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# REALISE-Forum

Renewable energy and liberalisation  
in selected electricity markets-Forum

## Final Report

by

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Enschede, March, 2007

**The University of Twente is a university for technical and social sciences in the Netherlands.**

The CSTM is the interfaculty institute for environmental studies at the University of Twente. The research, educational and advisory activities of the CSTM aim at the development of new strategies for public policy, technology and management as conditions for a responsible environmental protection.

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We gratefully acknowledge the individual engagement of the members of the national desks of the participating countries. Additionally, we would like to thank all the twelve members of the Steering Group for their active participation in the activities of the project, for the constructive discussion with the consortium and for their valuable suggestions.

## Executive Summary

REALISE-Forum analyses the interaction between liberalised/liberalising electricity markets and focuses on policies and measures supporting the market penetration of electricity generated with renewable energy sources (RES-E), concentrating on the two most prominent RES-E promotion instruments FITs (Feed-in Tariffs) and quota systems with tradable green certificates (TGCs). In doing so, REALISE has endeavoured to establish a basis for coherence of national policies in the view of the co-ordination of supporting mechanisms.

In trying to achieve its set objectives, i.e. to:

- evaluate supporting mechanisms and incentives for RES-E in the participating countries;
- identify barriers to a possibly co-ordinated EU support system;
- analyse how currently prevailing incentive schemes for RES-E are in line with liberalisation criteria and which degree of cohesion exists at a national level about the support instrument in use;
- encourage a broad debate about criteria to render such future support schemes compatible with the requirement of the liberalisation and sustainability;
- address/involve major stakeholders and decision makers in the development of a discussion platform and of policy recommendations;
- draw recommendations for future policymaking.

REALISE-Forum has attempted to:

- **develop** a novel actor focused analysis;
- **investigate** the level of national cohesion on the prevailing support schemes;
- **identify** existing barriers for a co-ordinated approach;
- **establish** a platform for stakeholders and decision makers to discuss in a balanced way specific support policy issues and promote the exchange of information and experience;
- **initiate** an organised dialogue to discuss steps on the way to future incentive schemes compatible with market criteria, sustainability and social acceptability;
- **work out** the initial steps for guidelines and to sketch lessons for policy.

The project has been managed by a joint contact point and by five national desks in the respective countries of the partners. The composition of the consortium has been determined by the tasks to be addressed and by the search of a balanced combination of national representative cases. The outcome has been a group of new and old Members States, among which one finds supporters of the feed-in system (D, SI and recently also Norway); pioneers of the implementation of green certificates (I, Sweden, NL) or countries that stick to investment support (Finland). The Norwegian partner

has taken into account the experience of Nord Pool and of all Scandinavian countries. Valuable input and advice came from a steering group whose members include decision makers and experts from the key actors and target groups also from countries that have adopted quota and green certificates such as the UK and Belgium, but which were not present in the consortium.

Although a number of national and international studies have already compared the advantages and disadvantages of the various promotion systems, REALISE-Forum has several novel features. These concern especially the analysis of stakeholder positions and of the degree of cohesion on the support instruments in use. In fact, the systems differ on crucial points which have to be considered in the view of a possibly co-ordinated approach.

### **Analytical framework**

The original analytical framework had to be adjusted to take into consideration new policy viewpoints of the EC (coordination and not harmonisation of national support systems), input of some running EU-projects and national policy adjustments. Both work on the analytical framework and the perspectives of the project have been continuously refined and have relied on an actor focused analysis. The concept is based on criteria such as the typology of the electricity market (degree of liberalisation and “greening”), actor cohesion about the national support scheme as well as the interplay between actors. The consensus on national support schemes and/or willingness to change the schemes in use has been analysed against criteria such as the degree of competitiveness, of risk and of specification of the respective systems.

This structure has been taken into account in the course of the evaluation of the national surveys and by drafting the country reports. The approach used has been based on extensive consultations with stakeholders and has tried to complement existing European policy initiatives for improving co-ordination.

In the third project’s phase, additional working steps have been taken up to consider the policy change at EU level and major documents such as for example the Communication “The Support of Electricity from Renewable Energy Sources” of December 7, 2005 as well as political and policy changes of some of the participating countries. Although in Italy and in Germany the ground philosophy has hardly been affected, the Netherlands not only changed but also stopped the financial support of RES-E production arguing that new projects would not be needed for the goal attainment in 2010. In Norway, this has meant the postponement and eventually abandonment of decisions to join the Swedish certificate market. In Slovenia the liberalisation of the energy market has become an issue attracting much effort.

## **Stakeholders' forum**

One of the operative objectives of REALISE-Forum (RF) was to initiate an organised dialogue of various stakeholders and discuss steps on the way to converging future RES-E incentive schemes compatible with market criteria, sustainability and social acceptability. The result has been the creation of a platform for various stakeholders to discuss in a balanced way such requirements. The consultation process has been furthered in all countries and surveys, hearings, in depth-interviews have been carried out against a moving policy environment. The country desks consisted of the project partners and selected stakeholders (consumer organisations, NGOs, RES-E producers, industrial consumer/producer associations, policy-makers, consultants, research institutes, financial institutions/brokers, etc.). The involved national actors have accompanied the national work phases, provided advice, participated in project's activities and partly supported the dissemination of the project results within their respective interest groups.

National characteristics rather than a rigid common structure have determined the procedure and methodology chosen for the consultations, but timing and procedures have differed from country to country. Nevertheless it was possible to draw a common structure for the questionnaires considering national peculiarities. In Germany, Italy and the Netherlands analogous questionnaires have been prepared and have been distributed to the most important stakeholders to be involved later in the respective national hearings. The consultation process in Scandinavia and Slovenia has followed another pattern. The Country reports illustrate in detail stakeholders' viewpoints and expectations.

The core ambition of the consultation was to learn more about the stakeholders' willingness to accept a change of RES-E support and/or to understand the reasons why they were not willing to adjust. Thus the willingness to move to other support systems or modify present RES-E support schemes for the benefit of EU harmonisation has been one of the foci of RF. The project has analysed the topic in terms of policy change and the conditions supporting or hindering change.

## **The findings**

The REALISE-Forum project has:

- Assessed and monitored supporting mechanisms and incentives for RES-E in countries that are in the phase of completing or have liberalised their electricity market. (See Country Reports and Chapter 2-4);
- Reviewed financial mechanisms and incentives for the production of RES electricity in new member countries (Slovenia) in the phase of liberalising their electricity market. (See Country Reports and Chapter 4);

- Identified barriers to a possibly converging support system and verified whether currently prevailing incentive schemes for RES-E are in line with the internal market (See Chapter 2);
- Encouraged a broad debate about criteria to render such future support schemes compatible with the requirement of the liberalisation and sustainability;
- Addressed/involved major stakeholders and decision makers in the development of a discussion platform and of policy recommendations.

### **Major results are:**

- An independent and coherent analysis and an assessment of the interplay between RES-E measures and liberalisation of the electricity markets in selected new/old Member States of the EU, where the liberalisation of the electricity market has already been completed or almost accomplished;
- Lessons for policy from ongoing experiences from feed in schemes and quota/certificate schemes;
- The establishment of a regular dialogue and of a web platform (REALISE Forum) in the shape of a forum (national desks activities and hearings/workshops) to promote a broad debate and exchange of experience and information between policy makers, energy practitioners, regulators, NGOs, consumers associations and major stakeholders involved in the initiation, implementation and promotion of renewable energy;
- Development of basic principles as a guidance for a possibly coordinated RES-E support system;
- Recommendations for a coordinated, open and transparent support system in line with liberalisation principles, cost-efficiency and sustainability criteria;
- A broad debate with national/international stakeholders, among other things about criteria to render future support schemes compatible with other policy objectives such as industrial and technology policy, environmental policy, competition policy, etc. (See the pentagon of complexity in Chapter 4);
- Increased interaction between various market actors in the development and mapping of national/EU paths and establishment of a balanced dialogue.

### **The general lessons learnt are:**

- It is still too early for the harmonisation of RES-E support in the EU;
- Hasty reforms based on theoretical foundations are bound to fail. Liberalisation is not accomplished yet;
- In some countries the investment context for RES-E is still perceived as too risky or unstable, especially because of administrative and grid barriers;
- Feed-in tariffs are the most widespread instrument to support RES-E within the EU. There has been a pattern of policy diffusion from pioneer

countries like Germany to Spain (premium tariffs) and new member countries as Slovenia and the Czech Republic;

- The co-existence of systems provides an ideal ground for learning about the strength and weakness of different types of support and to step up coordination;
- In some cases the two main support schemes, namely TGC and FIT, could be complementary rather than competing (Italy);
- The optimum set-up of RES-E support instruments can vary widely from one country to another depending on its peculiar electricity market and economic and social conditions;
- The compatibility between the RES-E market niche and the internal electricity market can be facilitated by rules on disclosure GO, redemption trading, labelling and the like;
- Trading schemes for greenhouse gas emissions, green certificates and white certificates must be carefully designed to keep the different markets separate. Linking their associated environmental markets would risk undermining the objectives of the respective schemes.

## **Structure of the report**

The final report summarises the findings of the REALISE-Forum and puts forwards the project's conclusions and policy recommendations which have been prepared earlier as Work Package 8, 9 and 14.

The report is structured as follows. After a general introduction, Chapter 2 deals with the state of the art of RES-E support in the EU. Chapter 3 summarises the core findings of the national desks which have been described extensively in the country reports. Chapter 4 provides the comparative analysis whilst Chapter 5 draws lessons for policy and puts forwards the policy recommendations of the project. These are mostly based on the findings of the national hearings and the lessons drawn from two international workshops and the final international conference organised in the context of RF dissemination activities. The appendix provides the individual updated country reports.

## TABLE OF CONTENTS

Executive Summary .....	I
List of Figures .....	VIII
List of Tables .....	VIII
Definitions .....	IX
1 Introduction.....	1
1.1 General Projects Objectives. Analytical framework.....	1
1.2 Project's current relation to the state-of-the-art .....	2
1.3 Project's development and adaptation: Adjustment to current policy changes in participating countries and EU energy policy priorities .....	3
1.3.1 From harmonisation to coordination of support schemes. Background and political embedment of the project.....	3
1.3.2 Stakeholders Forum .....	6
1.4 The findings .....	7
1.5 Structure of the report .....	9
2 State of the Art in EU RES-E Support .....	10
2.1 Introduction.....	10
2.2 The two dominant support schemes in brief.....	11
2.3 Diffusion of FITs and quota/certificate systems in the EU .....	12
2.4 The EU Ambition in Renewable Electricity .....	15
2.5 State of the art in renewable-based electricity production in the EU ..	15
2.5.1 State of the art in progress of renewable based electricity production at the Member State level.....	17
2.6 State of the Art in RES-E support in the EU .....	20
2.7 State of the art in the Europeanization of RES-E support .....	25
3 Findings from the National Hearings .....	29
3.1 Introduction.....	29
3.2 Findings from the Italian Hearing .....	29
3.2.1 State-of-the-art of Electricity System and RES-E Production.....	29
3.2.2 State of the Art of Liberalisation of the Electricity Market .....	31
3.2.3 RES-E Support Instruments .....	32
3.2.4 Stakeholder perceptions and willingness to change support scheme .....	33
3.3 Findings from the German hearing.....	35
3.3.1 State-of-the-art of Electricity System and RES-E Production.....	35
3.3.2 State of the Art of Liberalisation of the Electricity Market .....	36
3.3.3 RES-E Support Instruments .....	38
3.3.4 Stakeholder perceptions and willingness to change support scheme .....	38
3.4 Findings from the Dutch Hearing.....	40
3.4.1 State-of-the-art of Electricity System and RES-E Production.....	40
3.4.2 State of the Art of Liberalisation of the Electricity Market .....	41
3.4.3 RES-E Support Instruments .....	42
3.4.4 Stakeholder perceptions and willingness to change support scheme .....	42
3.5 Findings from the Slovenian Hearing .....	45
3.5.1 State-of-the-art of Electricity System and RES-E Production.....	45
3.5.2 State of the Art of Liberalisation of the Electricity Market .....	46

