to meet the FQD target.

Because biomass is used in other sectors than included in the scope of the Renewable Energy Directive there are also linkages with Directives related to sectors such as food and agriculture, industry, the chemical sector and waste. A relevant Directive in relation to the use of biomass from waste and residues is for example the Waste Framework Directive (Directive 2008/98/EC on waste) and the overall waste hierarchy as set out in this Directive. Where the Waste Framework Directive defines clear end-of-life-criteria, the RED does not include a clear definition of waste and residues. Besides a clear definition of waste, the Waste Framework Directive also contains a waste hierarchy, which indicates the priority order that should be applied in waste prevention and management legislation and policy. This hierarchy is depicted in Figure 12.

Figure 12 Waste hierarchy according to the Waste Framework Directive



Source: <http://ec.europa.eu/environment/waste/framework/>

According to Article 4 of this Directive, recovery - like energy recovery - is only listed as the fourth option after prevention, re-use and recycling. The incentives in the RED provided to increase the use of waste and residues for biofuel or bioliquid might therefore work counterproductively, while the RED should ideally not counter the efforts to reduce waste and increase recycling rates as laid down in the Waste Framework Directive (IEEP, 2013).

***Would the results have been achieved without the RED/article, i.e. without EU intervention?***

Articles 17-19 are partly the result of efforts within different (international and European) organisations to develop voluntary certification schemes and minimum GHG emission savings: also before 2009 there were a number of voluntary programs in development and in operation, such as the RTRS (Roundtable on Responsible Soy) and the RSPO (Roundtable on Sustainable Palm Oil). These schemes would have continued anyhow, albeit voluntarily. A number of MS also promoted biofuels from non-food feedstock, in line with Art. 21(2): the UK had a duty differential for UCO based biodiesel, the Netherlands intended to implement double counting in its biofuels obligation. The RED did ensure, however, (obligatory) implementation across the EU, thus ensuring a much larger volume of biofuels to adhere to the criteria, and a larger volume of biofuels from waste and residues on the EU market. Furthermore, the provisions have achieved harmonisation of the voluntary





certification systems at the European level, reducing the cost for economic operators. This would not have been achieved without the RED.

There is, however, significant overlap between the RED and the FQD, which both contain the same sustainability criteria. As fuel suppliers have to meet the FQD GHG reduction target in 2020, it can be expected the inclusion of the sustainability criteria in the FQD alone would already be sufficient. However, to ensure that the RED does not (unintentionally) promote biofuels that do not meet the criteria, and for reasons of consistency between transport fuel policies, it does have an added value to have these criteria in both directives.

***Are there alternative measures/improvements which could have led to the same results?***

A number of alternative approaches could be feasible to increase the GHG emissions achieved with these provisions, and to minimise impacts on other aspects such as biodiversity. For example, by only allowing low ILUC or ILUC free biofuels, thus effectively banning biofuels from feedstock that requires land - directly or indirectly. This approach is effectively proposed by the Commission for the period after 2020, in the 2012 ILUC proposal. Regarding art 21(2), alternative support schemes aimed at providing incentives for the use of biofuels from waste and residues or advanced biofuels (other than UCO and animal fat) could also be envisaged.

### **C.8.5 Lessons**

***What key lessons can be learned from the experience of implementing the article so far?***

- The importance of stable and clear regulations and policies: the delay in the EU decision process on how to include indirect land use change (related to Article 19(6)) has hampered both policy development and implementations at Member State level, as well as investments by industry.
- It is feasible to implement sustainability criteria for biomass on EU level. The RED started with biofuels and bioliquids but the principle and general approach can likewise be applied for solid biomass as well as for biomass for non energy applications.
- Many lessons can be learned from the implementation of these sustainability criteria, for all stakeholders involved. Member State authorities have been put in place to monitor and verify compliance, and knowledge of the topic has increased throughout the biofuels supply chain. This can be seen as an important test case for future related policy.
- The RED required a number of issues to be further developed, investigated and decided on, at EU level in the years after its adoption. This process took longer than anticipated, for various reasons (e.g. ILUC methodology, recognising voluntary schemes, etc.). MS transposition and implementation also took longer than allowed. Some of the delays may be due to political or scientific debate or a low priority of the topic on the political agenda of a MS, but the inherent complexity of the issues probably also contributed to the delay. A more extensive analysis of the potential risks for delay combined with a strategy to manage these risks could have been helpful.
- It is difficult to modify a regulation once it has been adopted. The ILUC debate illustrates this: any proposal to include ILUC in the RED may have significant positive environmental impacts, but it may also significantly affect the market. This creates uncertainties in the market which hampers investments and innovation and it is likely to have negative impact on part of the stakeholders who see a lower return on their investments and lower profit margins in the future. This creates a strong resistance from



stakeholders with vested interests in the status quo, such as economic operators and biofuel producing countries.

- It is recommended to provide further guidelines on the definition of ‘biofuels from waste ...’ in Art. 21(2), to ensure a harmonised approach throughout the EU. Likewise, there is a need to ensure that the feedstocks really are waste. This is currently the responsibility of the MS. An EU approach would ensure harmonisation, and increase efficiency as well.

So far, Art. 21(2) has not yet led to promoting advanced biofuels processes such as bioethanol from lingo-cellulosic feedstock. Other means should be considered to promote the more innovative and (currently) costly biofuels from non-food feedstocks

***What improvements may help to increase the effectiveness of the measures in place under this article?***

- speedy decision on inclusion of indirect land use change;
- speedy implementation of all provisions in all MS.

### **C.8.6 Data/information gaps**

Lack of differentiated statistics on type of biofuels, feedstock use, average emission savings, share of double counting biofuels, etc. Eurostat statistics are not in line with the level of detail of the NREAPs.

Statistics not up to date: the 2013 progress report on RE had to be based on 2010 data.

Lack of insight in certified shares of biomass and share of different certification systems

### **C.8.7 Sources**

#### **DG Energy, 2014**

Biofuels Sustainability schemes

Available at: [http://ec.europa.eu/energy/renewables/biofuels/sustainability\\_schemes\\_en.htm](http://ec.europa.eu/energy/renewables/biofuels/sustainability_schemes_en.htm)

Last retrieved: September 29, 2014

#### **Department for Transport, 2014**

Renewable Transport Fuel Obligation: Post Implementation Review - Impact Assessment

London : Department for Transport, 2014

#### **EC, 2009**

Directive 2009/30/EC, amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC

Brussels : European Commission (EC), 2009

#### **EC, 2010a**

Communication on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme

Brussels : European Commission (EC), 2010



**EC, 2010b**

Communication from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels

Brussels : European Commission (EC), 2010

**EC, 2010c**

Report from the Commission to the Council and the European Parliament on sustainability requirements for the use of solid and gaseous biomass sources in electricity

Brussels : European Commission (EC), 2010c

**EC, 2013**

Renewable Energy progress report

Brussels : European Commission (EC), 2012

**EC, 2014**

Commission staff working document - State of play on the sustainability of solid and gaseous biomass used for electricity heating and cooling in the EU

Brussels : European Commission (EC), 2014

**Ecofys et al., 2013a**

Renewable energy progress and biofuels sustainability.

Utrecht : Ecofys, 2013

**Ecofys, 2013b**

Analysis of the operation of the mass balance system and alternatives

S.l. : Ecofys, 2013

**IEEP, 2013**

The sustainability of advanced biofuels in the EU

London : Institute for European Environmental Policy (IEEP), 2013

**IISD, 2013**

Addendum to Biofuels-At What Cost? A review of costs and benefits of EU biofuel policies.

Geneva : IISD, 2013

**Johnson et al., 2012**

Transformations in EU biofuel markets under the Renewable Energy Directive and the implications for land use, trade and forests

**C.9 Article 22 and 23: Reporting****C.9.1 Article presentation and relevance**

Article 22 stipulates the reporting requirements of Member States to the Commission to monitor progress on the promotion and use of energy from renewable sources. A report had to be submitted by 31 December 2011 and every two years hereafter. The last report is due on 31 December 2021.

The article provides a list of data to be included in the Member States' reports that includes, *inter alia*, an overview of the shares of renewable energy sources and measures taken or planned to promote the growth of energy from renewable sources, it also includes details of how the planned support schemes will function, and what other measures Member States intend to use to promote energy from renewable sources, etc.



According to Article 22(1)(k) the Member States need to report the estimated net greenhouse gas emission savings due to the use of energy from renewable sources. In estimating net greenhouse gas emission savings from the use of biofuels, the Member States, may use the typical values given in Part A and part B of Annex V.

The article also specifies the additional information the Member States are required to supply in their first report on their plans for implementation. In each report the Member States may correct the data they have submitted in the previous reports.

In order to facilitate the reporting and ensure the completeness and comparability of the Member States' reports, the European Commission has prepared a guidance template for the progress reports. The template in all EU languages is accessible from the following link:  
[http://ec.europa.eu/energy/renewables/reports/2013\\_en.htm](http://ec.europa.eu/energy/renewables/reports/2013_en.htm).

Article 23 stipulates monitoring and reporting of the origin of biofuels and bioliquids by the Commission. This includes the impact of their production, including impact as a result of displacement, on land use in the Community and the main third countries of supply.

The monitoring is based on Member States' reports, submitted pursuant to Article 22(1), and those of relevant third countries, intergovernmental organisations, scientific studies and any other relevant pieces of information. The Commission also monitors the commodity price changes associated with the use of biomass for energy and any associated positive and negative effects on food security.

## C.9.2 Effectiveness

### *Are the measures clearly set out as well as how progress will be monitored?*

All Member States' progress reports clearly set out the measures taken or planned at national level to promote the growth of energy from renewable sources as required by Article 22(1)(a).

The majority of Member States have limited the scope of information provided strictly to what is required within the table. The measures are listed in the table provided for this purpose in the Commission's guidance template.

A few Member States also provide additional information/description of their measures: Belgium does it in separate sections in addition to the table; Bulgaria provides some further information within the column 'start and end dates of the measure'; Italy provides further information in the column 'existing or planned' and Lithuania in the column 'Name and reference of the measure'; Luxembourg added a further column called 'Change compared with NREAP' to the table.

Only Denmark has not adopted the table proposed by the Commission.

No report addresses the issue of how the progress will be monitored. This information has not, however, been requested by Article 22 or the guidance template.



***Is the information provided in the progress reports robust, comprehensive and consistent?***

The Commission undertook a review of MS' progress reports in 2011. These were the first progress reports submitted by the MS according to Article 22 of the RED. The report utilises the Member State data on Renewable Energy production as required in Article 22(1) to track overall EU progress against predicted growth for each renewable energy source. The review concluded that the data and analysis for the renewable energy progress reports showed that while the EU as a whole is on its trajectory towards the 2020 targets, some Member States need to undertake additional efforts. The only criticism of missing information within the progress reports was that many Member States had not addressed the administrative reforms specifically listed in Article 22(3) of the Directive<sup>38</sup>.

The Commission also identified that Member States' progress reports only provided little conclusive evidence about the impact of increased biofuel production on the national land use patterns, required by Article 22(1)(h). Some Member States did not allocate any of the land use changes to biofuels (Austria, Denmark), others concluded that these changes were insignificant (Bulgaria, Netherlands), and others still reported decreasing land use for biofuel crops (Estonia, Lithuania). France, Slovakia, Slovenia reported that the area occupied by feedstock that can be used for biofuel production increased. Romania reported significant expansion in land use for rapeseed between 2004 and 2009 onto previously unused agricultural land. The UK claimed a small increase in the land used for oilseed rape and sugar beet as biofuel feedstock between 2009 and 2010; also the start of domestic ethanol production from wheat in UK resulted in expansion of the land used for wheat as a biofuel feedstock (2% of the total UK wheat crop was used for ethanol production)<sup>39</sup>.

Further analysis of Member States progress reports submitted by 31 December 2013 was undertaken by the Ricardo-AEA study team. It was assumed that the template covers all the requirements laid down in the Article 22 of the RED, as stated in the template itself.

Information provided in the progress reports on the sectoral and overall shares of energy from renewable sources in the preceding two calendar years (Article 22(1)(a)) corresponds to the template allowing comparison of one Member State's data with others.

***Has the template provided sufficient guidance to deliver consistent progress reports across all MS?***

With regards to the overview table of policies and measures (Article 22(1)(a)) there seems to be sufficient guidance to allow consistent information to be provided across.

The measures have been mostly categorised as suggested by the guidance template - regulatory, financial and soft. In some instances it is, however, not clear whether the suggested type of measures in the guidance template is exhaustive or not. As a result, other types of measures have been proposed, such as Organisation related (Croatia); Research and competence development, Policy programme (Finland); Infrastructure, Planning (France);

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<sup>38</sup> Renewable energy progress report, COM(2013) 175 final.

<sup>39</sup> Commission Staff Working Document accompanying Renewable energy progress report, SWD(2013) 102 final.



Technical (Greece and Ireland); Voluntary, Study (Portugal); Training (Spain), etc.

The sample list of targeted groups and/or activities appears to provide sufficient guidance to allow consistent reporting. Overall, most MS have use targeted groups, however, Croatia, Finland, Ireland, Portugal and Spain have named sectors (rather than using the list of targeted groups) for some measures, so the guidance could be clearer on this point.

The last column 'Start and end dates of the measure' has been understood by all Member States.

On the other hand, in the column 'Expected result' the Member States provide inconsistent data. Only some Member States restrict the expected result to that suggested by the guidance template i.e. behavioural change, installed capacity (MW; t/year), energy generated (ktoe), and only few Member States have quantified the expected results for some measures, including Portugal, Finland, France, Hungary, Malta, and Slovenia. The majority of the Member States provide a description of the measure or its aim in the column, e.g. France has provided 'Simplification for small renewable electricity or heating projects; better account to be taken of the environment in large projects (photovoltaic, wind, biomass)' and 'Tighter thermal standards in new buildings'. In some cases the aims used by Member States are too broad (according to the guidance), e.g. Croatia has only mentioned 'Contribution towards achieving the 20% target of RES in direct energy consumption by 2020'; Romania aims to 'Transpose partially the provisions of the (Commission) Decision' and the UK 'To assist in delivery of target for 500 MW of renewable energy in Scotland to be locally/community owned by 2020.' Greece has left the column blank altogether. Overall, this suggests that the guidance for 'expected result' could be improved.

***Have new data collection systems and processes been needed?***

Given the introduction of bi-yearly reporting from each Member State, there is the possibility that MS have had to instigate data collection systems and processes in order to complete the template with the necessary detail. The template requires information that may be held within various MS Government departments, or even Devolved Administrations (such as in the UK).

However, the completed template does not ask MS whether they have had to set up new data collection systems and processes, and the research team could not find any additional reporting that commented on this. This may be a potential area for further exploration.

***Has it added to the MS' administrative burden?***

With regards to data on the sectorial and overall shares of energy from renewable sources some MS strictly limit the information as required in the template's tables while others provide additional explanation of the figures and how they compare to the projections in the NREAPs.

There is no mention in the completed templates of the administrative burden on each MS to collate and report this data, and the research team could not find any additional reports that commented on administrative burden.

***Has it had other negative or positive impacts (e.g. the new data helps to better understand impacts and inform national policy)?***

Almost all MS have adhered strictly to the template, completing only the necessary information. The template does not require MS to comment on the usefulness of collating this information, or what impacts this has had on their understanding of their overall impact to inform national policy.

The only MS to report additional information was Belgium (2013 report) although this only provided further information on measures being implemented, rather than reflections on the use of having the data. However, it is plausible that the Article 22 reports are used alongside other national level data by national authorities to monitor progress against national targets and inform policy decisions.

**From the Article 4 assessment:** In combination with the progress reports of the Member States, the sectoral targets (Art. 4(1): national targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling, in 2020) and the indicative (estimated) trajectories for the growth of renewable energy use in each sector between 2010 and 2020 have proven an effective means for the Commission (and others, see for example the reports by the IEE funded programme 2020 Keep on Track) to assess progress towards the target. In the 2013 Renewable Energy Progress report (COM(2013) 175) and its associated Commission Staff Working Document, the Commission notes, however, that progress monitoring is hampered by significant time lag of the national statistics, due to the complexity of that process (in that 2013 report, the latest available data were from 2010).

In the bi-annual progress reports Member States are obliged to report deviations regarding the introduction or functioning of support schemes and other measures, and any developments in the measures used with respect to those set out in the NREAP. This should allow the Commission to get an up-to-date overview of the status of these measures, every two years. However, the requirements of the progress reports as given in Art. 22 focus on reporting progress, both regarding renewable energy uptake, policy introduction and functioning, and a number of other parameters. They do not require Member States to explicitly report on deviations from the NREAPs.

***What is the value of EU level reporting?***

In completing the template using comparable data across all MS, there is considerable value in being able to analyse all MS data and measures relating to the RED.

The Commission report on renewable energy progress (2013)<sup>40</sup> is the product of having MS level data ready for analysis and interpretation at the EU level. This has allowed the Commission to state '*an impression is gained of a generally solid initial start at EU level but with slower than expected removal of key barriers to renewable energy growth*'. This allows reflection on priorities at the EU level and for key messages to be directed back to MS that are not performing as well as others. The next reporting period should allow direct comparison of progress over the next 2 years, allowing for further targeted priorities and feedback to MS.

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<sup>40</sup> Renewable energy progress report, COM(2013).





### C.9.3 Efficiency

***Has the RED added to the administrative burden on MS public authorities and economic stakeholders, or has this been reduced? Is the effort involved appropriate or is it too onerous and therefore places extensive administrative burden on the MS or stakeholders?***

Increased administrative costs can be assumed as Member States need to report their progress to the Commission in the promotion and use of energy from renewable sources every two years. In total there will be 6 progress reports, the last one will be submitted by 31 December 2021.

In view of facilitating reporting, the Commission issued a template for Member State progress reports under Article 22. The uniform template and the fact that it draws on the template for the NREAPs (including tables) should reduce the administrative burden; also as much of the template.

Article 22(4) of the RED permits Member States to correct the data of the previous reports in each report. This provision potentially increases Member States' administrative burden as instead of providing data for 2 preceding years, data provided in previous reports would also need to be re-assessed. This is, however, not mandatory and only few MS have used this option (Austria, Bulgaria, Germany and Italy).

***Are the selected mechanisms the most cost-efficient way to achieve the targets?***

The MS reports from 2013 do not contain cost information regarding the mechanisms selected by each MS, simply the expected result and the completion date.

***Could the same results have been achieved with less funding/lower cost?***

The MS reports do not require an analysis of the predicted results. This could be assessed by comparing selected measures across MS (as the template allows for direct comparison) and further data on costs and results achieved over the next 4 reports to 2021.

### C.9.4 Added value

***To what extent is the directive/article complementary to other EU initiatives in the field and has synergies with them?***

The research team could not find any additional EU initiatives regarding reporting of Renewable Energy data at a national level. However, there are many initiatives and analyses that are based on the data reported under Article 22. These include the Eurostat data on energy from renewable sources<sup>41</sup> and linkages with NREAPS produced under the requirements of Article 4 (e.g. DG ENER recently published a report on the Integration of Renewable Energy in Europe<sup>42</sup>).

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<sup>41</sup> [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Energy\\_from\\_renewable\\_sources](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Energy_from_renewable_sources)

<sup>42</sup> DG Energy (2014) Integration of Renewable Energy in Europe, [http://ec.europa.eu/energy/renewables/doc/201406\\_report\\_renewables\\_integration\\_europe.pdf](http://ec.europa.eu/energy/renewables/doc/201406_report_renewables_integration_europe.pdf)



***Would the results have been achieved without the RED/article, i.e. without EU intervention?***

It is unlikely that this level of national data reporting would have occurred without Article 22.

It is difficult to say whether the measures identified in each MS report would have been chosen or results achieved without the requirements of Article 22. Certainly the measures and results would not have been as well understood across all MS, and the data would have been less accessible on an EU level.

***Are there alternative measures/improvements which could have led to the same results?***

One possibility is that the template could have been simplified to minimise the potential administrative burden, although MS have not reported in the public domain that they have identified issues with completing the existing template.

Another alternative to a regulatory requirement to report on renewable energy progress would have been to set up a voluntary knowledge sharing mechanism. The major risk inherent in this option would be that not all MS would sign-up to the voluntary reporting scheme, and that the quality of data reported would be lower than the current level under Article 22.

## **C.9.5 Conclusions and recommendations**

***What key lessons can be learned from the experience of implementing the article so far?***

As the first two sets of MS reports (2011 and 2013) have shown, the level of reporting compliance has increased, potentially with familiarity with the template, and given time for each MS to set up data collection systems and processes. The lesson here is that MS do not necessarily collate their data in the same manner as required by the template, and so time is needed to allow for higher quality of reporting.

***What improvements may help to increase the effectiveness of the measures in place under this article?***

The template could improve on the guidance for reporting measures regarding 'targeted groups' and 'expected results' to improve the consistency of reporting between MS. There was a higher degree of interpretation to these two table headings across MS than for any other table in the template.

For progress monitoring, the measures table should include a column reporting on how progress against each measure will be monitored, the frequency and format of monitoring, and how this will be reported and evaluated. From a European perspective, this should give a much deeper understanding of how MS plan to track their progress against each reported measure, and provide potential areas of knowledge exchange across similar measures or approaches.

An additional requirement could be for MS to report on the expected costs of each reported measure, in order to assess value for money against expected results. A column could be added to the measures table, requiring MS to give an estimated cost for each measure identified. Again, this could provide a learning opportunity for MS with similar measures but differing cost estimates.

It may be useful to survey MS to gather feedback on the administrative burden of complying with Article 22-23, although there may be a consequential push-back from MS to request reductions in reporting requirements due to a high administrative load.



To address the comments from the Commission report<sup>43</sup> on MS' progress regarding missing information on administrative reforms, a potential solution is to improve the guidance given to MS regarding the expectations for this information. MS reports should also undergo a review and approval process to ensure that progress reports are submitted with all sections completed.

### **C.9.6 Data/information gaps**

As described in the sections above, there are a number of information gaps leading to difficulties in assessing the evaluation questions:

- firstly, there is a need for an analysis of the effectiveness of the measures put in place by each MS;
- there is a lack of quantification of the administrative burden placed upon MS to comply with Article 22;
- MS have not identified the additional effort needed to set up reporting processes to comply with Article 22.

### **C.9.7 Sources**

#### **EC, 2013**

Staff Working Document accompanying Renewable energy progress report, SWD(2013) 102 final

Brussels : European Commission (EC), 2013

#### **EC, 2013**

Renewable energy progress report, COM(2013) 175 final

Brussels : European Commission (EC), 2013

**Member States' progress reports** submitted by 31 December 2013 under Article 22 of the EED

<http://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports>

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<sup>43</sup> Renewable energy progress report, COM(2013) 175 final.



# Annex D Overview of administrative procedures across EU Member States



Table 25 Overview of administrative procedures across EU Member States

Member State	'One Stop Shop'?	One permit? (Nr. of permits?)	Online application for permit?	Max time limit for procedures?	Automatic permission?	Facilitated procedure for small scale	Identification of geographic sites?	Automatic entry into financial support scheme	Overall assessment
Austria	Yes	No (?)	No	No	No	Yes	No	No	low
Belgium	No	No (4)	n.a.	Partly (6 mths - 1 yr)	No	No	n.a.	n.a.	low
Flanders	No	Partly (2)	n.a.	Yes (15 days - 4 mths)	No	Yes	Yes	No	medium
Wallonia	No	Partly (2)	n.a.	Yes (90-140 days)	No	Yes	Yes	No	medium
Brussels	Yes	Partly (2)	n.a.	Yes (20-450 days)	No	Yes	n.a.	n.a.	medium
Bulgaria	No	No (?)	No	No	No	Yes	Yes	Yes	low
Czech Republic	No	No (3)	n.a.	Yes (60 days - 72 mths)	No	Yes	No	n.a.	low
Cyprus	Yes	No (5)	No	Yes (2-3 months)	n.a.	Yes	Yes	n.a.	medium
Denmark	Yes	Yes	n.a.	No	n.a.	Yes	n.a.	Yes	medium
Estonia	No	No (2)	No	No	No	No	Yes	No	low
Finland	No	No (3)	n.a.	n.a.	n.a.	Yes	Yes	n.a.	low
France	No	No (3)	Partly	Partly (?-1 yr)	No	Yes	n.a.	No	low
Germany	Partly	Partly (2)	Partly	Partly (?-10 months)	n.a.	Yes	Yes	Yes	medium
Greece	Yes	No (3)	No	Yes (n.a.)	n.a.	Yes	n.a.	n.a.	low
Hungary	Yes	Partly	Partly	Yes (n.a.)	n.a.	Yes	n.a.	No	medium
Ireland	No	No (2)	No	Partly (6 -8 weeks)	n.a.	Yes	Yes	No	low
Italy	Yes	Yes	No	Yes (30-90/180 days)	Partly	Yes	n.a.	No	medium
Latvia	No	No (8)	No	Partly (30-180 days)	n.a.	n.a.	n.a.	No	low
Lithuania	Partly	No (2)	n.a.	Partly (10-30 days)	Partly	Yes	n.a.	No	low
Luxembourg	No	No (2)	n.a.	Partly (3-5,5 months)	n.a.	Yes	n.a.	n.a.	low
Malta	No	Partly	No	Partly (4 weeks)	n.a.	Yes	n.a.	No	low
The Netherlands	Yes	Yes	Yes	Partly (6 months)	n.a.	Yes	Yes	No	medium
Poland	No	No (4)	No	Partly (30-65 days)	Partly	Yes	n.a.	n.a.	low
Portugal	Yes	Partly (2)	Partly	Yes (120-250 days + 30 days for connection)	n.a.	Yes	Yes	n.a.	medium
Romania	No	No (7)	n.a.	Partly (30 days)	n.a.	No	n.a.	No	low
Slovakia	No	No (3)	No	Partly (n.a.)	n.a.	Yes	Yes	n.a.	low
Slovenia	No	No (>5)	n.a.	No	No	Yes	n.a.	n.a.	low
Spain	No	No (>5)	n.a.	Yes (3 mths)	Yes	Partly	n.a.	No	low
Sweden	Partly	Partly (2)	Partly	Partly (n.a.)	n.a.	Yes	Yes	No	medium
UK	No	No (3)	n.a.	Partly (1 yr)	n.a.	Yes	Partly	No	low

Source: Based on Ecofys et al. 2013.

# Annex E Country report: Bulgaria

## E.1 General framework

Bulgaria is one of the newest members of the European Union and joined at a much lower level of economic development than most of the other Member States (MS).

### Legal and policy framework

In 2005 the share of RES in the gross final consumption of energy was 9.27% (coming mainly from the historical use of hydropower and biomass for heating and cooling) and 0% for transport. There was not a coherent state policy with defined mandatory targets before the RED. The establishment of a legal and institutional framework to support and promote the production and use of RES only began in 2007 and was initially laid down in the Energy Act, although there are older country strategies that attempted to address the issue.

The transposition of the Directive 2009/28/EC (RED) was completed with the adoption of the Renewable Energy Act (ZEVI) in May 2011 (amended 4 to 5 times since; last amendment in August 2013). The details and the mechanism of enforcement have been established mainly via measures from the responsible implementing Ministries.

### Implementation of the RED

Bulgaria has a centralised system of government. The Ministry of Economy and Energy (ME&E) is the main implementing body for RES policy, but several other ministries, agencies and regional and local administrators are involved in the delivery as well. A new agency - the Agency for Sustainable Energy Development (ASED) - was established by ZEVI. This agency is responsible for both energy efficiency and RES development. The State Energy and Water Regulatory Commission (SEWRC) is responsible for setting the preferential prices for RES once a year or as an exception twice a year. The preferential price depends on many factors and is technology specific.

### Support schemes

The main supporting instrument for the uptake of RE in electricity are the feed in tariffs. They were first introduced in 2007 and committed 12 years of support, which was amended by ZEVI to 20 years for energy produced from geothermal and solar technology, 15 years for RE produced by hydro power stations, and 12 years for RE from wind energy. The scheme was to conclude once Bulgaria achieved its 2020 national target. This target was reported as achieved in the second national report to the European Commission. As a result, a letter from the Deputy Minister of the Ministry of Economy and Energy confirmed that from 27 December 2013, due to the achievement of the national target, new RES installations would no longer be offered preferential prices. The feed in tariff scheme for electricity has therefore been put on hold since then. No new RES projects have been developed and the system operator forecasted no additional grid capacity for new RES projects.

With regards to heating and cooling, there is no centralised support scheme. Funds for sustainable projects do come mainly from programmes that support particular technologies and sectors. In most cases these are European or state funds provided for the public and not for the profit sector. There are also some preferential credit lines for small business.



The main instrument in achieving the 10% target for RES in transport is the mandatory obligation of suppliers of conventional fuels to blend them with a minimum percentage of biofuels. This percentage is meant to gradually increase overtime, to a level which shall allow the country to meet its 2020 target. A small share of the target will be met by the use of electricity from RES in transport. However, the RED sustainability criteria were only implemented in late 2012 and so the latest progress report does not provide monitoring data on these criteria. As the impact of the new criteria is still not fully understood or reported, it is difficult to forecast whether Bulgaria will meet this target.

## **E.2 Assessment of the effectiveness, efficiency and value added of the RED**

### **E.2.1 Article 3: Targets and measures**

#### **Effectiveness**

The RED sets a target of 16% RES within the total energy consumption for Bulgaria. This target has already been achieved as reported in the second national progress report. On the other hand, Bulgaria did not report progress on biofuels uptake and its subsequent impact on the target due to the late adoption of the sustainability criteria. The main challenge for Bulgaria in terms of biofuels seems to be switching from the old criteria to the new while maintaining investors' appetite for further investments.

Prior to the RED, Bulgaria had an indicative target of 11% of gross domestic consumption of electricity from RES by 2010 which was set in the Treaty for the accession to the EU. The National Long-term Programme for the Promotion of the Use of Renewable Sources 2005-2015 (NLTPPURES) was the main policy document setting out the means to achieve this goal.

Although the indicative pre-RED targets and the targets defined in the RED are not directly comparable, it seems fair to say that this Article did set up higher ambitions for the country. The 2020 target was established based on economic potential, GDP growth expectations and historic circumstances. The NREAP of Bulgaria, however, does not strive for a higher level of RES.

Given that Bulgaria has already achieved its 2020 target, it could be argued that a more ambitious target may have been possible but it does raise issues about the costs to the economy and consumers.

With regards to transport, the National Long-term Programme for the Promotion of the Use of Biofuels for Transport 2008-2020 was developed and adopted in 2007 and was the first central policy document establishing indicative targets for biofuels consumption. The programme envisaged an achievement of 5.75% share of biofuels in consumption of petrol and diesel fuels in the transport sector. The RED establishes a higher and mandatory target of 10%. In addition, the new sustainability criteria exclude some of the previously recognised sources of biofuels. However, at this early stage of implementation, the impact of the 10% transport target, including the new sustainability criteria, is still not fully understood and analysed.

The mandatory targets have had a positive effect on the deployment of RES in Bulgaria by increasing the level of ambition and providing an incentive for a more coherent approach and streamlined measures. There were no mandatory targets before the RED and policy intervention was scattered and uncertain.



With the RED and its transposition into the national legislation, the legal framework, visibility and transparency have improved and the uptake in RES increased dramatically. Within only a couple of years, Bulgaria increased its share of RES by over 50% according to the official reports to the EU Commission. However, this fast increase came at a high cost to the consumers and the capacity of the electricity system.

The introduction of incentives and state policies for the deployment of RES led to a quick saturation of the market (with too many investors expressing interest in deploying wind power technologies) combined with uncertainty with regards to the actual delivery of investment projects (initially only 10 to 15% of the planned projects would reach completion). In addition this quick uptake created a challenge for the electricity system and the grid, and raised concerns about the unsustainable use of agricultural land and the associated environmental impacts. At a later stage the support schemes for RES in electricity led to high consumer prices for electricity. Combined with the overall economic slowdown and the changes in the regional electricity market, this led to questions about the market sustainability of the RES.

The Government tried to compensate for the overly generous incentives by introducing taxes and fees in order to cool the market down. However, this approach was challenged in court, declared illegal and thus abandoned.

The latest change in ZEVI (in summer 2013) stated that the support measures, including preferential access to grid and feed-in tariffs will only apply until the country reports achievement of the national target in accordance to RED. As the target has now been achieved and reported as such the support scheme no longer applies. There is no certainty as to whether or when this support mechanism might be re-introduced. This coincides with a wider political uncertainty as the country had a temporary government for several months and only just went through elections (October 2014) which led to a coalition government.