3.5.3 RES-E Support Instruments .....	47
3.5.4 Stakeholder perceptions and willingness to change support scheme .....	47
3.6 Findings from the Scandinavian Hearing.....	49
3.6.1 State-of-the-art of Electricity System and RES-E Production.....	49
3.6.2 State of the Art of Liberalisation of the Electricity Market .....	50
3.6.3 RES-E Support Instruments .....	51
3.6.4 Stakeholder perceptions and willingness to change support scheme .....	52
4 Comparative Results .....	54
4.1 Introduction.....	54
4.2 The context: National Electricity Markets .....	54
4.2.1 Liberalisation, Ecologisation and RES-E support .....	55
4.2.2 Conclusions on context .....	62
4.3 Stakeholders viewpoints and stakeholder preferences .....	63
4.3.1 Who was involved?.....	63
4.3.2 Perception of the market .....	64
4.3.3 Perception of the national support system .....	65
4.3.4 Compatibility of national support scheme with competitive electricity market.....	68
4.3.5 Willingness and need to change support scheme .....	68
4.3.6 Stakeholder consultation: Conclusions.....	71
4.4 Conclusions.....	73
5 Policy Recommendations .....	76
5.1 Introduction.....	76
5.2 Lessons from the international workshops and final conference.....	76
5.3 Recommendations for a coordinated approach.....	80
5.3.1 Recommendations for the EU Commission.....	80
5.3.2 Recommendations to Member State governments .....	87
5.3.3 Recommendations to stakeholder groups .....	89
References .....	92
Annex .....	93

## List of Figures

Figure 2.1 The feed in system.....	11
Figure 2.2 The quota based certificate system .....	12
Figure 2.3 Historical development of “new” RES-E in the EU 1990-2003	16
Figure 2.4 RES-E as a share of the total achieved potential in 2004 for the EU-15 .....	17
Figure 2.5 RES-E as a share of the total achieved potential in 2004 for the EU-10 .....	17
Figure 2.6 Share of RES-E in gross electricity consumption of EU-25 in 2004 (in %) .....	18
Figure 2.7 RES-E target achievement at country level: actual and normalised RES-E penetration (2004 vs. 1997) (in %) .....	18
Figure 2.8 RES-E target achievement at country level where 2005 data are already available actual and normalised RES-E penetration (2004 vs. 1997) (in %) .....	19
Figure 2.9 Europeanization of RES-E support .....	26
Figure 4.1 Resource base of Realise Forum countries .....	56
Figure 4.2 RES-E profiles of Realise Forum countries.....	56
Figure 4.3 Degree of concentration in production and retail market .....	57
Figure 4.4 Degree of market concentration and ecologisation in Realise Forum countries .....	59
Figure 4.5 Degree of competition in national support scheme and degree of ecologisation of the electricity market .....	60
Figure 4.6 Change rate and degree of competition in support system.....	61
Figure 4.7 Multidimensional space of RES-E support in EU .....	74

## List of Tables

Table 2.1 Assessment of the EU Member States’ progress towards the 2010 target (in %).....	33
Table 3.1 Basic production data of the Italian electricity system.....	43
Table 3.2 Electricity production from renewable energy sources in Italy .	44
Table 3.3 Net electricity production in Germany (2005) .....	49
Table 3.4 Green Electricity production in Germany (2006) .....	49
Table 3.5 Dutch electricity system key data (2005).....	54
Table 3.6 Basic data of the Slovenian electricity system (2005) .....	58

## Definitions

*This report understands the following concepts as defined below*

- **Support instruments** or support schemes: Policy instruments to stimulate the production and/or consumption of renewable (green) electricity.
- A **feed-in scheme** or system is characterised by a specific price set for a specific period of years for producers of green electricity to compensate for the additional costs of producing green electricity. The compensation can be a fixed amount for the whole period (tariff), a premium that decreases over time or a premium that follows the market price of grey electricity.
- A **quota/certificate scheme** or system is a system in which the green electricity is sold at the normal market price. In order to finance the additional cost of producing green electricity, and to ensure that it is generated in sufficient quantities, all consumers are obliged to purchase a certain number of green certificates from RES-E producers according to a fixed percentage (quota) of their total electricity consumption/generation.
- In a **tendering scheme** or system the State issues a series of invitations to tender for the supply of RES-E, which will be sold at market price. The additional cost is passed on to the final consumer in the form of a special tax.
- **Investment subsidy** is understood as a financial compensation for parts of the investment costs.
- **Fiscal instruments** are tax based (financial) means to compensate for parts of investment or production costs of green electricity or to charge environmentally hazardous activities.
- **Guarantee of Origin (GO)** The guarantee of origin certifies the production of renewable electricity. Especially when a cross border situation occurs, a standardised proof of the origin of the electricity is needed. In case this proof is not standardised the traded electricity can be sold as renewable energy more than once and double counting and double selling might occur.
- **Voluntary green market** A voluntary market consists of different types of green power products. RECS International recommends that for any kind of product the guarantee of origin is redeemed where the product is consumed. And if the guarantee of origin is imported, this must be a standardised GO to avoid double counting and double selling. In Europe a considerable voluntary market for renewable electricity exists.
- **Disclosure** means that the supplier gives information about the fuel mix of all its electricity supplies to all its costumers from the previous year. In order to prove that the supplier has indeed supplied the renewable electricity, the GO must be used in a standardised form.
- **Europeanisation** The evolution of nationally differentiated RES-E support schemes into EU harmonised support schemes.

# 1 Introduction

## **1.1 General Projects Objectives. Analytical framework**

REALISE-Forum analyses the interaction between liberalised/ liberalising electricity markets and focuses on policies and measures supporting the market penetration of RES-E, concentrating on the two most prominent RES-E promotion instruments FITs (Feed-in Tariffs) and quota systems with tradable green certificates (TGCs). In doing so, REALISE has tried to establish a basis for coherence of national policies in the view of the co-ordination of supporting mechanisms.

### **General objectives are:**

- to improve the knowledge and understanding of the RES-E market and incentives and of their economic and social acceptability;
- to investigate regulatory frameworks that at the same time render profitability and efficiency compatible with sustainability;
- to discuss steps to pave the way for a possibly co-ordinated support system for renewables at EU level;
- to initiate an organised dialogue of various stakeholders and discuss steps on the way to future RES-E incentive schemes compatible with market criteria, sustainability and social acceptability.

### **Operative objectives are:**

- Evaluate supporting mechanisms and incentives for RES-E in the participating countries;
- Identify barriers to a possibly co-ordinated EU support system;
- Analyse how currently prevailing incentive schemes for RES-E are in line with liberalisation criteria and which degree of cohesion exists at a national level about the support instrument in use;
- Encourage a broad debate about criteria to render such future support schemes compatible with the requirement of the liberalisation and sustainability;
- Address/involve major stakeholders and decision makers in the development of a discussion platform and of policy recommendations;
- Draw recommendations for future policymaking.

In doing so REALISE has attempted to:

- **develop** a novel actor focused analysis;
- **investigate** the level of national cohesion on the prevailing support schemes;
- **identify** existing barriers for a co-ordinated approach;

- **establish** a platform for stakeholders and decision makers to discuss in a balanced way specific support policy issues and promote the exchange of information and experience;
- **initiate** an organised dialogue to discuss steps on the way to future incentive schemes compatible with market criteria, sustainability and social acceptability;
- **work out** the initial steps for guidelines and to sketch lessons for policy.

The project is in line with the aim of the Commission to accelerate the rate of growth of the EU renewable energy market and to encourage a broad debate on the best ways to achieve the goals of:

- a 12%-share of renewable energy in EU final energy consumption and
- a 21% share of RES in EU gross electricity consumption by 2010.

REALISE-Forum has also looked into the changed institutional framework and market players structure and partially tackled the issue of how new markets, such as CO<sub>2</sub> emission permits/credits may affect or overlap with the promotion of RES-E and discussed steps towards a possibly coordinated support system for renewables at EU level.

The project has been managed by a joint contact point and by five national desks in the respective countries of the partners. The composition of the consortium has been determined by the tasks to be addressed and by the search of a balanced combination of national representative cases. The outcome has been a group of new and old Members States, among which one finds supporters of the feed-in system (D, SI and recently also Norway); pioneers of the implementation of green certificates (I, Sweden, and formerly the NL) or countries that stick to investment support (Finland). The Norwegian partner has taken into account the experience of Nord Pool and of all Scandinavian countries. Valuable input and advice came from a steering group whose members include decision makers and experts from the key actors and target groups also from countries that have adopted green certificates such as the UK and Belgium, but which were not present in the consortium.

## ***1.2 Project's current relation to the state-of-the-art***

Although a number of national and international studies have already compared the advantages and disadvantages of the various promotion systems, REALISE-Forum has *several novel features*. These concern *especially the analysis of stakeholder positions and of the degree of cohesion on the support instruments in use*. In fact, the systems differ on

crucial points which have to be considered in the view of a possibly co-ordinated approach.

The project goes beyond the state of the art and builds upon the experience and results of a set of EU financed projects such as:

- ENER-IURE,
- Tradable Renewable Energy Certificates Know-how & Initiatives Network (TRECKIN),
- Renewable Energy Certificate Systems (RECS),
- Renewable Electricity Certificates in EU Accession Countries (ASCERT) and
- GREEN-X

which have been concluded and others which were running parallel to REALISE-Forum such as for example OPTRES. Regarding the issue of green power and “guarantee of origin”, REALISE draws evidence from projects such as E-Track.

### ***1.3 Project's development and adaptation: Adjustment to current policy changes in participating countries and EU energy policy priorities***

The original project's objectives had to be adjusted to take into consideration the policy change of the EC, input of some running EU-projects and national policy adjustments.

The REALISE-Forum draft approved for grant of and the description of the action were built upon the EU-RES policy set down in the COM (2004) 366 final “The share of renewable energy in the EU” and the Commission Staff Working Document SEC (2004) 547: “EU-25 country reports”. The proposal had been prepared on the foundation of political and policy specifications which have subsequently changed.

#### **1.3.1 From harmonisation to coordination of support schemes. Background and political embedment of the project**

At the time of the original project design, expectations regarding the establishment and performance of the competitive internal electricity market (Directives 96/92/EC and 2003/54/EC) were rather high. The quota and certificate trading system met similar high expectations when it came to support of renewable resources for electricity production. Thus in the period of the original set up of REALISE-Forum, harmonisation of support schemes was expected to be the logical path to match with the liberalised and harmonised electricity market. The certificate trading scheme was expected to be the most viable alternative in this respect, because of its market based architecture and

its potential to develop from a national to the European level. It was anticipated that a market oriented type of support could be easily integrated in the internal (competitive) electricity market and it was felt necessary to devise common rules for support mechanisms for RES-E.

In fact, the European Commission in its report on harmonisation in 1998 had argued that the co-existence of different support schemes would provoke distortions in trade and competition. EU wide harmonisation of renewable energy policies was alleged to be necessary for implementing the single energy market, to boost cost-reduction in the renewables field and to foster the international competitiveness of the EU economy. The market logic of the quota/certificate system and the liberalised electricity market were alleged to provide both an effective and efficient combination.