### **Efficiency**

The main support schemes before and after the RED remain largely the same although they were defined further after the RED. Some lessons from the past were taken into account, longer term planning was introduced, and more transparency was achieved. Therefore no new support schemes were implemented (with the exception of the cooperation mechanism) but there is no evidence of significant streamlining either. There have been a few alterations as to the number of years in which the feed in tariffs will apply for different technologies and the actual preferential prices.

The main challenge for policy makers remains: determining the best balance between the necessary level of state support and natural market development.

According to interviewees from the private sector the cost of RES deployment has come down but there is no official data or quantitative analysis to illustrate this, and it is difficult to determine the extent to which the RED can be credited for this.

### **Added value**

The RED was instrumental for the initial market development, as the existence of binding targets, at least until their achievement, was the main driving force behind the policy development and support schemes. According to investors, there will be further appetite for new installations if new targets were to be introduced for the next period.



## Conclusions and recommendations

The mandatory targets set out in Article 3 RED have made a decisive impact on the deployment of RES in Bulgaria. However, this positive impact should be balanced against the overall cost to the economy and final consumers and therefore further support schemes should be better assessed in order to achieve a gradual market uptake and ultimately to prepare the RES industry to become fully commercially viable.

Mandatory targets for 2030 would therefore drive further deployment but the implementation of new targets would need to consider how to develop a viable market for RES in the long run.

### E.2.2 Article 4: National Renewable Energy Action Plans

#### Effectiveness

Bulgaria submitted its NREAP in June 2010. It was amended and resubmitted in April 2011 because the projections for the transport target were not sufficient and some details on institutions and responsibilities were missing.

The NREAP is the main document specifying how the national RES targets will be achieved. It provides information about the existing and planned measures to support the deployment of RES. It is the most comprehensive document summarising targets, measures, incentives, procedures and administrative procedures so far.

However, two factors limit its effectiveness over time: the level of detail varies across policy areas and in some cases is insufficient; and there have been important differences between the measures identified in the NREAP and those eventually implemented on the ground.

Indeed, the NREAP has not been updated since 2011 (and as Bulgaria has already achieved its 2020 targets it is unlikely to be revised in the future) so the information it contains is not up-to-date and some of the policies have been changed or not implemented as envisaged.

For instance, the NREAP envisaged the creation of a national coherent GIS which should have provided up-to-date and comprehensive information about the legal and administrative requirements associated with RES investment projects as well as fully detailed information about existing deployment of RES and grid connection caveats. The system is still under development with ASED as the responsible body.

Overall, there is quite a discrepancy between what was planned in the NREAP and what has actually been implemented. It would therefore be useful to assess whether the measures that have been adopted were proportionate and appropriate for the market, as they clearly overheated the investors' appetite.

The NREAP has been a useful tool to generate discussions and thinking about RES policies at national level. It was created before the actual transposition of the RED into national legislation. Thus some of the policies and measures and institutional structures were discussed as part of the plan's development process. This was beneficial for the stakeholders as it generated timely discussions about what the ZEVU might contain.

The impact of NREAPs on the visibility of RES in the national policy agenda is difficult to assess, but it is likely that there is room for improvement. The NREAP assumed the involvement of all levels of administration in the implementation of the RES targets. Two consultative, political, cross-ministerial bodies were envisaged but have not yet been set up. These bodies would have had coordination and advisory functions and would have made sure that sustainable energy was considered within the overall objectives of the government. In addition, there is limited capacity at regional level and in the smaller agencies and state organisations. This combined with the quick turnover of personnel makes it difficult to achieve continuity in policymaking and enforcement.

From the investors' perspective, the NREAP is a reasonable indicative source of information with regard to potential policy development. However, the level of detail in the NREAP might not be sufficient for an investor to make an informed decision. Furthermore the NREAP does not constitute a binding obligation for the state to introduce or keep in force the described measures but is just a summary of intended development. Its implementation and enforcement is in the hands of the executive bodies. As mentioned earlier, since the adoption of the NREAP many of the anticipated policies and measures have been amended, some systems, bodies or procedures have been changed, so with time the practical value of the NREAP to investors diminishes. If the plan is to be a practical guide for investors it needs to be updated permanently and the level of practical detail enhanced.

Currently the NREAP is only used as background information by industry associations and NGOs but not directly by investors.

As for the wider public, there was no consultation process during the creation of the NREAP (it is not legally required) so awareness is limited but the plan is published on various public websites and thus available to the general public.

### **Efficiency**

The administrative burden involved in producing the NREAP cannot be quantified and none of the public stakeholders were available for interview (largely because this study coincided with elections). However, over a dozen administrative bodies at different levels were involved in its preparation.

### **Added value**

Despite weaknesses in the forecast document, the NREAP and the progress reports are the only coherent, comprehensive and overarching sources of information about the general trends and state policies in the RES field and are much more comprehensive and explicit in comparison to the previous attempts to establish long term planning and reporting.

### **Conclusions and recommendations**

The NREAP (and the progress reports) are a good starting point to monitor progress and to generate discussions and strategies for RES policy at national level. However, the level of detail and the description of soft measures, administrative procedures and details on supporting schemes could be improved. It would also have been beneficial if the NREAP contained more information about the specific roles of the different stakeholders involved and the process of developing and deploying energy from RES.



### E.2.3 Articles 6-12: Cooperation mechanisms

#### Effectiveness

ZEVI establishes the possibilities and rules for the use of cooperation mechanisms - i.e. statistical transfers, joint projects, and joint support schemes. The institutions responsible for information exchange on the implementation of joint projects have also been identified.

At this stage, however, Bulgaria has not made use of any cooperation mechanisms so it is currently impossible to assess the impact of these Articles on the deployment of RES.

This is not to say that the measures facilitated by these Articles could not be used in the future. The country is expected to have a surplus which could be offered to other MS. There are several possibilities for joint projects - for example, projects involving national or local governments and municipalities. There is not sufficient information on options available at this stage to determine which are the most likely. In addition, according to statements in the official reports, participating in joint projects is seen as extremely difficult due to the complex coordination process.

#### Efficiency

As mentioned earlier, cooperation mechanisms have not yet been used in Bulgaria so there is no basis on which to determine their efficiency.

#### Added value

Based on the interviews and the available literature it is felt that the option of using cooperation mechanisms would not exist without a European framework in place.

#### Conclusions and recommendations

Little can be said about these Articles of the RED at this stage in the process given they have not been used in Bulgaria. However, this may change in the future and the EU can continue to facilitate continued dialogue between MS and provide assistance to coordinate projects if or when they come through.

### E.2.4 Article 13: Administrative procedures, RES in buildings, heating

#### Effectiveness

##### *Responsibilities and administrative framework*

Before the RED there were 12 main legal acts, 25 secondary acts defining authorisation, certification and licensing procedures. The State Energy and Water Regulatory Commission (SEWRC) was the main implementing body.

After the RED and ZEVI, the new Sustainable Energy Development Agency (ASED) took on part of the SEWRC's responsibilities, namely GOs, the NREAP and some coordination and information functions in order to optimise the administrative procedures.

The NREAP recognises that the existing administrative burden is too onerous and proposes streamlining the process. Some measures were included in the plan, like establishing a one-stop-shop, developing methodological guidelines for investors and administrators, and GIS systems. However, these measures are still to be implemented.



The NREAP also envisaged that the SEWRC would establish and maintain a list of the authorisations granted and the connection agreements concluded, and time limits for decision procedures, support schemes and so on in order to help investors. This requirement has been imposed upon system operators who have the obligation to publish on their websites information about applications for connections, granted connections and when the limit has been reached. They then send this information to SEWRC which does not yet centralise or publish it, however.

Changes in the Spatial Act have also been made in order to facilitate the process of obtaining rights to develop energy infrastructure on state and private land. Better long term planning process has been put in place with regards to overall grid and infrastructure development (see grid section).

Due to the complexity of the procedures different levels of administration - national, regional and local - are involved. Some simplification and redistribution of authority has taken place - e.g. the provision of environmental assessment has been decentralised and it is now down to regional environmental authorities to conduct environmental impact assessments (with some exceptions for certain territories).

The number of involved administrative bodies in order to complete the process was up to 20 before RED. Some procedures have now been simplified but overall a similar number of bodies remains involved.

ASED was expected to provide overall coordination between the bodies. Some guidance has been provided to local authorities and municipalities in order to harmonise practice. There is no comprehensive overview of the authorisation process developed so far.

For some small operators the process has been simplified. For example for RES installations of up to 30 kW placed on buildings in urban territories the procedure is simplified and should be completed within 30 days from the filing of the application. Similarly RES installations with up to 200 kW capacity developed on commercial buildings in urban areas are certified and connected in a faster way. Small biomass RES plants up to 1.5 MW have simplified procedures.

#### *Timescale to go through the process*

The whole process from acquiring land, submitting application, obtaining building permission, and securing licensing and other agreements can take between six months to two years according to industry representatives. Since December 2012, when the second national progress report was submitted, the support schemes have been put on hold and thus no new effort to streamline and simplify the administrative procedures have been pursued.

Complaints about delays and disputes on documents are resolved via dialogue between the economic operator and the administration. If an agreement cannot be reached then the dispute is taken to the administrative court under the general administrative law. There is no specific arbitration or simplified procedures to resolve disputes or address complaints.

#### *Technical specifications required to benefit from support schemes*

Except for the sustainability criteria for biofuels there are no other technical specifications with regard to the RES technology that have to be met in order to benefit from the support scheme. Feed-in tariffs are technology specific. Technical specifications with regard to construction follow the general rules.

### *Building regulations*

There is no mandatory requirement for RES use in existing building but the use of RES in new buildings has been made mandatory from 2012 for public buildings and from 2014 for other buildings. Regional, local governments and municipalities are expected to draw their own plans and introduce RES but no further mandatory obligation is imposed on them to pilot RES uptake. Local authorities and municipalities are interested in optimising heating and cooling and do make use of subsidies and other funding mechanisms.

The obligation is for a minimum of 15% of heating and cooling to come from RES when feasible and cost-effective (Article 20 ZEVI). In the building's compulsory EE certification it is mentioned whether the building is connected to RES. This information could then be used for preferential tax rates.

Tax incentives are also offered to energy efficient buildings, with higher discounts for those using RES as well (although no specific level of RES input or technology is defined).

### **Efficiency**

Before the RED there was no simplified procedure for small scale decentralised installations. A few changes have been introduced since:

- Change to the Spatial planning act - simplified procedure for installing RES installations with a total capacity below 30 kW on existing buildings in urban areas. The procedure for obtaining building rights on state owned land has also been simplified.
- Streamlined procedure for geothermal energy up to 50 kW installed for own use and on own land (1 MW in industrial zones).
- Change in the Water Act to simplify procedures for hydro power plants in certain cases (when the facility does not significantly affect river beds or borders). In these cases, authorisation is replaced with a simple notification or the documents required are reduced, the procedure is decentralised and time limits are shortened.
- Simplified procedure for installing small PV plants on roofs and buildings.

This would suggest that the administrative burden has been reduced as a result of the RED but insufficient information was found in order to support this conclusion. Overall the whole process remains quite complicated and requires significant resources.

### **Added value**

Overall the RED has encouraged public authorities to simplify and streamline the process but there is still some way to go to make it truly efficient.

### **Conclusions and recommendations**

Administrative procedures for complex investments cannot be designed in isolation of the overall administrative structure of the country. Regulation and administration of investments in RES sits within the state legal and administrative structure and therefore reflects its efficiency and effectiveness.



## E.2.5 Article 14: Information, certification, training

### Effectiveness

The national training requirements for obtaining installer qualifications and the period of validity of the relevant certificates are laid down in two ordinances of the Minister of Education, Youth and Science in coordination with the Minister of Economy and Energy (Minister of Education, Youth and Science 2012a and 2012b). Both ordinances were adopted in October 2012. The qualifications are for different levels of speciality and concern the following RES technologies: biomass boiler and stoves; heat pumps; shallow geothermal systems; solar PV systems; solar thermal systems; wind power systems.

The certification scheme is largely harmonised with the schemes of other MS. Bulgaria has joined the common certification and accreditation system for installers of small scheme RES systems in the EU. The professional qualifications of nationals from other MS are recognised in accordance with the Recognition of Professional Qualifications Act 2008.

Before the RED there was no statutory requirement with regards to the qualifications and skills required to install and maintain RES technologies. With ZEVI, in accordance with Article 14 RED, statutory requirements have been laid down regarding the certification/qualification of installers.

Each year, the institutions entitled to carry out training leading to vocational qualifications in accordance with the Professional Education and Training Act submit a list of the persons who have obtained the qualifications to carry out the above activities to the ASED. This list (public register of certified contractors) is regularly updated and published on the ASED website; there are currently 340 entries.

No information has been found on the impact of this Article on the uptake of RES in Bulgaria.

### Efficiency

No official information was found on the administrative burden placed on operators and public institutions as a result of Article 14 RED. However, as it is a new mandatory requirement, it will have added some additional obligations on installers.

### Added value

The certification scheme was established after the big wave of investments took place in 2011-2012. After this only very few, mainly small RES installations were created and as a result the full effect of the Article is still to be experienced and assessed.

### Conclusions and recommendations

Given the limited application of the article so far and the absence of information on impact and administrative burden, it is too early to draw useful conclusions.





## E.2.6 Article 15: Guarantees of origin

### Effectiveness

According to the ZEV and the supporting ordinance, GOs are used as an evidence that a given share or quantity of electricity was produced from RES and to determine eligibility for feed-in-tariffs.

In the electricity generation sector, the gross consumption and production from RES is established on the basis of GOs which also serve as an evidence for the final consumer and the basis for preferential tariffs.

As a result, GOs are a useful tool for statistical, monitoring and policy development purposes.

The GO scheme is administered by the ASED. It is authorised to decline issuing a GO if the information provided is insufficient or the criteria are not satisfied. ASED can verify the data by enquiring to other administrative bodies or do on-the-spot inspections. The GOs issued are tracked in a central national register which is maintained by ASED. The register is currently a spreadsheet which is updated regularly. Eventually, it will include GIS information as well. The register is publicly accessible and can be used for statistical, policy development, investment and public purposes.

If ASED finds inaccuracies or incorrect data in the register, these have to be corrected.

A new requirement was established - a verified copy of the invoice for purchasing energy should be included among the required documents. This allows cross checking of the information and fraud prevention.

As the GOs are currently mainly used for the feed in tariffs and the system is cross-checking what has been actually been purchased, there is little risk for misuse of the certificates.

Overall, the Article has been implemented smoothly but there are still untapped opportunities to use the GOs in the open market and between MS. So far GOs have not been traded with other MS but the possibility of doing so has been envisaged and included in legislation.

### Efficiency

The implementation of the GO system does not appear to put too much burden on suppliers. The applications are demanding but streamlined. There are several documents that need to be obtained from different administrative bodies and submitted to the ASED.

According to ASED, 16,717 applications for GOs were dealt with in 2013. This seems to be manageable and given that there are no significant new operators it will remain appropriate for the time-being.

### Added value

Bulgaria adopted the rules established in the RED. Prior to that there was a similar electronic document called Certificates of origin, which was administered by the State Energy and Water Regulatory Commission. With the transposition of the RED, the adoption of ZEV and related secondary legislation the name of the certificate, the scope, and the administering body were changed. Now ASED is responsible for the issuance and administration of



the GOs. With RED, the GOs are now recognised across Europe, and the information is collected in a more coherent way and has been made public.

The value of having a standardised approach at the EU level is that it enables transfers across MS and the development of a European market for GOs. However, at this stage this has not been picked up by Bulgaria.

### Conclusions and recommendations

Overall, the system was found to be working smoothly and providing transparent information to interested stakeholders but its use remains limited, especially in terms of trade with other MS.

Simplification of the procedures of trading with other MS and membership of the Association of Issuing Bodies might be a way to accelerate deployment of the GOs.

## E.2.7 Article 16: Grid access and operation

### Effectiveness

#### *Process for grid access and investment*

This article has been transposed in the national legislation. Feed in tariffs and the supporting mechanisms including access to the grid existed in Bulgaria before the RED. With the RED and the adoption of the ZEVI the scope of grid access was defined and expanded further: access, transmission, priority of distribution, re-purchase of electricity for RES are guaranteed; and the ‘construction of necessary infrastructure and capacities’ which should regulate the electrical energy system and thus secure the guaranteed access, transition and distribution of RES is a priority. However, no practice has been introduced of “reserving” connection capacity only for producers of electricity from RES.

With regards to grid infrastructure, changes in the Spatial Act and other legislation provide for support for the construction of new transmission and distribution networks. In order to promote investments in RES, the new facilities and network infrastructures of the transmission and distribution companies in areas with high potential for development of energy from RES are granted the status of national infrastructure facilities. This allows quicker and cheaper authorisation of construction on state and private land.

The ZEVI establishes a new approach towards coordination and harmonisation of connection procedures with the introduction of new steps in the connection process:

- Planning the development of the transmission and distribution networks, and coordinating the intended investments of the network operators for the connection of RES-generating facilities, by connection zone and voltage level.
- Forecasting, approving and providing information on the anticipated maximum capacity that can be made available for connection to RES-generating facilities to the transmission and distribution system. Transmission and distribution companies have an obligation to develop the electricity transmission network in compliance with the long-term forecasts and plans for development of the electricity sector.

This approach intends to identify and address capacity limitations in the network. Forecasts and information regarding the maximum capacity is made available to investors and producers and taken into account when signing new agreements.



A new procedure of annual planning (see below the long term planning) has been established under ZEVl, which requires network operators to determine the capacity for the connection of new SEWRC-approved resources on an annual basis by connection zone and voltage level.

Entities wishing to build a RES generation facility, expand an existing power station or increase the capacity of a power station generating electricity from RES must submit a connection application to the electricity network operator of the relevant zones. The network operator considers the applications in the order they are received, carries out a study and issues its opinion on the conditions and means of connection. The information about accepted, submitted or rejected applications must be reported to SEWRC.

Producers of energy from RES are included on a first come first serve basis until the maximum capacity is reached. Once the capacity of the network is reached no further RES installations can be offered access.

According to ZEVl, the agreement between the RES producer and the operator should include grid capacity allocation and the penalties the operator will pay if the access and distribution of RES cannot be offered. At the moment, however, there is no mandatory minimum penalty included within the law. This is left to the contractual parties.

Real time management of electricity systems is a challenge especially when it comes to wind and solar RES plants and thus according to latest reports, currently no more than 1,800 MW of wind power installed capacity and 600 MW of PV power installed capacity are to be allowed; hydro and biomass are encouraged as they offer more flexible opportunities for management.

The operator could temporarily suspend or curtail the access or distribution of electricity (not only from RES) in circumstances specified in the Energy Act for system security and maintenance reasons. The act does require RES installations to be excluded only after all other options have been exhausted. In cases of suspension or curtailment, the operator is obliged to report annually to the regulator (SEWRC).

In order to avoid or limit curtailment, the network operators are required to undertake the following actions:

- obligatory inclusion of the nominated production capacity of the RES electricity producer in the dispatching schedule for production;
- strict compliance with the dispatching schedule in respect of electricity producers;
- bilateral coordination of the time period for preventive maintenance of installations generating energy from RES and network facilities;
- reducing the time period for preventive maintenance and emergency repairs to the technically feasible minimum;
- annual allocation of funds in the investment programme of the network operator for development and reinforcement of the network in areas with high RES potential.

#### *Future investment in grid infrastructure*

ZEVl requires network operators to provide development plans (10 year plans for transmission and five year plans for distribution) to ensure the secure integration of all generators, particularly those using RES. The Act introduces a procedure for coordinating these plans which are approved by SEWRC.

Plans for the transmission and distribution networks include the capacities eligible for connection by zone and voltage levels, thereby providing investors with advance information on the connection capabilities.

An Electricity System Development Plan should include information about the main transmission infrastructure, which has to be built or modernised, information about any necessary investments which have already been approved, information about any new investments for which a decision has already been taken as well as a timetable for all investment projects.

The Plan should be based on the following: a study of the development of electricity demand in Bulgaria and electric load forecast until 2020; a study of electricity generating capacities in Bulgaria, including those using RES; system management options, capacity and energy balance until 2020, indicating the expected power surplus/shortage; a study of the load on the electricity transmission system, taking into account the existing electrical loads and generating capacities; a transmission system development plan, including the need to construct new interconnectors; an estimate of the investments required for the implementation of the proposed transmission system development plan; an analysis of electricity consumption.

A key element of the development plan is the new generating capacities from RES and the implementation of RED, in particular its provisions relating to electricity.

On the basis of the short and long term plans, additional networks are planned. The investment costs for network development are subject to approval by the State regulator (SEWRC) who recognises them and compensates the investor - transmission, distributor, system operator - via the energy prices. The producer of RES pays only the costs for infrastructure required within the limits of its property.

The latest decisions of SWERC from 1 July 2014 establishing the quantity of energy from RES that can be connected to the grid states that there is no spare capacity in the grid to take new installations in the next period until 30 June 2015. A need for additional infrastructure has therefore been identified.

In the northeast of Bulgaria with the highest wind energy potential the grid is not in a position to cope with all potential RES generating capacity. Investor interest in new capacity is blocked due to transmission network limitations. Expansion of the network is planned and undergoing.

#### *Use of smart grids*

There is recognition that the energy infrastructure should use real-time information technology to the extent possible. Indeed, ZEV1 requires that when infrastructure development plans are considered by SEWRC the inclusion of intelligent elements is considered and if seen as cost effective should be adopted as an option.

Intelligent control systems in the distribution networks are still in infancy, however, there are plans to introduce 'intelligent elements' like: uniform exchange information protocols standardised at SET level - European Smart Grids Technology Platform; new dispatching rules in distribution networks; and centralised and local network management to improve security of supply.

Bulgaria's system operator (ESO) has gradually implemented elements that are part of 'intelligent networks'. Currently the existing system creates challenges and disputes between the system operator and the RES producers.

#### *Other impacts*

Bulgaria's energy sector is still not fully private. Since accession to the EU, steps have been taken to decentralise and privatise the sector, however, the process is not completed yet.

A recent fact finding mission by the European Commission (DG Energy and DG Competition, 2013) has highlighted an urgent need for full structural reform and the need for more administrative capacity within the key bodies like SWERC. It found that the implementation of the RED - although a step in the right direction - had also added to the overall difficulties and complexity of the sector.

#### **Efficiency**

The implementation of the RED to date has provided more structure and long-term security to RES producers. It has led to a very intense period of building and integrating RES into the system.

However, since the grid's limits have been reached no new installations can be added to it and therefore the grid access obligation is de facto undermined and the challenge of balancing the needs of different operators remains.

The government is expecting that long term planning and grid development should eventually lead to secure grid access.

#### **Added value**

RED had an overall stimulating effect on the coherence and development of procedures for grid access until the achievement of the agreed target. If obligatory targets are confirmed for the next period the process of improving grid infrastructure and access might continue.

#### **Conclusions and recommendations**

Overall, the RED has had some positive impacts on grid access for RES but continued progress to improve the framework and invest in the infrastructure is needed in order to tackle bottlenecks. The whole energy sector in Bulgaria needs to be continuously restructured, investments identified and finance secured.

According to the latest reports, further network development would depend on various factors including: shutdown of major conventional power plants, commissioning of new units in conventional power plants, expanding international electricity systems, etc.

### **E.2.8 Article 17-19, 21: RES in transport, biofuels and bioliquids sustainability**

#### **Effectiveness**

Bulgaria was late in adopting the sustainability criteria (December 2012) and therefore in its second progress report could not include any legitimate biofuels used in transport.



RED sustainability criteria have now been transposed, however, their effect is still not fully understood and assessed by the authorities. As a result, no official data was found with respect to the scope or impacts of the sustainability criteria. The change to the eligibility of biofuels, however, might create a problem in achieving the 10% mandatory share of RES in transport.

### **Efficiency**

No information about the impact of the sustainability criteria has been found, although the implementation of new criteria implies higher administrative burden at an early implementation stage.

### **Added value**

It is unlikely that sustainability criteria such as those defined in Articles 17-19 RED would have been implemented in Bulgaria without EU level intervention.

### **Conclusions and recommendations**

Unfortunately, it is currently too early to draw conclusions and lessons from the application of these articles in Bulgaria.

## **E.2.9 Article 22 and 23: Reporting**

### **Effectiveness**

The reporting requirements from the RED are well described overall.

The information follows the requirements of the provided template and thus should be considered as sufficient. There is an opportunity for further detail to be offered in the area of describing administrative procedures and end to end steps required for achieving certain objectives.

### **Efficiency**

The research conducted for this case study has not found information on whether the RED reporting requirements have involved the creation of new data collection systems and processes so it is impossible to assess the impact of the Articles in terms of efficiency and administrative burden.

### **Added value**

There is value-added in having a consistent reporting approach at EU level. It provides an incentive for administrators to gather and assess information in a systematic and consistent way and encourages cross-administration cooperation. It also enables easy comparison across MS and their approaches to achieving the RED's objectives.

### **Conclusions and recommendations**

The reporting requirements seem to be adequate and provide a good synthesis of information. The templates could be further developed to assure an appropriate level of details where necessary. For example within the section of planned and existing measures a minimum level of detail should be included to allow the reader to fully understand the possible implications of the measure.

## **E.3 Sources and interviews**

### **Council of Ministers, 2013**

Regulation on the sustainability criteria for biofuels and biomass-derived biofuels, Decree No 302 of 26 November 2012, published in SG No 95 of 4 December 2012, in force as of 3 January 2013

### **Council of Ministers, 2011**

Decree No 200 of 13 July 2011, Regulation on the use of surface waters

### **Council of Ministers, 2004-2013**

Decree No 35 of 20 February 2004, Regulation on the regulatory control of electricity prices published in SG No 17 of 2 March 2004; amended SG No 62 of 31 July 2007; amended and supplemented SG No 42 of 5 June 2012; repealed SG No 33 of 5 April 2013, repealed SG No 38 of 23 April 2013

### **DG Energy and DG Competition, 2013**

Report from a fact finding mission conducted by the European Commission and the Government of Bulgaria regarding the energy market in Bulgaria

### **Ecofys and IEEP, 2012**

Analysis of Member State RED implementation  
Brussels : European Commission, 2012

### **Government of Bulgaria, 2014**

Energy from Renewable Sources Act  
Promulgated State Gazette 35/3.05.2011, effective 3.05.2011, last amended and supplemented, State Gazette No. 109/20.12.2013, effective 1.01.2014

### **Government of Bulgaria, 2013**

Energy Act  
Promulgated State Gazette No. 107/9.12.2003, last amended State Gazette No. 66/26.07.2013

### **Government of Bulgaria, 2012**

Spatial Planning Act, Promulgated State Gazette 1/2 Jan 2001, amendment State Gazette 82/26.11.12

### **Government of Bulgaria, 2011a**

Environment Protection Act  
Promulgated State Gazette No. 91/25.09.2002 last amended and supplemented, State Gazette No. 42/3.06.2011

### **Government of Bulgaria, 2011b**

Excise Duties and Customs Warehouses Act,  
Promulgated SG/2005, amendment State Gazette No 99/16.12.2011

### **Government of Bulgaria, 2011c**

Forests Act  
amendment State Gazette No 19/ 8.03.2011

### **Government of Bulgaria, 2011d**

Local Taxes and Fees Act, amendment State Gazette No 102/2012

### **Fraunhofer Institute, 2011**

Assessment of National Renewable Energy Action Plans  
Karlsruhe : Fraunhofer ISI, 2011





**Ministry of Economy and Energy, 2014**

Letter for the Deputy Minister from 31 January 2014 confirming that after the second report to the EC new RES won't benefit from the preferential tariffs and connection

**Minister of Economy, Energy and Tourism, 2013a**

Regulation No RD-16-317 of 27 February 2013 on the procedure for issuing certificates and inclusion in the register of the persons performing activities relating to the installation, maintenance, repair and reconstruction of facilities at energy sites for production of electricity from renewable sources.

**Minister of Economy, Energy and Tourism, 2013b**

Second National Report on Bulgaria's progress in the promotion and use of energy from RES

**Minister of Economy, Energy and Tourism, 2012**

Regulation No RD-16-558 of 8 May 2012 on the collection and provision of information through the National information system for the potential, production and use of energy from renewable sources in Bulgaria, published in SG No 39 of 22 May 2012, in force as of 22 May 2012

**Minister of Economy, Energy and Tourism, 2011-2013**

Regulation No RD-16-1117 of 14 October 2011 on the conditions and procedure for issuing, transferring, cancelling and recognising the guarantee of origin of the energy from renewable sources, published in State Gazette No 84 of 28 October 2011, in force as from 1 January 2012; amended and supplemented State Gazette No 54 of 17 July 2012, in force as from 17 July 2012; and amended State Gazette No 24 of 12 March 2013, in force as of 12 March 2013

**Minister of Economy, Energy and Tourism, 2011a**

First National Report on Bulgaria's progress in the promotion and use of energy from RES,

**Minister of Economy, Energy and Tourism, 2011b**

National Renewable Energy Action Plan, resubmitted

**Minister of Economy, Energy and Tourism, 2011c**

Regulation No RD-16-869 of 2 August 2011 on the calculation of the total share of energy from renewable sources in the gross final energy consumption and of the consumption of biofuels and energy from renewable sources in transport, published in State Gazette No 70 of 9 September 2011

**Minister of Economy, Energy and Tourism, 2009-2010**

Regulation on the issuing of certificates of origin for electricity produced from renewable energy sources (promulgated: State Gazette No 10, 6.2.2009; amended: No 85, 29.10.2010)

**Minister of Education, Youth and Science, 2012a**

Regulation No 40 of 9 January 2012 on the acquisition of qualifications in the profession 'Technician in energy facilities and installations', published in State Gazette No 17 of 28 February 2012, in force as of 28 February 2012; amended State Gazette No 62 of 14 August 2012



**Minister of Education, Youth and Science, 2012b**

Regulation No 41 of 9 January 2012 on the acquisition of qualifications in the profession 'Installer of energy facilities and installations', published in State Gazette No 17 of 28 February 2012, in force as of 28 February 2012; amended State Gazette No 62 of 14 August 2012

**Minister of Environment and Water et al., 2012**

Minister of Environment and Water jointly approved by the Minister of Environment and Water, the Minister of Economy, Energy and Tourism and the Minister of Agriculture and Food 2012. Order NoRD-854 of 23 November 2012, Methodology for the calculation of the emissions of greenhouse gases throughout the entire lifecycle of biofuels and biomass-derived liquid fuels

**State Energy and Water Regulatory Commission (SEWRC), 2014**

Decision 1 July 2014 establishing the quantity of energy from RES that can be connected to the grid for the next year

**State Energy and Water Regulatory Commission (SEWRC), 2012a**

Decision No Ts-018 of 28 June 2012

**State Energy and Water Regulatory Commission (SEWRC), 2012b**

Decision No Ts-28 of 29 August 2012

**State Energy and Water Regulatory Commission (SEWRC), 2012c**

Decision No Ts-33 of 14 September 2012

**State Energy and Water Regulatory Commission (SEWRC), 2011a**

Decision No Ts-010 of 30 March 2011

**State Energy and Water Regulatory Commission (SEWRC), 2011b**

Decision No Ts-18 of 20 June 2011

**State Energy and Water Regulatory Commission (SEWRC), 2011c**

No Ts-35 of 27 October, points 44 to 47 inclusive

**Interviews**

For this case study, the following organisations were interviewed:

- Bulgarian Photovoltaic Association, Chairman of the Board of Directors;
- Eltech Visison RES producer, Director;
- Alliance of the producers of ecological energy Bulgaria, member; and
- Biofuels Association, member.

The Ministry of Economy and Energy (ME&E), the State Energy and Water Regulatory Commission (SEWRC) and the Agency for Sustainable Energy Development (ASED) were approached but were not available for interviews.

The study coincided with elections and a new government making it difficult to get appointments with government representatives.



# Annex F Country report: Estonia

## F.1 General framework

### Policy context and RED implementation

According to Directive 2009/28/EC, Estonia must ensure that the share of energy from RES amounts to 25% in the gross final consumption of energy and 10% in the energy consumption of the transport sector in 2020.

Energy-related matters fall within the area of governance of the Ministry of Economic Affairs and Communications (the Ministry) and as such cover the implementation of the RED. Several other ministries and regional and local administrations are involved in the delivery as well.

Several strategic documents on the use of RES have been drawn up and adopted in Estonia. The National Development Plan of the Energy Sector up to 2020 is the main strategy of the energy sector (Riigi Teataja, 2009). In addition to this the NREAP stipulates the actions and measures in the RES sector more specifically. The NREAP and the progress reports are produced by the Ministry in cooperation with other relevant authorities and in consultation with representative organisations or interest groups.

With regards to the energy sector, the 2013 progress report indicates that the deployment of RES in Estonia has been much faster than planned: the share of RES considerably exceeded the expected gross final consumption of RES in heating and cooling and electricity generation. Indeed, the NREAP predicted the RES share in final consumption to be 21.2% in 2011 and 22% in 2012, but, in reality, it reached to 25.9% in 2011.