Against this background, the REALISE-Forum project proposal had a stronger focus on liberalisation and on market support mechanisms for RES such as quota and certificate systems. One of its objectives was - in accordance with the EC policy objectives - to analyse barriers playing against and paths for future harmonisation of the EU systems. The quota/certificate system was taken - as perceived by the European Commission then - as the reference model for harmonisation, especially because this scheme was expected to better fit to the liberalised electricity market.

Following the appointment of the new Commission, harmonisation was no longer part of the EU plans and the focus of policy makers within the Commission has moved from harmonisation and one predominant EU-wide mechanism to co-existence of mechanisms and supranational/regional coordination. This modification had then to be reflected by the analytical framework of REALISE-Forum.

Accordingly, the envisaged theoretical framework has been adjusted to the new policy viewpoint (coordination and not harmonisation of national support systems) and it has been decided to enlarge the scope of the project, in order to accommodate an analysis considering a wider spectrum of supporting mechanisms (FIT and TGC). It was decided to identify barriers of coordination between support schemes (instead of "harmonised", as initially planned) and to investigate the likely steps to reach this and draw policy recommendations.

Consequently, both work on the analytical framework and the perspectives of the project have been continuously refined and have relied on an actor focused analysis. The concept is based on criteria such as the typology of the electricity market (degree of liberalisation and "greening"), actor cohesion about the national support scheme as well as the interplay between actors. The consensus on national support schemes and/or willingness to change the schemes in use has been analysed against criteria such as the degree of competitiveness, of risk and of specification of the respective systems.

This structure has been taken into account in the course of the evaluation of the national surveys and by drafting the country reports (see Annex). The approach used was based on extensive consultations with stakeholders and tried to complement existing European policy initiatives for improving co-ordination.

In December 2005, almost a year after the start of Realise Forum (RF), the EU published the first evaluation report on RES-E support. One of the major conclusions of the communication was that the alleged superiority of the certificate system to stimulate renewable based electricity generation was not convincingly supported by empirical findings. Moreover, the evaluation showed that the feed-in system had become by far the dominant support model in Europe and its performance in terms of effectiveness and cost efficiency is compelling. Based on these findings, the Commission relieved the harmonisation ambition by amending the time frame of harmonisation and by introducing an intermediary step of coordination between support systems in use.<sup>1</sup>

Thus in the third project's phase additional working steps were taken up to consider the policy change at EU level and major documents such as for example the Communication "The Support of Electricity from Renewable Energy Sources" of December 7, 2005 as well as political and policy changes of some of the participating countries.

In fact, since the start of the project there have been political changes in all RF-countries. This has somehow affected the priorities/design of the respective national energy policies. Although in Italy and in Germany the ground philosophy has hardly been affected, the Netherlands not only changed but also stopped the financial support of RES-E production arguing that new projects would not be needed for the goal attainment in 2010. In Slovenia the liberalisation of the energy market has become an issue attracting much effort. In Norway, this has meant the postponement and eventually abandonment of decisions to join the Swedish certificate market.

As a consequence REALISE-Forum has taken into account the changing specific legal, administrative and economic situation in the RF countries and other relevant countries as well as national objectives and

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<sup>1</sup> In its most recent report on the progress of RES-E from January 2007 (COM(2006) 849 final), the EU Commission mentions eight main areas of action on renewable electricity which must be immediately developed. One of this eight recommended actions is the optimisation of the support schemes as defined in COM(2005) 675. The Commission also stated that in 2007 it will re-examine the situation concerning Member States' support systems for renewable energies with a view of assessing their performance and the need to propose harmonised support schemes for renewables in the context of the EU internal electricity market. The Commission also claims, that while national schemes may still be needed for a transitional period until the internal market is fully operational, harmonised support schemes should be the long term objective.

activities planned or underway in the countries under scrutiny and elsewhere (as for example the so called feed-in co-operation between Germany and Spain).

### **1.3.2 Stakeholders Forum**

One of the operative objectives of REALISE-Forum (RF) was to initiate an organised dialogue of various stakeholders and discuss steps on the way to converging future incentive schemes compatible with market criteria, sustainability and social acceptability. The result has been the creation of a platform for various stakeholders to discuss in a balanced way such requirements.

In the intentions, the identification of barriers and the search for coordinated approaches for RES-E support in the EU was to be carried out by means of stakeholder consultation and dialogue. The idea behind this approach was that dialogue and exchange of views between stakeholders could possibly pave the way for a change of RES-E support which could facilitate next steps in the intended process. RF has applied this communicative approach as a pilot in a selection of countries to learn more about its potential. The country desks of RF have conducted stakeholder's consultation in the countries involved. The consultation process has been furthered in all countries. The work has been advanced and surveys, hearings, in depth-interviews have been carried out against the moving policy environment described under 1.3.1.

The country desks consisted of the project partners and selected stakeholders (consumer organisations, NGOs, RES-E producers, industrial consumer/ producer associations, policy-makers, consultants, research institutes, financial institutions/brokers, etc.). The involved national actors have accompanied the national work phases, provided advice, participated in project's activities and partly supported the dissemination of the project results within their respective interest groups.

National characteristics rather than a rigid common structure have determined the procedure and methodology chosen for the consultation, but timing and procedures have differed from country to country. Nevertheless it was possible to draw a common structure for the questionnaires considering national peculiarities. In Germany, Italy and the Netherlands analogous questionnaires have been prepared and have been distributed to the most important stakeholders to be involved later in the respective national hearings. The consultation process in Scandinavia and Slovenia has followed another pattern. The Country reports (in the Annex) illustrate in detail stakeholders' viewpoints and expectations.

The core ambition of the consultation was to learn more about the stakeholders' willingness to accept a change of RES-E support and/or to understand the reasons why they were not willing to change. It was expected that *this kind of knowledge could help the Commission to improve the conditions for a stepwise change towards converging RES-E support in Europe*. Thus the willingness to move to other support systems or modify present RES-E support schemes for the benefit of EU harmonisation has been one of the foci of RF. The project has analysed the topic in terms of policy change and the conditions supporting or hindering change.

## **1.4 The findings**

The REALISE-Forum project has:

- Assessed and monitored supporting mechanisms and incentives for RES-E in countries that are in the phase of completing or have liberalised their electricity market. (See Country Reports and Chapter 2-4);
- Reviewed financial mechanisms and incentives for the production of RES electricity in new member countries (Slovenia) in the phase of liberalising their electricity market. (See Country Reports and Chapter 4);
- Identified barriers to a possibly converging support system and verified whether currently prevailing incentive schemes for RES-E are in line with the internal electricity market (See Chapter 2);
- Encouraged a broad debate about criteria to render such future support schemes compatible with the requirement of the liberalisation and sustainability;
- Addressed/ involved major stakeholders and decision makers in the development of a discussion platform and of policy recommendations.

**Major results are:**

- An independent and coherent analysis and an assessment of the interplay between RES-E measures and liberalisation of the electricity markets in selected new/old Member States of the EU, where the liberalisation of the electricity market has already been completed or almost accomplished;
- Lessons for policy from on going experiences from feed-in schemes and quota/certificate schemes;
- The establishment of a regular dialogue and of a web platform (REALISE Forum) in the shape of a forum (national desks activities and hearings/workshops) to promote a broad debate and exchange of experience and information between policy makers, energy practitioners, regulators, NGOs, consumers

associations and major stakeholders involved in the initiation, implementation and promotion of renewable energy;

- Development of basic principles as a guidance for a possibly coordinated RES-E support system;
- Recommendations for a coordinated, open and transparent support system in line with liberalisation principles, cost-efficiency and sustainability criteria;
- A broad debate with national/international stakeholders, among other things about criteria to render future support schemes compatible with other policy objectives such as industrial and technology policy, environmental policy, competition policy, etc. (See the pentagon of complexity in Chapter 4);
- Increased interaction between various market actors in the development and mapping of national/EU paths and establishment of a balanced dialogue.

**The general lessons learnt are:**

- It is still too early for the harmonisation of RES-E support in the EU;
- Hasty reforms based on theoretical foundations are bound to fail. Liberalisation is not accomplished yet;
- In some countries the investment context for RES-E is still perceived as too risky or unstable, especially because of administrative and grid barriers;
- Feed-in tariffs are the most widespread instrument to support RES-E within the EU. There has been a pattern of policy diffusion from pioneer countries like Germany to Spain (premium tariffs) and to new member countries as Slovenia and the Czech Republic;
- The co-existence of systems provides an ideal ground for learning about the strength and weakness of different types of support and to step up coordination;
- In some cases the two main support schemes, namely TGC and feed-in tariffs, could be complementary rather than competing (Italy);
- The optimum set-up of RES-E support instruments can vary widely from one country to another depending on its peculiar electricity market and economic and social conditions;
- The compatibility between the RES-E market niche and the internal electricity market can be facilitated by rules on disclosure GO, redemption trading, labelling and the like;
- Trading schemes for greenhouse gas emissions, green certificates and white certificates must be carefully designed to keep the different markets separate. Linking their associated environmental markets would risk undermining the objectives of the respective schemes.

By tackling the issue how new markets such as CO<sub>2</sub> emission permits/credits may affect or overlap with the promotion of RES-E, the German Desk reached the conclusions that whilst RES-E FIT schemes are technology oriented systems, emission trade is technology neutral. A certain overlap between the two systems does exist as both aim at reducing CO<sub>2</sub> emissions. Within the ETS, the electric utilities may decide to switch to RES-E production to fulfil their CO<sub>2</sub> emission reduction commitments. The additional contribution of RES-E to the fulfilment of the national CO<sub>2</sub> emission reductions should be taken into account in the national allocation plans, i.e. with a special reduction target only for RES-E (for example a 21% reduction target for Germany until 2010 + a 2% extra reduction based on the contribution of RES-E). The conclusions of the German desk conceded that such proposals are unlikely to be considered until 2010, but pointed out that the discussion on such issues should be commenced.

### ***1.5 Structure of the report***

The final report summarises the findings of the REALISE-Forum and puts forwards the project's conclusions and policy recommendations which have been prepared earlier as Work Package 8, 9 and 14.

The report is structured as follows. Chapter 2 gives the state of the art of RES-E in the EU. Chapter 3 summarises the core findings of the national desks. These have been described extensively in the country reports (see Annex). Chapter 4 provides the comparative analysis whilst Chapter 5 draws lessons for policy and puts forwards the policy recommendations of the project. These are mostly based on the findings of the national hearings and the lessons drawn from two international workshops and the final international conference organised in the context of RF dissemination activities. The appendix provides the individual updated country reports.

## 2 State of the Art in EU RES-E Support

### 2.1 Introduction

The goal of increasing the share of RES-E in the overall electricity mix in the EU is fostered through a wide range of different promotion instruments (feed-in based schemes, quota/certificate based schemes, tendering schemes, investment subsidies, fiscal and green labelling schemes). The most prominent ones are feed-in schemes based on tariffs or premiums (FIT) and quota/certificate schemes (TGC)<sup>2</sup>. In order to harmonise the diverse legal situation of RES-E support within the different EU Member States, a EU directive should have provided a uniform regulatory framework valid throughout the EU as a whole. But Directive 2001/77/EC finally opted for a different approach, only laying down some general principles with regard to definitions of RES-E, non-binding targets, guarantees of origin, administrative procedures or grid issues. Concerning support schemes, the directive stated that the Commission, by late October 2005, would present a report on the experience gained with the application and coexistence of the different mechanisms of support used in the member states, possibly including a proposal for a community-wide support framework for RES-E. This report was presented at the beginning of December 2005<sup>3</sup>. Therein and based on the national experiences gained, the EU Commission again postponed a uniform support approach arguing that it is still too early for a single solution at EU level and that for the next years, the priorities should be optimisation and coordination of the national RES-E support schemes.

Following a short explanation of the mode of operation of feed-in scheme and quota/certificate scheme, this chapter will give a historical overview of the diffusion course of these two main support instruments within the EU. This will be followed by a description of the state of the art of the renewable-based electricity production in the EU. Subsequently the latest developments in RES-E support in the REALISE-Forum Member States (Germany, Italy, the Netherlands, Sweden, Finland, Denmark, and Slovenia) as well as in Norway will be explained. The chapter ends with a short analysis of the first steps taken by different EU Member States to foster a common European RES-E support, including national similarisation (as the Feed-in cooperation between Germany, Spain and most recently Slovenia) and

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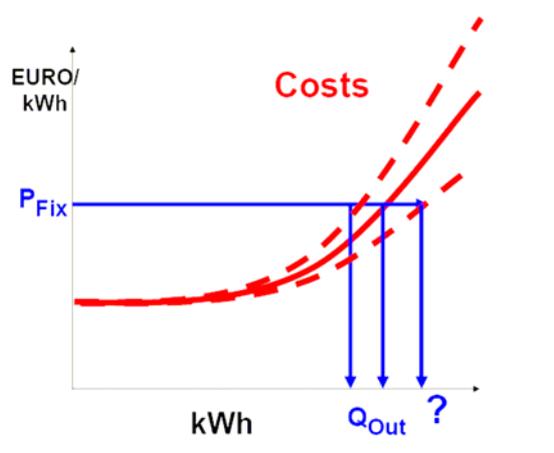
<sup>2</sup> In the rest of the text the feed-in scheme is named FIT and the quota/certificate scheme TGC.

<sup>3</sup> EU Commission, The support of Electricity from Renewable Resources, COM (2005) 627, Brussels 2005.

regional markets (like the voluntary trade renewable energy certificates in several EU countries) as intermediary steps.

## 2.2 The two dominant support schemes in brief<sup>4</sup>

FITs show two basic features: Purchase obligation by utilities for RES electricity and guaranteed premium prices (mostly for a certain time period, e.g. 15 years) for producers of RES electricity. The specific feed-in conditions (considered RES technologies, level of remuneration, grid access, equalisation of extra costs of RES, etc.) are normally part of an own RES regulation.

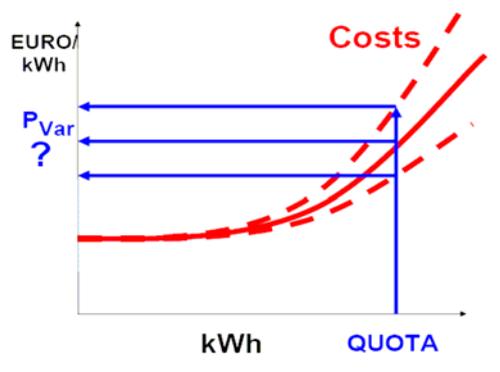


**Figure 2.1 The feed in system**

On the vertical axis the figure indicates the fixed (feed-in) support and on the horizontal axis the amount of RES-E based kWh initiated by the support. The amount of support is decided by the state and the volume of RES-E production is decided by the market. In a quota-based system this is just the other way around. In the case of quota/certificate systems a certain amount or share of RES power is fixed (by the state) and has to be produced, purchased or bought in a given time period by a certain group of actors (suppliers, producers, traders or end customers). Figure 2.2 illustrates this situation showing the fixed quota on the horizontal axis and on the vertical axis a certain price decided in the market. Quota systems are normally combined with tradable green certificates (TGCs) mainly to separate the physical power market from the TGC market and to control the compliance of the set quota. The specific conditions of quota systems (e.g. fixing of different quotas for each RES

<sup>4</sup> This and the following section draw heavily on Bechberger and Reiche, 2005. Relevant information has been updated.

technology, level of fines in case of non compliance of quota, etc.) are (also) normally set by an own RES regulation.



**Figure 2.2 The quota based certificate system**

### ***2.3 Diffusion of FITs and quota/certificate systems in the EU***

From a chronological point of view, Portugal was the first EU country introducing a FIT system in 1988, which – in an amended version of 2001 – is still in force. Mostly Germany (FIT firstly introduced 1990), but also Spain (1994) and Denmark (1992) can be regarded as model countries for the FIT approach due to the substantial increase of the share of RES in the power supply under the FIT in both countries. First of all the German RES Act (EEG) from 2000 set an example for other countries, which later on also decided for a FIT system. This was the case i.e. for the Czech Republic, where the Czech Renewable Energy Association arranged a translation of the EEG and distributed it to all members of the Czech Parliament. This fact initiated a discussion about the promotion of RES through a FIT system, which finally led to the implementation of a respective instrument. An even stronger orientation by the German EEG can be identified in the French case. In a comparative study by the Member of the French National Assembly Yves Cochet on different RES promotion models by order of the then prime minister Jospin, the implementation of a FIT system was recommended with explicit reference to the success of the German (but also the Spanish) promotion approach. On the other hand, the study also referred to the difficulties of implementation of a quota system in the Netherlands, Great Britain and Italy and its problems to realise clear increases of the RES share on the energy supply in a relatively short time period.

But also in the most recent past there are examples for an orientation by model countries: The amendment of the Spanish regulation for RES

electricity of March 2004 is partly orientated by the German Feed-in law of 1990 and the new Czech RES act – which came into force in August 2005 – shows many strong similarities to the current Spanish RES promotion model as well as to some provisions of the current German RES law. Before the adoption of the Czech RES act, a couple of meetings between the German and the Czech environment ministries took place, where the German side advised the Czech delegation in some critical issues. Also the Spanish energy regulatory office consulted its Czech counterpart as well as the Czech ministry of industry and trade on the functionality of the Spanish green bonus model for RES electricity.

Beside this more trans-national diffusion factors, the repeated increase of EU-28 countries introducing FITS since 2001 until October 2006 (13 new introducers)<sup>5</sup> can also be explained by a couple of factors on a macro level: Firstly, the necessity of a systematic support of renewable energies in the national electricity markets based on the indicative targets of the European Directive on the promotion of green electricity from September 2001 and the fact that this EU Directive didn't include a determination for one specific RES promotion model. Furthermore, the legal security concerning the conformity of the German Feed-in law with European law on competition regulations due to an identical sentence by the European Court of Justice of March 2001 as well as the great successes mainly regarding the growth in wind power capacities of EU countries like Germany, Spain or Denmark – which all used FITs – convinced other EU member states to introduce such a RES promotion instrument.

Besides the 19 countries in the EU-25 respectively the 21 countries in the EU-28 (including Bulgaria, Romania and Turkey) with a FIT system in force October 2006, some more countries, which meanwhile changed their RES promotion approach, also used a FIT system. This applies to Italy (between 1992 and 2001), Ireland (until the end of 1994) and Poland (1993 – 2001) (Bechberger et al. 2003). In August 2005, Italy adopted a new feed-in tariff system for PV applications, which entered into force in October 2005 (Di Nucci et al. 2005). Furthermore, in 2005 the region of Flanders in Belgium for PV applications as well as Turkey for all kinds of RES has adopted a feed-in tariff system, which both came into force in January 2006. The most recent adopter of a FIT system is Ireland in June 2006, thereby replacing its former tendering approach. With this decision, Ireland also returned to a FIT scheme, already in place until the end of 1994.

A historical view concerning the diffusion of quota/certificate systems reveals a quite different situation. The first EU country, which opted for

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<sup>5</sup> These are France (2001), the Czech Republic, Slovenia, Lithuania, Bulgaria (all 2002), Austria, Hungary and the Netherlands (all 2003), Cyprus (2004), Italy (since 9/2005, only for PV), Belgium (only the region of Flanders and only for PV since 1/2006), Turkey (since 1/2006) and Ireland (since 5/2006).

such a RES promotion model was the Netherlands in 1998. But the Dutch attempt to support the development of RES in this way only lasted three and a half year, because in July 2001 the Netherlands changed to a more demand orientated RES policy based on energy tax exemptions for green power. Nevertheless between 1998 and 2001 more EU countries (six)<sup>6</sup> introduced a quota/certificate system than a FIT (three)<sup>7</sup>. There are mainly three reasons for the dominance of quota system diffusion during this period: Firstly, the European Commission – as one very important external actor regarding the diffusion of policy innovations – already in a first unofficial draft of an EU-Directive for the promotion of RES in the internal electricity market of October 1998 preferred a RES support model based on quota systems. This fact clearly hampered the further diffusion of FITs as EU Member States feared costly administrative adjustments to a possible EU wide quota model if – before the adoption of the EU-RES Directive – would have introduced a FIT system. Secondly and also in 1998, the resistance of German energy suppliers against the recently amended German Feed-in law (StrEG) reached the European level: The then German supplier PreussenElektra filed a lawsuit against the StrEG by the regional court of Kiel, which forwarded the case to the European Court of Justice (ECJ). Not until March 2001 the ECJ decided that the StrEG was no state subsidy and therefore conform with European competition regulations. Until this sentence there was no legal security for countries thinking about the implementation of a FIT. Thirdly, the international economic respectively neo-liberal framework conditions benefited the diffusion of quota systems because they (in economic theory) are normally perceived to comply better with the conditions of international trade, market mechanisms and competition (in general) than FITs (Reiche 2002; Van Sambeek/Van Thuijl 2003).

After this first “diffusion wave” of quota systems between 1998 and 2001, four more EU-28 countries opted for such a RES support model: The UK and Belgium in 2002, Sweden in May 2003 and Romania in 2004 as the most recent example for a country with a quota system (Stability Pact Watch 2005). In October 2006 it turned out that 21 of the EU-28 countries were using a REFIT system with only 5 countries left in the quota/certificate model.

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<sup>6</sup> These were the Netherlands (only between 1998 and 2001), Denmark (but until now not implemented) and Italy in 1999, Austria (only between 2000 and 2003, only for small hydro, but never implemented), Poland and Belgium (2001). The Belgium quota systems also have partly similarities with a fix price system as minimum prices for the tradable green certificates were set, depending on the respective RES technology (see the presentation of A. Verbruggen in the proceedings of the Realise-Forum Workshop in Milan available on the web page).

<sup>7</sup> These were Estonia, Latvia (both 1998) and France (2001).

## **2.4 The EU Ambition in Renewable Electricity**

In 2001 the EU adopted the Directive on the promotion of electricity produced from renewable sources (European Council, 2001). The Renewables Directive (2001/77/EC) is the common guideline for the Member States to increase renewables-based electricity within the EU. The Directive sets targets for the share of RES-E in total electricity consumption at EU and Member State levels. The overall share of renewable energy sources in total primary energy supply in the EU-15 is to reach 12% in 2010<sup>8</sup>, with a renewable energy share in electricity consumption of about 22%.<sup>9</sup> It is said “about” because of the impact of the membership of the accession countries in 2004. The RES-E directive holds indicative targets for each Member State for 2010 and Member States are allowed to continue different support schemes during the transition period until a harmonised RES-E support framework has been agreed<sup>10</sup>.