With regards to transport, the NREAP set an expected reduction of 9.9% (92/934 ktoe) of the final consumption of energy in the transport sector by 2020. The results of 2011 and 2012, however, indicate that the actual contribution of RES in the transport sector is 1 ktoe, which is roughly 0.1% (1/934 ktoe). The figures indicate that Estonia is not on the road to meeting the 10% target for 2020. The 2013 progress report therefore acknowledges that thorough changes are required to ensure the required use of RES in the transport sector.

### Support Schemes

According to the 2013 Progress Report, a significant contribution to increasing the RES share was made by the support mechanisms stipulated in the Electricity Market Act for plants that generate electricity from RES, as well as the investments made with the support of EU funds over 2007-2013 for the transition from fossil fuels to RES in the district heating sector. However, these measures pre-date the RED: the current support mechanism stipulated in the Electricity Market Act was launched in 2007 and inspired by targets set in Directive 2001/77/EC - and the Directive did not lead to a redesign of this scheme.



## F.2 Assessment of the effectiveness, efficiency and value added of the RED

### F.2.1 Article 3: Targets and measures

#### Effectiveness

According to the RED, Estonia must ensure that the share of energy from RES amounts to 25% of the gross final consumption of energy, and 10% of the energy consumption of the transport sector in 2020.

These targets are reflected in the NREAP. It predicted intermediary shares of RES in final consumption to be 21.2% in 2011 and 22% in 2012, but, in reality, it was 25.9% in 2011, exceeding the RED target. This has been driven by increased production of RES from biomass, biogas and wind.

On the other hand, progress data for 2011 and 2012 indicate that the actual contribution of RES in the transport sector is only 0.1%, which is far from the target set by the RED. Estonia is therefore very unlikely to meet the target for the use of energy from RES in transport, unless urgent measures are adopted.

Prior to the RED, the Estonian energy policy was defined in two strategic documents:

- The Long-Term Fuel and Energy Sector Development Plan to 2015 was approved by the Parliament in December 2004 (Riigi Teataja, 2004). The Plan set a strategic target of 5.1% of RES in gross electricity consumption by 2010 (equivalent to 300-360 GWh or 26-31 ktoe), according to Directive 2001/77/EC. The Development Plan further envisaged - but did not set it as a target - that the RES share would keep increasing and by 2020 the share of RES should reach 10% of gross electricity consumption. In order to achieve these targets, the plan identified a need for funding of 2-4 million Estonian krone in investments for RES cogeneration and 90-144 million Estonian krone to support schemes. Support measures taken to increase the deployment of RES electricity included: subsidy for generation of RES electricity as stipulated in the Electricity Market Act; joint implementation and emission trading under Kyoto protocol; and use of EU structural funds. The Development Plan also stipulated a strategic 20% target for the share of electricity from CHP in gross energy consumption by 2020 and which would be generated from RES as preference.
- In its Biomass Action Plan the European Commission called the MS to develop national biomass action plans; hence the Development Plan 2007-2013 for Enhancing the Use of Biomass and Bioenergy was approved by the Estonian Government in January 2007. The Estonian biomass development plan stated a target of 3% of the share of electricity generated from biomass in an efficient cogeneration process in gross final consumption of electricity by 2013; and 33% of the share of district heating generated from RES in gross final consumption of district heating.

Overall, the targets set in these documents tend to be less ambitious than those set by the RED and now also included in the National Development Plan of the Energy Sector up to 2020 (approved through a Government order of 15 June 2009) and the NREAP.

With regards to the growth observed in RES deployment in the energy sector, the 2013 Progress Report finds that a significant contribution to the increased share of RES was made by the support mechanisms stipulated in the Electricity Market Act for plants that generate electricity from RES, as well as the



investments made with the support of the funds of the European Union budget period 2007-2013 for the transition from fossil fuels to RES in the district heating sector. On the other hand, the RED did not have a significant impact on the design of these support schemes.

The current support mechanism stipulated in the Electricity Market Act was in place from 2007 on and inspired by targets set in Directive 2001/77/EC (5.1% of RES electricity in brut electricity consumption by 2010). It led to a higher than expected uptake of RES: according to the analysis undertaken by the Estonian Competition Authority, the support mechanism allows the producers to achieve high profit margins (40% of the invested capital), which has attracted investment in RES.

However, the Government considers the support scheme to be too burdensome for the consumers who bear the costs associated with its implementation and now that Estonia has met its RES target, the Government plans to modify the scheme. A draft legislation to this effect was submitted to the Parliament in 2012. The proposed support scheme is directly related to the RES targets set in the NREAP. However, with the Parliamentary elections due next year, the outcome of the proposal remains unclear.

In view of these potential changes, it might be argued that the binding target in the RED has limited the further deployment of RES in Estonia. However, given the costs associated with the support scheme for the consumers, it is likely that a proposal to change the scheme would have been produced anyway.

With regard to transport, the Long-Term Fuel and Energy Sector Development Plan to 2015 quoted the target as set in Directive 2003/30/EC: increasing the proportion of biofuels and other renewable fuels to 2%, calculated on the basis of energy content, of all petrol and diesel for transport purposes placed on the markets by 2006 and to 5.75% by 2011. The Development Plan committed to measures to allow the use of liquid fuels (primarily bio diesel) in the transport sector. The Development Plan 2007–2013 for Enhancing the Use of Biomass and Bioenergy set the target of 6% of the share of biofuels in gross final consumption of fuels by 2013.

The main support for biofuels was an exemption from excise duty in accordance with the Alcohol, Tobacco, Fuel and Electricity Excise Duty Act. However, the validity of the State Aid permit granted by the Commission for this exemption expired in July 2011 and no further incentives have been offered to fuel suppliers to incentivise the uptake of RES in the transport sector since then.

The RED has therefore set a higher target for the share of energy from RES in the transport sector compared to previous policy documents. The National Development Plan of the Energy Sector up to 2020 and the NREAP now state that the share of fuels from RES in 2020 is 10% in the transport sector. It is doubtful that the Government would have targeted the RES deployment in transport sector so aggressively without the obligation stipulated in the RED. To meet the target the Ministry has prepared a draft legislation introducing mandatory requirements for fuel suppliers to place biofuels on the market. However, the draft legislation was withdrawn due to the European-level target for 2030 as agreed in the European Council meeting on 24 October 2014 which does not include a transport target. However, during the interviews the stakeholders thought that the withdrawal was actually due to the Parliamentary elections due in 2015.

In any case, Estonia is unlikely to meet its RES target of 10% in the transport sector without the legislation. Reasons for the slow deployment of biofuels in Estonia were researched through available literature and stakeholder interviews. The National Audit Office of Estonia undertook an audit in 2006 entitled 'Handling of issues related to rape and biodiesel fuel by the Government' (The National Audit Office, 2006). The audit concluded at the time that none of the Ministries felt that it had the responsibility for increasing the use of biofuels in transport. This barrier does not, however, seem to be a problem anymore as the Ministry of Economic Affairs and Communications has assumed the responsibility and drafted the legal act to increase the use of biofuels in transport to pursue the RED target. Another barrier identified by the audit report and interviews is the relatively negative public attitude towards introducing biofuels in vehicles in Estonia. The Estonian fleet is one of the oldest in the EU and there are fears that fuels with bio-additives may damage vehicle engines. At the moment, on the Estonian market, there is therefore no considerable demand for biofuels suitable for use in transport.

### **Efficiency**

As mentioned above, the implementation of the RED has not had any significant impact on the support schemes in place for RES; the scheme stipulated in the Electricity Market Act pre-dated the RED and has not been changed since.

According to the interviewed stakeholders, the RED has not directly resulted in cost reductions of RES deployment. However, it sets binding targets and a legislative framework that enables the development of RES technologies. As the deployment of RES increases, the costs to developers decrease (including the cost of technology).

During the interviews, the Ministry raised concerns about the cost-efficiency of the transport target for Estonia and sectoral targets generally. It highlighted that the national energy profiles are different between the MS and therefore flat binding targets at national level may cause inefficiency. For example, in the case of Estonia, no transport fuel is produced domestically (all fuels are imported). Estonia must, however, meet the mandatory 10% RES target in the transport sector by 2020. Setting a mandatory RES obligation for suppliers risks increasing the cost of fuel available to consumers and, as such, does not provide additional value.

### **Added value**

The main source of added value from the RED in terms of target setting is its binding nature and impact on setting a clear policy framework that creates investment stability for developers. This in turn encourages innovation.

### **Conclusions and recommendations**

Overall it was agreed by the interview partners that binding targets encourage the MS to take measures to increase RES uptake. However, views differed on how the targets should be set. The RES stakeholders found it necessary to have binding targets for 2030 at national level to ensure the effective development of RES and ensure investment in Estonia.

On the other hand, the Ministry did not support binding targets at national level, in particular for transport because of the trade pattern of fuels in Estonia. As mentioned above, it therefore states that EU-wide targets would be more cost-efficient.

## F.2.2 Article 4: National Renewable Energy Action Plan

### Effectiveness

Estonia submitted its NREAP to the European Commission in 2010. The NREAP provides a comprehensive overview of the Government's plans with regards to implementing the RED in 2010 and the Government has largely followed the plan in practice. However, it has not been updated since so the information it contains is not always up-to-date or reflective of the current situation in the country. For example, Estonia has furthered its implementation of the RED and some of the measures have not been implemented as planned. More up-to-date information on the state of implementation is contained in the progress reports.

The detailed NREAP was found to be very useful. However, according to the Ministry, updating the NREAP entails significant administrative burden and long processes. This is why not many MS have voluntarily updated their NREAPs and why MS' plans often do not correspond to those initially set in the NREAPs. The process of updating NREAP could therefore be more flexible according to the Ministry. This is explored further in the conclusions section.

During the interviews, one stakeholder also mentioned that the NREAP and the progress reports provide useful means for the European Commission to monitor against MS' plans and targets. If there were no NREAPs, the system would lack a monitoring mechanism.

As for the impacts of the NREAP, the interviewed stakeholders agreed that only a small number of people are aware of the NREAP itself in Estonia; it is therefore not expected that the NREAP would have any widespread effect on public awareness although it did get some coverage in the news. In addition, while the NREAP might not directly raise public awareness itself, the stakeholders believed that the plans and measures included in the NREAP and implemented as part of it can help raise public awareness of RES deployment.

With regards to its impacts on investors, the level of detail on policy commitment may not be specific enough to significantly improve the perception of investment security. For instance, in some cases the interventions included in the NREAP are broad, soft measures (e.g. research and analysis) which provide limited information for investors. Only certain plans and measures are expected to increase the investment security.

### Efficiency

The administrative burden was estimated to be relatively high by the Ministry, especially for a small country like Estonia. Based on an analogous development plan, it was estimated that compiling the NREAP would fill two expert positions for 1.5 years. In addition, several other external consultants and organisations would have contributed to the analysis as well. However, the most of the NREAP would have likely been covered in the context of different strategic documents.

It was further mentioned by the Ministry that not all topics stipulated in the NREAP might be of the same relevance to all MS and therefore inefficiencies are created where MS need to also compile information not relevant to their national circumstances.





### **Added value**

There is added value in compiling all information on RES policy and measures in one document. The NREAP provides comprehensive and overarching sources of information about the general trends and state policies in the RES field, all accessible in one document, and are much more comprehensive and explicit in comparison to the previous attempts to establish long term planning. It is unlikely that Estonia would have drafted a specific and unique plan for RES without the RED. It would more likely have been covered separately across several strategic documents and development plans.

During the interviews, another source of value added from the NREAPs was highlighted: the common template at EU level is a good source of consistent information for developers on the different MS' plans to develop RES. This allows them to gather information across Europe and make investment decisions and plans. Not all MS would have otherwise had the administrative capacity to develop and publish such plans.

### **Conclusions and recommendations**

Overall, there is a general consensus that the NREAP are providing value. During the interviews it was believed that the NREAP contains the right information; no suggestions were made on how it could be improved except that it could be more mainstreamed for specific national circumstances.

There is an issue about the value of revising the NREAP. On the one hand, the process has been highlighted as quite time- and resource-consuming. On the other hand, as time goes on, the information contained in the NREAP becomes more out of touch with what is actually happening on the ground. There may therefore be some value in exploring the potential to have a 'light' updating process which would not involve re-doing the whole NREAP but rather to build on the progress reports.

## **F.2.3 Articles 6-12: Cooperation mechanisms**

### **Effectiveness**

Estonia has not yet been involved in cooperation mechanisms. Estonia will reach its national target of 25% RES share in gross final energy consumption by 2020 by using its own potential and its measures. It therefore does not have to rely on flexible cooperation mechanisms for target achievement.

Looking forward however, Estonia might consider statistical transfers or joint projects in order to deal with any surplus in the future. Indeed, more cooperation mechanisms are expected to be implemented closer to 2020 as MS need to meet their targets.

Estonia has a slight preference for statistical transfer over other mechanisms such as joint support schemes or joint projects, as it is technology neutral (in principle), the implementation is easier, administration costs are lower, and it is the most straightforward from a State Aid perspective (Ecofys, 2014). Estonia is currently actively seeking cooperation with other MS through statistical transfer: negotiations are underway with Luxembourg for transfers between the two countries allowing Estonia to sell expected RES surplus.



The country also has long-term established practices and experience in carrying out joint implementation projects under the Kyoto Protocol. There is a large potential in Estonia to develop joint projects in offshore wind power as well as untapped potential for the production of heat and electricity using biomass.

There are, however, barriers to the use of cooperation mechanisms:

- At the moment there is no specific legal framework for implementing cooperation mechanisms. General communication with MS and third countries is being stipulated in the Foreign Relations Act. According to the interviewed stakeholders an act on procedural activities for statistical transfers and joint projects with EU Member States has now been drafted by the Ministry.
- In terms of joint projects, the main hindrance to the development of the sector are the limited possibilities of the links with the grids and power networks of other EU MS.

### **Efficiency**

The administrative burden related to cooperation mechanisms could not be estimated at this stage. According to a recent study on Statistical Transfer between Estonia and Luxembourg (Ecorys, 2014), however, the following direct costs are associated with cooperation mechanisms: support costs and transaction costs. No additional support costs should, however, be incurred in case Estonia decides to implement statistical transfer as the energy sold will relate to existing RES production in other words, no changes to the RES production are anticipated. On the contrary, this should reduce the burden of the consumer to cover RES production costs in Estonia. The proceeds from the transfers would be used to pay for the support that is otherwise passed on to consumers. The transaction costs are present in all contractual arrangements but these are expected to be minor.

### **Added value**

The RED has a direct influence on creating the legislative basis for statistical transfers and joint projects. The interviewed stakeholders agreed that it is unlikely that any transfers would be done without the RED regulation. It can therefore be said that the RED has contributed to any future implementation of cooperation mechanisms.

In addition, a recent study identified that successful cooperation mechanisms could incentivise further RES deployment in Estonia. If proceeds from statistical transfers recover the costs of RES support, the government might have an argument to deploy further RES in the country (Ecofys, 2014).

### **Conclusions and recommendations**

Overall, from the Estonian perspective as a seller, the RED targets do not contribute to the uptake of cooperation mechanisms: MS are only interested in implementing the mechanisms when this is necessary in order to meet their national targets.

The RES stakeholders interviewed see little advantage to statistical transfers for the RES sector unless it would lead to further financial support of RES production. When the draft legislation is adopted in Estonia, a legal framework will be created nationally for the implementation of cooperation mechanisms. However, this draft legislation does not create incentives for RES producers to develop further RES, as no further support is provided for this.

During the interviews, it was argued that as no statistical transfers have taken place in the EU, Estonia as a country which has been undertaking negotiations with other EU MS for statistical transfers, has faced the risk of the first mover i.e. engaging in the cooperation mechanism without building on the experience and best practice of other countries (no previous projects that can be used for price setting). In addition, for Estonia, there is a risk of non-compliance that creates barriers to engaging in cooperation mechanisms (e.g. if they agree to a transfer but do not meet the target at the end).

However, no potential improvements to the Article were suggested by the RES stakeholders interviewed. The wording of the Article was found to have been satisfactory in creating the enabling framework for cooperation mechanisms.

The Ministry did note that the RED defines three different cooperation mechanisms - statistical transfers, joint projects, and joint support schemes. In practice, however, the mechanisms are closely related: for example statistical transfers are a part of all the cooperation mechanisms as RES has to be transferred from one account to another in Eurostat. There is also seen to be little difference between joint projects and joint support schemes: the outcome of both mechanisms is investment in RES and the differences only relate to the title of the mechanism itself and whether it is the energy or generating installation that is 'bought'. The Ministry suggested that the RED should aim at treating the cooperation mechanisms together and reduce the minimum criteria common to all mechanisms (e.g. energy statistics, transfer of energy in Eurostat, criteria relating to eligibility of generating installations, etc.), enabling the MS to implement different cooperation mechanisms suitable for their national circumstances.

Finally, the European Commission has recently called for a mandatory opening of RES support systems to cross-border supply as it is expected to encourage negotiations for cooperation mechanisms and increase the uptake of RES. During the interviews, however, one stakeholder stressed that this approach creates 'bad blood', as producers from other MS would have access to national funds and it is doubtful whether opening the Estonian RES support system would provide the effect sought, as RES in Estonia is relatively cheap compared to other EU MS. When opening the national support scheme, developers from other MS (like UK) might not be able to compete with local producers due to the low price. The stakeholder suggested that the measures would not be applied to all 28 EU MS and it should remain within the competence of the MS whether to open its support schemes in order to strike the right balance between the benefits sought and the administrative burden associated with the opening of RES support systems.

## **F.2.4 Article 13: Administrative procedures, RES in buildings, heating**

### **Effectiveness**

#### *Administrative procedures*

RES producers must overcome several approval and licensing steps in order to start producing RES. These include amendments to spatial planning depending on the size and location of RES; application for building permits; permits for use of the building; and authorisation for generation of electricity. In addition, according to Article 55(1) of the Electricity Market Act, generating installations shall conform to the technical requirements established by the Grid Code. The network operator shall certify the installation's compliance with these requirements after the end of a testing period on the basis of test results. Legal analysis undertaken by Borenus law firm stated that the

requirements in the Grid Code are very laconic and leave wide discretion for network operators to apply the requirements. This hinders the transparency of the processes (Borenus, 2013).

Generating licenses and authorisations are under the responsibility of different state bodies: applications for the authorisations are decided by the Competition Authority; the Ministry of the Interior is responsible for preparing a national spatial plan; county governments are responsible for preparing county plans; and local authorities are responsible for drawing up comprehensive and detailed plans. The preparation of detailed plans is mandatory for areas located in cities and towns and for existing or planned, clearly delimited built-up parts of small towns and villages. Building permits and permits for use are also issued by local authorities. Finally, generating installations must conform to specific technical requirements, compliance with which is certified by the network operator after the end of a testing period.

Applications for the permits to generate electricity are to be decided on by the Competition Authority within 60 days. Applications for permits to provide network services through the transmission network are to be decided on within 10 months. During the interviews, no specific statistics were provided on how long the licensing processes take overall (from spatial planning to testing) though it was estimated to be between three to six years. This is all very dependent on the public authorities' willingness to cooperate.

### *RES in buildings*

With regards to RES in buildings, according to the NREAP, no national and regional legislation concerning the increase of the share of RES or minimum requirements for the use of RES in the building sector have been established, although there is a plan to add some requirements to the Building Act and legislation issued on the basis thereof. The NREAP also states that by 31 December 2014 an analysis will be made regarding the expediency of applying minimum levels of RES in new and renovated buildings and, if necessary, building legislation and rules will be developed accordingly.

### *RED impacts*

The 2013 progress report did not identify an urgent need to amend the existing legal acts with regard to administrative proceedings; it is felt that the administrative procedures have worked well and not created bottlenecks.

According to the Ministry, the number and size of the RES projects is not such that it would warrant a review of the procedures. In addition, the 2013 progress report states that the authorisation process is not unjustifiably and disproportionately complex for RES producers who plan new plants. In this report the Ministry also noted that granting automatic approvals for planning license and authorisation applications is not justified because planning shapes long-term spatial development, and as such it must take into account the long-term developments and needs of the economic, social, cultural and natural environment in a balanced way. The automatic approvals for plants producing RES would risk creating imbalance in the process of planning spatial development.

A different opinion was, however, expressed in the interview by a RES stakeholder. While they did not identify any duplication of efforts at different levels, they highlighted that spatial planning is ultimately the responsibility of county governments and that the Government has therefore no power to ensure the enforcement of the RED article. The development of RES therefore depends on the willingness of the county governments to support it.

The planning process can indeed take a very long time, making it difficult for producers to plan their investments.

Some measures have been implemented by the Government to accelerate the uptake of RES, according to the 2013 progress report:

- With regards to *micro-generation*, a common understanding has been developed in cooperation with distribution network operators under which private individuals are given the easiest, most economically viable and least time-consuming possibilities for connecting micro-generation facilities to the grid. As a result of this work and with the support of the funds from the public sector, RES equipment has been installed in small residential buildings in different regions in Estonia.
- With regard to *wind energy*, for the first time in Estonia, county-wide thematic spatial plans for using wind energy in four counties have been developed and adopted, covering the counties in Western Estonia that have the greatest potential for generating wind power. These plans set out the principles for developing wind energy and map the suitable areas for wind farms. Thus, more favourable conditions for faster processing of projects are created. In addition, the awareness of local inhabitants about wind energy and, more broadly, RES will be raised.
- In addition to the thematic spatial plans, the integral planning of *marine areas* has started. This means that when planning marine areas, all potential resources are comprehensively taken into account and the interests of different interest groups, individually and as a whole, with regard to marine areas, are mapped as far as possible. Within this framework, the potential locations of wind farms will be developed in cooperation with local communities, scientists, energy companies and relevant interest groups. This should in turn accelerate the development of these projects.

The steps mentioned above might somewhat accelerate the special planning processes in the future but do not reduce the number of steps required for development of RES. According to one interviewed stakeholder, the adopted thematic spatial plans may, however, hinder the deployment of RES as the plans stipulate too rigidly the possible locations for RES. All production locations assigned in the plans have already been used. That means that if a new production location is to be developed the spatial plans will need to be amended, making the licensing procedures more burdensome. Overall, therefore, the RED has not resulted in a significant streamlining of approval and licensing procedures, and there has been no change in the number of bodies involved in the licensing process and no one-stop-shop has been set up.

With regards to the role of the public sector as an exemplar, the Ministry has commenced activities for completing some low-energy buildings. During the interviews, the Ministry mentioned that in 2012 it signed a co-operation programme with Switzerland that aims to enhance the energy efficiency of public buildings and to develop new building regulations and standards. Within the framework of the project, four local government buildings will be reconstructed and built as demonstration investments, to increase public awareness about low energy buildings and to test new energy performance standards during the project preparation stage. The Ministry also pointed out that a 'Low and nearly zero- energy buildings' manual has been prepared by Tallinn University of Technology and the state-owned State Real Estate Ltd that reviews low and near-zero energy building solutions compared to conventional building practices. However, there are concerns that the impact of this article on public buildings is very limited, in part because most of the public buildings are owned by state-owned State Real Estate Ltd i.e. not public buildings.

### **Efficiency**

No cost or resource data was found on the administrative procedures related to the licensing of RES operations in Estonia.

### **Added value**

Based on the analysis above, there seems to have been limited added value from EU level intervention on administrative procedures in Estonia.

### **Conclusions and recommendations**

The Article contains very important principles, such as the fact that authorisation, certification and licensing procedures should be proportionate and necessary. These principles allow a wide enough interpretation that MS can easily comply with the article's requirements. According to one interviewed stakeholder, more specific provisions in the RED would increase the effectiveness of the measures in place under the Article. It was also suggested that an Energy Agency should be created with responsibility for spatial planning in relation to RES and permit issuance.

At this stage however, there is little political interest in and commitment to changing approval and licensing procedures. Indeed, in the first progress report, the Ministry stated that there was no need for new administrative bodies responsible for processing authorisation, certification and licensing applications for RES installations and providing assistance to applicants.

## **F.2.5 Article 14: Information, certification, training**

### **Effectiveness**

#### *Certification & training*

Until recently, no national and/or regional certification or equivalent qualification schemes for installers as specified in Article 14 (3) RED existed in Estonia. However, in 2013 several occupational qualification standards were adopted that describe the activities and competency requirements for the RES sector. For example qualification standards were adopted for: heat pump installers, photovoltaic system installers, small scale wind turbine installers. The occupational qualification system ensures that the workforce is competent and has the necessary knowledge and skills to install RES infrastructure. The qualifications are officially recognised.

No official assessment has been found on the impact of this article on the uptake of RES in Estonia but some positive impact can be assumed with regards to certification. For example, the newly adopted qualification standards will increase the level of specialists in the field, raise awareness of the RES and will encourage the uptake of RES in the long-term.

#### *Information*

According to the NREAP, no specific legislation related to information and awareness raising campaigns or programmes in the field of RES has been established or developed as a result of the RED.

The NREAP states that project-based events providing information on RES have been organised at national, regional and local levels and they will continue in the future as well. During the interviews it was identified that for example an 'energy efficiency week' is organised every year in order to raise awareness of energy efficiency options. However, as highlighted by one interviewed stakeholder, RES-related campaigns are mostly organised by professional





associations in the sector that may include information provision to secondary and high school students, and training for other interested people. According to the stakeholder, these initiatives are, however, not driven by the provisions of the RED but organised at industry's own initiative.

No official information has been found on the impact of the provision on the uptake of RES in Estonia. Given that information campaigns are organised by the producers irrespective of the RED, the impact is expected to be minimal.

### **Efficiency**

No information was found on the administrative burden placed on operators and public institutions as a result of Article 14 RED. However, some minor burden can be expected for public institutions through developing occupational qualification standards and organising information campaigns.

### **Added value**

The occupational qualification standards were only developed in 2013 and thus the effect of the Article are still to be experienced. It is, however, expected that the article has contributed somewhat to raising general awareness of the public and would indirectly encourage the uptake of RES.

### **Conclusions and recommendations**

In the stakeholders' opinion, the wording of this Article's provisions is very general, which somewhat complicates the transposition and implementation at national level. The requirements cannot be transposed to national legislation one-to-one as the general wording of the provisions does not fit into the national legal system of Estonia. Nationally the transposition would be met for example through the combined effect of different legal acts.

## **F.2.6 Article 15: Guarantees of origin**

### **Effectiveness**

In Estonia, GOs are used to prove to final customers the share or quantity of energy from RES in an energy supplier's energy mix.

They are also used in the Estonian Electromobility Programme: every electric car purchased with the programme's financial support (financed by funds from the sale of Assigned Amount Units (AAUs) under the Kyoto Protocol) must use electricity from RES. Every beneficiary must therefore buy GOs in the amount that corresponds to the energy used by the vehicle. The first GOs up to 5 MWh are given to the beneficiaries for free by the fund manager (equal to about 25,000 km). The GO gives the vehicle owner the guarantee that the electricity is produced from RES.

The provisions on GOs were introduced into national legislation in 2007 i.e. before the adoption of the RED. The regulation was, however, very basic and further details and requirements were included as a result of the RED. As an example, it was stipulated that the GO is an electronic document, an electronic database will be established so that GOs can be issued, transferred and cancelled electronically and that GOs issued by other MS can also be used to certify the electricity used. The amendments derived from the RED therefore created prerequisites for the GOs to be issued, transferred and cancelled electronically.



The Estonian electronic database did not, however, allow electronic international transfers of GOs. For this, Estonia decided to join the Association of Issuing Bodies (AIB) so that the GOs are electronically transferrable via the secure European Energy Certificate System (EECS). According to the website of Elering AS - the authorised issuing body for Estonia - the Estonian registry has been a member of AIB since September 2014. The 2013 progress report acknowledges that joining AIB is necessary to efficiently ensure and achieve the reliability and protection against fraud of the GO system. The registry protocol has been drafted to ensure the robustness and transparency in the facilitation of the EECS Scheme for Estonian Domain. The registry protocol is accessible at the following link:

[http://elering.ee/public/Taastuenergia/Estonia\\_Elering\\_AS\\_Domain\\_Protocol.doc](http://elering.ee/public/Taastuenergia/Estonia_Elering_AS_Domain_Protocol.doc)

### **Efficiency**

From September 2014, when Estonia became a member of AIB, to November 2014, no transfers of GOs have been completed. The information on trades is made publicly available on the homepage of the Estonian transmission network operator: <http://elering.ee/paritolutunnistused/>

According to the supporting document amending the Electricity Market Act, the TSO's costs for managing the database for the administration of guarantees of origin constitute about 0.0001 Euro cents per kWh electricity transmitted. The costs will be included in the network charges.

### **Added value**

The RED provides a basis for the MS to start thinking about regulation with regards to GOs. Specifically in Estonia it incentivised the creation of prerequisites for electronic transfer of GOs and to start seeking options to secure the transfers from fraud.

It was discussed during the interviews that the interest amongst the RES industry towards GOs has increased since Estonia became a member of AIB (with potential aim to trade the GOs). It can be assumed that the increased use of the GOs will again raise the awareness of the customer on the source of energy they use.

### **Conclusions and recommendations**

The RED only states that MS are obliged to put in place appropriate mechanisms to ensure that GOs shall be issued, transferred and cancelled electronically and are accurate, reliable and fraud-resistant. It does not, however, stipulate how this can be best met and what is considered "fraud-resistant", and membership to AIB is not mandatory.

The Article would benefit from clearer instructions from the European Commission on which solutions MS could or should use to meet the requirements e.g. supporting AIB would help towards the effective implementation of the Article.



## F.2.7 Article 16: Grid access and operation

### Effectiveness

#### *Grid access*

In Estonia, access of RES plants to the grid is subject to the general legislation on energy.

Article 65 (1) of the Electricity Market Act stipulates that a network operator shall ensure, on the basis of a corresponding request, connection to the network of any electrical installation that conforms to the requirements. Further, according to section 65 (2) of the Electricity Market Act, a network operator shall observe the principle of equal treatment of market participants when providing network services. This means that there are no explicit limitations placed on RES access to the grid but equally, there are no explicit preferential conditions either.

Despite the transparent and non-discriminatory criteria, barriers exist for the deployment and integration of RES plants. The Estonian grid is built on the economic model deployed in Soviet times i.e. grid capacity exists in old production centers. However, these do not necessarily align with the current production centers, especially for RES. Therefore, while there is sufficient grid capacity in parts of the country, grid capacity is limited in places where there is RES potential. For example, on the island of Saaremaa - which has significant potential for wind farms - grid capacity has already been reached, meaning that no additional producers can be connected.

According to section 65 (3) of the Electricity Market Act, a network operator has the right to refuse to provide network services if the network of the network operator lacks the necessary transmission capacity for the provision of network services. As there is a lack of sufficient grid capacity in parts of Estonia, it creates constraints on the country's ability to maximise RES deployment.

#### *Grid expansion*

According to Article 66 (1) of the Electricity Market Act, network operators must develop the grid in accordance with the condition of authorization within its service area, such that the continued provision of network services to all consumers, producers, line possessors and any other network operators connected to the network is guaranteed. When developing the network, the network operator aims to guarantee the security of supply. The grid is therefore developed, according to one interviewed stakeholder, by the network operator according to the needs of the consumers, rather than the RES production.

In Estonia, a deep-cost allocation approach is used which means that a producer requesting connection to the grid must bear the infrastructure-related costs (grid connection, reinforcement, and extension). Therefore, in general, the deep-cost approach usually entails higher costs and risks for the producer, which might hinder the deployment of RES (Öko-Institut and Eclareon, 2012). For example, developing the grid to the remote island of Saaremaa will be costly and would not make the moderately sized production worthwhile. The deep cost approach has therefore a strong impact on RES investment decisions, especially for small developers (Öko-Institut and Eclareon, 2012). In some cases, the charge for the connection to the network that includes the infrastructure development costs might be so high that it is



more cost-effective for the producer to develop the grid itself. In any case, significant costs are borne by the producers.

As a result of some of these challenges, rather than developing grid connections to allow further RES deployment within the country, the Government has directed its efforts towards developing grid connections with neighboring countries. One of the actions stipulated in the NREAP was to construct new electricity infrastructure from the Baltic States to other EU countries, including Estlink 2. As of February 2014, the direct connection between Estonia and Finland was made available for commercial operations. It was reported at the Estlink website that the Estlink 2 connection triples the transmission capacity between the two countries and significantly strengthens the integration of electricity markets in the Baltic Sea region.

#### *Smart meters*

According to the Grid Code, all electricity meters in domestic settings must be replaced with smart meters by January 2017. According to SmartGridNew.com, mass installation of smart meters took place in March 2013 and by the middle of 2014, over 263,000 meters had been installed. Approximately 357,000 meters are yet to be installed.