## **2.5 State of the art in renewable-based electricity production in the EU**

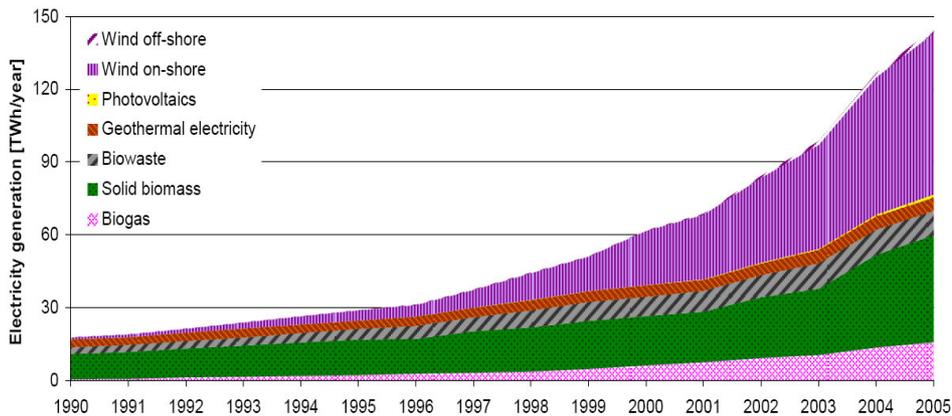
About 65% of RES-E production in the EU regions by the end of 2005 still originated from hydropower. However, since the publishing of the last Commission report (COM(2004) 366), around 50% more renewable electricity (non-hydro) has been produced. In the most recent report on progress in RES-E from January 2007 the EU gave the following overview of RES-E electricity production in the EU-25 region with renewable resources, excl. hydro.

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<sup>8</sup> In its recently released climate change package from January 10, 2007, the EU Commission even proposes for the first time a binding RES target of 20% by 2020 of its overall energy mix (COM(2007) 1 final).

<sup>9</sup> After the accession of ten further countries to the EU in May 2004, the EU-25 RES-E goal was reduced to 21% of gross electricity consumption in 2010.

<sup>10</sup> In any case such an harmonised EU-wide support scheme for RES-E include sufficient transitional periods for national support systems of at least seven years, as laid down in the EU Directive 2001/77/EC (§ 4, 2 (e)).

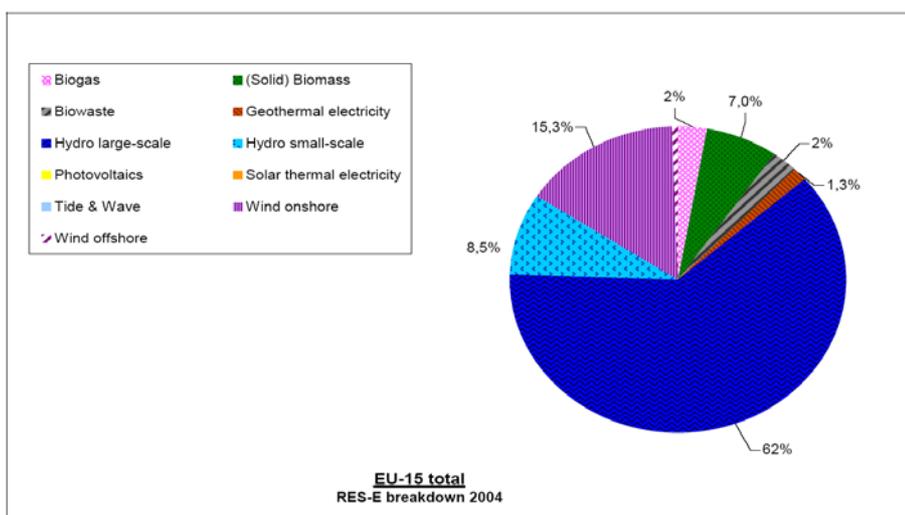


**Figure 2.3 Historical development of “new” RES-E in the EU-25 1990-2005**

Source: Communication of the EU Commission COM (2006) 849 final

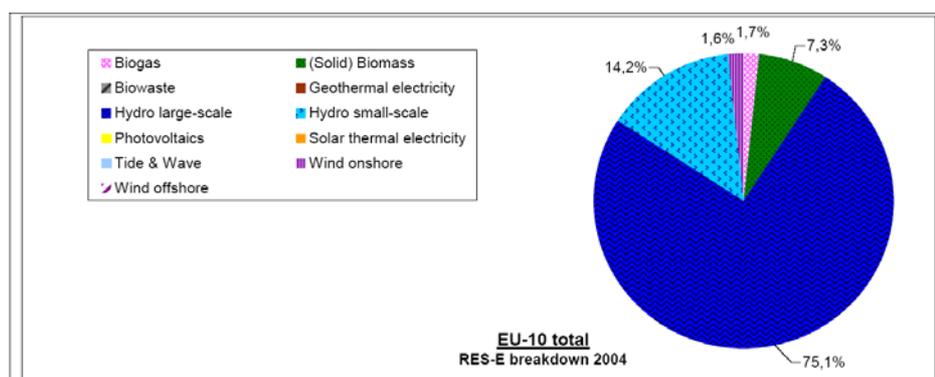
In 2005, renewable electricity contributed by 15% to the gross electricity consumption of the EU-25. The 2005 figures still include provisional data from IEA and Member States. Consolidated figures for 2004 showed a share of 14.2%. In 1997 this share was already 13.9%. Thus only a slow increase can be observed, mainly because of a considerable growth in electricity consumption of 2% per year in the EU<sup>11</sup> and recent very dry years which reduced the hydro power production. Nevertheless, the larger part of renewable based electricity production in the EU still comes from hydro power which contributed to 10% of the EU gross electricity consumption in 2005. In 2004, the large hydropower plants alone, covered 62% of the overall RES-E production of the EU-15 and 75.1% in the 10 new EU Member States in the same year, but wind and solid biomass are steadily increasing their share.

<sup>11</sup> If the EU-25 electricity consumption had been constant since 1997, the current share of renewable electricity would have been 16% in 2005 (COM(2006) 849 final).



**Figure 2.4 RES-E as a share of the total achieved potential in 2004 for the EU-15**

Source: Communication of the EU Commission COM (2005) 627



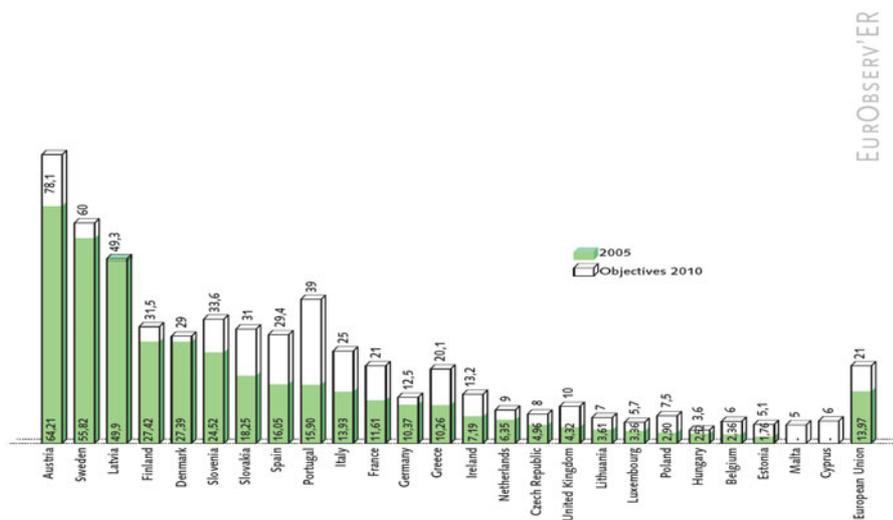
**Figure 2.5 RES-E as a share of the total achieved potential in 2004 for the EU-10**

Source: Communication of the EU Commission COM (2005) 627

### 2.5.1 State of the art in progress of renewable based electricity production at the Member State level

With regard to the progress of RES-E development in the individual Member States, the next figures show first the total share of RES-E of gross electricity consumption of all EU-25 Member (Figure 2.6) and then the relative levels achieved in 2004 (Figure 2.7).

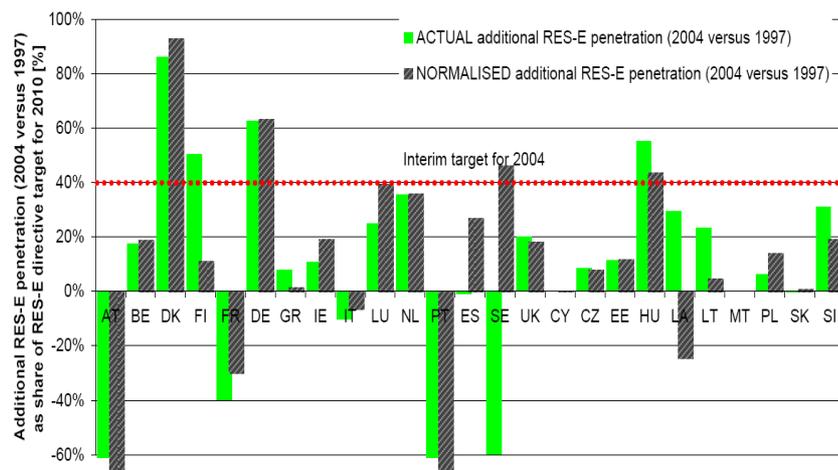
The two following figures then illustrate the development of RES-E for the EU-25 until the end of 2004 (Figure 2.7) and until the end of 2005 (where 2005 data was already available) (Figure 2.8) in comparison to the situation in 1997. These two figures also show normalised data with normal rainfall and wind conditions to avoid the influence of climatic conditions.



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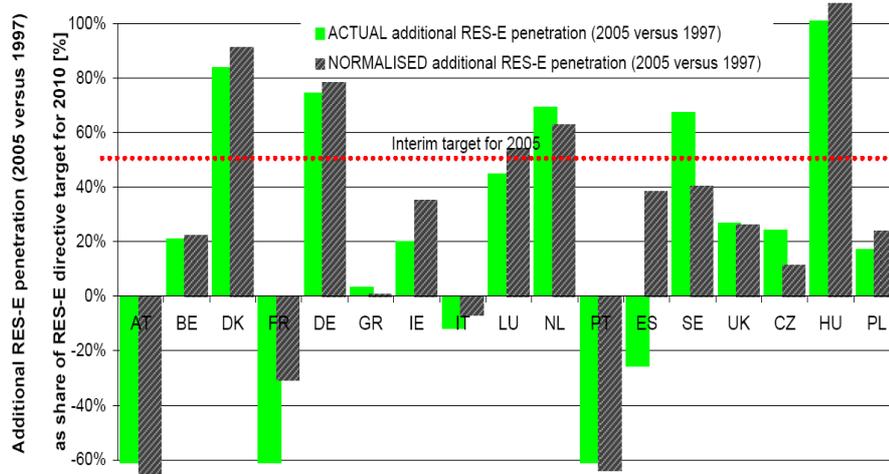
**Figure 2.6 Share of RES-E in gross electricity consumption of EU-25 in 2005 (in %)**

Source: EurObserv'ER 2007



**Figure 2.7 RES-E target achievement at country level: actual and normalised RES-E penetration (2004 vs. 1997) (in %)**

Source: COM(2006) 849 final



**Figure 2.8 RES-E target achievement at country level and (when 2005 data available) actual and normalised RES-E penetration (2005 vs. 1997) (in %)**

Source: COM(2006) 849 final

Based on these national figures, the EU Commission in its most recent report on the progress in RES-E of January 2007 also presented an updated ranking of the EU Member States concerning the RES-E market penetration achieved and policies implemented<sup>12</sup>. Therein the Member States are classified into five categories:

1. Perfect: on track for meeting 2010 target 😊😊
2. Current developments provide a reasonable chance of reaching the 2010 target 😊
3. Additional effort needed to achieve the 2010 target 😐
4. Stronger additional efforts are needed in order to reach the 2010 target 😞😞
5. Far from commitment 😞😞

Within this ranking, the EU Commission came to the conclusion that nine Member States are performing well, including Denmark, Germany and Hungary with good possibilities to reach the target in advance and the rest of them with reasonable chances to reach the 2010 target. However, eleven Member States seem to fail to meet their national commitment. Consequently the EU Commission now expects that only a share of 19% of RES-E in the EU gross electricity consumption will be

<sup>12</sup> See: EU Commission, Communication from the Commission to the Council and the European Parliament, *Green paper follow-up action - Report on progress in renewable electricity*, COM (2006) 849 final, Brussels 2007.

reached by 2010 instead of the 21% as set by the overall EU RES-E target. Table 2.1 shows the complete ranking for the EU-25.

**Table 2.1 Assessment of the EU Member States progress towards the 2010 target (in %)**

	Reference year (1997 or 2000)	Achieved penetration 2004/2005	Normalised penetration 2004/2005	Objective By 2010	Classification
<b>Denmark</b>	8.7	25.8 (2005)	27.3 (2005)	29.0	☺☺
<b>Germany</b>	4.5	10.4 (2005)	10.8 (2005)	12.5	☺☺
<b>Hungary</b>	0.7	4.4 (2005)	4.0 (2005)	3.6	☺☺
<b>Finland</b>	24.7	25.0 (2005)	25.4 (2005)	31.5	☺☺
<b>Ireland</b>	3.6	6.1 (2005)	8.0 (2005)	13.2	☺
<b>Luxembourg</b>	2.1	3.6 (2005)	4.0 (2005)	5.7	☺
<b>Spain</b>	19.9	17.2 (2005)	21.6 (2005)	29.4	☺
<b>Sweden</b>	49.1	53.2 (2005)	52.0 (2005)	55.2	☺
<b>The Netherlands</b>	3.5	6.9 (2005)	6.5 (2005)	9.0	☺
<b>Czech Republic</b>	3.8	4.8 (2005)	4.0 (2005)	8	☺
<b>Lithuania</b>	3.3	3.7 (2004)	3.3 (2004)	7	☺
<b>Poland</b>	1.6	2.8 (2005)	3.2 (2005)	7.5	☺
<b>Slovenia</b>	29.9	29.1 (2004)	29.4 (2004)	33.6	☺
<b>United Kingdom</b>	1.7	4.1 (2005)	4.2 (2005)	10.0	☺
<b>Belgium</b>	1.1	1.8 (2005)	1.9 (2005)	6.0	☹
<b>Greece</b>	8.6	9.1 (2005)	7.7 (2005)	20.1	☹
<b>Portugal</b>	38.5	14.8 (2005)	28.8 (2005)	39.0	☹
<b>Austria</b>	70.0	54.9 (2005)	57.5 (2005)	78.1	☹☹
<b>Cyprus</b>	0.0	0.0 (2004)	0.0 (2004)	6	☹☹
<b>Estonia</b>	0.2	0.7 (2004)	0.7 (2004)	5.1	☹☹
<b>France</b>	15.0	11.0 (2005)	14.2 (2005)	21.0	☹☹
<b>Italy</b>	16.0	15.3 (2005)	15.3 (2005)	25.0	☹☹
<b>Latvia</b>	42.4	47.1 (2004)	43.9 (2004)	49.3	☹☹
<b>Malta</b>	0.0	0.0 (2004)	0.0 (2004)	5	☹☹
<b>Slovak Republic</b>	17.9	15.4 (2005)	14.9 (2005)	31	☹☹
<b>EU-25</b>	12.9	13.7 (2004)	14.5 (2004)	21.0	

Source: COM(2006) 849 final

## 2.6 State of the Art in RES-E support in the EU

The Renewables Directive (2001/77/EC) provided a framework for Member States' support of RES-E production and consumption. The 2005 Communication of the EU Commission COM(2005) 627, showed that the feed-in system has become the dominant support system in the EU. Five countries, Belgium, Italy, Sweden, the United Kingdom and Poland introduced a quota type of support in combination with green certificate trading, whereas the other countries introduced a feed-in based type of support (see section 2.3). Some countries introduced other types of support instruments, such as a tendering scheme (Ireland)<sup>13</sup> or a grant scheme (Cyprus).<sup>14</sup> Latvia adopted a combination of quota and feed in. Besides, most countries used additional support

<sup>13</sup> In May 2006, Ireland replaced its tendering scheme to a feed-in scheme.

<sup>14</sup> This grant scheme includes both investment subsidies as well as a feed-in scheme.

instruments as investment subsidies, soft loan schemes or fiscal measures (tax exemptions, etc.). Support schemes have been implemented exclusively on a national level, aiming to meet the national indicative targets as stated in the RES-E directive.

In the communication of the European Commission in 2004 COM (2004) 366, it was shown that most countries will not meet their indicative target with the current support schemes. It also put in evidence that most Member States used feed-in based support schemes instead of quota based systems with green certificate trading schemes as it was initially expected. Quota based systems were preferred due to their fit with the liberalised model of the internal electricity market. The communication document also listed the major barriers to the development of RES-E in the EU being of administrative, financial, social and technical in nature. In its most recent communication on the support of electricity from renewable energy sources of December 2005 (COM(2005) 627 final) the Commission concluded that the next step in developing a common framework for RES-E support in the EU should focus on coordination between support schemes: “While gaining significant experience in the EU with renewable support schemes, competing national schemes could be seen as healthy at least over a transitional period. Competition among schemes should lead to a greater variety of solutions and also to benefits: for example, a green certificate system gains from the existence of a feed-in tariff scheme, as the costs of less efficient technologies fall due to the technological learning process, which in turn leads to lower transfer costs for consumers. Moreover, it is too early to compare the advantages and disadvantages of well-established support mechanisms with systems with a rather short history. Therefore, and considering all the analyses in this Communication, the Commission does not regard it appropriate to present at this stage a harmonised European system. The Commission considers a coordinated approach to support schemes for renewable energy sources to be appropriate, based on two pillars: cooperation between countries and optimisation of the impact of national schemes” (p. 16).

The Commission invited Member States to intensify coordination between similar support schemes, such as the feed-in cooperation between Germany and Spain and made suggestions for optimisation of national support systems. In particular the Commission has made the following suggestions:

- To increase legislative stability and to reduce investment risks
- To reduce administrative barriers
- To improve transparency of grid-connections
- To encourage technological diversity
- To ensure compatibility with the internal electricity market
- To encourage local and regional benefits
- To connect with actions on energy efficiency and demand management.

After the publication of the Commission's communication on RES-E support in December 2005, some changes in the RES-E support have taken place in the Realise Forum countries. In **Germany**, the new governing parties (conservatives and social democrats, the so called "grand coalition") provided for continuity in the national support scheme. As agreed under the previous government, the Renewable Energy Act (Erneuerbare-Energien-Gesetz, EEG) will be evaluated by the end of 2007.

In the first half of the 2006 the government decided to reduce the EEG-costs for the 330 most electricity intensive companies and the Deutsche Bahn (German Railway) to a maximum of 0.05 €ct/kWh. In the focus of the political discussions in the field of renewable energies in the first half of 2006 were not only the electricity, but also the heat and the bio-fuels markets. On biofuels a new law was approved by the end of October 2006 which set minimal quotas for the admixture of biofuels with conventional diesel and gasoline, starting in 2007 with a share of 4.4% of biofuels in conventional diesel and 1.2% in gasoline with an annually increase of 0.8% to reach 3.6% in 2010. Besides, an overall biofuels quota was set, beginning in the year 2009 with 6.25%, 6.75% in 2010 and further annual increases of 0.25% till reaching a level of 8% in 2015. With the start of the quota obligation, the former exemption of biofuels from the mineral oil tax will no longer apply. Only pure biofuels which will not be used for the fulfilment of the quota will continue to profit from reduced mineral oil taxes, although by a decreasing level until 2012, when nearly the normal tax rate (44.9 €ct/l) will be applied. A new law for the heat market (similar to the EEG in the electricity market as a minimum payment system or alternatively as binding obligation) is under discussion and expected to come into force in 2008. At the end of 2005 the share of renewable energy in the electricity market reached 10.2% (2004: 9.4%). Because of the high demand for the Market Incentive Programme for Renewable Energies (MAP) (since the beginning of 2006 already 100,000 applications were made) as well as the increased operating efficiency of the supported technologies, on June 21, 2006 the German Government reduced the investment subsidies for the renewable technologies included in the MAP for all application made after February 1, 2006.

Investment subsidies for solar thermal collectors have decreased by 35% to 54.60 €/m<sup>2</sup> for facilities processing hot water and process heat respectively 70.20 € for plants processing hot water and space heating (subsidies for solar thermal plants bigger than 200 m<sup>2</sup> won't be reduced (= 48 €/m<sup>2</sup> solar collector space). Besides, the investment subsidies for automatically operated plants for the combustion of biomass to produce heat up to an output of 30 kW and a boiler efficiency of at least 90% were reduced by 20% to 38.40 €/kW (at least 1,088 €). The investment subsidies for similar plants with a thermal output higher than 30 kW and up to 100 kW were reduced even by 50% to 24 €/kW. Finally, also the

investment subsidies for manually operated plants for the combustion of biomass to produce heat up to an heat output of 30 kW and a boiler efficiency of at least 90% were reduced by 35% to 26 €/kW (at least 780 €). Despite the reduction of the investment subsidies, the demand for applications within the MAP continued increasing. By mid August 2006, already 160,000 application for subsidies had been placed (a 50% increase to 2005) leading to a premature exhaustion of the 2006 MAP budget. The government announced that the MAP will be prolonged after the end of 2006.

In **Italy** the main developments since the end of 2005 have been:

- a) Two Provisions by AEEG (Regulatory Authority for Electricity and Gas) providing rules for grid-connection of RES-E plants (No. 281 of 19<sup>th</sup> December 2005) and for energy exchange contracts between network operators and RES-E plants not exceeding 20 kW (No. 28<sup>th</sup> of 10<sup>th</sup> February 2006).
- b) The new Ministerial Decree of 6<sup>th</sup> February 2006, which made the terms of the former Decree of July 2005 granting feed-in tariffs to photovoltaic plants over 20 years, even more favourable (among others, much higher ceilings were set to overall capacity of funded projects after the striking surge of bids that had followed the former Decree).
- c) A Legislative Decree (No. 152 of 3<sup>rd</sup> April 2006) which, while generally dealing with environmental matters, also extended the availability of the Tradable Green Certificates of the major support scheme (the Quota/TGC scheme) from 8 years to 12 years since the start of plant operation.
- d) A Ministerial Decree of 6<sup>th</sup> May 2006 specifying the kinds of non-biodegradable waste and RDF (Refuse Derived Fuel) admitted to get TGC in accordance with Art. 17 of Decree No. 387 of 29<sup>th</sup> December 2003, thus clearing a situation that had given rise to many concerns among investors in RES-E plants, who feared competition by non-strictly-renewable sources.

The provisions under a), b) and d) had long been awaited as they were still wanted for implementing Decree No. 387 of 29th December 2003 and therefore for fully transposing Directive 2001/77/EC, while the extension of the TGC term mentioned under c) was rather unexpected, but obviously most welcomed by RES-E investors.