#### **Efficiency**

No evidence has been found that the RED has had an impact on the cost-efficiency of grid access in Estonia, which leaves significant room for improvement. Indeed, one interviewed stakeholder confirmed that studies commissioned by them have found that the procedures for grid access in Estonia are some of the most bureaucratic ones in the EU.

#### **Added value**

Based on the analysis above, there seems to have been limited added value from EU level intervention on access to grid in Estonia.

#### **Conclusions and recommendations**

Overall, the RED seems to have had limited impact on grid access and operation in Estonia. This is due to two main barriers: the lack of sufficient grid capacity and the deep cost approach.

The first barrier is affected by the fact that the obligation of the network operator to develop the grid is not connected to the achievement of the State's 2020 targets and the targets are not taken into consideration to a sufficient extent when planning the grid. The current system therefore lacks regulatory instruments to encourage grid development on behalf of RES production.

### **F.2.8 Article 17-19, 21: RES in transport, biofuels and bioliquids sustainability**

#### **Effectiveness**

Estonia is one of the few EU MS where biofuels are not produced for use in transport: all transport fuels are imported from neighbouring countries (like Finland and Lithuania).

The sustainability criteria specified by the RED has been included in national legislation through the regulation of the Ministry of Environment of 21 June 2013. According to section 11 of the regulation, the Ministry of Environment is responsible for the monitoring of the quality and quantity of liquid fuels sold in

Estonia. This is done on the basis of annual data received from the Tax and Customs Board on the type and quantity of the fuel sold in Estonia during the preceding calendar year.

However, the data provided by the Tax and Customs Board is limited and does not allow verification of the compliance with the sustainability criteria. In practice, the sustainability criteria are therefore not adequately enforced, checked and audited.

In addition, the requirement to certify compliance with the sustainability criteria was removed from the regulation in 2013 as it was not deemed to be necessary because the regulation's supporting document did not place an obligation on fuel suppliers to produce biofuels. In practice no biofuels are therefore declared to customs.

In 2014, however, in order to transpose the RED, the Ministry proposed a draft legislation (available at:

<http://www.riigikogu.ee/?op=ems&page=eelnou&eid=da929829-584b-495f-b983-4a949eff5f2b&>) that includes a mandatory requirement for suppliers to supply biofuels and the enforcement and auditing rules for the sustainability criteria. According to the draft legislation the supplier must retain the information in relation to every consignment of biofuels released for consumption that allows monitoring compliance with sustainability criteria throughout the whole supply chain. The information will be retained by the supplier for five years. The verification of compliance with sustainability criteria is done using any of the following approaches: (1) voluntary schemes as recognised under the RED; (2) other MS' national schemes; (3) schemes derived from bilateral or multilateral agreements with third countries containing provisions on sustainability criteria and (4) monitoring of the supply chain by independent auditor.

The Ministry has, however, decided to withdraw the proposal due to the European-level target for 2030 as agreed at the European Council. In reality, however, this is thought to be due to the Parliamentary elections due in 2015. The Ministry has confirmed that they still plan to meet the 10% RES target in the transport sector but meeting the target without the draft legislation is unrealistic.

Overall, it can be said that without the RED, Estonia would not have pursued the mandatory requirement to supply biofuels or taken steps to introduce draft legislation to meet the 10% RES target in the transport sector. However, as mentioned, the draft legislation has been withdrawn and as a result of a lack of a legal basis the RED Articles have had no effect in Estonia so far.

There is therefore insufficient experience at this stage to assess the effectiveness of the sustainability criteria in protecting biodiversity and land with high carbon stock and ensuring the sustainability of biofuels production.

No views were provided in the interviews on whether the criteria were reviewed regularly enough or whether the right level of information was required. It was felt that the Articles have promoted innovation and investments but no supporting evidence was provided. Another potentially positive impact from the implementation of these Articles is that they would ultimately contribute to the harmonisation of the biofuels market within the EU and the development of the internal market.



### **Efficiency**

During the interviews it was estimated that the costs related to operation of the sustainability system could reach up to € 200,000 per year. This would, however, not include the initial costs incurred to develop the system.

From the suppliers' perspective, they estimated that the additional reporting burden related to sustainability criteria would be minimal as it would only involve adding a few lines to existing reporting obligations. However, there may be major compliance costs related to the necessary infrastructure upgrade (e.g. installation of tanks suitable for biofuels).

The stakeholders are not yet in a position to evaluate whether the same results could be achieved in a more cost-efficient way. The interviews did point out that there are, at present, numerous national biomass and biofuel sustainability certification schemes being developed or implemented in the EU. The schemes could work towards recognition at EU level, enabling companies to expand market coverage without extra certification. Time and comprehensive communication is needed to link relevant systems at all levels. Due to the short implementation periods of the RED, as well as different national circumstances, gaps exist in creating consistency amongst the systems which may again create depression of markets. However, no mechanism has yet been found to overcome the gaps.

### **Added value**

Based on the analysis above, there seems to have been limited added value from EU level intervention in terms of sustainability criteria unless the draft legislation, now withdrawn, is adopted.

### **Conclusions and recommendations**

Until a definitive legal framework is in place to implement and enforce sustainability criteria in Estonia, the impact of the RED on biofuels in Estonia will be limited at best.

## **F.2.9 Article 22 and 23: Reporting**

### **Effectiveness**

Estonia has submitted both 2011 and 2013 progress reports.

Overall, the reporting requirements from the RED have been well described. The information provided in the progress reports mostly follows these requirements and should therefore be considered as sufficient.

There were only few deviations from the template identified. For example, under Question 3 on support schemes, only one of the most important support schemes was discussed in the 2013 progress report, instead of providing information on all relevant support schemes, and Table 3 (to quantify the support provided) was not used. In some cases, there was insufficient information accessible for the Ministry to provide the information in the report (e.g. the amount of biomass from EU and non-EU countries).

### **Efficiency**

According to the Ministry, the production of the progress reports requires a large amount of work, in particular in terms of data collection as some of the data required cannot be derived from Eurostat and are not contained in existing national statistical databases (for example with regards to biomass). Therefore additional time and resources are required for data collection for the progress reports, as these; data are not always used for other national



purposes (e.g. overview of bioenergy). During the interviews, it was estimated that compiling the progress report can be expressed as one year's work for two full time staff members.

### **Added value**

The Ministry identified only minimal added value from this article of the RED. For example, it mentioned that during a recent EU level meeting, values from the NREAP were still being used even though the progress reports were already available. This implies doubt regarding whether the progress reports are actually being fully used for monitoring purposes.

### **Conclusions and recommendations**

The value of the progress reports is not maximised and would benefit from being better tied with updating the NREAPs (see earlier discussion). It was also suggested that in order to reduce administrative burden, only existing data should be required, although this may limit the ability of reports to monitor progress against RED targets.

During the interviews, the Ministry also mentioned that the template is rather old now and may need updating, but did not supply specific examples of how this might be done.

## **F.3 Sources and interviews**

### **AIB, 2014**

Website available at: [http://www.aib-net.org/portal/page/portal/AIB\\_HOME](http://www.aib-net.org/portal/page/portal/AIB_HOME)

### **Borenius, 2013**

Võrgueeskirja analüüs 2013

### **Ecofys, 2014**

Cooperation between EU Member States under the RES Directive. Task 1

Available at: <http://www.ecofys.com/files/files/ec-ecofys-tuvienna-2014-cooperation-member-states-res-directive.pdf>

### **Ecorys, 2014**

Statistical Transfer between Estonia and Luxembourg

Available at: [http://www.res-cooperation.eu/images/pdf-reports/2014\\_Cooperation\\_under\\_the\\_RES\\_Directive\\_Case\\_study\\_Statistical\\_Transfer\\_Estonia\\_Luxembourg.pdf](http://www.res-cooperation.eu/images/pdf-reports/2014_Cooperation_under_the_RES_Directive_Case_study_Statistical_Transfer_Estonia_Luxembourg.pdf)

### **Elering, 2014**

Webpage: Certificate of Origin

Available at: <http://elering.ee/certificate-of-origin-3/>

### **ELMO, 2014**

Estonian Electromobility Programme (Elmo)

Renewable Energy for Electric Cars Derives from 220 Energia

Available at: <http://elmo.ee/elektriautode-taastuenergia-tuleb-220-energialt/>

### **Estlink, 2014**

EstLink 2 has been taken over

Available at: <http://estlink2.elering.ee/news-2/?article=17193>



**Estonian Parliament, 2014a**

Act amending the Electricity Market Act and other legislation in regards to the Second Additional State Budget Act for 2009. State Budget act for 2009 (318 SE)

Available at: <http://www.riigikogu.ee/?op=ems&page=eelnou&eid=188f4633-4b15-41b6-a2dc-8bfe0e25946f&>

**Estonian Parliament, 2014b**

Act amending the Electricity Market Act (687 SE)

Available at: <http://www.riigikogu.ee/?op=ems&page=eelnou&eid=703cf508-cb75-4e89-a4ee-3666c6092a84&>

**Estonian Parliament, 2014c**

Act amending Liquefied Fuel Act and Ambient Air Act (675 SE)

Available at: <http://www.riigikogu.ee/?op=ems&page=eelnou&eid=da929829-584b-495f-b983-4a949eff5f2b&>

**GL Garrad Hassan**

Review of the Estonian Grid Code

S.l. : GL Garrad Hassan Germany GmbH

**Ministry of Agriculture, 2007**

Development Plan 2007–2013 for Enhancing the Use of Biomass and Bioenergy, Available at:

<http://www.agri.ee/sites/default/files/public/juurkataloog/BIOENERGEETIKA/bioenergia.pdf>.

**Ministry of Economic Affairs and Communications, 2013**

Renewable Energy Progress Report

**Ministry of Economic Affairs and Communications, 2011**

Renewable Energy Progress Report

**Öko-Institut and Eclareon, 2012**

Integration of electricity from renewables to the electricity grid and to the electricity market - RES-INTEGRATION, final report

Berlin : Öko-Institut ; Eclareon, 2012

Available at: <http://www.oeko.de/oekodoc/1378/2012-012-en.pdf>

**Riigi Teataja, 2014a**

Electricity Market Act (RT I, 12.07.2014, 20)

Available in English at:

<https://www.riigiteataja.ee/en/eli/528082014005/consolide>

**Riigi Teataja, 2014b**

Grid Code (RT I, 19.11.2014, 3)

Available at: <https://www.riigiteataja.ee/akt/119112014003>

**Riigi Teataja, 2014c**

Regulation of Ministry of Environment no 45

Environmental requirements for liquid fuels, sustainability criteria of biofuels, monitoring and reporting procedures for liquid fuels for compliance with environmental requirements, and greenhouse gas emission reduction determination methodology for biofuels and liquid biofuels (RT I, 29.07.2014, 10)

Available at: <https://www.riigiteataja.ee/akt/129072014010>





**Riigi Teataja, 2011**

Alcohol, Tobacco, Fuel and Electricity Excise Duty Act

**Riigi Teataja, 2010**

National Renewable Energy Action Plan  
(RT III, 30.11.2010, 3)

**Riigi Teataja, 2009**

National Development Plan of the Energy Sector up to 2020 (RT I 2009, 33, 215)

Available at: <https://www.riigiteataja.ee/akt/13194286>

**Riigi Teataja, 2004**

Long-Term Fuel and Energy Sector Development Plan to 2015 (RT I 2004, 88, 601)

Available at: <https://www.riigiteataja.ee/akt/829062>

**SmartGridNews.com, 2014**

Six Lessons from Estonia's Smart Metering Push

Available at:

<http://www.smartgridnews.com/story/6-lessons-estonias-smart-metering-push/2014-09-08>

**The National Audit Office, 2006**

Handling of issues related to rape and biodiesel fuel by the Government, Audit report No. OSIV-2-6/06/25 28.04.2006

Available at:

<http://www.riigikontroll.ee/tabid/215/Audit/1932/WorkerTab/Audit/WorkerId/55/language/et-EE/Default.aspx>

**Interviews**

For this case study, the following organisations were interviewed:

- The Estonian Renewable Energy Association;
- The Ministry of Economic Affairs and Communications;
- The Estonian Oil Union; and
- Skinest Energia AS.

The transmission network operator (Elering), the Ministry of Environment and Baltic Wind Energy OU were also contacted but declined to be interviewed.



# Annex G Country report: Germany

## G.1 General framework

### **Institutional and administrative context; responsibilities for RED implementation**

The coalition agreement of 2013 (CDU/CSU/SPD, 2013) defines new competencies for the different ministries, for example, centralising the energy portfolio under the roof of the Ministry for Economic Affairs and Energy (Bundesministerium für Wirtschaft und Energie, BMWi) and thus largely ending the split of political responsibility on energy issues between the former Ministry for Economy and the Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, BMUB).

The Ministry for Economic Affairs and Energy (BMWi) took over the responsibility for the transposition of the EU law into German law in the field of energy policy, including RES, and thus of the RED.

Regulatory functions are carried out by the Federal Grid Agency (Bundesnetzagentur, BNetzA) which is responsible inter alia for regulating the energy market and for implementing the Grid Expansion Acceleration Act. The BNetzA is also foreseen to implement and to operate the new tendering system under the Renewable Energy Sources Act (initially only applicable to free field PV plants; at the latest from 2017 onwards also for all other RES plants). Furthermore the BNetzA is responsible for the control of further provisions as laid down in Article 85 Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, EEG), which are of minor relevance with regard to the present study.

The Federal Environment Agency (Umweltbundesamt, UBA) is responsible inter alia for the implementation of the guarantees of origins registry (Herkunftsnachweisregister). The UBA also issues guarantees of origin to RES producers which, in contrast to certificates of origin, do not give rise to any ownership rights and are not part of the support scheme for RES, as their purpose is to provide confirmation for the final customer that the stated amount of electricity introduced to the distribution or transmission grid has been generated from RES.

The Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, BLE) is the competent authority for the enforcement of the sustainability criteria laid down in Directive 2009/28/EC; the Federal Ministry for the Environment, however, is responsible to control the exact implementation of Article 17-19, 21 RED.



## Energy policy

The current energy policy is defined in the 'Energy Concept', a document adopted by the Government in 2010 (Bundesregierung, 2010).

The 2010 Energy Concept sets the following targets:

Targets	2020	2030	2050
GHG emissions (compared to 1990)	-40%	-55%	-80% to -95%
Renewable Energies			
Share of total energy consumption	18%	30%	60%
Share of total electricity consumption	35%	50%	80%
Primary energy consumption (compared to 2008)	-20%		-50%
Energy productivity	+2.1%/yr (2008-2050)		

Source: Bundesregierung, 2010; BMWi/BMU 2012.

Next to these targets, the 2010 Energy Concept also outlines specific targets for the building sector (20% reduction of heat demand by 2020; 80% reduction of primary energy demand by 2050) and for the transport sector (10% reduction of the end energy consumption by 2020 and 40% reduction by 2050 compared to 2005) (Bundesregierung, 2010). Several legislative acts have been agreed on in 2011 to implement the Energy Concept.

In December 2012, the government presented the first annual monitoring report on the 'Energiewende' (BMWi/BMU, 2012) including an advisory report by an expert commission giving additional information and outlining the progress and main challenges (Expertenkommission, 2012). On 3 December 2014 the government signed off on the first report on the progress of the 'Energiewende' together with the action programme on climate protection 2020 and the national action plan on energy efficiency. The focus of this comprehensive package of measures on climate protection lies on energy efficiency with inter alia plans to introduce tax incentives for energy-related building renovations and to boost competitive tendering for energy-saving projects. With the Action Programme on Climate Protection 2020, the government included additional measures to reach the 2020 target, as according to current estimates, Germany would most likely have missed its goal by 5 to 8% without the new plan. The statement of the expert commission, however, points out that the instruments still need concretisation and quantification in order to effectively reach its objectives (Expertenkommission, 2014).

Based on the Energy Concept, the national target is to increase the share of RES in electricity production to 35% by 2020. The coalition agreement of the new government formed by CDU/CSU and SPD foresees now a corridor for the expansion of RES including an upper and lower bound. By 2025, a maximum share of 40-45% and by 2035, a maximum share of 50-65% should be achieved (CDU/CSU/SPD, 2013). These targets seem to be in line with the previous 2020 target, although there has been no upper limit so far. However, according to the German Renewable Energy Federation (Bundesverband Erneuerbare Energie, BEE), the implementation of an upper bound for renewable electricity generation implies that the annual growth rate of 2.2% over the last four years will decrease to 1.34% until 2025 which constitutes a massive slow-down of the RES expansion (BEE, 2013b). The German Advisory Council on the Environment (SRU) emphasized that a share of 60-70% of renewable electricity generation by 2030 is economically and socially feasible (SRU, 2013).



## Legal framework

The requirements of the RED are implemented into national legislation mainly with the Renewable Energy Sources Act (EEG), the Renewable Heat Act (Erneuerbare-Energien-Wärme-Gesetz, EEWärmeG), the ordinance on GOs (Herkunftsnachweisverordnung, HkNV), the Biofuel sustainability ordinance (Biokraftstoff-Nachhaltigkeitsverordnung, Biokraft-NachV) and the biomass-electricity-sustainability ordinance (Biomassestrom-Nachhaltigkeitsverordnung, BioSt-NachV).

## Current RES support schemes

The principle instrument for the promotion of renewable electricity is the Renewable Energy Sources Act (EEG) that basically guarantees priority access of the RES installations and feed-in of the electricity as well as fixed feed-in tariffs. As one of its first actions, the new coalition fundamentally reformed the feed-in tariffs system in 2014. The main changes are shortly described here:

- limits regarding the annual extension of RES plants (so-called extension corridors);
- direct marketing becomes mandatory for new RES plants - statutory FIT only in exceptional cases and for small plants;
- stepwise introduction of an auctioning system for determining the future support levels;
- obligation of new domestic consumption plants to (partly) pay the EEG-surcharge;
- adapted special balancing scheme for electricity-costs-intensive undertakings.

With regard to the promotion of renewable heat, the principal instrument is the 2008 Renewable Energies Heat Act (EEWärmeG), last amended in 2011 that obliges owners of any new buildings and of public buildings undergoing major renovations to cover part of the heating or cooling with RES. The overall objective is to increase the share of RES in heating to 14% in 2020. Calculations by the working group energy balance (AG Energiebilanzen) revealed that heat from RES has a share of 10% in the heat market and accounted for an annual savings of GHG emissions of 40 million tCO<sub>2</sub>eq in 2012.

In the transport sector, the relevant RED articles have been implemented with a biofuels quota system and the biofuels sustainability ordinance based on the Federal Pollution Control Act. The (minimum) biofuels quota of 6.25% per year (years 2010-2014) will be changed to a GHG reduction quota starting on 1 January 2015. This quota is set at 3.5% for the years 2015 and 2016, followed by 4.5% in 2017 and 7% in 2020 and refers to the required minimum GHG-savings of the biofuels placed on the market in relation to fossil fuels as reference fuels. Besides the quota, biofuels were supported through fiscal regulation; this support was phased out from 2013 onwards as the associated tax deficits were no longer compatible with the governments' consolidation politics (BT-Drs. 16/2709, page 1).



## G.2 Assessment of the effectiveness, efficiency and added value of the RED

### G.2.1 Article 3: Targets and measures

At least concerning interim goals, Germany is well on track with a RES share of 25.3% in the total electricity consumption in 2013 (AGEE-Stat, 2014). In the heating and cooling sector the RES share amounts to 9.1% of the total heat consumption in 2013 (AGEE-Stat, 2014). In the transport sector, the share of biofuels slightly decreased in 2013 compared to 2012 from 6.1 to 5.5% of total energy consumption (AGEE-Stat, 2014).

#### Effectiveness

Germany had official RES targets in the electricity as well as the heating and cooling sector before the implementation of the RED in 2009 as laid down in the EEG 2009 (§ 1 (2): at least 30% of the total electricity consumption in 2020) and the EEWärmeG 2008 (§ 1 (2): 14% of the total heating and cooling consumption in 2020). These targets, however, were not legally binding but have the character of declarations of intent. In the transport sector there were no official biofuels or RES targets before the adoption of the RED.

The target in the NREAP was set at 18% of the total energy consumption and was therefore concurrent with the RED target for Germany. Regarding the expected 19.6% RES share in gross final consumption in 2020, the government explicitly points out in its NREAP 2010 that this is not a national target of the Federal Government.

All interviewed stakeholders agree that the binding targets have been effective means to drive the RES sector. The fact that these targets are binding has been and still is conducive for investor security. Besides this, the binding targets have led to the initiation of a transformation of the energy system all over the EU instead of being restricted to a single MS. In doing so, the objective of a common internal energy market has been given an extra impetus.

Concerning the transport sector, it was pointed out by Sauter that nothing would have happened without the sector-specific binding targets as the relative CO<sub>2</sub>-reduction costs are higher in the transport sector than in the other sectors (Sauter-Verbio AG, 2014).

The target setting on the basis of the resource potential of the MS on the one hand and their GDP, i.e. their ability to exploit their potential, on the other hand combined with an 'early starter bonus' for MS that had achieved reasonable growth in recent years is seen as appropriate by all stakeholders that have been asked the respective question.

BEE indicated that some of the national overall RES targets (for example in Sweden, Austria and Poland) obviously have been set too generously. Applying the existing directive, the European Commission should insist on additional measures to fully achieve the targets in all Member States. Another point is that the definition of RES seems to be too broad especially with regard to co-firing biomass in coal-fired plants. As this sets no incentives for innovation, the definition of RES should be adapted in a revision of the RED (BEE, 2014).

In terms of target achievability the stakeholders from the public sector as well as the stakeholders from the private sector consented that it will be possible to reach the 18% target. In terms of the transport sector target, the picture is



different: While there is consensus that the 10% target could have been achievable in Germany, stakeholders pointed out that this minimum target no longer seems to be the subject of discussion (Sauter-Verbio AG, 2014). The proposal of the European Commission to limit the share of first generation biofuels and require greater use of non-food feedstock (European Commission, 2012) and the reactions of the European Council were the starting point of long lasting discussions that are still not settled. This entails a huge insecurity especially for the producers, suppliers and investors in the biofuels sector and could lead to overall non-compliance (Sauter-Verbio AG, 2014).

### **Efficiency**

Stakeholders from the public sector indicate that the RED clearly defines the information and data delivery duties of all RES actors and therefore its implementation in national law led to a reduction of the administrative costs on public authorities and economic stakeholders as well. Besides this, the overall RES extension on the basis of the binding targets of the RED will probably reduce the overall costs of the necessary transformation of the energy system. Common efforts can lead to a quicker completion of the learning curves and therefore contribute to driving down costs of technologies as well as services.

In Germany, with its already existing RES support instruments which only had to be adapted to a minor degree (mainly regarding the Guarantees of Origin and an improvement of grid access), the overall administrative burden, presumably, has decreased through the RED implementation.

The non-mandatory instruction to promote and encourage energy efficiency and energy savings as laid down in the last sentence of Article 3 (1) RED seems to have been barely noticed. The (direct) link between the RED and domestic energy efficiency targets seems to not have been established. Stakeholders pointed out that in comparison to the European Directive on Energy efficiency, this instruction did not have any effect or at most had a minor effect with regard to the setting of the energy efficiency objectives.

The EAG EE (the act implementing the RED into German law) also only mentions energy efficiency in the context of an increase of energy efficiency in public buildings and thus underlines the finding.

The RED probably has resulted in cost reductions of RES deployment, compared with no EU level action, according to interview partners, as EU-wide joint efforts lead to a reduction of the costs for the necessary energy system transformation as well as a decrease of RES technology costs due to its EU-wide coverage.

Sauter refers to the declining costs of biofuels in absolute terms - bioethanol even being significantly cheaper than gasoline over the last year - and traces this back to a continuous reduction of production costs. This was only possible because a huge number of investments were initiated by the RED and its implementation became a necessity in the EU MS (Sauter-Verbio AG, 2014).

### **Added value**

In the transport sector, Sauter points out that the current results would not have been achieved without the RED as the mandatory sectoral targets are essential and would not have been laid down at the domestic level (Sauter-Verbio AG, 2014).

Without the Directive's RES targets, there would have been the same RES expansion in Germany but in other EU MS this was different. The RED provided additional momentum. But even in Germany, the publicly communicated mandatory targets in combination with the obligations in the NREAP make it much more difficult to fall behind the planned measures with regard to timing (BEE, 2014).

### **Conclusions and recommendations**

All interview partners agree on the necessity of binding and sectoral national targets for the achievement of RED objectives in a certain time period. It is essential, however, to find the right balance between setting ambitious and sector-specific targets and leaving sufficient leeway for MS when it comes to the details of these targets (such as sub-targets or sub-categories for the relevant sectors).

#### **G.2.2 Article 4: National Renewable Energy Action Plans**

The total share of RES in the gross final consumption of energy in Germany in 2012 was 12.4%, slightly above the forecast value of 11.4% given in the National Renewable Energy Action Plan (NREAP). Electricity generation from solar, wind, hydro, biomass and geothermal energy rose during the reporting period from 18.1% in 2010 to 23.6% in 2012. This is about 10% better than the estimates in the NREAP for 2012 (125,258 GWh).

#### **Effectiveness**

The general picture is that the NREAP template and procedures as well as the NREAP itself are looked upon favourably in Germany. Substantially there is nothing missing. BEE pointed out that this procedure is needed also in the future, since it prevents MS from falling short of the RED objectives and the related plans and measures (BEE, 2014).

One stakeholder points out that the NREAPs of other EU MS are beneficial for German business companies willing to invest in these MS as the NREAPs are seen as reliable bases for MS plans and measures. None of the stakeholders mentioned that the effectiveness is reduced because the implementation of actual MS policies deviates from the measures in the NREAPs, as does the expected uptake of the various RES technologies.

An example of an unforeseen impact is mentioned by BEE: In its NREAP 2011, the government estimated the development of PV to be 52 GW in 2020. Despite the fact that this was only an estimate (and explicitly not a goal) this value was first used to shape the upper level of the extension corridor in the EEG. In the following, the 52 GW was set as the maximum amount of PV that will be supported under the EEG. The estimation in the NREAP thereby developed a momentum that led to a rather problematic and unforeseen result (BEE, 2014).



### **Efficiency**

The drafting of the forecast document in Germany has been prepared with the scientific support of several research institutes.

The BMWi has a whole department dealing with monitoring and statistics. As\ national reporting and the NREAP are two processes that are not running in parallel, additional costs occur. Information on these costs (in terms of man-days, etc.), however, could not be given by the interview partners and this information is not publicly available.

The efforts involved for the development of the NREAPs, however, are not seen as too onerous based on the fact that in Germany, the expertise and the data are already there and basically had to be put in a different content and structure.

### **Added value**

The Government has to evaluate the EEG as well as the EEWärmeG and to report on this evaluation to the Parliament (Bundestag) every four years (Erfahrungsbericht, Article 97 EEG and Article 18 EEWärmeG). Under the EEG, these assessment reports pursue the objective to analyse each RES sector separately on its performance as well as on necessary changes regarding the relevant provisions to form the basis for revisions of the EEG. A similar approach applies for the EEWärmeG.

In addition, the Government has to annually report to the Bundestag inter alia on the state of the RES expansion and the target achievement (Monitoringbericht, Article 98 EEG).

Besides this, the BMWi is responsible as the lead ministry for the Energiewende annual monitoring reports. These monitoring reports are complemented by the progress report every three years (Fortschrittsbericht). Based on recent official statistical data, these reports analyse the national measures on their contribution to target compliance and give access to the necessity of additional measures and politics.

These reports, however, are for national purposes and differ, mainly in structure, from the NREAPs.

### **Conclusions and recommendations**

One interview partner suggested aggregating the national reporting obligations on energy efficiency, RES expansion and climate protection under the Governance 2030 as this could lead to a more coordinated joined-up thinking of the respective measures that are linked together.

#### **G.2.3 Article 6-12: Cooperation mechanisms**

Germany is not yet involved in any of the cooperation mechanisms as laid down in Articles 6-12 RED. However, there have been discussions and project initiations with several MS but in the end, the concrete implementation of a joint project failed mainly because no consensus could be reached concerning the distribution of the costs and benefits of the envisaged projects. Discussions between GB and Ireland seem to have failed due to similar problems.

### **Effectiveness**

As Germany has reached the interim goals for RES extension and is still expecting to exceed the 2020 RES objective on the one hand and on the other has basically committed itself to reach the targets domestically, it has no immediate need to make use of the cooperation mechanisms either as a seller or a buyer.

This, however, could change in the near future as the new Guidelines on State aid for environmental protection and energy 2014-2020 as a general rule oblige MS to grant future RES subsidies only in the form of transboundary auctioning processes (European Commission, 2014). As a consequence, according to one stakeholder of the public sector, a number of MS could be more willing to use the cooperation mechanisms in order to gain experiences with a view towards future common auctioning systems. Questions that have to be answered inter alia concern national targets. However, there is still no market for these kinds of actions and presumably, private operators especially still need additional incentives.

One stakeholder points out that because of the rather disappointing Council Conclusions on 2030 Climate and Energy Policy Framework, there is uncertainty concerning the execution of the 2020 RES targets as well as concerning the future legal framework. In respect to the character of the RES targets, at national level there is currently no incentive to make use of the cooperation mechanisms either from the side of potential sellers or buyers. In the author's opinion, this might change if the Governance 2030 and especially the part on fostering regional cooperation take shape.

BEE highlighted that the existing cooperation mechanisms are difficult to grasp. In addition, the assumption that buying RES power or heating from abroad is less expensive than domestic action turned out to be incorrect in many cases and MS (BEE, 2014).

### **Efficiency**

As there is no involvement in cooperation mechanisms so far, no details can be given on the (expected) administrative burden and on the overall efficiency of these mechanisms.

### **Added value**

Question N/A

### **Conclusions and recommendations**

As has been shown in this section, the developments concerning state aid and subsidies gave momentum to a future use of these mechanisms as the number of MS looking for ways to prepare for cross-border auctioning significantly grows. An idea would be to appoint the European Commission as a kind of 'broker' or a transparency platform in this process. However, the still non-existing market is a clear restraint in the development of the cooperation mechanisms.

#### **G.2.4 Article 13: Administrative procedures**

The RES plants are subject to licensing procedures depending on their size and - where applicable - the raw materials used under the Federal Pollution Control Act (Bundesimmissionsschutzgesetz, BImSchG), the Federal Town and Country Planning Code (Baugesetzbuch, BauGB), the Codes of Construction Law of the Länder (Landesbauordnungen), the Federal Water Act, the Federal Nature Protection Act (Bundesnaturschutzgesetz, BNatSchG) and/or the

Environmental Impact Assessment Act (Umweltverträglichkeitsprüfungsgesetz, UVPG). The responsibility to enforce these Acts generally lies with the federal states (Länder) but enforcement follows common or very similar requirements. The Federal Ministry for the Environment, however, is the competent authority for the implementation of the respective RED-Article.

### **Effectiveness**

According to the interview partners, this article did not play an important role in Germany as the approval and licensing procedures for RES installations were already streamlined before 2009 in order to speed up the RES expansion. Although a formal one-stop-shop does not exist, licensing procedures are sped up on the basis of the so-called concentrating effect of Article 13 Federal Pollution Control Act. This concentrating effect on the one hand ensures the coordination of the different responsible authorities and on the other hand simplifies the procedure as the installation owner in general has to apply for a license only at the competent pollution control authority.

Administrative procedures are expedited with appropriate time limits: The decision period for approvals under the Federal Pollution Control Act is seven months for the formal procedure, for the simplified procedure it is in general three months (Article 10 (6a)).

Spatial planning which, for example, contains height and distance restrictions for erecting wind power plants, differs from one federal state to another and can even differ within one state as some municipalities have planning authority on these issues and can decide, for example, to include a height limitation in their land-use plan (a common limitation is around 100 m overall height). These restrictions may hamper repowering of older wind power plants (Fouquet et al., 2010).

However, none of the interview partners mentioned either approval procedures for RES installations or spatial planning or procedures for grid reinforcement as barriers to the RES deployment in Germany.

### **Efficiency**

For certain types of installations, a simplified procedure is provided which takes Article 13 RED into account. The simplified procedure is regulated in Article 19 BImSchG which declares inapplicable certain rules that apply to the formal approval process. In particular, Articles 10(3) (5), 11 and 14 of the BImSchG (exclusion of certain objections and claims) do not apply. The deadline for the authorities' decision is only three instead of seven months and therefore much tighter than for the formal approval. The approval in the simplified procedure also has the so-called concentrating effect.

As such, the article did not have an effect on the administrative burden in Germany as the provisions were already there.

### **Conclusions and recommendations**

Article 13 RED does not seem to be the focus of the interest of the interview partners; to the opinion of the author this is an indication of the general functioning of the respective regulation on the national level.

No recommendations were made regarding the further development of this Article.

### G.2.5 Article 14: Information and training

In Germany, all recognised skilled trades require a legally binding vocational training to receive the necessary title to work in their field. The content of the training is set by the training regulations which are developed and updated with the involvement of trade associations, chambers of trade as well as guilds. The training regulations are continuously updated to meet market demand for certain skills. The regulations are formulated to be technology-open and function-oriented. RES were identified very early as new market opportunities and vocational trainings were adapted. Since 2003, RES are part of the relevant vocational trainings. The dual vocational training system consists of a theoretical and a practical component. Companies working in skilled trades can only be run by craftsmen with a master tradesmen certificate or graduation from an equal vocational training (e.g. abroad) or a university degree in a technical subject. This master tradesmen certificate has to be earned with an additional fee-based education of four months to two years (when carried out full-time) on top of the usual vocational training with an apprenticeship examination.

The German vocational training system for skilled trades is highly regulated and therefore creates a market entry barrier. At the same time, this guarantees a high level of education for the whole skilled trades sector. German apprentices without master certificate are usually rated 3-4 on the scale of the European Qualification Framework.

Certain trades are only permitted to do certain work. Therefore, vocational training is very specific for each trade. The installation of RES systems is carried out by trades such as electrical technicians, plumbing and heating installers or roofers. Generally, workload is high on the side of the RES installers. There is a lack of apprentices due to demographic changes and a higher share of students seeking higher education. At the same time, tasks for installers are getting more complex, raising requirements in vocational trainings which not all apprentices can meet.

#### Effectiveness

The influence of Article 14 RED on the uptake of RES in Germany can be assessed as negligible. When the RED entered into force, the necessary training infrastructure had already been implemented and RES were already on the rise (BEE, 2014). Moreover, due to the characteristics of the German vocational training system, certification only plays a role in niches. Article 14 RED was implemented with Article 16a EEWärmeG, which, however, is rather declaratory in nature.

In terms of qualification, a study carried out for the German Environmental Ministry concluded that there was no need to implement provisions of Article 14 RED. The provisions of Article 14 Annex IV RED were appraised as fulfilled with the existing vocational training system in Germany. However, to assure knowledge and qualification regarding RES installations of installers with a less recent training background, the voluntary advanced training programme 'Fachkraft für erneuerbare Energien' was created. The programme uses a broad approach covering technical, legal and economic aspects of renewable energy installations addressed in Article 14 RED and is open to a broad range of trades. However, so far only 10 of 53 chambers of trades have introduced examination guidelines for this programme, four further chambers are planning an introduction while 28 have not moved on this topic so far. The total number of programme participants in 2013 was five. Many chambers of trade do not see the benefit of this programme on top of the usual training as they deem the existing system to be sufficient. One reason for the low



participation in the introduced trainings is seen in the broad training approach of the programme which does not fit well with the specific training expectations of the various trades. Also programme costs and time are mentioned as barriers for participation.

The report on deviations and barriers from the '2020 Keep on Track!' project mentions that German installers in the field of RES heating and cooling still lack technical expertise which is seen as a barrier for RES uptake, especially in the heat sector. Our interview partners mainly share this assessment, especially pointing at insufficient calibration of solar thermal and heat pump installations and therefore less than optimal energy harvests. However, they only partially regard a lack of training to be the reason for this. Installers sometimes simply do not offer the calibration of the installations as part of their service, as this needs regular checkups during the first months of application and reduces time for further installations. Generally, workload is high on the side of the RES installers and there is a lack of work force (especially regarding apprentices). Consumers for their part often do not know about the specifics of RES installations and requirements towards calibration and therefore do not demand for these specifics.

### **Efficiency**

Regarding administrative burden, Article 14 RED had only limited impacts in Germany. On the side of the regulatory institutions, some additional effort was required for the comparison of Article 14 RED provisions and the existing German qualification system. The advanced training programme 'Fachkraft für Erneuerbare Energien', introduced upon the implementation of the RED added administrative burden mainly at the beginning of its introduction, when training and examination regulations had to be developed. A quantification of the effort could not be made.

On the side of the installers there is potential administrative burden in the case of programme participation. Participation is fee-based, but sometimes co-funded by regional government projects or chambers of trade. A larger burden is the amount of time needed for completion. Price and length of the training depend on the local programme design implemented by the responsible chamber of trade. The programmes generally consist of a general module and technology-specific modules (photovoltaic, solar thermal, heat pumps, biomass). Training, including the general module and two technology specialisations, can take around 200 hours (Handwerkskammer Koblenz, 2014). Often the training can be carried out outside of working hours, thus not causing costs from lost working time. Nevertheless, installers are currently facing a high work load and often do not find the time to devote to training.

### **Added value**

From the German perspective, Article 14 RED generated low added value to the existing vocational training system. By the time of its introduction, the necessary training infrastructure had already been in place. RES have been part of vocational trainings in the relevant skilled trades since 2003. Nevertheless, there is a partial need to train installers who received vocational training before 2003. The newly created voluntary advanced training programme 'Fachkraft für erneuerbare Energien' was supposed to fill this gap. However, it has not been introduced country-wide to date and lacks participants where implemented.

Furthermore, the point was raised that Article 14 RED does not include country specific characteristics in terms of technology application. For example, heating systems in Northern countries are likely to be much more complex than in the South which should be mirrored in relating training systems. A single minimum training standard of RES installers in Europe might therefore be inefficient and cause problems related to mutual recognition.

### **Conclusions and recommendations**

Leeway for country specific training systems is considered important as parallel systems are deemed to be ineffective and inefficient. Training systems should be designed in a technologically-open way and be flexible enough to react to market demands. The level of training is generally very high in Germany. However, installers with vocational training before 2003 could partly profit from an additional training on RES. However, programme design has been too broad and the required investment of time too extensive to create voluntary participation.

#### **G.2.6 Article 15: Guarantees of Origins**

Article 15 RED is one of the few provisions that needed additions and changes in the existing legal framework to be implemented (Bundestag, 2011) as this instrument was not foreseen in the required format and quality in the EEG.

The GO registry was established in 2013 and is maintained by the Federal Environmental Office (UBA). The official website is available at:

<https://www.hknr.de/Uba>

#### **Effectiveness**

In Germany, the GOs are exclusively used for electricity disclosure in a quantitative way; they are not a seal of quality. The GOs have their origin in consumer protection and according to Marty, the RED Article is transposed in a way that attaches much importance to the protection of the final customer in Germany (Marty-UBA, 2014).

The system of the GOs effectively prevents a double counting of electricity produced from RES and “green washing” and therefore contributes to a more reliable and trustworthy system in terms of sustainability and consumer-friendliness than the one before the introduction of GOs (Marty-UBA, 2014). This improvement holds true especially for the supply of RES electricity (eco-electricity) to customers as the electricity suppliers are obliged to use GOs for disclosure of electricity from RES according to Article 42 of the law on the energy sector (Energiewirtschaftsgesetz, EnWG). Besides that the GOs are often used for the verification of the criteria of eco-electricity. According to Marty, the GOs now receive high consumer acceptance while RECS were commonly criticized in Germany (Marty-UBA, 2014). One stakeholder pointed out that the Commission had originally planned to also use GOs for target compliance and thus mix up two things that should be kept apart (BEE, 2014).

Currently, GOs indicate that there exists another system of direct marketing of electricity from RES in addition to the system under the EEG. It is clear that the support scheme and GOs are two different things in Germany.

The tracking systems are estimated to be very effective in terms of auditing as well as fraud prevention, inaccuracy and multiple accounting: GOs ensure that double-marketing is no longer possible Europe-wide and prevent VAT-fraud via the cooperation of the different national GOs registers. In terms of prevention of inaccuracies, the UBA highlights that it plans to check the electricity disclosure together with the Federal Network Agency. The procedure for the





electricity delivered in 2013 will start in the 2<sup>nd</sup> quarter 2015 (Marty - UBA 2014). According to Article 85 EEG, the BNetzA is the competent authority for checking the disclosure according to the EEG.

Further positive impacts of the GOs according to Marty are the possibilities of an 'ecological charging' of the GOs. The option to include this kind of information in the GOs creates (additional) incentives such as, for example, ecological modernisations of hydro power plants with so-called fish-ladders, etc. Another optional measure is the 'tying' of the supplied eco-electricity to a determined installation in order to meet the expectation of the consumer towards the utility to not only buy the GO but also the RES electricity stemming from the RES installation (Marty-UBA, 2014).

Another positive impact is linked to the recognition of GOs issued by other EU MS. The examination of the foreign GOs on their compatibility with the relevant criteria (accuracy, reliability or veracity) have led to a temporary refusal of GOs from Norway and Iceland in some domains because it was observed that the disclosure or the preventing of double counting was not implemented in accordance with the respective Directive. This led to an adaptation of the legal systems in Norway and Iceland. The criteria, however, according to Marty, are formulated too vaguely and still lack concreteness. MS helped themselves by creating a catalogue of criteria (Marty-UBA, 2014).

Lastly, GOs led to an increase in public notice of the electricity disclosure by the respective connection of the two instruments.

No negative impacts have been detected. However, there is an additional need for public relations work as the system is not easily communicated according to the interview partners.

### **Efficiency**

Quantifications of the administrative burden placed by GOs on suppliers are not available. Not many plant owners and grid operators participate in the system yet due to the strong feed-in-system which prohibits the issuing of GOs for the same amount of electricity. As the participation is obligatory for suppliers of eco-electricity and grid operators, these stakeholders have to bear costs for the personnel dealing with the system or for external service providers and the fees of the UBA.

The UBA, however, developed an easy system together with the Federal Association of Energy and Water Management (BDEW) building on existing procedures and data that has to be delivered to transmission grid operators anyway.

When taking into account that GOs can be used to promote enterprise-policies and contribute to internal as well as external corporate communications, to the author's opinion it can be assumed that the benefits outweigh the administrative burdens.

In the UBA itself, 10 personnel positions are foreseen for the tasks under the GO register in the explanatory remark of the Ordinance on the GOs (Begründung HKN-V). Additional costs incur for the software of the register and its further development, maintenance, hosting and other operating costs. The one-off costs for the development and establishment of the register were expected to account for one million Euros in 2013. In addition, annual costs for the continuing operation are estimated to amount to € 200 000 (Begründung HKN-V).



According to the UBA, 43 million GOs were imported in 2013 and 46 million in 2014 (state of end of September) as the demand for eco-electricity is steadily increasing. The biggest part of the GOs comes from Norway, Austria and Switzerland (Marty-UBA, 2014). For more details:

[http://www.umweltbundesamt.de/sites/default/files/medien/376/dokument/e/statistik\\_des\\_deutschen\\_herkunftsnachweisregisters\\_fuer\\_strom\\_aus\\_erneuerbaren\\_energien\\_2014\\_mit\\_legende.pdf](http://www.umweltbundesamt.de/sites/default/files/medien/376/dokument/e/statistik_des_deutschen_herkunftsnachweisregisters_fuer_strom_aus_erneuerbaren_energien_2014_mit_legende.pdf)

### **Added Value**

According to the UBA, a GO system and register would not have been introduced in Germany without the RED. Although there was some demand for RES certificates and the RECS system with a register did exist, this did not turn out to have a broader effect (Marty-UBA, 2014).

The standardized approach of Article 15 RED has a high intrinsic value as all EU MS have to establish GO systems on a similar basis. Under the CARES project, a working group developed and published a catalogue of criteria as a basis for the recognition of foreign GOs in order to specify the rather vague terms in the RED. If some of these criteria would be included in Article 15 RED, this might be sufficient to make the terms ‘accuracy’, ‘reliability’ and ‘veracity’ (more) manageable. In order to increase the value added of the EU approach, the European Commission should possibly engage in creating and supporting a platform for exchange of the MS on the further development of the GOs and their recognition (Marty-UBA, 2014).

### **Conclusions and recommendations**

As the electricity market is highly complex, an active and regular exchange with the grid operators and the suppliers is necessary in order to develop a reliable and easy GO system. The details given in Article 15 RED were helpful and necessary in the implementation process. It is necessary to assist new EU MS in implementing this Article (Marty-UBA, 2014).

If the electricity disclosure would be extended to all energy sources, this could lead to an overall increase of the effectiveness of the GOs according to the UBA. If the GOs were additionally mentioned in the Single Electricity Market Directive or another strong link between Article 15 RED and the Single Electricity Market Directive could be drawn, this would reinforce the connection between GOs and electricity disclosure and might provide an additional boost to the deployment of GOs (Marty-UBA, 2014).

If the GOs were made obligatory for electricity suppliers that are supplying consumers with eco-electricity in all EU MS, this could give them a greater significance and accelerate their deployment (Marty-UBA, 2014).

Another measure to increase the deployment of GOs as well as its public perception and understanding would be the ‘tying’ of both the GO and the supplied amount of eco-electricity to the respective RES installations (as already implemented in the German system). The European Commission could include such a provision in Article 15 RED and thus contribute to an EU-wide recognition and exchange of GOs which is demanded by the end-consumers.

A future linking of the GOs with support schemes or (direct) marketing models is another option to foster the importance of GOs. In Germany, there is currently a debate on such a ‘green electricity marketing model’ based on the Government’s power to issue an ordinance in Article 95 no. 6 EEG where GOs could play a role (Marty-UBA, 2014).



Finally, the UBA suggests to mandate public authorities with no self-interests in GOs to carry out the tasks of the competent body under Article 15 RED.

## **G.2.7 Article 16: Access to and operation of the grids**

### **Effectiveness**

The national implementation of Article 16 RED did not directly improve grid access conditions in Germany as RES plant operators were already guaranteed priority grid access beforehand. The content of the article with its detailed provisions on grid access and information duties, however, according to one stakeholder of the public sector, added to the legal security and by this to investment security both for plant and grid operators. Article 16 RED played an important political role in Germany as it helped to defend the priority grid access for RES installations.

Transmission and distribution grid planning in Germany are to be aligned with each other to integrate RES via a variety of instruments. In reality, however, both transmission and distribution grid companies plan their grid investments separately based on the available information about their grid. The network development plan conducted by the TSOs each year considers the aggregated data of the expansion of the distribution grid. However, according to regulatory expert view, there is no integrated and coordinated network development, which might even be very challenging in particular due to the high fragmentation level of the German DSOs.

A recent study on the distribution grids suggested among other things the setting of efficient incentives to trigger the right choice of investment instruments like for example the utilisation of smart grid technologies as a valid alternative to the traditional expansion of the grid (E-Bridge et al., 2014). According to this study, smart grids and the controllability of decentralised power plants shall be taken into account in the grid planning processes in order to reduce the costs of conventional grid extension (E-Bridge et al., 2014). As in the current regulatory regime there is no specific incentive to use more opex weighted (or related) smart technologies it is planned to adapt the incentive regulation in this respect.

The EEG does not foresee explicit limitations for installed capacities or capacity quota for RES access to the network. Only as an interim solution, the output of RES plants can be limited in case of (feared) system irregularities. The EEG 2014 now also obliges smaller PV plants to provide the necessary technology for output limitations. The general rule in Article 12 EEG is that the grid has to be expanded in order to integrate the output of all RES producers in the electricity sector as long as it is economical feasible. The DSOs/TSOs are allowed to curtail RES production to the grid only in exceptional cases under the conditions as laid down in Article 13.2 EnWG as well as in Article 14 EEG (the so-called Einspeisemanagement). In case of such an exceptional curtailed production, the RES installation owner, however, has to be compensated for 95% of his or her lost income. This provision already existed before the RED was implemented and according to interview partners provides a good compromise.

According to the already mentioned study on distribution grids, smart grids and the controllability of decentralised power plants shall be taken into account in the grid planning processes in order to reduce the costs of grid extension (E-Bridge et al., 2014).

### **Efficiency**

The administrative burden is estimated to be quite low. The estimations in the grounds of the EAG-EE were criticized to be too high by the Federal Statistical Office as the implementation also led to simplifications especially with regard to the information duties of the economic operators.

### **Added Value**

Question N/A

### **Conclusions and recommendations**

Interview partners highlighted that they are satisfied with Article 16 RED as it currently stands. The inclusion of more details would be rather negative as this would mean a change in a well-balanced and effective system.

## **G.2.8 Articles 17-19, 21 (2): Sustainability criteria for biofuels and bioliquids**

In the German NREAP, it is estimated that the RES share in the transport sector will amount to 13.2%. As driving forces, the energetic quota and the GHG quota from 2015 onwards respectively for biofuels as well as the double counting according to Article 21 (2) RED are mentioned by the Government. However, in the current public debate, it is questioned if the 10% target is still achievable due to the (planned) changes in the legal system at national as well as at European levels and the insecurity about the future framework after 2030.

### **Effectiveness**

Interview partners from the public sector highlighted that the most relevant sustainability aspects are covered. The RED started with the most important aspects: GHG emissions and nature protection. The handling of iLUC, however, is missing in the RED and this is very problematic especially with regard to biofuels. The European Commission should foster its respective proposal concerning the iLUC problem.

According to BEE, the sustainability criteria played an important and clarifying role. Sauter pointed out that the system as such is good and is covering all necessary sustainability aspects (Sauter-Verbio AG, 2014). However, the provisions according to interview partners from the private sector are not implemented and enforced systematically throughout the EU and thus a level playing field does not exist (BEE, 2014 and Sauter-Verbio AG, 2014).

BEE complains about politics on national and European levels 'shying' away from clear guidance and targets and target enforcement in the biofuels and biomass sectors, partly because of the predominating negative public opinion. In respect to biofuels, the application of the sustainability criteria has been going on for years and the iLUC problem is about to be cured by inappropriate means. On the other hand, the transfer of the sustainability criteria to the whole biomass sector is not yet decided. Ongoing discussions, however, create a strong insecurity in the market. Independently from this, it is very likely that the 10% RES in the transport target will not be reached (BEE, 2014).

Sauter highlighted that the biofuels producers in Germany face the problem that they are deprived market entry in the MS where quota systems exist whereas the German market is open. In France, for example, up to 90% of the quota is in the hands of French companies. In 2013, according to Sauter, there was a high amount of imported non-sustainable raw materials on the German market (Sauter-Verbio AG, 2014).



The GHG-savings of 35% and 50% as laid down in Article 17 (2) RED have been easily achieved and as such do not drive innovation. However, in Germany, the GHG-value will have a quantitative character beginning from 1 January 2015 whereas in most of the other EU MS the purely qualitative character will be maintained. This will lead to a distortion of competition as the customers will pay the biofuels dependent on the GHG-value. In addition to this, the European Commission and the BLE as the competent authority in Germany seem to be divided on the question of calculating the GHG-value which adds to the insecurity of the biofuels industry in Germany (Sauter-Verbio AG, 2014).

The BMUB values the mass balance system according to Article 18 RED as an effective system and a good compromise that needs no changes. The use of a voluntary system seems to work well as there are many certificates in the market. This also applies for the review and revision of criteria (BMUB, 2014). Regarding the use of biofuels from non-food feedstock as aimed by Article 21 (2) RED the interview partners agree that a shift to these advanced biofuels is necessary. The implementation of the iLUC aspect will foster their use according to the BMUB (BMUB, 2014).

Sauter highlighted that the pure GHG emissions savings are not the right approach here but rather the raw material basis needs to be taken into account. As the first generation biofuels meet the GHG emissions savings quite easily, the advanced biofuels become uncompetitive. Sauter mentions the example of biomethane which is not requested by the market and therefore Verbio is no longer investing in this field. As biomethane has great potential, Sauter suggested the initiation of a Directive on the logistics and transport of biomethane over the gas network between the EU MS (Sauter-Verbio AG, 2014).

An unforeseen impact is mentioned by the BMUB regarding the relationship between cross compliance under the CAP and the provisions of Articles 17-19 RED: There seems to be an ambiguity relating to the need of an (additional) proof of the MS itself that the agricultural raw material is meeting the respective criteria as the certifying authorities are considered not to be competent in this respect on one hand (position of Italy) and on the other that the certificates are sufficient in this respect (position of Germany).

### **Efficiency**

The administrative costs (basically for the certifiers, the annual auditing and the personnel dealing with the administrative processes) are quite low in the private sector and amount to around 10 Dollars per ton biofuels. However, if it is counted in that the whole system is not working well, then even these costs are much too high (Sauter-Verbio AG, 2014).

The stakeholders from the public sector pointed out that the cost-benefit-ratio is satisfactory. Articles 17 to 19 and 21 (2) RED address central future questions and the foreseen system is relatively lean and organized in decentralized way. The main task of controlling the functioning of the system is shouldered by the certifying bodies. (The respective costs are passed on to the economic agents.)

No data is available for a quantification of the administrative burden in the public and the private sectors.

### **Added value**

According to the BMUB, Germany planned a similar national regulation before the RED was drafted. This probably accelerated the process on the European level. The national regulatory process was then stopped with reference to the legislative activity on the EU level. With regard to the expansion of the sustainability criteria to solid and gaseous biomass, however, the decision-making process is ongoing and thus a gap still remains that needs to be closed (BMUB, 2014).

### **Conclusions and recommendations**

Sauter pointed out that the biofuels expansion amounting to a replacement of 5% of the conventional fuels with biofuels until 2014 is a success story. Now the European Commission should execute the respective provisions and ensure an EU-wide enforcement in order to maintain the general investor security as well as the willingness of the capital market to invest in this field.

If there are insecurities with regard to future developments, transparent and understandable intermediate targets should be set foreseeing consequences for the eventual compliance or non-compliance of these targets. Another option to deal with these insecurities could be to annually establish the quota by transparently declaring that a fix quota is not possible due to insecurities regarding further development (Sauter-Verbio AG, 2014).

The BMUB highlighted that the objectives were adequately achieved with the system as laid down in Articles 17-19 and 21 RED. However, with regard to the GHG quota, which is required to be implemented in all EU MS by the Fuel Quality Directive, as well as iLUC the sustainability scheme will be required to be more transparent and clear especially with regard to the calculation processes in the future (BMUB, 2014).

## **G.2.9 Articles 22-23: Reporting and monitoring**

Germany has not reported on any deviations regarding the introduction or functioning of support schemes and other measures or any developments in the measures used with respect to those set out in the NREAP.

### **Effectiveness**

Interview partners who have been asked this question did not express any necessary changes to this Article. It seemed to the author of this country report, however, that this Article was and is not a focus of interest for the interview partners.

### **Efficiency**

The question if the reporting obligation requirements became more efficient or if the reporting burden increased was not clearly answered one way or the other. In the view of the author, however, this is an indication that the reporting requirements are not seen as too burdensome.

### **Conclusions and recommendations**

Question N/A



### G.3 Sources and interviews

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### **Interviews**

For this case study, the following persons and organisations were interviewed:

- BEE 2014. Interview with Rainer Hinrichs-Rahlwes, Carsten Pfeiffer, Corina Bolintineanu, Bundesverband Erneuerbare Energie, 18 November 2014;
- Sauter-Verbio AG, 2014. Interview with Claus Sauter, CEO, Verbio AG, 1 December 2014;
- Marty-UBA, 2014. Interview with Michael Marty, Head of the Team, Register of Guarantees of Origin for Renewables, Section I 2.7, Federal Environment Agency (Umweltbundesamt), 1 December 2014;
- Interview with the German Confederation of Skilled Crafts, 2 December 2014;
- Interview with the Federal Ministry for Economic Affairs and Energy (BMWi), 3 December 2014;
- BMUB, 2014. Interview with the Federal Ministry for the Environment (BMUB), 8 December 2014.





# Annex H Country report: Poland

## H.1 General framework

### **Institutional and administrative context: responsibilities for implementation of the RED**

Poland's energy policy is set out by the Ministry of Economy, which is also responsible for the transposition into Polish law of the EU acquis in the field of energy.

Regulatory functions are carried out by the Energy Regulatory Office (ERO), which is responsible for regulating the energy market and for the implementation of the state energy policy. It also implements the transposing provisions of regulatory measures set out in the RED. Its responsibilities include, inter alia: licensing, approval and control of tariffs; appointing transmission, distribution and other networks; imposing fines, collecting information on investment projects in the energy sector; monitoring cross-border capacity allocation mechanisms, balancing mechanisms and congestion management; and monitoring conditions for connections to the grid and grid repairs.

ERO issues and redeems certificates of origin used in support schemes for RES, agricultural biogas and cogeneration. In line with Article 15 RED, ERO also issues to RES producers guarantees of origin which, in contrast to certificates of origin, do not grant ownership rights and are not part of the support scheme for RES, as their purpose is to provide confirmation for the final customer that the stated amount of electricity introduced to the distribution or transmission grid has been generated from RES.

Finally, ERO controls the quality standards and parameters of fuels. However, regulatory oversight of the production of bio-components and biofuels is shared with the Agency of Agricultural Market (AAM). AAM maintains a registry of biofuels producers and importers and a registry of farmers producing biofuels for their own use. Biofuels and bio-components traded in Poland must be certified by an accredited certification entity that follows Polish law on certification.

### **Energy policy**

The current energy policy is defined in the "Energy Policy of Poland until 2030" (EPP2030), a document adopted by the Council of Ministers in 2009. The EPP2030 assumes that the overall growth of gross energy consumption will lead to an increase in the consumption of oil products, electricity and district heating. The greatest rise in energy demand until 2020 is expected to happen in transport (31.7% of the overall increase in energy consumption), followed by services (31.3%) and agriculture (13.6%). In contrast, the use of energy by industry is not expected to change, while the demand from households would increase by only 0.5%.

The EPP2030 assumes a change of primary energy sources during the period leading up to 2020, with a decrease in the use of coal offset by an increase in the consumption of natural gas (+11%) and RES (+45%). The RES sector will develop in stages, with the prominence of certain technologies at different stages. Until 2020, solid biomass will play the central role followed by wind generation and solar thermal energy. From 2020 onwards, other technologies



such as photovoltaics and second-generation biofuels are expected to kick in. In April 2014, the government adopted a strategy on 'Energy Security and Environment' envisaging an integrated approach involving an increased use of domestic energy sources, the development of nuclear energy, growth of RES in line with the EU requirements, and the modernisation and development of the transmission and distribution grid. The Ministry of Economy is currently working on a draft 'Energy Policy of Poland until 2050'. The first round of public consultations on this document was closed on 1 September 2014.

### **Legal framework**

Directive 2009/28/EC has been transposed into the Polish legal system through amendments to the existing legislation regulating energy production and distribution, production of transport fuels, bio-components and biofuels. In order to codify existing provisions into one piece of legislation with the aim to increase transparency and clarity, as well as to improve national support schemes for RES producers, the Ministry of Economy prepared a draft law on RES, which is currently being debated by the lower chamber of Parliament. The adoption of the law on RES will undoubtedly remove one of the barriers for prospective small investors in understanding how the system works and what provisions are made to support further deployment of RES.

### **Current support schemes**

Current support schemes for RES, cogeneration and agricultural biogas are based on a quota system whereby final energy providers must purchase pre-defined quantities and relevant types of certificates of origin, or else they face fines. The request for certificates of origin is approved by the Minister of Economy. Co-firing of biomass and coal is not exempt, with the result that the bulk of 'renewable' energy in Poland comes from co-firing. This result is compounded by the fact that co-firing is also used by conventional power plants in Europe to lower their emissions in the ETS.

The draft law on RES proposes to replace from 2016 onwards the current quota system with a system whereby the state auctions the RES purchasing rights to producers, thereby guaranteeing purchase of RES produced by them, which will be valid for the next 15 years. Auctions would be organised reflecting overall demand for RES, with the selection of bids based on the lowest price. The advantage of the new support system would be that the price for energy received by the investor would remain stable during the contracted period, while the price of the certificates is lowered by the increase in supply (new RES applying for certificates), and the demand is set by the quota system. The new system would apply to new energy sources and initially both systems would function side by side, with the certificates of origin phased out gradually, taking into account that the maximum length of support period for RES is set at 15 years. Certain types of installations with low production costs such as hydropower with installed capacity above 5 MW, would be exempt from support. In addition, energy sources with negative environmental effects such as production from quality wood and grain, would not qualify for support. It is expected that auctioning could start at the end of 2016 at the earliest, or early 2017.

Operators of small installations (i.e. with total installed capacity of up to 5 MW for electricity production and up to 1 MW for cogeneration units) are eligible for reduced connection fees and are exempt from the stamp duty for the issuance of an operating permit and certificates of origin. The energy law and supporting regulations impose obligatory purchase of energy from RES on electricity distributors providing connections to the grid for



micro-installations. Energy produced from RES is also exempt from excise duty.

Financial support to RES investments such as low interest loans and grants is provided from public funds (National Fund for Environment Protection and Water Management) and EU funds. The support from the EU funds combined with the money from the state budget was considerable and resulted in a fast increase of wind power capacity after Poland's accession to the EU. In June 2014, total installed capacity of wind power in Poland exceeded 3.6 GW, of which 800 MW was set up in 2013. During the 2007-2013 financial programming period a total of PLN 3,340 million was spent on support to RES. Support to RES from the EU funds continue in the 2014-2020 programming period under the Infrastructure and Environment national programme, and 16 regional operational schemes.

## **H.2 Assessment of the effectiveness, efficiency and value added of the RED**

### **H.2.1 Article 3: Targets and measures**

#### **Effectiveness**

Poland had RES targets and biofuels targets in transport before the RED was adopted, as well as measures implementing Directives 2001/77/CE and 2003/30/EC. The previous policy set out a target of 7.5% RES in the primary energy balance by 2010 and 14% by 2020. By 2005, the share of RES in the gross final energy consumption was 7.2% and the 2010 target of 7.5% was therefore easily achievable.

Under the RED, the overall 2020 mandatory target for RES is now defined as a share in the gross final energy consumption and is set at 15%. The indicative intermediate target for the RES share by 2014 is 9.54%, growing to 10.71% in 2016 and 12.27% in 2018.

It is widely considered that the targets for Poland in RED were determined appropriately. The use of GDP in the target calculation was one of the arguments used by Polish policymakers to demonstrate to voters the overall value of EU membership as established in the EU's solidarity principle. The target under the Effort Sharing Decision (ESD) was accepted under similar considerations, which, to some extent, ensured political support for the adoption of the RED as part of Climate and Energy Package in 2008.

The country did not increase its RES target to a level higher than that set out in the RED. The key underlying reasons quoted by the government, then and now, are the security of supply and the prevention of an increase in energy costs which lower the competitiveness of industry, as well as negatively impact consumers. Poland is still a poor country, despite its EU membership. According to the official government data, in 2012, 13% of the Polish population lived in extreme poverty. The cost of fuel and electricity for consumers therefore matters.

Poland is on track to fulfilling the 15% RED target and may slightly overachieve it based on current trends. The intermediate targets for the years 2014, 2016 and 2018 are not in jeopardy, according to the Ministry of Economy, based on statistical data on progress to date and projections.

Poland currently supports the production of RES through a system of certificates of origin (popularly known as ‘green certificates’), even though different colours are used to distinguish between energy sources, e.g. purple for methane, or brown for cogeneration). The system is based on a quota mechanism whereby energy providers have a legal obligation to obtain appropriate types and quantities of certificates of origin in order to demonstrate to the Energy Regulatory Office (ERO) that they have met the requirements of the annual obligatory share of RES in the total energy volume provided to customers, or else potentially face fines. The quota is defined annually, in line with overall targets. The certificates become tradable upon being entered into the registry on the energy exchange as property rights. The system was not modified after the adoption of RED as it was recognised by the government as a useful tool to support the achievement of the targets.

According to stakeholders the existing support framework for RES in Poland, introduced in 2004, has been stable and has long provided certainty to investors. In 2011, the IEA praised Poland’s determination in reaching its RES targets and described the green certificates scheme as effective in supporting that goal (IEA, 2011). However, a rapid increase in co-firing has led to a reduced price of these certificates. This has led to discontent amongst RES investors, particularly as the installed capacity of wind farms and biogas installations has continued to increase over time. In the draft law on RES, the government proposes a new support system based on auctioning, which although will provide a stable price for winners, is not seen as satisfactory by investors, because it does not provide sufficient certainty and it lowers the incentive for banks to finance RES installations.

With regards to transport, mandatory targets for biofuels and bio-components were implemented in Poland from 2007, when the target was initially set at 2.3% and was subsequently raised annually in order to achieve 5.75% in 2010, as set in Directive 2003/30/EC. The gradual increase of bio-components and biofuels’ share in transport to 10% by 2020 is promoted mainly through the increase in the annual National Indicative Targets (NITs) - the ratio between the minimum share of bio-components and other renewable fuels in all modes of transport to the total amount of liquid fuels and liquid biofuels used in road and rail transport in a calendar year, in terms of energy content. Entities obliged to implement NIT must supply in a given year at least the minimum share of bio-components and other renewable fuels in proportion to the total amount of liquid fuels and liquid biofuels sold, otherwise disposed of, or destined for own use. The NIT for 2014 was defined as 7.55% and will remain constant until 2016. It will then increase quite steeply to 7.8% in 2017, and 8.5% in 2018. As signalled by stakeholders, this was planned in order to enable time for investment in second generation biofuels. As noted by ‘SCC biofuels in transport report 2014’, the annual NIT in Poland is achieved mainly by bio-components share in fuels, and the share of liquid biofuels in transport is negligible.