The major general political event in the **Netherlands** has been the short political crises caused by the fall of the second Balkenende coalition and the announcement of new elections in November 2006. During this period it became clear that the Dutch feed-in premium system called MEP caused a steep increase in renewable based production capacity before 2008. In combination with the fall of the governmental coalition, this information let to the instant stop of subsidisation of new RES-E production investments on August 18 2006. The re-established Balkenende coalition motivated its decision on the instant stop with

reference to the expectation that the Netherlands would attain the 2010 indicative goal by the approved and ongoing RES-E projects. This was the reason for the coalition to immediately stop the subsidisation of new RES-E projects under the MEP-rules. It was said that a decision about future RES-E support was left to the new government. The new government should also decide about new RES-E ambitions (goals) for the years after 2010. Production support of combined heat and power production did not stop and would continue until 2008. The government reserved 150 million euros extra from the gas revenues for general R&D on renewable energy. Renewable energy production will benefit from this extra R&D investment despite the interruption of direct production support. The Dutch Parliament heavily criticised the decision to stop direct support of RES-E production and forced the government to compensate in particular smaller investors who heavily suffered from the instant stop of production support.

In a recent law reform **Swedish** authorities have prolonged the certificate system until 2030. The electricity certificate system was given a new target, where the goal was to have renewable energy generation shall increase to 17 TWh, in 2016. The electricity certificate system was prolonged till 2030, in order to create stability and long term commitment for the actors' investment in renewable energy generation. The quota obligation was moved from the electricity consumers to the electricity suppliers. At the same time, the electricity intensive industry was exempted from quota obligations.

With the new labour-socialist-centre party government, **Norway** chose to opt out of the plan for a joint Swedish-Norwegian certificate market. After having signalled an alternative support system for some time, further details of the Norwegian system were presented with the State budget in early October 2006. Norway here opts for a feed in system, but combined with a long term new renewables target of 30 TWh in 2016. The feed in system will be financed through a government fund of 20 billion NOK, with an expected return of 880 million NOK. The operative management of the system is largely left to ENOVA, an agency oriented at renewable energy and energy saving. The new Norwegian feed in system will provide 8 øre, or about 1 €ct/kWh for wind power; 10 øre, or about 1.25 Eurocent/ kWh for bio-electricity and immature technologies. In addition to the feed in system, the new Norwegian government proposes a separate programme for support for infrastructure for district heating; support arrangements for households, and increased investment in energy efficiency.

The **Finnish** support system has remained fairly stable. Finland is one of the few European countries without either feed in or certificates and quota systems. They have continued a policy of investment subsidies and tax refunds since the 1990s. There seems to be a broad agreement that this policy approach has worked well. There is broad industrial and energy-industrial consensus. Nevertheless, there is some concern

within environmental groups that wind energy does not get a sustainable deal. They would like to have feed in for that sector. The ministry of trade and industry is following the certificate and feed in systems closely, but they are not convinced of their efficiency. Particularly, the feed in is seen to lead to inefficient technology and localisation development.

The liberal-conservative Fogh Rasmussen government was seen by both energy- and industrial stakeholders to shift the **Danish** greening of electricity policy towards market solutions. The current Government outlook, as presented by the representative of the DEA and as reported in “Energy Strategy for 2025” envisions that the market effect of higher electricity prices, following the high oil prices and high CO<sub>2</sub> prices will be sufficient to further renewable energy, with the maintenance of the present support of 10 øre/kWh.

The present **Slovenian** feed in price/premium scheme is still under investigation of European Commission assuming to be non-declared state aid. Meanwhile the level of support for micro, small and middle sized natural gas fired CHP and for electricity generated from wood biomass has been increased with the consent of the Commission. The Slovenian government also adjusted feed in support for PV installation above 36 kW installed power to the present tariff/premium for installation below that level.

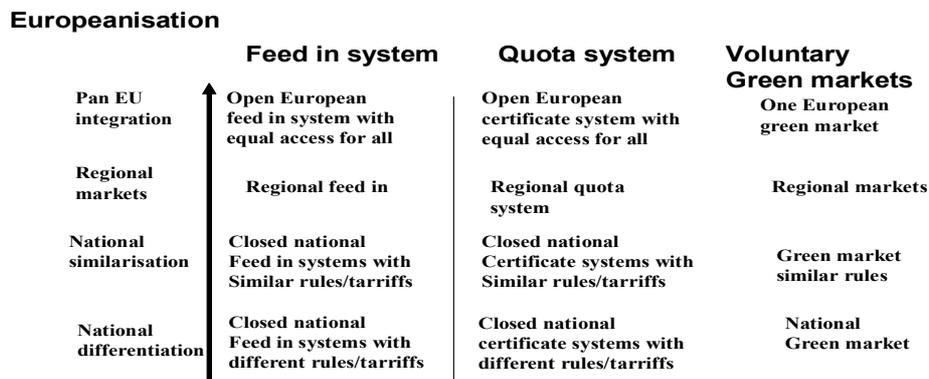
In general the Slovenian government has recognised the limits of the present support scheme. Under the current scheme the RES-E targets will not be met. The scheme provides no real incentive to investors, it does not reduce investment costs enough, it does not promote energy innovation and it provides excessive profits to some investors. To avoid these effects in the future and to avoid new disputes with the EU on state aid, the Slovenian government considers a renewal of the current support scheme. The new scheme should also meet the rules of the “CHP Directive”, next to the rules of the “Renewables Directive”. The Slovenian government is planning the first part of the new support scheme to be operational within 6 – 8 months and the second part within a year.

## ***2.7 State of the art in the Europeanization of RES-E support***

The ultimate ambition of RES-E support in the EU is to have a harmonised support of RES-E in the longer term. In the 2005 Communication the Commission indicated the need for a coordinated approach as intermediary step towards this longer term ambition of harmonised RES-E support. The REALISE Forum project showed that

in the RES field there is a richness of perceptions and expectations with regard to the support systems in use. This applies not only to the duration of support and its differentiation, but varies in relation to national interests, various technologies, stages of development and size of the market. There are differences both at national level and within stakeholder groups (see also next chapters). If one places this in the context of the Europeanization necessary to achieve the politically pursued coordination (or even medium-long term harmonisation), the picture becomes more complex. The core of the current ongoing dynamics in RES-E support is illustrated in Figure 2.9 below.

The horizontal dimension of Figure 2.10 displays the major support mechanisms currently in use in the EU. Next to the feed in and quota/certificate system there is a voluntary green market initiated by a group of market players to voluntary trade renewable energy certificates through whole of Europe. In 2005, 135 companies located in 19 European countries participated in the voluntary green market. In the feed-in system 19 EU Member States respectively 21 countries of the EU-28 participate and in the quota/certificate system 5 countries in the EU-25 respectively 6 in the EU-28. The vertical dimension of Figure 2.9 refers to the geographic extension of the two support systems and of the voluntary scheme, ranging from a closed national level to the pan European integration level, with national similarisation and regional markets as intermediary steps.



**Figure 2.9 Europeanization of RES-E schemes**

Figure 2.9 provides a framework for clarifying the ongoing dynamics in RES-E support in the EU.

1. Starting with the feed in column, the degree of Europeanization is actually still quite low, because this type of support is nationally differentiated. Germany, Spain and Slovenia have initiated a feed-in cooperation aiming at coordinating the still nationally differentiated systems, for instance by harmonising level and duration of support under the feed-in in the three countries. During the last workshop of the feed-in cooperation in late November 2006 in Madrid, further steps of a harmonised feed-in system at EU level were discussed such as a harmonised approach based on a feed-in law with a modular and transparent premium for RES-E producers, which considers technology costs, some grid services, political incentives and national priorities. This common approach should also comprise adjustment mechanisms to update and revise premiums, to avoid windfall profits for producers, and to share technology innovation benefits with electricity consumers while maintaining incentives for innovation. The proposed common approach also takes into account other necessary considerations for harmonisation, such as grid access, additional national funding, definition and standards, ownership of rights derived from renewables, and exceptions for small non-commercial producers and energy-intensive industries.
2. However, the feed in systems currently in force in the EU Member States still do not show signs of European market integration such as for example by allowing commercial transactions across borders.
3. The quota/certificate type of support in the EU is also still in a phase of national differentiation. The 5 countries in the EU-25 using the quota type of support have different schemes and there is no sign yet of a cooperation of systems, a sort of quota coalition similar to the feed in cooperation between Germany, Spain and Slovenia. So the quota type of support is, as the feed-in support, still nationally differentiated. Yet the planned implementation of a common Swedish-Norwegian certificate market, only cancelled in the last minute by the new Norwegian government, shows that cross-border trade might be a feasible option, provided that the involved countries have settled such critical issues like how to set the quota target for each country. Likewise the Dutch certificate trade showed the importance of symmetric exchange in the international trade of green certificates.
4. As indicated above, the voluntary green market organised under RECS International, can be considered a European market, since the Guarantees of Origin (GOs) were traded in 19 European countries in 2005. The major certificate issuing countries are Norway and Sweden, then Finland and the Netherlands; with Sweden, the Netherlands and, to a lesser extent, Austria as the major redeemers. The largest exporters are Sweden, Norway and Finland; while Austria and Netherlands are major importers.<sup>15</sup>
5. The current state of the art of Europeanization becomes more complicated when other relevant aspects of RES-E support are

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<sup>15</sup> [www.aib-net.org](http://www.aib-net.org): market information

considered. For instance, the RES-E directive prescribes the implementation of the Guarantee of Origin (GO) in the Member States. In 2005 eleven MS had implemented the GO, in five countries under EECS standardization. Thus the GO can also be considered to have developed from the national differentiation to national harmonisation. Only seven countries implemented the GO according to the EECS standardisation, which can be considered as regional market.

6. When looking at the application of the GO in the EU, the picture becomes more diverse and complicated. For instance only Austria and the Netherlands use the GO for disclosure and only in five countries the GO is used for redemption. The GO is not connected to any renewable labelling system in the EU.
7. Finally, target counting is still nationally differentiated because all countries are counting only domestic production.

The conclusion on the state of the art of Europeanization of RES-E support, therefore, is that there is high diversity in support system as well as the conditions for moving along the Europeanization of support. The necessary conditions for next steps in Europeanization like standardised GO, disclosure, redemption and labelling are still not at hand. Only the voluntary trade of green certificates can be considered to have entered the level of regional/transnational market. This voluntary initiative is however almost completely disconnected from any formal regulation in the Member States, except in the Netherlands.

Based on the country reports of the Realise Forum project, the next chapter analyses the willingness to change RES-E support in the eight countries involved in the project to ascertain whether and how next steps could be made to move towards the Europeanization dimension in Figure 2.9.

## **3 Findings from the National Hearings**

### ***3.1 Introduction***

The findings of the national hearings are discussed in detail in the country reports which have been produced by the national desks during the project (see REALISE-Forum website). This chapter presents the core findings of the various national consultations in four sections:

- a section presenting the country's state of the art of the electricity system and RES-E production;
- a section presenting the state of the art of the country's liberalisation of the electricity market;
- a section presenting the state of the art of RES-E support;
- a section discussing the findings of the willingness to change the support system in the country.

The next chapter discusses the findings comparatively.

### ***3.2 Findings from the Italian Hearing***

#### **3.2.1 State-of-the-art of Electricity System and RES-E Production**

Italy depends heavily on imported fossil fuels. This trend has been ongoing since several decades and has gradually been worsened as a consequence of growing energy consumption and depletion of domestic oil and natural gas. For instance, in 2003, 84.6% of the fossil fuels was imported (ENEA, 2004). This trend has been increasing Italy's foreign energy bill and has adjusted the country's focus on domestic energy resources, particularly renewables.

Electricity imports also account for a significant percentage, around 14-15% yearly of gross domestic electricity consumption. It is worth recalling here that this quantity, which is given by gross domestic electricity production plus the balance of international electricity trade (imported minus exported electrical energy) is, among others, the reference quantity assumed for checking the attainment of national RES-E targets by EU Directive 2001/77/EC. In 2005, Italy's gross domestic electricity consumption reached 352.8 TWh.