Finally, the mandatory nature of the targets set out in the RED is seen as crucial in ensuring that the RES share continues to increase and reaches the 2020 objectives. Poland’s RES targets were mandatory even before the RED was adopted. Additionally, in the case of Poland, mandatory targets are more effective in promoting RES than financial support measures and education measures, as confirmed by a recent report of the Supreme Chamber of Control on the implementation of the multi-annual programme on promotion of biofuels 2008-2014 (Supreme Chamber of Control, 2014a). The Supreme Chamber of Control noted that in the case of measures taken to increase the share of bio-components and biofuels in transport fuels, mandatory NITs were



also the most effective measure. According to stakeholders, hefty fines for non-compliance with NIT are a good measure to ensure compliance. Under the quota system underpinning the current support scheme for RES, some entities preferred to pay fines than to purchase green certificates. The most effective system would be one in which non-compliance would be punished in addition to the obligation still required to be met, such as with the EU ETS.

### **Efficiency**

A key component of the value of the RED is the facilitation and encouragement of measures which support the deployment of RES in order to achieve mandatory targets. It does not prescribe to MS which RES to support but creates a framework for measures which lowers administrative barriers, ensures access to the grid, and results in the deployment of support schemes.

However, the RES support scheme based on a quota system existed in Poland before the adoption of the RED. It already imposed mandatory obligations on energy distributors, and as such, the RED's mandatory targets did not influence existing support schemes, although additional support measures were introduced to further boost RES such as the exemption from excise duty and temporary tax exemptions for biofuels.

In addition, it may be argued that public money from EU funds was disproportionately channeled to big projects, especially wind power, as stated by the Supreme Chamber of Control, and that it was not spent on micro- or small installations. By 2013, this source of funding provided sizeable support to the construction of 36 wind farms, 10 biogas power stations producing electricity or cogeneration of electricity and heat, and three biomass cogeneration plants. The cheapest measures to fulfil the mandatory targets, such as co-firing, are mainly used in Poland, so in this respect, by allowing these practices to be counted towards the RES targets, RED did not support the deployment of RES (in co-firing there is no need to modernise installations to a great extent as traditional coal-fuelled boilers can burn biomass) and technological modernisation.

It is the author's opinion that other EU legislation, such as on emissions trading, also incentivizes co-firing which is not only happening in Poland but is a widespread practice in Germany and other MS with coal fired power plants. The government acknowledged this and in the draft law on RES co-firing of certain types of biomass will no longer qualify for support. According to some stakeholders, it should be prohibited.

With regards to the link with energy efficiency, stakeholders do not see an obvious connection with RES, except on the abstract level (less energy use equals less demand, including lower demand for RES, so lower investment costs overall).

Energy efficiency in Poland in the period 2001-2011 improved by 2.6% annually. Overall, energy efficiency in Poland is expected to rise by 9% by 2016 relative to average final energy use in the period 2005-2011. The final EE targets for 2016 are set in Directive 2006/32/EC and implemented under the National Action Plan on Energy Efficiency (2011). These goals ensure that Poland fulfils its mandatory EE target for 2016, which is often seen as another target to complement the RED target. The draft act on RES, now being reviewed by the parliament, includes financial support instruments which promote innovative technologies to increase energy efficiency which in turn should promote further energy savings.





Overall, the current support framework and measures deployed to implement targets set out in RED do not influence energy efficiency in a clear way. The disconnect between EE and RED at EU level is reflected through separate streams of legislation which are replicated at the national level.

### **Added value**

A clear added value of the RED is that binding targets introduce greater discipline in the implementation of the Directive: the intermediate targets must be achieved and monitoring of progress is obligatory. The negative side of mandatory targets is that overachievement is not sufficiently promoted.

Some stakeholders point out that the mandatory character of targets is particularly important in the early stages of the RES development. Once a certain level of deployment is achieved, mandatory character of targets becomes less critical.

For stakeholders other than the government, administration and energy regulator, the RED is not even a reference point. For example, the grid operator is bound by the EPP230 and its Grid Development Plan (Plan RozwojuSieci). For other stakeholders, the overall value of RED is in the targets. However, other stakeholders also see the value in having the legal framework and support schemes at the national level.

### **Conclusions and recommendations**

Overall, national targets at MS level provide clarity for investors and energy producers and are needed for 2030 and beyond. Indeed, nearly all interviewed stakeholders expressed their preference for mandatory targets and stressed that indicative targets create a degree of uncertainty.

There would also be value in linking RED targets more directly to energy efficiency targets in order to achieve better synergies between the measures undertaken.

## **H.2.2 Article 4: National Renewable Energy Action Plans**

### **Effectiveness**

The NREAP offers an overview of the Government's policy approach towards achieving the mandatory targets for RES and biofuels in transport, and outlines the measures deployed to achieve these targets. It also outlines the general terms of financial support for RES and high-efficiency co-generation projects.

Setting the date for submission of the NREAP on 30 June 2010 was appropriate in order to provide an overview of the existing policy measures in relevant sectors influenced by RES policy from the outset. The NREAP was submitted as early as possible in order to provide information on how the country proposes to implement its policies and measures to achieve the mandatory targets of RED, and in order to provide information to investors. Poland's draft NREAP was subject to public consultation in May 2010. Without the deadline, the preparation and submission of the NREAP could have been delayed.

In terms of positive impacts, by outlining the policies and measures involved in supporting RES, for example by stating which RES will be used to achieve the targets, NREAP does provide a signal to private investors and entities about which technologies to invest in. The goals stated in the NREAP and energy policy also guide development plans of the energy transmission network.



However, domestic regulation and support measures have greater value in investment planning.

Other positive impacts from the NREAPs include:

- The obligation to submit a revised NREAP if the RES share falls below the indicative trajectory two years in a row. This is seen as a useful provision to enable countries to address problems.
- NREAPs and progress reports are official documents based on national policy and government statistics and produced according to an agreed template. In that respect, they provide a source of reliable data for the European Commission.
- Interested stakeholders can access NREAP through the Ministry website and participate in public consultation process.

Some criticisms regarding the NREAP concern the lack of detail as well as a lack of process to update them when circumstances change over time:

- The NREAP is not sufficiently detailed about the measures to be taken to implement it at the national level. It would be useful for the NREAP to describe the various stages in RES development and how these will be accomplished. Indeed, according to some stakeholders, the time horizon in NREAPs is too short to use as a basis for investment decisions, and more detailed and up-to-date information than provided in the NREAP is necessary.
- As mentioned earlier, NREAPs only need to be amended if the intermediate targets are not met; some stakeholders would prefer regular updates of NREAP to reflect changing circumstances.
- NREAPs and other policy documents are not universally known by the general public so their impact in terms of awareness-raising is limited.

It is felt that these issues limit the effectiveness of the NREAP. In addition, the preparation of the NREAP should be more coordinated with the preparation of the government energy policy: the two documents should be more aligned, as the national energy policy provides a wider context with respect to energy security and energy supply.

### **Efficiency**

The preparation of the NREAP required considerable effort from the Ministry of Economy: there was a need to coordinate cooperation with stakeholders, collect and collate information, and conduct inter-ministerial and public consultations. Consequently, other entities were also engaged in preparation of the NREAP. There was also need to reconcile the NREAP with other policy documents, including the National Energy Efficiency Plan.

It is, however, not possible to quantify the number of man-days or the cost involved in this exercise, as this is not data that is collected or made available.

### **Added value**

Member States must monitor the implementation of their policies. In Poland this is done, among others, by the SCC. The Parliament also commissions studies and reports on the implementation of government policies. So without the NREAP, RES targets would have been monitored anyway, although the focus of monitoring would have likely been different: for example, focused on the efficient spending of public funds, as in the case of SCC reports.



## Conclusions and recommendations

The NREAP is a policy document which does not raise the interest of the general public. However, due to public consultation of the NREAP, in May 2010, interested stakeholders were able to get acquainted with the planned policy measures and provide their comments to the proposed draft which were then reflected, as appropriate, in the final document submitted to the European Commission.

### H.2.3 Articles 6-12: Cooperation mechanisms

#### Effectiveness

Poland is not engaged in cooperation mechanisms. Private investors are aware that such instruments exist but there is no interest at present to explore these options in Poland.

Looking forward, Poland does not plan to resort to cooperation mechanisms in order to fulfil its 2020 target.

Enabling legislation for all the cooperation mechanisms exists and is codified in Energy law, Art.55 a,b,d,e,f. The law includes a provision that no transfer can be made in the years in which Poland does not achieve its intermediate target. Bearing this condition in mind, it stipulates that statistical transfers and joint projects may take place pursuant to international agreements. Similarly, an international agreement would be required to set up joint support schemes. Plans to transfer renewable electricity abroad, which may affect the overall target of Poland, must be approved. Article 55d Energy law stipulates that energy enterprises generating electricity in RES on the territory of Poland may take part, on conditions laid down in an agreement with other entities from the MS of the EU, the Swiss Confederation or a Member State of the European Free Trade Association (EFTA) - a non-EU states in the European Economic Area (EEA), in the implementation of joint energy projects concerning electricity generated from RES. However, this mechanism has not been used so far by any private company, even though the scope for such projects in Poland does exist. Indeed, according to the grid operator, potential for cooperation mechanisms exists and Poland could engage in the future in cooperation with some neighbours, e.g. Lithuania or Slovakia.

However, EPP2030 expects that Poland will achieve its 2020 RES target with domestic measures. As Poland does not plan to overachieve its target by more than 0.5% statistical transfers to other MS are not planned either.

Stakeholders agree that for countries that are not on track to achieve the Directive's targets, the cooperation mechanisms inscribed in RED, especially statistical transfers, will provide a way out by enabling the laggards to cover their deficits. A similar mechanism is integrated in decision 406/2009/EC (Effort Sharing Decision, or ESD) which was adopted, like RED, as part of the Climate and Energy Package, and which obligates MS collectively to achieve a reduction of -10% compared to 2005 levels, with individual MS allocated their own appropriate reduction targets.

Cooperation mechanisms as a means to address other MS' difficulties in achieving their goals is not considered, as this would call for additional measures to increase the level of domestic effort in promoting RES.

### **Efficiency**

Engaging in joint cooperation mechanisms requires an international agreement, an approval of the Minister of Economy, and results in an obligation to notify the European Commission about the scope and outcome of such projects. This, inevitably, places an additional burden on the public administration and participating entities.

However, even if some prospective participants may consider the related burdens to be onerous, these burdens provide the safeguards necessary to ensure that national targets and intermediate targets are met.

### **Added value**

Such a mechanism would not function without a European Framework, as the key reason for its use is to provide countries with flexibility in achieving their targets. However, a similar mechanism exists under the Effort Sharing Decision in order to enable MS to jointly fulfil the target at EU level.

### **Conclusions and recommendations**

In the author's opinion, the key lesson from the implementation of this Article in Poland is that a country planning to comply with the mandatory target but not expecting to overachieve has no incentives to promote participation in cooperation mechanisms. Rather, such a country is likely to introduce safeguards and measures which ensure that, should any entities engage in cooperation mechanisms on its territory, the achievement of intermediary targets and of the final mandatory targets under RED is not threatened.

PIGEO is of the view that the use of cooperation mechanisms by private companies could be stimulated by financial incentives, such as cheap loans or grants. However, the fact that such projects may negatively influence the progress of a MS towards achieving its RED target means that the state should be informed prior to the project's implementation and can therefore monitor the level of RES produced on its territory; such provision was introduced in the legislation.

## **H.2.4 Article 13: Administrative procedures, RES in buildings, heating**

### **Effectiveness**

In Poland, legal and natural persons undertaking economic activity are subject to the rules and provisions of the Law on economic activity: they can undertake economic activity once they have submitted an application to be included in the Central Registration and Information on Business, or once they are registered as an entrepreneur on the National Court Register. This is a general legal provision pertaining to all economic activity in Poland.

However, if undertaking and conducting a given economic activity is conditional upon the acquisition of a license or a permit, these provisions do not apply. The Energy law stipulates that a license is required for the production of fuel and energy, with the exception of:

- a solid or gaseous fuels;
- b electricity generated from sources with a combined installed capacity not exceeding 50 MW which are not renewable energy sources or co-generation energy sources used for electricity generation, with the exception of the generation of electricity from agricultural biogas;
- c heat from energy sources with a combined installed capacity not exceeding 5 MW.



Licensing makes sense for installations that are to be connected to the grid, in order to monitor and safeguard the security of the energy system. The equipment used in Poland must comply with EU regulations and certifications. Technical requirements for equipment connected to the energy network are defined in a regulation on the energy system.

All formalities should be expedited within a reasonable timeframe as defined by laws and regulations, and without unnecessary delay. However, there is no such thing as a one-stop-shop for RES producers.

The time for processing applications for licenses or for connection to the grid varies depending on the size of the project, and whether the installation is to be connected to the transmission or distribution network. The security of the transmission network is a paramount concern for the grid operator.

Developing RES requires that corresponding provisions are incorporated into local spatial development plans, but this also applies to other construction works and other types of investment. Spatial planning at the local level is subject to environmental impact assessment.

With respect to the provision of energy at the local level, options for the use of RES are taken into account but no special preference is required by the Energy Law and the decision on how much to rely on RES rests with the local government in consultation with local energy distributors. The local mayor is responsible for preparing a draft framework of the plan for the supply of heat, electricity and gaseous fuels for an individual commune for a period of at least 15 years (updated at least once every three years). The draft plans are subject to public consultation and can be amended accordingly, also with respect to targets for the use of cogeneration and RES proposed by the local government.

Administrative procedures have generally been reduced for small and uncontroversial installations. However, if an installation is subject to an environmental impact assessment, or is to be constructed in the area of Natura 2000, a construction permit is obligatory.

Small and micro-installations are connected to regional distribution networks, and only big plants apply for connection to the grid. Generally, procedures for small installations are less onerous. Installations below 40 kW do not need a construction permit. Heat pumps and solar panels can be installed by the investor without permits. The increase in small installations is correlated with the availability of support mechanisms. Photovoltaic cells are still too expensive for small investors, and the investment in a photovoltaic cell of 10 kW is expected to pay back in 20 years, which for many individual investors, except wealthy individuals, is too long. Local governments, hospitals, care homes, etc. are the early adopters, and they can be recognised as leading the trend for RES use.

Legal provisions enabling prosumers to sell excess energy to the electricity network were introduced in September 2013. According to ERO, from 11 September 2013 until 30 June 2014, only 312 photovoltaic installations were connected to the distribution network (total installed capacity of 1.7 MW) and the majority of these installations were partly supported by grants from the National Fund for Environmental Protection (NFOS). As grants are issued in relation to the overall cost, they generally promote bigger installations.

In general, without provisions for prosumers and simplified procedures for small installations following the principles of the RED, small installations would not have taken off. However, the growth is stalled by the relative cost of these technologies compared to average incomes, and this can be a bigger obstacle in deployment of small dispersed energy sources than administrative procedures (Institute for Renewable Energy, 2013).

### **Efficiency**

A range of administrative bodies are involved, especially at the local level, but the uptake of small installations has been slow and it is therefore difficult to assess the additional burden on local administration. Some micro-installations do not require either a building permit or a connection agreement (they can be connected based on a notification), so in some cases the administrative burden is small.

Some burden was added for entities collecting information on the connection of small installations to the electricity network.

The burden on small investors, especially on those that can connect to the network based on a notification, and do not require building permit, was considerably reduced.

### **Added value**

RED was a catalyst in the process of easing regulations for small investors and micro-installations, and especially in providing an incentive for the deployment of RES in public buildings.

### **Conclusions and recommendations**

In simplifying procedures for RES investors, the authorities must take into account the need to maintain the stability of the network (security of the network is the key principle for the grid operator but also a concern for ERO) and the need to safeguard environmental protection principles and safety rules with regards to big installations, such as wind farms.

## **H.2.5 Article 14: Information, certification, training**

### **Effectiveness**

The Energy Law provides a legal framework for the certification of persons installing micro- and small RES installations, confirming their qualifications and required experience. The procedure does not discriminate against citizens of other EU MS. A person wishing to obtain a certificate may apply in writing to the President of the Office of Technical Inspection (OTI). A wide variety of qualifications are considered as adequate and therefore do not constitute a barrier of entry. However, the interests of the public and consumers are protected by a system of examinations for RES installers to obtain the certificate. Such an examination is organised at least twice a year (subject to demand). Information on the date and place of the next examination is published by the President of OTI at least 30 days in advance.

Without the provision of Article 14 RED introducing the requirement for training and certification schemes for installers, certification would not have been required in Poland.



### **Efficiency**

Additional burden with regards to the recognition of certificates issued abroad was added to the tasks of the Office of Technical Inspection. At present, this burden is potential rather than real, as there is no difficulty for installers with certificates issued in other MS to obtain recognition of their qualifications in Poland.

### **Added value**

In Poland there is a trend towards de-regulation and the removal of barriers in order to boost employment. Certification of installers goes against this trend, but it was implemented in order to comply with the Directive. The added value of certification is difficult to assess, given that it is not a prerequisite for registering economic activity in this field. The uptake of micro-installations is currently at a very low level, and therefore does not allow for any relevant conclusions.

### **Conclusions and recommendations**

According to one interview partner from the public sector, certification schemes do not guarantee that certified installers will perform their task in a way that will ensure the highest quality and best value for the investor, nor do they protect the investors from mistakes. On the contrary, they may to some extent provide a sense of false security. Each investor should undertake the necessary efforts to identify service providers who can be trusted to perform installation tasks competently and at a fair price.

## **H.2.6 Article 15: Guarantees of origin**

### **Effectiveness**

GOs were introduced in Poland solely for the purpose of compliance with the RED. An entity wishing to demonstrate to the end user that a certain amount of electricity introduced into the electricity system has been produced in RES, must have a valid GO corresponding to that amount of electricity.

A GO is issued upon request from the RES generator submitted to the electricity distribution system operator or the electricity transmission system operator. The request must be submitted within seven days from the date of production of a given amount of electricity. The operator of the distribution system is obliged to verify the data submitted in the application and submits it in turn to the President of ERO who issues GOs. GOs are issued within 30 days in electronic format, are supplied with a unique number and stored in the registry of GOs. A GO is valid for one year or until it is submitted to the final customer. If not used, it expires after one year from issuance. The entity which provided the GO to a third party, which is recorded in the appropriate register, loses the right to demonstrate to its customers that a certain amount of electricity introduced into the electricity system, was produced from RES (provision against double-counting).

GOs are not to be mistaken with certificates of origin, which are issued under the RES support scheme to green energy producers, based on an obligatory quota to energy providers fulfilled by acquiring certificates of origin (green certificates) which are tradable. Energy providers must acquire the prescribed number of certificates of origin, or else face fines. Certificates are marketable and can be purchased either from the producer or at the energy exchange. In contrast, GOs are not linked to ownership rights, are not traded on the energy exchange or other regulated markets, and do not represent an exchange commodity as referred to in the Law on Commodity Exchanges.



The Energy Law stipulates that the transfer of GOs shall not be conditional upon the transfer of ownership rights resulting from the certificates of origin.

The usefulness of GOs is not that evident at present, as certificates of origin effectively have a similar role, apart from providing financial benefits to the producer. In addition, the existence of both systems may be confusing for some stakeholders. However, once the support system for RES changes, as is planned by the government, this confusion should be resolved.

According to stakeholders, this system is safe and does not impose burdens that are unnecessary taking into account protection against fraud, inaccuracy and potential multiple accounting. A comparison with the initial lack of security in the emissions trading scheme which resulted in widespread fraud shows that protection against fraud should be one of key priorities in any system where non-compliance may lead to penalties or financial loss.

### **Efficiency**

All the measures necessary for the issuance and deployment of GOs are in place in Poland.

GOs place an administrative burden on the producer (to apply for issuance of GOs within seven days from the date of production of corresponding electricity), on the transmission or distribution system operators (to accept, verify and process the applications) and on ERO (to issue GOs within 30 days). The Energy Exchange maintains the registry of GOs.

The administrative requirements generated by GOs are not considered too burdensome as they do not exceed the minimum required in order to prevent fraud and to ensure accurate information for the final customer. However, this is an additional layer of bureaucracy in the system, the value of which does not support delivery of the mandatory goals in the way that the current system of certificates of origin already does.

In order to accelerate the deployment of GOs it would be necessary to raise awareness among final customers who should demand to know where the energy they use is coming from. Certificates of origin currently used in Poland are already a way of tracking the origin of green energy. However, they are also tradable and hold value. The existence of both certificates of origin and GOs seems superfluous to some stakeholders. However, when the certificates of origin are replaced with other forms of support to RES, the role of GOs will increase.

### **Added value**

In line with the Energy Law and ensuing regulation, electricity providers are obliged to fully and fairly inform consumers about the structure of fuels used to generate electricity and where they might find information on the environmental impact of the production of electricity sold in the previous calendar year in terms of carbon dioxide, sulphur dioxide, and other pollutants.

However, the added value of this information is low, if the customer cares more about the price than the type of energy used, as is largely the case in Poland, where the cost of energy and heating constitutes a large share of the monthly household expenditure. According to the Central Statistical Office, in 2012, Polish households spent on average 20% of their disposable income on energy (GUS, 2012). Judging on the basis of how some corporate websites present their green credentials, corporate customers which are energy



consumers do not as a rule treat RES as a primary way to demonstrate their corporate responsibility, although they often indicate that they care about environment, and, for example, use best available technologies in order to reduce the use of energy.

The added value of EU intervention under this article is therefore unclear, especially in view of the existence of green certificates.

The value of having a standardised approach should be to enable consumers across the EU to have access to accurate information on the level of RES they consume. Where energy is traded across the borders, this standardised approach would prove useful. However, this would only happen with further development of the grid networks, and incentivised or mandatory interest of the customers in the source of energy they use.

### **Conclusions and recommendations**

The question therefore remains as to the practical value of the information provided at present by GOs. At least in Poland, with the current system of quota obligation and low level of customer awareness, GOs do not serve as incentives stimulating RES demand.

For GOs to play a role, it would be necessary to raise general public awareness and to incentivise consumers to use RES, the origin of which would be then confirmed with GOs.

The final consumer receives information on the source of energy, since it is included in the energy bill. However, energy providers do not offer a choice e.g. 100% RES for those who want to use only RES.

One way to increase the interest of the final customer in purchasing RES would be through incentives, e.g. lower prices for that part of electricity but then a means of financing such a scheme would have to be found. Another option, for corporate customers, would be to introduce mandatory use of RES at some level, starting from public administration.

## **H.2.7 Article 16: Grid access and operation**

### **Effectiveness**

The influence of RED has been most significant with regards to legal provisions for small and micro-installations introduced in Poland. The Energy Law accords priority to the connection of micro-installations (i.e. RES with a combined electrical installed capacity not exceeding 40 kW, connected to the electric power transmission network with rated voltage lower than 110 kV or with a combined installed heat capacity not exceeding 120 kW). This is done through a simplified procedure enabling the connection of a micro-installation on the basis of the relevant notification. The micro-installations connected to the network must comply with the technical and operational requirements specified by the law. The detailed conditions for connection, technical requirements as well as the terms and conditions of cooperation of the micro-installation with the electric power transmission system are laid down in the regulation on the electricity system. The information is freely available and customers who are not familiar with the regulation may inquire directly at DSOs.

Granting priority to micro-installations has not so far been tested against the safety and security of the network - due to a low uptake of micro-installations unrelated to the ability to connect to the grid (investment costs and long return on investment are key issues).

Bigger installations must be connected based on an agreement with the DSO, and larger installations still based on an agreement with the TSO. This means that for these installations the connection is not granted automatically but this is totally justified by the concerns for the overall safety of the energy system.

As stated by the National Grid Operator (PSE), its primary responsibility is to ensure the safety and security of the energy system in Poland. This means that RES installations cannot be connected to the grid without taking this into account. The implementation of the RED did not change this approach, however, the mandatory RES target has been considered in view of the capacity of the grid. The system has the capacity to connect up to 8,000 MW of wind power until 2020 so that the currently planned capacity of the grid will align with the 2020 target. Even with a very dynamic growth in wind power in the period between accession to the EU in 2004 and 2014, total installed capacity of wind sources in Poland reached ca. 3,700 MW this year. Connection agreements were issued to about 20,000 MW of potential wind power installations, of which PSE (TSO) estimates that about 30% could eventually be built. The agreements for the connection of 2,200 MW of off-shore wind have already been signed.

With regards to future grid infrastructure, TSO and DSO planning is aligned and has been aligned all along, so the implementation of the RED was not critical in this respect - there are five DSOs in Poland and their development plans are submitted to the TSO which in turns submits its plan to ERO. The plans are assessed with the security of the energy system as a primary criterion in mind.

The electricity distributor is obliged to specify to potential energy producers, in the statement of conditions for connection, the considered connection schedule for RES, taking into account the subsequent stages of network extension, as well as the schedule of contemplated works.

The costs of network extension beyond the simple installation of a connection necessary to draw power from the connected energy sources shall be taken into account and financed - pursuant to the relevant legislative provisions - from the tariff revenues of network operators.

At this stage, it is possible but not probable that a surge of requests to connect micro-installations would test the system by 2020. In addition, there is a safety valve in case of an oversubscription for potential connections. A DSO or TSO may refuse to connect a RES installation to the grid in case of insufficient grid capacity. However, in case of such a refusal, the DSO/TSO must define the planned date and conditions of the necessary extension or modernisation of the grid to address this shortage, and a deadline for setting up the connection. This does not necessarily mean that a connection right will be issued enabling the installation to be connected within a reasonable timeframe.

Smart grids are a question for the future but not really relevant at this point in Poland.

### **Efficiency**

As mentioned above, the Energy Law guarantees priority access to the grid for RES providers as long as the reliability and safety of the domestic power system is maintained.

Renewable electricity supplied to the network is covered by obligatory purchase arrangements. The obligation in question stems from the provisions of the regulation on certificates of origin. The 'green certificate' system (Art. 9a and 9e of the Energy Law) also guarantees the priority access of electricity obtained from RES. So the necessity to comply with these obligatory quotas is reflected in the plans of TSO to provide the adequate capacity of the system. The general provision of access to the grid was, in this respect, of a lesser importance as the safety of the energy system is overrides other concerns.

It is not possible to quantify the administrative burden of this Article. The grid operator does its share in enabling Poland to achieve its mandatory RES target by 2020 but its key consideration is always to assure security of the energy system. DSOs also have their responsibilities in this respect.

Nevertheless, the combined capacity of the connections to the grid issued demonstrates that RES investors are dealt with. Investors sometimes complain that some of these RES projects will not be implemented but in the meantime block access to the grid for other investors (see for example *Blokowanie mocy przyłączeniowej przez deweloperów farm wiatrowych*, published on 6 March 2014 at [www.ebiomasa.pl](http://www.ebiomasa.pl) (in Polish); an article by Jean-Claude Moustacakis, *Farmy wiatrowe wirtualnie podłączone do sieci* in : *Gazeta Prawna.PL* of 4 March 2014 available at [www.serwisy.gazetaprawna.pl](http://www.serwisy.gazetaprawna.pl). However, this is not an issue directly related to the RED as at the time of issuance of the connection permits, it is not possible to ascertain which applicant is indeed planning to implement his project, and who only wants to prepare a project for further sale to other investors (meanwhile blocking access to the grid for other projects). This issue was also mentioned by PSE Operator during the interview.

### **Added value**

At present the added value of this Article rests mainly in reducing the administrative and financial burden for owners of micro-installations who want to connect to the electricity network. This, together with an option to sell surplus electricity, a support scheme and cheap loans from a state owned bank (BOS), helped to launch such installations in Poland. However, the uptake of micro-installations faces other barriers, in particular with regards to initial investment costs.

### **Conclusions and recommendations**

The government does not plan to exceed the planned target for RES deployment, and the capacity of the energy system allows for this target to be achieved. There are therefore no technical constraints that would prevent the achievement of mandatory RED targets.

While the grid would not be able to connect all the planned wind power plants, many of those projects may never materialise. This is in part due to the fact that not all projects which apply for permission receive it, and in part because of a growing backlash against large wind farms in Poland as public opinion increasingly adopts a NIMBY approach. There are concerns about the noise and adverse environmental effects (e.g. on migratory birds) as well as about the negative visual effects of large wind farms on the landscape.

With regards to micro-installations, their high cost relative to average incomes is hampering their development in Poland. This means that ensuring priority access to the electricity network does not, by itself, assure a large-scale deployment of RES as costs remain a significant barrier to entry.



Large support schemes are much more effective in increasing the installed capacity of RES, but this is not the cost-efficient way as it comes with a burden to taxpayers, while benefits accrue to (a few) private investors. For instance, the surge in wind farm capacity in Poland after accession to the EU was due to generous grants from the EU structural funds and state aid, combined with income provided by green certificates.

## **H.2.8 Article 17-19, 21: RES in transport, biofuels and bioliquids sustainability**

### **Effectiveness**

Sustainability criteria have been introduced in Poland only recently and it is difficult at this stage to see what impact they will have on the use of bioliquids and biofuels.

The possibility of counting biomass or biofuels towards the National Indicative Target (NIT) depends on confirmation that they comply with the sustainability criteria in accordance with Article 17 RED (Art.28 a.1.1 of the Act on biofuels). In line with the Act on biofuels, entrepreneurs can confirm compliance with the sustainability criteria only by using documents from a recognized certification system i.e. a system guaranteeing the fulfilment of the sustainability criteria set out in Article 17 RED. However, voluntary certification schemes are viewed by stakeholders with a dose of suspicion, especially with regard to imported biofuels from non-EU countries.

In addition, according to some stakeholders, the mass balance approach is not clear with respect to blended biofuels.

Provisions for GHG standards have also been introduced into Polish law. Bio-components meet the requirement to reduce greenhouse gas emissions, if the greenhouse gas emission reduction amounts to at least:

1. 35% - by 31 December 2016;
2. 50% - from 1 January 2017.

In the case of bio-components produced at facilities which will start production after 31 December 2016, the required greenhouse gas emission saving will amount to at least 60% from 1 January 2018.

The main driver for the use of biofuels from non-food feedstock is to exclude biofuels from food feedstock from eligibility under support schemes, to ban these, or at the very least reduce their permitted level of use.

However, some agricultural producers have invested in the production of fuel from food feedstock given the initial stress was to fulfil the mandatory target on the EU level; and the policy change at EU level soon after the adoption of the Directive resulting in a shift towards second and third generation biofuels means that they would not recoup their investment costs.

With regards to consumers, they have no influence on how sustainable the bio-components used in petrol and diesel are, and some are hardly aware of the fact that there is such a requirement. This is another provision of the RED which cannot be influenced by the choice of the final consumer.

## Efficiency

It is difficult to gauge whether the establishment of the sustainability scheme for biofuels and bioliquids has led to the creation of a cost-efficient framework. It was only introduced recently and, in addition, it introduced a number of obligations for producers and the entities responsible for the implementation of the NIT.

In 2014, the European Commission approved the first certification system for biofuels in Poland administered by INIG (KZR INIG) which covers all types of biomass. Before this date, Polish entrepreneurs had to obtain certificates from abroad. Certified entities include: collection points for biomass (FGP) and biomass producers; processing plants, producers of bio-components and biofuel traders. These organisations are under the obligation to obtain a certificate.

The sustainability of biomass or bio-components is confirmed by three categories of documents: a document issued by an agricultural producer provided for by the recognised certification system, an attestation, or certificate. These documents are issued at specific stages of bio-component production. The system is administered by the Agency of Agricultural Market which maintains the registry of certification systems administrators, and a registry of certified entities.

As pointed out by INIG which already has a first-hand experience with certification, the burden of acquiring certificates may be especially onerous for agricultural producers who need to provide verifiers with proof that the land used for production was in the category permitted under the system in 2008. Since the issuance of the confirmation document incurs payment for each plot of land, in the cases where many small plots are involved, this is not only burdensome but also costly.

## Added value

The Ministry of Environment in its strategy for sustainable development mentions sustainability criteria with respect to biofuels from third countries. The key potential added value of introducing burdensome sustainability criteria is to encourage the deployment of secondary generation or third generation biofuels, albeit at the expense of bio-components from food feedstock.

## Conclusions and recommendations

According to the interviewed stakeholders, the burden of certification does not sufficiently ensure the sustainability of biofuels as the information provided on the certificates is not sufficient. For instance, it would be useful if the certificate included information on whether real or standard values were used, and which activity was certified (e.g. biofuels production, trade).

In order to simplify the issuance of sustainability certificates to agricultural producers, a database of land which would be accessible to verifiers would be very useful. Such a database or databases in Poland could be set up and administrated at the regional or county level.



## H.2.9 Article 22 and 23: Reporting

### Effectiveness

The biannual report published in January 2014 by the Ministry of Economy and referring to the period 2011-12 confirms that Poland is on track to achieve its 15% RES target in gross final energy consumption in 2020, and that the assumptions used in EPP2030 were correct.

Biannual reports as stipulated in Article 22 (1) RED provide continuity with respect to monitoring the implementation of the Directive. Information is as contemporary as possible based on statistical data and domestic reporting of MS. They are therefore, together with NREAP and its revision, a good way to monitor the overall progress of MS towards achieving their mandatory targets.

However, so far the Ministry of Economy has only produced one progress report; the second one will be prepared soon. Therefore the effectiveness of the progress report is yet to be confirmed but the uniform template is well received, as well as the guidance on preparing the report.

A need for a data collection system as a way of reducing the administrative burden has been identified but it is not being considered at this stage due to limited budget.

### Efficiency

According to the interviewed stakeholders, the burden of overall reporting increased as a result of this article but they perceive added value from some of the information collected for the purposes of RED reporting. This information is also made publicly available, increasing transparency of the implementation of NREAP and of RES policies.

### Added value

The report produced as a result of Article 22 (1) RED and submitted to the European Commission is based on statistical data and thereby provides useful confirmation that the country is on track towards fulfilling its 2020 target and is meeting its interim targets. In contrast, other studies and sources may be based on qualitative judgments by stakeholders and therefore present subjective viewpoints which are not necessarily balanced by the views of stakeholders with different perspectives.

However, using statistical data means that the picture presented in the report is not current but dates back a year or two. This is the trade-off involved in using quantitative - and more accurate - data compared to more up-to-date qualitative information from stakeholders.

The use of a unique template and guidance means that MS reports can be compared across MS and that peer reviews are made easy, as well as giving a good insight into MS policy implementation to stakeholders.

### Conclusions and recommendations

Since there is a unique template for the biannual reporting, a database facilitating the collection of data and information for the purposes of reporting would have been useful and would reduce the burden of compiling the data and collecting documents.





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### **Interviews**

For this case study, the following organisations were interviewed:

- Ministry of Economy - Director of Department of Renewable Energy and Specialist, Department of Renewable Energy;
- PSE (Grid Operator);
- ERO (Energy Regulator) - Director of Department of Support Systems;
- Polish Wind Energy Association - Director;
- Polish Chamber of Biofuels (KIB) - Director General;
- Institute of Naphta and Gaz (INiG) - Manager of KZR INiG System;
- Institute of Automotive Industry (PIMOT) - Director for Fuels and Renewable Energy; and
- PIGEO (Polish Chamber of Renewable Energy) - Director General.







# Annex I Country report: Spain

## I.1 General framework

### **Institutional and administrative context: responsibilities for implementation of the RED**

Spain was among the first Member States to embark on a power sector liberalization process in 1998. The EU Market Directive of 1996 was transposed into the Electric Power Law of 1997 (Law 54/1997). The path to liberalization was, however, ahead of the EU Market Directive on some aspects, e.g. in opening all sectors to competition, legal unbundling and the appointment of a regulatory institution, the National Energy Commission (CNE). In addition, it included target for RES of 12% of primary energy supply in Spain.

CNE's mandate was reinforced in 2005, and since then regulates interconnections, remuneration of transmission and distribution activities, and certification of origin of RES. It has, however, only an advisory and consultative role. Its regulatory decisions, for example regarding tariffs, must be approved by the Ministry of Industry, Tourism and Trade.

The Institute for Energy Diversification and Saving (Instituto para Diversificación y Ahorro de la Energía, IDEA) is the central institution for the development and implementation of RES policy, reporting to the Department of Energy within the Ministry of Industry, Tourism and Trade. Activities in the RES sector include i) advising the government on policy issues, ii) co-developing projects in partnerships with private/commercial entities; and iii) promoting RES technologies in Spain and abroad.

### **Energy policy**

Spain's energy policy historically targets the support of sustainable development and assurance of energy supply that allows for economic growth and competitiveness, while reducing the environmental impact of energy production, transformation and end use.

The framework focused on promotion of energy efficiency and RES through a range of measures as laid out in the 2004-2012 Energy Savings and Efficiency Strategy, the Action Plan 2008-2012 under this Strategy and the Renewable Energy Plan 2005-2010. Spain has introduced several institutional innovations that have been replicated in other countries. Spain was the first country to introduce a variable feed-in premium (FIP) system for wind energy, feed-in tariffs (FITs) for concentrated solar power (CSP) and a bonus system for power plants that can provide reactive power to the grid (Couture and Bechberger, 2013). Measures on transport were included in the Sustainable Mobility Strategy adopted in 2009.

The support for RES in electricity production resulted in a strong rise in several technologies in Spain, and notably Solar-PV and Concentrated Solar Power (CSP) in 2008-2009. The surge in investments surpassed ambitions by manifold and resulted in increasing financial pressure and an arising tariff deficit (see below). Since 2008, the Spanish government has shifted focus to gain control over the budgetary implications of the Renewable Energy Plan and the tariff deficit as one of the key objectives of a National Reform Programme (NRP).



### Current support schemes

Since the adoption of the Electric Power Act of 1997, Spain has had a special tariff regime for electricity from RES and combined heat and power. The cost of the support scheme was to be borne by electricity consumers, proportional to their consumption. In 2004, the Royal Decree 4361/2004 introduced the opportunity for electricity generators under the special regime to choose between two options: i) a regulated tariff (FIT), ii) a market price plus a premium (FIP). In the event a certain capacity threshold was reached, the FITs and the FIPs were adjusted. In 2007, the Royal Decree 661/2007 further modified the FIP support system, introducing a cap and floor to the support scheme for some technologies. Here, level and duration of the support depended on the technology and the size of the project. The scheme covered all major RES technologies except for solar photovoltaics (PV), eligible for FITs only. Wind energy projects typically opted for the FIP, while a specific tendering procedure was in place for offshore wind projects. The FITs and FIPs options were also available for high-efficiency cogeneration using either biomass or biogas.

The FIT and a FIP was paid on top of the wholesale electricity price. Supply of electricity is, however, subject to tariff regulation. Until 2009, consumers could choose to either: i) obtain a negotiated price and access tariff including the costs in the system; or ii) obtain a regulated tariff set by the Ministry of Industry, Tourism and Trade. In 2009 a last-resort tariff system was introduced for contracted capacities below 10 kW. Electricity supplied under this tariff was acquired from generators through quarterly auctions but included subsidized network tariffs, in effect forcing utilities to sell electricity at a loss and giving rise to a tariff deficit resulting in an outstanding debt of the government to the utilities. In an attempt to resolve the increasing pressure of the credit crunch in the aftermath of the financial crisis in 2009, the government agreed to create and guarantee a fund, but also negotiated a new social end-user tariff for low-income households (bono social) that does not cover the cost of generation and froze electricity prices until 2012. The gap between the last-resort tariff and the new social end-user tariff was to be covered by the utilities.

The tariff deficit became the central challenge in the Spanish electricity market. The deficit is mainly a result of regulated end-user prices that do not reflect generation costs (Marañón and Morata, 2011). At the end of 2012, the total deficit was € 25.5 billion (Couture and Bechberger, 2013). According to the Spanish National Reform Programme (NRP), addressing the tariff deficit is one objective of Spanish energy policy. This should be underpinned by various measures, such as suspending 'economic incentives for new renewable energy facilities'. Spain remains 'firm(ly) ... commit(ted) ... to the fight against climate change and the achievement of an increasingly sustainable energy system' and sees a key role for renewable energies in the transition to a low-carbon economy (NRP-ES, 2013a). This is also reflected in economic policy that identifies 'growth that respects the environment and combats the effects of climate change' as a specific strand of action under the 2013 European Semester priority 'Promoting growth and competitiveness for today and tomorrow' as set out by the European Commission.

By January 2012 a moratorium on RES promotion was put in place. Further, for wind energy plants with a capacity of over 50 MW the FIP was reduced by 35% compared to 2010 values until the end of 2012. Moreover, there was a cap on operation hours that are eligible for the FIP. Any excess income needed to be repaid by the operator within three months of the government's request. For solar PV, the FIT was reduced by between 5 and 45% depending on the size



of the plant and the amount of eligible hours was capped. Furthermore, the incentives for CSP were reduced significantly.

In February 2013, the FIP system was abolished. In addition, an extra premium of up to € 0.7 ct/kWh for repowered wind farms, old wind farm installations that are upgraded by more recent wind energy technologies, was abolished.

In summer 2014, the government issued a new clean energy bill, introducing retroactive adjustments to RES support on the basis of a rate of return linked to 10-year sovereign bonds plus 3 percentage points applicable from July 2013 onwards.

## **I.2 Assessment of the effectiveness, efficiency and value added of the RED**

### **I.2.1 Article 3: Targets and measures**

#### **Effectiveness**

From the onset of the liberalisation of the electricity sector in Spain (1998) the Act 54/1997 included a RES target of 12% of the energy demand in Spain in 2010. The target was based on the 1996 green paper on renewable energy sources (RES) from the European Commission (Energy for the Future: Renewable Sources of Energy, COM(96) 576, November 1996). The target has driven the Plan for RES promotion 2000-2010, which was reviewed in 2004 (RES National Plan 2005-2010). Different provisions (the last one was RD 436/2004) have been setting the level of the necessary incentives to reach this target.

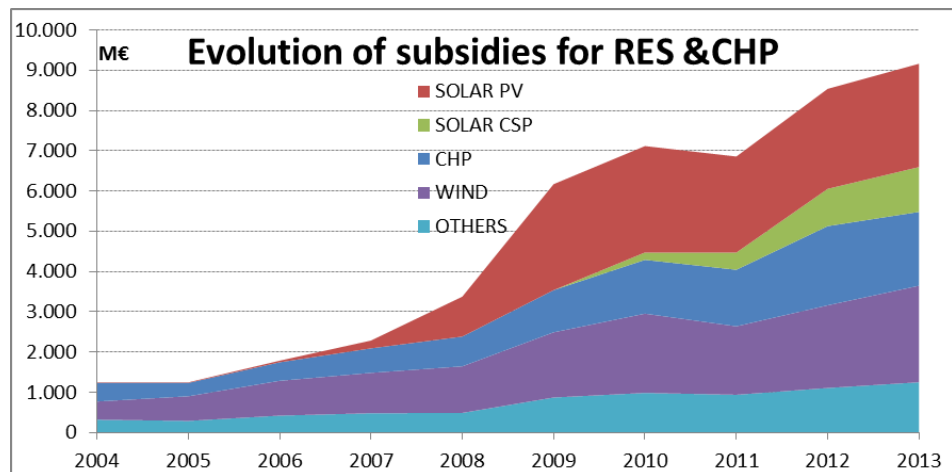
By 2007, economic growth and associated growth in energy demand proved the target to be more challenging than expected. A new regulatory provision set the incentives to achieve the targets of the Plan 2005-2010. In addition, an indicative target of 1.9% biofuel use in transport was set for 2008, an interim target of 3.4% for 2009, a mandatory target of 5.83% for 2010 and a provisional quota-system was brought into place. In 2011, the Spanish Government set biofuel targets to reach 6.2% of total transportation fuel in 2011 and 6.5% in 2012-2013, as compared to the initial target of 6.1% by 2013.

When the RED came into force in 2009, no revision of the targets were applied since RES deployment in Spain was foreseen to be above the indicative path established in the Directive.

The targets set for Spain were generally considered to be realistic and appropriate considering the development of RES already achieved. Except in biomass, the targets aligned with national targets set in 2007 for 2010 and Spain appeared to be well on track.

The evolution of the subsidies paid for RES & CHP, however, showed a strong increase since 2009 largely driven by a strong growth of solar technologies:





The subsidy was granted to a large number of applicants representing a much higher capacity than expected and targeted (3,800 MW in PV vs. 400 MW of PV in the plan and 2,500 MW in CSP vs. 500 MW in the plan). One respondent points to the lack of coordination between national authorities, responsible for the support scheme, and regional administrations, in charge of permitting (and thus well-positioned to collect data). More effective coordination could have limited support to the capacity targeted. Others suggest a lack of political will to be strict with the figures of the Plan.

In the following years, the high expenditures for RES-e charged to the end-user combined with a regulated end-user tariffs for electricity led to the emergence of the so-called tariff deficit, running up to € 25.5 billion by the end of 2012. Though RES-e expenditures represent a substantial increase in costs, some interview partners also point to the increase of other cost components in the electricity sector however.

By 2013 the tariff deficit had become the primary focus of energy policy making in Spain. In early 2013, the new electricity law (24/2013) introduced retroactive changes to support schemes, creating an unstable economic environment for investments and severely compromising progress towards the 2020 targets. In addition, this turn of events has triggered a multitude of law suits against the administration.

Further comments from respondents suggest a general sense of frustration with recent turn of events although the problem framing differs from one interview partner to another. One respondent states that “Spain can be considered as a paradigm for poor regulation particularly in the case of the development of solar technologies. The challenge today is to find a way to finance both the current RES burden and the future development of renewable energy sources. This is by far the dominant cost component that also showed the highest increase in the electricity system in Spain in last years”. Several other interview partners believe the recent turn of events to be an outright reversal of RES support, demonstration of a lack of political will to incentivize RES deployment or even an act in defense of vested interests in fossil fuels.

### **Efficiency**

Few respondents comment on the efficiency of Article 3 RED, other than that the Article did not alter existing national energy policy fundamentally. Several point out that the indicative trajectory, representing an increasingly strong growth requirement approaching 2020 may prove to compromise efficiency as realisation becomes increasingly challenging which may severely compromise the final targets.

### **Added value**

Several respondents suggest that, though the RED targets had limited impact in case of Spain as the targets were in place well before the RED, the targets in principle support efforts for RES support and investment. However, several also believe it remains to be seen how the binding will affect future development of RES in Spain, notably given the fact that the recent turn of events has seriously compromised the stability of the investment climate. One interview partner states that binding targets set out at EU level will probably reduce interferences among the targets of EU energy policy, and should lead to higher economic efficiency by ensuring that only the most cost effective projects are developed. However, it is necessary to develop a methodology able to find an appropriate balance between the benefits of Member States working together and the safeguard of national interests.

### **Conclusions and recommendations**

It is generally acknowledged by most respondents that Article 3 RED in principle provides a good basis for RES support and development. However, in case of Spain, it has had limited impact so far as Spain had already the necessary targets in place on a national level, when the RED came into force.

Until recently Spain was reported to be well on track, particularly with regard to RES-e, but recent turn of events and adjustment of Spanish legislation embody a strong deterioration of the investment climate for RES in Spain. Hence there is a broad consensus that it remains to be seen how Article 3 RED will affect future RES development. Several respondents mention the increasingly challenging indicative trajectory as an additional risk.

One respondent states the methodology of target setting seems fit to support RES-e in the early stages RES development, but future methodologies should move towards market-driven methodologies on a European level. Others believe it to be too early for such market-based methodologies pointing to a remaining lack of level-playing field.

## **I.2.2 Article 4: National Renewable Energy Action Plans**

### **Effectiveness**

Before the adoption of the RED, Spain had a plan to reach certain capacity in the different RES technologies (it was not a target based on the gross final energy consumption, as in RED) in 2010. In 2010, the Spanish NREAP, which was sent to the European Commission, set new targets with the aim of being compliant with the RED target. One respondent states that less than one year later a new Plan (not sent to the European Commission) was released with more realistic targets.<sup>44</sup> According to this respondent the new Plan did not go accompanied with an immediate redesign of the support scheme, since Spain was well above the indicative trajectory set in RED.

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<sup>44</sup> The updated NREAP was actually submitted by June 2012.



Other respondents note that the development of the NREAP in Spain suggests that the planning is quickly outdated, though it is acknowledged that economic conditions changed severely.

### **Efficiency**

Though the planning involved in NREAPs is acknowledged to be required in support of target-setting as laid out in Article 3 RED, some respondents indicate that the NREAP development in Spain suggests requirements on such planning to lack substance.

### **Added value**

Question n/a

### **Conclusions and recommendations**

Question n/a

## **1.2.3 Articles 6-12: Cooperation mechanisms**

Cooperation mechanisms, as described in the RED, were included in the Act of the Electricity Sector. However, they have not been used and there are no expectations to use them in the future.

According to several respondents, statistical transfers between MS may make sense in case one of the MS has certainty that the target will be met and there will be an excess of RES which can be statistically transferred to another MS. Currently however, it is too early to tell if Spain will exceed the 20% target. In case of joint projects, the absence of significant interconnection capacity is a great barrier to undertake such projects with third countries. Physical transfer of RES electricity is considered to be a requirement on the Iberian Peninsula as already today intermittent RES integration in the system imposes significant challenges to the system operations. Planned development of interconnection capacity in coming years may therefore relax currently perceived barriers for joint projects. Another respondent states that a lack of harmonization and different pace and timing of deployment of RES between Spain and the neighbor countries is an obstacle to use cooperation mechanisms.

### **Effectiveness**

Question n/a

### **Efficiency**

Question n/a

### **Added value**

Question n/a

### **Conclusions and recommendations**

Question n/a

## **1.2.4 Article 13: Administrative procedures, RES in buildings, heating**

### **Effectiveness**

In general the provisions in the RED are considered to have had no or limited impact for electricity, though transposition of the provisions is believed to be largely in place already before the implementation of the RED.



Several respondents note, however, that competences are distributed among three different administrative levels:

- Central administration is in charge of assigning the incentive level as well as providing authorisation of RES plants above 50 MW.
- Administrative authorisation of RES installations below 50 MW is undertaken at a regional level. This was particularly problematic when there was no central body providing the incentive before the construction of the plant: authorization of projects was done at a regional level without coordination with national administration with regard to the nationally installed capacity targeted.
- Construction permits and local taxes are provided at a local level.

In spite of not having a one-stop-shop, as exemplified by this structure, the respondent goes on to note that there are more than 60,000 RES plants connected to the grid nowadays. Other respondents, however, state that the situation has not improved since the RED came into force. The three administrative requirements involved for RES-e developers render the requirements burdensome and time-consuming. In this sense, a one-stop-shop would have helped.

Also other aspects of coordination between the differing administrative levels are reported to be limited. One respondent, for example, notes that local administration has driven up costs through permitting and taxation, effectively cannibalizing on the national support schemes.

Though the administrative burden involved with RES-e project development is believed to be considerable, some state the grid connection procedures - to be the main bottleneck in the Spanish context. Others point to the great effort distribution companies have made in the process of analysis of requests for access and connection, particularly in 2007 and 2008 when a massive number of applications for the connection of solar-PV plants occurred. This implied a significant burden for distribution companies while no remuneration for this analysis was given.

With regard to heating/cooling, one respondent comments that recent transpositions of the RED provisions in updated legislation and support schemes incentivised the application of a broader set of RES technologies and appear to drive new investments. Another respondent, however, referring to the recent reporting<sup>45</sup> believe the recent update of the Technical Building Code (CTE) and the Regulation for Thermal Installations in Buildings (RITE) fails to substantiate transposition of RED (and EPBD) and doubt if regulations, requirements and standards established in both frameworks are able to promote a broad implementation of RES for heating and cooling in Spain. Furthermore, no official record of RES heating and cooling facilities is in place in Spain. Hence there is no official data and this hampers target-setting and monitoring.

## Efficiency

Question n/a

## Added value

Several respondents point to the lack of coordination between differing administrative bodies involved with authorization of RES plants as a cause of administrative burden involved with RES investment. In this sense the article failed to bring the benefits targeted.

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<sup>45</sup> With reference to recent reporting in the context of the project 'Keep on Track!'.





Further, with regard to heating/cooling, one respondent indicates that recent updates of the Technical Building Code (CTE) and the Regulation for Thermal Installations in Buildings (RITE) have officially been justified by the need for transposition of the RED and the EPBD, but according to recent reporting have not accurately been transposed.

### **Conclusions and recommendations**

A one-stop-shop or more tighter coordination between the national, regional and local administration may offer improved streamlining of processes and procedures involved with permitting, approval and licensing.

## **I.2.5 Article 14: Information, certification, training**

### **Effectiveness**

Article 14 RED is considered to have had a significant impact in Spain, particularly with regard to certification. Prior to 2009 there was no national certification while nowadays formal certification based on national coordination and harmonization exists. For further improvement, mutual recognition of national certification schemes by Member States is mentioned.

Training has improved significantly over the years, for example Universities offer a variety of tracks related to RES development such as project management geared to RES projects. Also technical training for installation and maintenance improved.

It is, however, noted that training and certification was already reasonably well established when RED came into force as should be expected given the strong RES growth already realised in Spain. The establishment of the information, certification and training systems was therefore demand driven rather than established on the basis of the RED.

Training and certification in other domains that wind and solar is typically still regionally developed, while in case of solar and wind, harmonization across Spain was established after the RED.

## **I.2.6 Article 15: Guarantees of origin**

### **Effectiveness**

One respondent states the required electronic database to be in place and it appears to be working in good order. Another respondent, however, comments that GOs are used for the first time this year as Spain was not linked to the European Energy Certificate System (EECS) before.

## **I.2.7 Article 16: Grid access and operation**

### **Effectiveness**

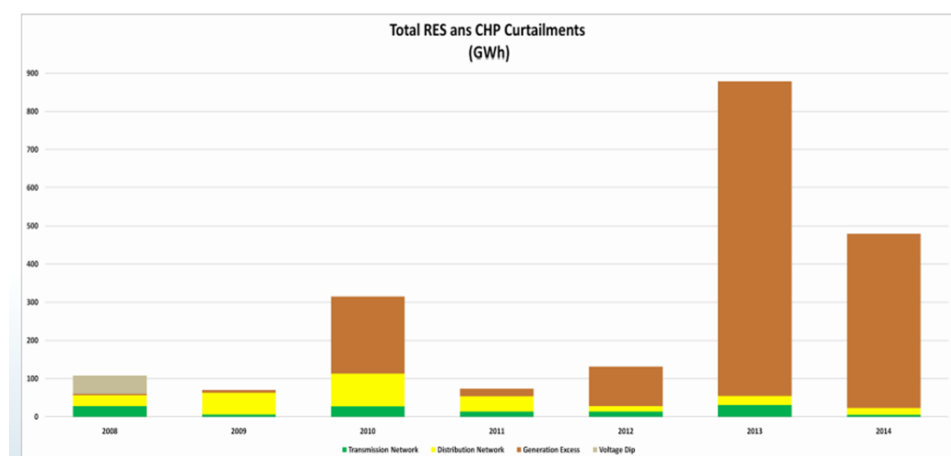
RES plants have borne the cost of access and connection to the grid in the same conditions as any other generator. Distribution companies are obliged to provide priority access to the grid for RES units. In case of absence of grid capacity for the access of the RES generator to the network, a second best option must be indicated.

Reinforcements of the grid at transmission level are part of the national infrastructure plan, which sets mandatory targets. At a distribution level, the companies assume the necessary investments to accommodate RES in-feed. However, the procedures are reported to have been slow and time consuming at times.

Though arrangements regarding reinforcement in principle assure grid access and priority dispatch, one respondent notes that limited RES curtailment does occur in Spain. The main three reasons for RES curtailments are stated to be:

- Excess generation  
Excess generation with respect to existing grid constraints is the most common cause of curtailment.
- Grid congestion  
Congestion occurs both on the distribution and transmission level.
- Voltage dips  
There is practically no curtailment for this reason in the last years, due to fault ride-through capabilities since approval of the grid code in 2007.

One respondent notes that according to Red Eléctrica de España (REE, the national grid operator), RES curtailments have reached 0.8 TWh (out of more than 110 TWh) in 2013 while there is no compensation for curtailed production (as in case of any other generator):



Several respondent note, however, that the wind sector has good experience in working with REE and grid problems occur only rarely, also due to an advanced planning and operational framework requiring frequent forecast updates so that REE only relies on shut down of turbines as a last resort.

One respondent further notes that requirements and incentives were tailored for small parties but remaining barriers relate to connection costs and shallow costs for operator.

With reference to recent reporting<sup>46</sup>, however, one respondent points to recent changes in the New Electricity Sector Law, that include a formulation restricting priority access and dispatch for RES-e to ‘equality of economic conditions in the market’, which means that such priority would be granted only when RES-e producers offer their electricity on the market at lower or equal prices as conventional power plants.

Finally, it is noted by one of the respondents that pending regulation foresees the introduction of grid access fee for self-consumption, excluding any reference to the net balance, i.e. even in case of complete self-consumption.

<sup>46</sup> With reference to recent reporting in the context of the project ‘Keep on Track!’.



## Conclusions and recommendations

Grid access conditions are generally considered to be reasonably well established in Spain, also prior to 2009. Grid connection procedures involving distribution companies are stated to have been somewhat slow. The pro-active measures and activities of REE have a beneficial impact on the facilitation of the integration of RES-e.

### I.2.8 Article 17-19, 21: RES in transport, biofuels and bioliquids sustainability

#### Effectiveness

Pending legislation has been halted for years in Spain as sustainability criteria are a central topic of ongoing debate on EU level.

Further, in February 2013, the Spanish Government approved severe reduction of biofuels consumption mandates from 2013 onwards. The global biofuel mandate has been reduced from 6.5 to 4.1%, whereas biodiesel and bioethanol targets were reduced to 4.1% (from 7%) and 3.9% (from 4.1%), respectively. These drastic adjustments are reported to have had a devastating impact on consumption as well as investment.

Another respondent points to a recent obligation for all petrol stations to offer 'protection grade petrol' until 2016, effectively blocking the introduction of E10-petrol.

The double counting mechanism established in the RED for biofuels produced from wastes, residues, non-food cellulosic material, and lingo-cellulosic material has been formally transposed into Spanish legislation in 2011, but not implemented in practice. The intended incentivisation of such biofuels therefore has not been brought about. There is a lack of regulations to incentivise biofuels of higher blends resulting in negligible consumption in Spain.

### I.2.9 Article 22 and 23: Reporting

Question n/a

## I.3 Sources and interviews

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Pain in Spain: New Retroactive Changes Hinder Renewable Energy

Available at:

<http://www.renewableenergyworld.com/rea/news/article/2013/04/pain-in-spain-new-retroactive-changes-hinders-renewable-energy>

#### IEA, 2014

Joint Policies and Measures Database (IEA/IRENA)

Paris : International Energy Agency (IEA), 2014

#### IEA, 2009

Energy policies of IEA countries : Spain 2009 Review

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Available at:

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**Marañóna and Morata, 2011**

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Progress report on the promotion and use of energy from renewable sources as established in Article 22 of Directive 2009/28/EC Spain (years 2011 and 2012)  
Madrid : Ministerio de Industria, Energía y Turismo, 2013

**NRP-ES, 2013**

Programa nacional de reformas - Reino de España - 2013

Available at: [http://ec.europa.eu/europe2020/pdf/nd/nrp2013\\_spain\\_es.pdf](http://ec.europa.eu/europe2020/pdf/nd/nrp2013_spain_es.pdf)





# Annex J Country report: Sweden

## J.1 General framework

### Institutional and administrative context: responsibilities for implementation of the RED

The Swedish Ministry of Enterprise, Energy and Communications is responsible for RES in Sweden. For specific areas of RES development relevant to the RED it has entrusted the Swedish Energy Agency (Energimyndigheten) to be responsible for grants and subsidies, associated with generation, distribution and use of biogas and other renewable gases, support for solar PV, and the market introduction of wind power. The Swedish Energy Agency is also responsible for issuing funding for energy research.

### Energy policy

Sweden started with the highest RES share of all Member States in 2005 at 39.8%. This high level of RES generation can be explained through a number of factors: since the late 1980s Sweden has had a succession of climate strategies and targets in place with the overall aim to reduce CO<sub>2</sub>e emissions; CO<sub>2</sub> from energy generation has been taxed since the early 1990s; and in 2006 the Swedish Government set a 2020 target of 25% emission reductions on 1990 levels. This was then revised to a 40% reduction by 2020 in a subsequent revision by the Swedish Parliament prior to the introduction of the RED (submitted in March 2009, approved 1 June 2009). This report (2008/09:162) set a renewable energy target of 50% by 2020. In order to meet the 50% overall target, sectoral targets have been set as outlined in Table 26.

Table 26 Sweden's renewable energy targets and progress

Sector	Swedish Parliament 2020 goals (2008/09:162 <sup>47</sup> )	2020 RED target	2020 NREAP target (June 2010)	2012 level <sup>48</sup>
Electricity	N/A	N/A	62.9%	60.0%
Heat and cooling	N/A	N/A	62.1%	65.6%
Transport	10%	10%	13.8%	12.6%
Total	50%	49%	50.2%	51%

As shown above, by 2012 Sweden had already exceeded its 2020 target.

Sweden has had a higher percentage of renewable energy than many other Member States for a long time. In 1990, total renewable energy production already accounted for 33.9%. The highest contribution was from biomass, with a large pulp and paper industry that uses biomass for heating and power. In addition, district heat networks have played an important role in enabling biomass CHP plants to provide renewable heat and electricity to the domestic sector. Hydropower has historically been the second largest contributor, accounting for 45% of Sweden's electricity generation<sup>49</sup>.

<sup>47</sup> Regeringens proposition 2008/09:162 Klimat: en sammanhållen klimat-och energipolitik.

<sup>48</sup> 2013 Article 22 Progress report.

<sup>49</sup> <http://www.energimyndigheten.se/Forskning/Kraftforskning/Vattenkraft/>



## Legal framework

The 2009 government bills (2009/10:128 Implementation of the Renewable Energy Directive and 2009/10:164 Sustainability criteria for biofuels and bioliquids) contain measures to implement the RED and a vision for 2030 of a transport fleet that is independent of fossil fuels.

## Current support schemes

RES in Sweden are largely incentivised through taxation: a plethora of different taxation mechanisms exist to cover the electricity, heat and transport sectors. The overarching aim of Swedish energy policy is to tax CO<sub>2</sub> emissions and thereby help steer the market to a low carbon future. The main incentive scheme in place is the 'Elcertifikat', an electricity certificate scheme (2003:113) which supports renewable electricity installed since 2002. It has been noted that this scheme does not really support offshore wind which will have higher development costs than onshore. Recent announcements (October 2014) by the new Swedish Government provide indications that this situation may change and increased support for offshore wind be introduced<sup>50</sup>. Renewable transport infrastructure is supported by the Pump Act (2005:1248) which concerns the provision of renewable fuel at refueling stations.

## J.2 Assessment of the effectiveness, efficiency and value added of the RED

### J.2.1 Article 3: Targets and measures

#### Effectiveness

Sweden originally set itself the goal of all energy generation being 50% renewable by 2020. The RED refined the details of how this will be achieved. As indicated in Table 26 the 2009 legislation did not specify the break down between electricity and heat & cooling. A recommendation was made that the Swedish Electricity Certificate scheme should be expanded and a target set in line with 25 TWh of renewable electricity for 2020. Specific sectoral targets were then specified in the 2010 NREAP as outlined in Table 26.

The national target of 49% had already been exceeded by 2012, with the share of renewable energy amounting to 104% of the RED target by then. The 2009 legislation indicates that this target is in line with existing objectives and therefore is achievable. The RED has resulted in Sweden building upon existing climate orientated (CO<sub>2</sub>) goals and establishing legally binding specific sub-sector targets for renewable electricity and heat.

As the RED's 2020 targets were attained by 2012, stakeholders were asked whether the target could have been more ambitious. It was felt that it could have been higher but there were mixed reactions within the sector, in particular there were doubts about whether a RES target was the optimum approach. Two of the industry stakeholders favoured renewable sector growth to be developed and steered from EU ETS rather than via specific RES targets such as the RED. This approach they argued is the most cost effective approach. Ultimately it was felt that the EU RED targets are derived from overarching CO<sub>2</sub> goals, the example of the new EU renewable energy target of 27% target for 2030 was referenced as a continuation of this approach. This view of how renewable sector growth should be driven therefore differs

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<sup>50</sup> <http://www.vindkraftsnyheter.se/2014/10/st-det-till-havsbaserad-vindkraft-ska-st-rkas>





from the approach of MS RES targets as per the RED. These targets were set based upon economic grounds rather than potential to deliver cheap RE.

Vattenfall's view is that the market should solve the problem, not EU regulation. In Sweden electricity generation is pretty much CO<sub>2</sub> neutral and the electricity price is low so that this does not stimulate significant further investment into RES. This situation is contrary to neighbouring member states which have much higher electricity prices and often less scope for wider renewable expansion. Providing a more integrated European market for renewable growth could stimulate further investment in Sweden. If the EU were to focus on where EU CO<sub>2</sub> emissions are high and use the EU ETS as the driver to reduce emissions this would stimulate investment into RES. Under the present circumstances new targets for RES and energy efficiency reduce the carbon price and so it becomes uneconomic for investment. Facilitating an international RES trade could increase the attractiveness of renewable investment to reduce CO<sub>2</sub> emissions for the EU as a whole, a point which is discussed further under Section 3.3 Cooperation mechanisms.

### **Efficiency**

The RED targets have definitely helped encourage RES in Sweden. Svenskenergi commented that advising that renewable electricity growth is steered by the EU Directives has helped to resolve debates over what further level of investment in RES required. For example, Sweden has not yet achieved its 2020 renewable electricity target as listed in the NREAP (60% compared to the target of 62.9% in 2012).

Cost reductions have been achieved in renewable energy since the implementation of the RED, in Sweden's case this has been driven by other countries such as Germany reducing the price of solar PV. The impact of RES development in Sweden has resulted in very low impact on the customers, the price of Electricity Certificates to customers equates to roughly 3 öre per kWh (€ 0.003/kWh) for RES generation according to Svenskenergi. Overall the price of electricity is relatively cheap in Sweden so there is little incentive for customers to save energy through energy efficiency measures.

### **Added value**

In the absence of the RED one could infer that greater flexibility would have been available to achieve more in one of the sectors compared to another. The RED did, however, focus attention on specific targets and has therefore provided a legally binding framework to stimulate the renewable sector.

One of the positive outcomes of the RED is that it sets out a framework upon which Sweden can report on RES development on a consistent basis with other MS. For example a different methodology was used in the first NREAP (with lower associated RES generation) for calculating the renewable proportion of heat pump generation. Since then a standardised approach for calculating the amount of renewable generation from heat pumps has been agreed at an EU level and been implemented in Sweden. This is important as it offers consistency across Europe when comparing renewable energy generation.

### **Conclusions and recommendations**

No serious issues appear to exist in relation to Sweden's compliance and attainment of the Article 3 RED objectives.

On a more strategic level a couple of stakeholders commented that the EU focussed on the production of renewable energy and did not pay sufficient attention to what impact this would have upon the market. Stakeholders commented that the market implications of increased renewable energy such as transmission infrastructure appear to only more recently have started to receive the appropriate attention and focus at an EU level which is restricting the overall renewable energy growth (or ability to import wind power) in neighbouring countries.

## **J.2.2 Article 4: National Renewable Energy Action Plans**

### **Effectiveness**

Sweden's NREAP was submitted ahead of the deadline (23 June 2010) and since its submission Sweden has been ahead of the NREAP trajectory.

The timescales to produce the NREAPs were found to be quite short which meant that it was difficult to fully achieve some of the timescales.

The usefulness of Sweden's NREAP itself as a tool to industry and investors is not immediately clear and difficult to judge. However, it was apparent that the production of NREAPs at an EU level promoted the discussion of renewable energy within Government and wider stakeholders such as the press. In Sweden this initiated a positive discussion about the RES progress being made, illustrating how it was clear that Sweden was on the right track and performing well compared to other MS.

### **Efficiency**

In terms of the effort required to compile the NREAPs there was much more detail required and more questions than initially expected when the NREAPs were outlined to MS. Examples of areas that were particularly challenging to complete were biomass fractions that did not work to identify the volumes being used in the renewable sector as compared to other sectors (further discussion on challenges to providing the required reporting information is provided in the section on Article 22 RED).

The Swedish Energy Agency would have appreciated more clarity from the European Commission on some of the specifics especially for biomass where it was not really apparent what the European Commission needed this information for.

In terms of the estimated burden there was at least one full time person within the Swedish Energy Agency working on the NREAP and others involved from other government bodies.

### **Added value**

As mentioned above Sweden's report was useful from the perspective of providing a comparison with other countries and it was useful in promoting a debate about renewable energy. Stakeholders were all in agreement about this particular aspect.

### **Conclusions and recommendations**

The NREAPs proved particularly useful for stakeholders to have a benchmark upon which Sweden's performance against other MS could be evaluated. This helped stimulate the debate on RES within Sweden. Other than this the NREAP has not had a significant impact upon the energy sector.

## J.2.3 Articles 6-12: Cooperation mechanisms

### Effectiveness

Sweden has a cooperation mechanism in place with Norway for the support of renewable electricity. Discussions with Norway on the cooperation mechanism started in 2007/08. Initially Norway proceeded with its own support scheme but this was not a success and provided an incentive to develop a cooperation mechanism with Sweden. The Swedish Electricity Certificate system was always designed with a wider market in mind such as Norway and other neighbouring countries. The primary objective of the Sweden-Norway cooperation mechanism is not to achieve the RED target but to increase investment, sector growth and deliver cost effective renewable energy.

The joint support for renewable electricity certificates as defined under Article 11 RED came into force on 1 December 2012. The 2013 progress report to the Commission reports that in 2012 a RES surplus of 9.3% (above the RED target) existed for potential trade under the cooperation mechanism. In 2012 Sweden transferred 351 GWh of renewable electricity to Norway under the cooperation mechanism.

For a number of reasons the cooperation mechanism has been more of a success in Sweden than Norway: significantly more wind has been developed in Sweden compared to Norway. Many of the factors influencing wind power development aside from the theoretical potential have played a role: more favourable investment conditions; familiarity of developers and investors with the scheme rules; more straightforward planning rules; and reduced connection costs. The latter in Norway is often expensive given the mountainous terrain. This has meant that the development level expected for Norway on the basis of the lower estimated cost of wind power has not materialized and that Norwegian consumers are helping finance Swedish renewable projects (see article assessment report). Sweden had the electricity certificate system many years ahead of Norway, which offered Swedish developers a head start compared to Norwegian projects in terms of administration and experience. The higher market attractiveness for RES deployment in Sweden to Norway results in a net level of Norwegian investment into Sweden, this is clearly a positive thing for Sweden.

### *Failure of cooperation mechanisms at a wider level*

The view amongst stakeholders is that the whole approach to cooperation mechanisms could have been very different. With no requirement to 'Opt-in' to cooperation mechanisms there is no incentive to investigate opportunities.

Stakeholders commented that trade of RE (electricity, biogas) must be facilitated between EU MS but there has been push back from some MS such as Germany, who have argued for German electricity for German customers. Whilst there is no direct barrier to trade the current energy market structures are domestic focussed and EU policy does not support a shift away from this.

Overall EU MS could have made significant savings by better encouraging the most cost effective investments in RES. However, according to the interviewed stakeholders the current structure of cooperation mechanisms is wrong. Aside from the current voluntary opt-in to cooperation mechanisms it is recognised that the current range of incentive schemes across Europe are not necessarily compatible. One market of interest to Sweden is Germany, yet the structure of the German incentive mechanism means it would be very complicated and difficult to enter into a form of investment market approach as currently exists between Sweden and Norway. Under a different approach Sweden would

have been willing to develop more cost effective renewable energy if there was an end market for the electricity that ensured a reasonable price could be obtained.

### **Efficiency**

The administrative burden of complying with the RED requirements of the cooperation mechanism is reported not to be significant, as most of the inputs relate to already existing statistical numbers. As such the reporting burden and requirements associated with the cooperation mechanism are perceived to be appropriate and not a burden.

Projects are developed based upon cost effectiveness criteria and this helps ensure that the cost of the Electricity Certificate Scheme remains low to consumers. The cooperation mechanism with Norway is set to remain in place through to 2020. However, there seems to be little potential for further use of cooperation mechanisms. The Ministry of Enterprise, Energy and Communications has sounded out interest from other MS about the opportunity of joint projects but interest at this stage is only weak. The Swedish Energy Agency's review of the cooperation mechanism highlights that interest from other MS risks coming too late to develop cooperation before 2020.

With regards to the failure of cooperation mechanisms at a wider EU level one of the stakeholders viewed the measures adopted to improve this area as unsuccessful. There was a concerted action meeting in mid-November 2014 on cooperation mechanisms. This action group on cooperation mechanisms has now been running for five years and does not appear to have delivered any impact.

### **Added value**

Discussions were already ongoing between Sweden and Norway prior to the RED on electricity market cooperation. It is therefore not really possible to attribute it being established to the RED. This was a wider goal of the Swedish Electricity Certificate Scheme design and in the case of Norway driven by the lack of success under their own domestic electricity incentive programme led them to view a cooperation mechanism more favourably. The experience of the cooperation mechanism with Norway is viewed positively (within Sweden, the remit of this research did not investigate Norwegian perspectives) and there is a feeling that this success should be built upon.

As such there is a strong feeling amongst stakeholders that there is definite value in having EU level policy on cooperation mechanisms. Stakeholders would like to see EU policy helping to support cooperation mechanisms if this can help incentivise low cost renewable energy within the EU.

### **Conclusions and recommendations**

There are areas where cooperation mechanisms could be expanded, for example, offshore wind is one technology that is too expensive to be competitive under the Elcertifikat System so given this and perhaps the location of developments in the Baltic Sea this could be one area to further develop cooperation mechanisms.

Svenskenergi commented that a key lesson from the Sweden-Norway cooperation mechanism is that it is important that harmonisation goes beyond the fiscal incentives for RES and also covers taxes, connection costs, and approval processes associated with renewable developments in order to ensure that there is a level playing field for cost effective RES to develop. There are



also other differences between the countries which should be considered given the current cooperation mechanism is in place until 2035. For instance, after 2020 Swedish participants can still receive a reduced subsidy to 2035 whilst in Norway the scheme closes to entrants completely from 2020 onwards.

Further feedback and lessons were provided to the European Commission by the Nordic electricity industry association in December 2012 outlining their views on the cooperation mechanism. Key points raised include: how co-operation mechanisms can leverage cost-efficiency in achieving RES targets, however, wider issues for market harmonization are required such as the removal of difference incentive levels, handling differences in investment conditions between nations and reaching agreement on transmission capacity between states. Nordenergi believed that cooperation between MS should be facilitated by the European Commission, including through improved guidance.

Finally, one of the failures of cooperation mechanisms was viewed as being the voluntary approach. There should have been an 'Opt-out' of 20-30% of a MS RE from cooperation mechanisms. The 'Opt-in' approach to the cooperation mechanism is wrong as there is no incentive for cooperation mechanisms.

#### **J.2.4 Article 13: Administrative procedures, RES in buildings, heating**

##### **Effectiveness**

There are well established procedures in Sweden relating to planning for RES, electricity licenses, environmental impact assessments, etc. These were established prior to the introduction of the RED.

National bodies set the overarching policy and objectives. Regional and local administrative bodies then specify the precise planning and building requirements aligned with the national legislation, in Sweden's case for example the Environment Code. This process is clearly specified in relation to the scale of the development: the Environmental Court examines larger installations (A installations) and the county administrative board examines smaller ones (B installations).

Given that much of the approvals are devolved to regional level it is difficult to see what 'added value' RED has provided in this area. Modifications that have taken place since the announcement of the RED include a new Planning and Construction Act (2009/10:170) which aims to make the process simpler and clearer. The main focus is at local and regional level where the municipality may specify which conditions are required for a building permit. It is not, however, clear from reading the NREAP how much of a direct link there is to the RED or wider renewable energy targets set at a national level. It is noted that in the NREAP reference is made to simplified procedures for wind farms at a local level, however, this came into force in August 2009 and therefore was not influenced by the requirements of Article 13 RED.

Under the aforementioned Planning and Construction Act, modifications to make the planning processes simpler and clearer at a local level for individuals and commercial enterprises was introduced in 2010. Under the act applications for building permits must be notified by the municipality within 10 weeks and planning notification given within four months. This is obviously of relevance for small scale RES, for larger scale RES projects such as wind farms it is the grid connection lead times and licensing associated with this aspect that takes the greatest amount of time. The Swedish Government believes it is important that processes are properly reviewed when it comes to matters relating to grid expansion.



The only technical specifications that exist for funding concern solar thermal. For this technology certain technical parameters are required in order to access grant funding, notably that the panel must be a Solar Keymark product with a valid certificate issued by an approved certification body. Other requirements include fulfilling the main EN standards for solar thermal EN-12975-1 and EN12975-2. Further specific details of the solar thermal requirements are provided in Sweden's NREAP.

There are no requirements within Swedish legislation for regulating an increased share of RES within the building sector. However, the use of fossil fuels for heating should be phased out by 2020. The Swedish Government commissioned the Swedish Energy Agency and National Board of Housing, Building and Planning) to present proposals for the implementation of Articles 13(3) - 13(6) RED by December 2011 for all components. This work was split into three separate studies:

- Part 1: The use of RES at planning, specification, renovation and construction in the accommodation and industrial sectors.
- Part 2: Promoting the use of RES in public sector buildings.
- Part 3: Review of building regulations for the RES promotion.

This work has now been completed and a number of solutions proposed by both the Swedish Energy Agency<sup>51</sup> and National Board of Housing<sup>52</sup>. Whilst not fully listed here some examples include improving the knowledge of renewable energy to those involved in the public sector, whether this be understanding of third party ownership and energy services, through to assisting municipality planning for renewable energy. The National Board of Housing, Building and Planning has also reported on the actions which align in focusing on increasing the knowledge of renewable energy in the building sector, improving engagement with the project Sustainable Municipalities (Uthållig kommun), specifying requirements for heat pump flow temperatures in buildings and other improvements to building standards.

### Efficiency

One restriction that the wind sector in Sweden has is that the Military currently prohibits wind power in significant portions of the country, estimated at 30% of Sweden's land area.

It has been noted that there are problems with network codes and too stringent a harmonisation will be a challenge for Sweden as the frequency of electricity in Sweden is narrow, largely due to the pulp and paper sector factories.

Sweden's approach for simplifying planning rules and requirements have been geared towards a 'one-stop shop'. This is formed of two components:

1. Environmental permit.
2. Planning - approval from the municipality.

With the latter, this has represented some challenges in particular where there is a conflict between different directives such as wildlife protection for example, for birds. From discussions with stakeholders it does not appear that this change is directly attributable to the RED and is more seen as tweaks to the existing planning framework that would have happened anyway.

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<sup>51</sup> <https://energimyndigheten.a-w2m.se/FolderContents.mvc/Download?ResourceId=2503>

<sup>52</sup> [http://www.boverket.se/globalassets/publikationer/dokument/2010/anvandningen\\_av\\_fornybara\\_energikallor.pdf](http://www.boverket.se/globalassets/publikationer/dokument/2010/anvandningen_av_fornybara_energikallor.pdf)





### **Added value**

No significant areas of ‘added value’ were identified as part of the stakeholder interviews under this article.

Stakeholders support the harmonisation of network codes’ technical specifications but it was highlighted that technical development can often happen by itself to solve problems such as the network codes’ standard. It is therefore unclear to what extent the Directive has had an impact on this area.

### **Conclusions and recommendations**

There has been no direct significant impact from the RED on planning or streamlining procedures as a clear framework existed prior to the introduction of the RED. Stakeholders felt that with regards to the development of RES in public buildings in Sweden, mandatory prescribing of RES on buildings would go against the Swedish policy of allowing the market to dictate where cost effective RES should be installed. Many public buildings have heat supplied by district heating which has a high proportion of renewable heat. However, opportunities for furthering the growth of RES in the public sector, for example in social housing, have been developed.

## **J.2.5 Article 14: Information, certification, training**

### **Effectiveness**

The Swedish Energy Agency is responsible for information provision associated with Article 14 RED. Existing measures in place that encourage the uptake of renewable energy include energy and climate change advisers working within municipalities that are funded by the Swedish Energy Agency. This work would include devising local energy plans. In addition funding is available for the provision of energy and climate change advice such as providing information on opportunities within the residential housing sector and to municipalities within their own buildings.

At the time of the NREAP there was no national coordination on certification schemes, and this was identified as lacking by the Swedish Energy Agency. In order to fulfil Sweden’s obligations under Article 14 RED a certification scheme for installers was established. This new measure ‘Certification of certain installers<sup>53</sup>’ (2012/13:32) (a new voluntary certification scheme) was outlined in Sweden’s 2013 progress report. This came into force on 31 December 2012 and covers the following technologies: biomass boilers and stoves, solar PV, solar thermal and heat pumps. It covers products up to 20 kW<sub>th</sub> capacity. The certification scheme is voluntary.

In general, the certification scheme requirement of Article 14 RED has been regarded as creating too much interference with the sector in Sweden. A very mature and well operating installer sector existed prior to the implementation of the RED particularly for biomass and heat pumps.

At a wider EU level the Swedish Energy Agency could see the benefits of this Article for certain MS but believes this was not appropriate for all MS, including Sweden, and has resulted in an unnecessary administrative burden. For example the same requirements do not exist for a gas boiler installer.

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<sup>53</sup> [http://www.riksdagen.se/sv/Dokument-Lagar/Forslag/Propositioner-och-skrivelser/Certifisering-av-vissa-installat\\_H00332/?text=true](http://www.riksdagen.se/sv/Dokument-Lagar/Forslag/Propositioner-och-skrivelser/Certifisering-av-vissa-installat_H00332/?text=true)





### **Efficiency**

The article has led to an increase in the administrative burden through launching the voluntary scheme for installers.

### **Added value**

Given the mature market status of the RES sector in Sweden at the time of the RED implementation no added value was identified for Article 14 RED.

### **Conclusions and recommendations**

Placing a mandatory requirement on a certification scheme in Sweden has not been viewed as an overly positive element of the Directive and instead been seen as increasing the administrative burden. The Swedish Energy Agency would have liked a consideration to be in place for MS to decide whether further information and training was required for the sector.

## **J.2.6 Article 15: Guarantees of origin (GOs)**

### **Effectiveness**

GOs are issued for renewable and nuclear electricity, and only for disclosure purposes, this is linked to the Swedish Electricity Certificate system. This relationship with the Electricity Certificate system operates differently to say Germany where there are restrictions on GOs being issued to renewable energy facilities based upon the generators fiscal support<sup>54</sup>.

The responsibilities for GOs are split between the Swedish Energy Agency and Svenska Kraftnät (TSO), the latter being responsible for issuing GOs and publishing information on the total amount issued. One single registry system is used with GOs cancelled after use. Regular checks are performed on the disclosure situation in countries where significant volumes of GOs are exported. A procedure exists for ensuring exported GOs are not double counted. For utility companies and consumers that do not specify any GO requirement for sourcing electricity from certain sources there is an established calculation of the residual mix in place. Sweden is a member of the Association of Issuing Bodies (AIBs). The AIBs and associated infrastructure such as EECs is seen as functioning well.

The system works well, double counting is avoided with certificates issued unique to the customer.

It has been reported that due to purely technical reasons it has not been possible for GOs to be imported into Sweden. The GO questionnaire<sup>55</sup> outlines that this should have been resolved by early 2013.

### **Efficiency**

There is a best practice procedure in place for disclosure but complexities can occur when one deals with electricity without GOs. This is understood to not be a problem specific to the Swedish market but rather to overall transparency of electricity flows from different countries. Improvements are being made by the AIB which is increasing the accuracy of GOs.

### **Added value**

Some parts of Article 15 are covered by existing legislation in Sweden under the Electricity Act (1997:857).

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<sup>54</sup> [http://cdn.eex.com/document/136092/Haendlerworkshop\\_GoOs\\_Englisch.pdf](http://cdn.eex.com/document/136092/Haendlerworkshop_GoOs_Englisch.pdf)

<sup>55</sup> [http://www.energimyndigheten.se/Global/F%C3%B6retag/Ursprungsgarantier/Questionnaire%20on%20GO%20and%20disclosure\\_SE.pdf](http://www.energimyndigheten.se/Global/F%C3%B6retag/Ursprungsgarantier/Questionnaire%20on%20GO%20and%20disclosure_SE.pdf)



Before GOs, Renewable Energy Certificates would have been issued. However, an advantage as a result of the Directive is that it brings more specific regulation and is linked more closely to disclosure. At a wider EU level it is clear that GOs are viewed by stakeholders as providing better regulation and transparency surrounding sources of electricity.

### **Conclusions and recommendations**

GOs are viewed as having a clear and well established process in place to avoid double counting. There are some complications in sourcing electricity without GOs from abroad but generally the article has been implemented well and is valued by industry.

## **J.2.7 Article 16: Grid access and operation**

### **Effectiveness**

There are no explicit limitations or conditions in place for the connection of renewable energy to the grid: the same treatment is applied to renewable electricity as to conventional power sources. A market-based model is used to identify which electricity generation technologies offer the lowest marginal cost. Onshore wind power is very attractive under this metric.

One aspect that encourages small scale RES is that the grid operator is obliged to install a meter with associated data collection equipment at the producer's grid connection point and the generator is exempt for this cost. This applies to generators below 1,500 kW (this would cover smaller scale renewable projects).

According to the latest progress report new legislation aims at integrating RES into the grid without undue penalties. The Budget Bill (2013/14:1) proposed the introduction of a sharing system for grid reinforcement costs of a transitional period. Under this system, when a new renewable project is identified Svenska Kraftnät will cover the proportion of the grid connection capacity that is not utilised by the renewable project. Should further renewable energy projects then connect to this capacity in the future they will then pay for the additional proportion of the connection capacity that they will utilise. This means that a calculation of the connection fee is made to share the grid connection fee. It overcomes the barrier that previously the first connector would have to pay for grid reinforcement which may include capacity that they would not be able to use. The total costs for Svenska Kraftnät are limited to SEK 700 million (€ 74 million).

Smart grids are viewed as an important part of increasing renewable electricity generation, reducing peak demand and increasing flexible electricity consumption. Sweden has some innovative smart grid projects integrating RES underway, for example Smart Grid Gotland which has received NER300 funding. The Swedish Government has also decided to set up a Swedish Coordination Council for Smart Grids. This Council was established in 2012 with the role of developing smart grids that contribute to more efficient and sustainable energy use. The first action plan by this Council is expected to be submitted by the end of 2014.

### **Efficiency**

Reduced costs for grid connection have been proposed and are planned to be introduced in the coming two years. The underlying principle for grid connection in Sweden is that it should be steered by economic means. Svenska Kraftnät builds as much transmission grids as is required by RES developments.



### Added value

It was found from the stakeholder interviews and from review of the NREAP and subsequent progress reports to the European Commission that Sweden had a well-established process in place for accommodating new RES projects. Since the RED came further improvements have been made to facilitate RES, however, stakeholders were not able to determine whether or not these measures would have happened in the absence of the RED.

### Conclusions and recommendations

No significant developments have been required as Sweden was already fulfilling the requirements of the Directive.

## J.2.8 Article 17-19, 21: RES in transport, biofuels and bioliquids sustainability

### Effectiveness

The Swedish Energy Agency has developed some useful knowledge of the strengths and weaknesses of this area of the RED.

### *Views on the sustainability criteria?*

The GHG targets are regarded as sensible. The grasslands definition is not yet finalised and it was noted the definition is not always appropriate to Swedish forests. Questions were also raised over the definition of 'degraded lands'. An example provided was that some land has cadmium contamination which means that no food crops can be grown there but energy crops should be able to be grown. It would appear that further detail and definition is required, however, it was also commented that adding further sections to the criteria makes the sustainability criteria complicated to manage.

### *Mass Balance System*

The Mass Balance System was designed with solid fuels in mind and not liquid fuels. It was definitely not designed with biomethane grid injection in mind. For example biogas being transported from Germany to Sweden where the distribution issue is a problem. GOs for biogas would have worked. There is a need to change the Directive on book and claim. This position is supported by the European Biogas Association's report on 'green gas grids'. They comment that cross border trade of biomethane is very limited. This is for a number of reasons but related to sustainability requirements without an international registration system the mass balancing requirements cannot be met<sup>56</sup>.

### *Article 18 (4) Voluntary Certification Schemes*

The European Commission approves Voluntary Certification Schemes with the Swedish Energy Agency acting in an advisory role. Once a scheme has been approved there is then no return within five years. Once approved, a Voluntary Certification Schemes could change their processes and structure, it is unclear what the European Commission does then. The Swedish Energy Agency would welcome some information and clarity from the European Commission on this point. There have been successes in that networks have been established between MS which has resulted in good cooperation. However, some schemes do not have enough traceability. There does not appear to be a mechanism if faults are identified, or at least no visibility. The Swedish Energy Agency would like a more proactive approach from the European Commission to schemes.

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<sup>56</sup> [http://european-biogas.eu/wp-content/uploads/2014/02/GGG\\_European-Biomethane-Roadmap-final.pdf](http://european-biogas.eu/wp-content/uploads/2014/02/GGG_European-Biomethane-Roadmap-final.pdf)



### *Drivers for biofuels from non-food feedstocks?*

Sweden is using a mix of feedstocks, much of which is derived from the waste sector. Whilst the double counting methodology is used for reporting the correct amount of renewable energy under the Directive biofuel producers in Sweden receive no taxation benefits for producing biofuels from non-food feedstocks. This approach is looking at the overall benefit to Sweden, what is most economically attractive to the sector. There have been some complaints from industry that for example biofuels from forestry waste are not receiving 'double counting'.

### *How has the article impacted the market?*

The article has created significant administrative burden even with simplification of the rules. The number of smaller biofuel producers involved in the sector has been reduced. Many of these companies were operating to obtain taxation benefits.

Smaller operators of bio-heating oil choose not to report, as they do not want to comply with the associated administrative burden. However, it was not clear whether this is a direct impact of the Directive or would have been the case anyway should sustainability criteria have implemented by the Swedish Government.

### **Efficiency**

The Swedish Energy Agency is unsure about whether a cost effective framework is in place. This is going to be the focus of an evaluation study funded by the Swedish Government in the coming year.

### **Added value**

The timing of the Directive was very positive for Sweden in this area. Renewable fuels in the transport sector such as biodiesel were at a very low level before the Directive so the timing of the implementation was very good for Sweden. One noticeable trend in the last five years in Sweden is that the vehicle fleet has shifted significantly from petrol to diesel. However, the added value associated with the Directive is difficult to assess as some form of sustainability requirements would have been introduced to regulate the sector but the exact specifications are uncertain.

In the absence of the RED Sweden would have treated sustainability requirements for biofuel heating differently. In Sweden this sector has been negatively affected by the RED, there are resources of tall oil in Sweden from the pulp and paper sector which represent an extremely sustainable resource but for which the sustainability reporting burden appears disproportionate.

One area identified as having added value was reporting on the origins of biofuels and how this changes on an annual basis. This is probably not something that would have been gathered otherwise in Sweden and provides an improved understanding of the sector.

### **Conclusions and recommendations**

Overall the sustainability requirements are viewed as heading in the right direction although a number of specific areas are regarded as being treated inappropriately. This in some cases is leading to unnecessary burden and negative development of the sector.



Some positives can also be taken from the RED implementation. It was interesting to note that industry was complaining that it would be impossible to report on the origins of biofuels when this was first proposed but this has in fact been implemented and complied with by industry without any significant problems. Two key areas were identified by the Swedish Energy Agency as requiring revision and consideration by the European Commission:

- The mass balance methodology for biomethane grid injection requires amendments;
- Greater transparency is required from the European Commission on the treatment of voluntary certification schemes.

## **J.2.9 Article 22 and 23: Reporting**

### **Effectiveness**

The Swedish Energy Agency is responsible for compiling the information for Sweden's Article 22 progress report. There are challenges associated with this process, in particular with regards to data gathering e.g. on the origins of biofuel feedstocks.

The analysis covers lots of areas for which the Swedish Energy Agency have the data but it is difficult to fit these into the prescribed tables and templates. The solid biomass sector is one such example: Sweden has excellent statistics on the trade of solid biomass partly as a result of its strong pulp and paper sector. However, one can never know which sector it will be used in; this depends upon market forces outside of the energy sector as well as the demand for pulp and paper, solid biomass prices and the ability of the pulp and paper sector to generate energy.

It was pointed out that question (10) about estimated net greenhouse gas emission savings due to RES will be tackled differently by every MS. For example, in Sweden hydro power was already in place in the early 1900s and so it is not realistic to compare to a situation with no RES being present. Other areas that are particularly unclear in this area are the environmental impacts from biofuels on water and land. One method has been selected although this was done without clear guidance.

The Swedish Energy Agency reported that the European Commission information meeting on Article 22 RED was extremely useful to them and they would be very keen that this is held again.

### **Efficiency**

The reporting burden has increased, and based upon the experience to date there are areas that could be improved particularly to ensure proportionate effort is spent on providing the best information to the Commission. However, there are benefits in spending extra time in collating this information to improve the robustness of the statistical information held as mentioned in the section below.

### **Added value**

Overall the progress reports leads to a better quality of statistical information. The summary of policies is useful for comparison purposes between MS to see what other countries are doing. Sweden would not have reported on biomass sustainability in the same form without the Directive so this can be viewed as a positive. In addition the Directive provides reason to investigate the percentage of waste that is renewable; without it this would have been done

on an approximate basis, therefore it has led to improved renewable statistics in Sweden.

### **Conclusions and recommendations**

The progress reports are useful and have provided added clarity about the information being provided such as reporting on policies.

Constructive feedback for the European Commission was identified. For those completing the report it is not often clear to them why some of the questions are needed and what the information will be used for, if this was known then those completing the report could focus their efforts on ensuring the questions that are really important to the European Commission are answered in the most robust way. At present significant effort is being expended on certain questions for which the end use and value to the European Commission is unclear.

## **J.3 Sources and interviews**

### **Boverket, 2010**

Hur kan förnybara energikällor främjas i planering och byggande? Eu-direktivet om främjande av användning av energi från förnybara energikällor, artikel 13.3 och 13.6

Available at: [http://www.boverket.se/globalassets/publikationer/dokument/2010/anvandningen\\_av\\_fornybara\\_energikallor.pdf](http://www.boverket.se/globalassets/publikationer/dokument/2010/anvandningen_av_fornybara_energikallor.pdf)

### **Energimyndigheten, 2010**

Föredömliga offentliga byggnader :främjar användningen av energi från förnybara källor

Available (in Swedish) at: <https://energimyndigheten.a-w2m.se/FolderContents.mvc/Download?ResourceId=2503>

### **European Biogas Association, 2013**

Green Gas Grids

Available at: [http://european-biogas.eu/wp-content/uploads/2014/02/GGG\\_European-Biomethane-Roadmap-final.pdf](http://european-biogas.eu/wp-content/uploads/2014/02/GGG_European-Biomethane-Roadmap-final.pdf)

### **European Energy Exchange AG, 2013**

Trading in Guarantees of Origin on EEX from 6th June 2013.

Available at: [http://cdn.eex.com/document/136092/Haendlerworkshop\\_GoOs\\_Englisch.pdf](http://cdn.eex.com/document/136092/Haendlerworkshop_GoOs_Englisch.pdf)

### **Government of Sweden, 2013**

Sweden's second progress report on the development of renewable energy pursuant to Article 22 of Directive 2009/28/EC

Stockholm : Government of Sweden, 2013

### **Government of Sweden, 2011**

Further information on NREAP

### **Government of Sweden, 2010**

The Swedish National Action Plan for the promotion of the use of renewable energy in accordance with Directive 2009/28/EC and the Commission Decision of 30.06.2009



**Regeringens proposition, 2008-09**

Klimat : en sammanhållen klimat-och energipolitik

Available (in Swedish) at: <http://www.regeringen.se/sb/d/11547/a/122778>

**Sveriges Riksdag, 2012**

Certifiering av visa installatörer : Regeringens proposition 2012/13:32

Available at : [http://www.riksdagen.se/sv/Dokument-Lagar/Forslag/Propositioner-och-skrivelser/Certifiering-av-vissa-installala\\_H00332/?text=true](http://www.riksdagen.se/sv/Dokument-Lagar/Forslag/Propositioner-och-skrivelser/Certifiering-av-vissa-installala_H00332/?text=true)

**Swedish Energy Agency, 2010**

Guarantees of origin questionnaire

Available at:

[http://www.energimyndigheten.se/Global/F%C3%B6retag/Ursprungsgarantier/Questionnaire%20on%20GO%20and%20disclosure\\_SE.pdf](http://www.energimyndigheten.se/Global/F%C3%B6retag/Ursprungsgarantier/Questionnaire%20on%20GO%20and%20disclosure_SE.pdf).

**Vindkraftnyheter (Wind Energy News), 2014**

Support to offshore wind to be strengthened

Available at:

<http://www.vindkraftsnyheter.se/2014/10/st-det-till-havsbasead-vindkraftska-st-rkas> (Published 03/10/2014)

**Interviews**

For this case study, the following organisations were interviewed:

- The Swedish Energy Agency (Energimyndigheten);
- Vattenfall;
- Svenskenergi (trade association for the energy sector in Sweden).