Table 3.1 summarises the other core features of the Italian electricity system as of the end of 2005.

**Table 3.1 Basic production data of the Italian electricity system**

Year	2004 (GWh)	2005 (GWh)	2005-2004 (%)
<b>Gross domestic production</b>	<b>303 321.2</b>	<b>303 671.9</b>	<b>+0.1</b>
hydropower plants (including pumped storage)	49 908.0	42 926.9	-14.0
thermal plants (gas, oil, coal, biomass etc.)	246 125.3	253 073.1	+2.8
geothermal plants	5 437.3	5 324.5	-2.1
wind plants	1 846.5	2 343.4	+26.9
photovoltaic plants (large grid-connected only)	4.0	4.0	0.0
Auxiliary service consumption	13 298.5	13 064.0	-1.8
<b>Net domestic production</b>	<b>290 022.6</b>	<b>290 607.9</b>	<b>+0.2</b>
Pumping plant consumption	10 300.3	9 319.4	-9.5
Electricity production available for consumption	279 722.4	281 288.5	+0.6
Electricity import-export balance	45 634.9	49 154.5	+7.7
<b>Electricity demand on the system</b>	<b>325 357.3</b>	<b>330 443.0</b>	<b>+1.6</b>
Transmission and distribution losses	20 867.6	20 626.2	-1.2
<b>End-use electricity consumption</b>	<b>304 489.7</b>	<b>309 816.8</b>	<b>+1.7</b>
agriculture sector	5 184.8	5 364.4	+3.5
industry sector	153 155.3	153 726.8	+0.4
tertiary sector (including transportation)	79 557.4	83 793.0	+5.3
household sector	66 592.2	66 932.5	+0.5

Source: TERNA (Italian TSO)

The 2005 contribution pattern of the various sources changed in comparison with 2004, as hydropower production (inclusive of generation from pumped-storage plants) in 2005 dropped by as much as 14% mainly because of less favourable weather conditions. The gross production of naturally-supplied hydropower plants in the same year (i.e. the really renewable share of hydropower production) reached 36,066.7 GWh

The drop in hydropower was offset by an increase in thermal generation, which covered 83.3% of 2005 gross domestic production. As the share of fuels, natural gas accounted for as much as 49% of overall gross domestic production; solid fuels supplied about 14%, oil products did not exceed 12% (they had long been Italy's mainstream fuel up to some years ago). The remaining thermal production came from refinery and process gases and other fuels. Gross production from renewable sources (RES-E) only is shown in Table 3.2 from GSE (body managing all RES-E support schemes), which takes into account also photovoltaic roofs and other small PV plants not recorded by the Transmission System Operator.

**Table 3.2 Electricity production from renewable energy sources in Italy**

Year	2004 (GWh)	2005 (GWh)	2005-2004 (%)
Hydropower plants without pumped-storage	42 744.4	36 066.7	-15.6
<i>of which from plants up to 10 MW capacity</i>	<i>8 859.9</i>	<i>7 616.2</i>	<i>-14.0</i>
Wind power plants	1 846.5	2 343.4	+26.9
Photovoltaic (PV) plants	27.3	31.0	+13.6
Geothermal power plants	5 437.3	5 324.5	-2.1
Biomass and waste fired plants, including biogas	5 637.2	6 154.8	+9.2
<b>Total gross RES-E production</b>	<b>55 692.7</b>	<b>49 920.4</b>	<b>-10.4</b>

Source: GSE

In 2005, total gross RES-E production corresponded to 16,4% of total gross domestic production, 15,1% of total electricity demand on the system, and 14,1% of Italy's gross domestic electricity consumption of 352,8 TWh (the last parameter is the reference denominator set by Directive 2001/77/EC for calculating national RES-E target percentages). All these percentages were lower than in 2004 for the reasons explained above.

Even considering that the hydropower drop in 2005 is incidental and other RES-E technologies (wind, biomass etc.) have been deployed at a growing rate, the general trend is not much encouraging for the pursuit of Italy's target of 76 TWh by 2010 (equalling 22% of a gross domestic consumption of 340 TWh) stated in the RES-E Directive. The situation however looks better if imported RES-E (certified as such by a Guarantee of Origin) is also taken into account, as it seems to be allowed by the Directive. If certified imports are included, according to GSE, Italy's overall RES-E percentage in respect of gross domestic electricity consumption would rise from 16% to 26% in 2004, and from 14.1% to 17.3% in 2005.

### 3.2.2 State of the Art of Liberalisation of the Electricity Market

Italy has implemented the liberalisation directive according to the time frame mandated in the directive. Formally, all obligations have been met. Competition has been established and consumers have the freedom to choose supplier. However, Italy, like other Member States, is facing concentration in the electricity market. Enel Produzione, stemmed from the former integrated power company, is by far the largest Italian company and rather dominant in the market. Next to Enel there are a number of somewhat large production companies and several hundreds of small producers, mostly in the RES-E segment of the market.

### 3.2.3 RES-E Support Instruments

The Italian RES-E support policy has a long tradition and goes back to 1982. Particularly, a number of RES-E plants are still benefiting from the feed-in tariffs granted by CIP Provision No. 6 of 29th April 1992.

The currently available support scheme is a quota-certificate based type of support which is legally grounded on Decree No. 79 of 16th March 1999 and the subsequent Decree No. 387 of 29th December 2003 (implementing the RES-E Directive). Since 2001, the RES-E quota obligation has been laid on operators who, in the reference year, have produced or imported electricity from non-renewable sources exceeding 100 GWh/year (electricity from CHP plants, auxiliary service consumption and exports of energy are excluded from this computation). These operators must feed into the Italian grid, within the end of the subsequent year, an amount of RES-E equalling a minimum quota of this non-renewable electricity. The quota was originally 2%, but was subsequently raised by 0.35% a year from the reference year 2004 to 2006 (for instance, the RES-E quota to be produced was 2.35% in 2005, 2.70% in 2006 and so on). No quota has been set yet for 2007 onwards.

Obligated operators can either hand in TGC from their own RES-E plants, or buy TGC from other RES-E producers on the TGC market run by GME (the Electricity Market Operator). To reduce their obligation, they are also allowed to feed imported RES-E into the Italian grid, but it must be certified. The market price of TGC should thus result from the interplay between the demand by obliged subjects versus the supply by qualified producers. IAFR-qualified RES-E producers get TGC for the first 8 years of plant operation (this term was extended to 12 years in 2006) and can thus add the income from TGC sale to that from the sale of energy on the free electricity market.

It has however to be pointed out that, to avoid double benefit, TGC due to RES-E plants already getting CIP 6/92 feed-in tariffs are retained by the managing body GSE. The latter must sell them at a price fixed every year also on the basis of the current CIP 6/92 feed-in tariffs. Since the number of these TGC is still large, qualified RES-E producers actually have to sell their own TGC at a price close to, but obviously not greater than, the price fixed for the GSE certificates. As compared to TGC schemes running in other countries, the Italian TGC scheme could therefore be defined as a “mixed-type” one, because the TGC price is not left to the mere interplay between supply and demand, but is controlled in a way that gives better revenue guarantees to RES-E investors.

Continuing the trend of previous years, the TGC share from IAFR-qualified plants grew further in 2005 as well, up to exceeding the total 2005 demand. However, some of these TGC were apparently not sold

on the 2005 market, as it is now possible to keep them in hold for another two years. GSE therefore contributed a small TGC share in 2005 as well. In 2006 price of GSE's TGC was fixed at 12,528 €ct/kWh.

Lately, to help deploy photovoltaic (PV) plants, which were not adequately supported by the quota-TGC scheme, specific feed-in tariffs were established for this technology by Decrees of 28th July 2005 and 6th February 2006. PV feed-in tariffs are available for 20 years and range from 44.5 to 49 €ct/kWh depending on the plant size. They have so far stirred up a striking interest, so that the ceiling of supported capacity has already had to be raised.

### **3.2.4 Stakeholder perceptions and willingness to change support scheme**

The Italian desk organised in 2005 a survey (82 responses to a questionnaire) and a hearing. A year later, further interviews with major stakeholders were held. About half of the respondents in the survey were RES-E producers, mostly small-sized companies, using all kinds of sources. The rest of the respondents comprised all kinds of other stakeholders such as large electricity producers, RES-E plant and equipment manufacturers, grid operators, electricity distributors and traders, financing institutions, public authorities, research institutes, consumer and environment protection association.

The survey showed that the Italian stakeholders having experience with both the feed in and the quota/certificate system, on average assessed the feed in type of support as more effective and fairer with respect to the various RES-E technologies than the quota-TGC type of support. The quota system was considered more compatible with a liberalised electricity market though, but due to the specific design of the Italian system, stakeholders considered the fit between the Italian support system and the EU internal electricity market poor.

The survey asked how a possible change in Italy's main quota/TGC scheme in the next 5 years would affect the deployment of RES-E plants. Many stakeholders felt that changing support scheme would hinder a further increase of RES-E in Italy, since RES-E production still heavily depends on a steady financial support. They preferred a further reduction of risks to investors by extending TGC availability beyond the 8-year term (this was actually done more recently in 2006, when the term was extended to 12 years). Only a few respondents wanted to return to the feed-in system again.

The larger part of the Italian stakeholders motivated a change of support by financial reasons, in particular more investment security for

the producer. Change of support scheme for political, economic or technical reasons was hardly mentioned as reason for change.

The survey asked for willingness to change support scheme for the benefit of EU harmonisation of support. Only a few stakeholders said harmonisation was not needed or impossible, but a majority felt that it could be achieved only after 2010. RES-E producers and manufacturers turned out a little more pessimist than the other stakeholders. As a general conclusion, the need for some harmonisation was confirmed, but to the modalities and timing remain an open question.

Italian RES-E stakeholders were also asked about their views and desires about future developments of the electricity market at large. Most stakeholders, regardless of their role, saw market liberalisation favourably and judged the chance to sell RES-E on the free market as a good alternative or even a decisive opportunity for RES-E development.

On the other hand, when asked whether a fully liberalised framework, with energy prices set only by the market, was to be preferred to a regulated framework, with energy prices set by tariff, as an effective way for developing RES-E plants, the largest stakeholder share were in favour of a mixed framework, where either way can be chosen by producers. The same trend was remarked within both stakeholder groups, thus confirming that guarantees provided by some regulation are still felt necessary.

Based on both the aforementioned questionnaire and more recent interviews with stakeholders, RES-E trade with foreign countries is currently seen by Italian operators mainly as a way to reduce the amount of their RES-E obligation thanks to imports of certified RES-E from abroad (they are allowed to detract this energy from the obligation). Moreover, the addition of imported certified RES-E to domestic production when calculating the national RES-E contribution percentage is now seen as the only likely way for Italy to attain the national RES-E target set by Directive 2001/77/EC (see also 3.2.1).

In addition to that, criticism from RES-E stakeholders and put in evidence that the whole process of promoting RES-E in Italy is still far from being fully satisfactory and still needs some further measures. Complaints do not concern so much the current mechanisms, which are generally pretty well accepted. This has been shown, for instance, by the fact that a significant share of respondents to the questionnaire were against any change to the current system in the next 5 years.

Complaints have rather referred to the way Italy's RES-E support policy has been implemented so far. RES-E stakeholders, especially investors, have condemned delays in issuing implementing measures regarding e.g. the new grid-connection rules, the single national procedure for plant permitting, the fixing of RES-E quotas for the years

from 2007 onwards, the setting of regional RES-E targets and several other implementing measures required by Decree No. 387 of 29th December 2003 transposing the RES-E Directive 2001/77/EC. A number of these measures are still lacking at the time of writing this report.

Some of the above-mentioned aspects could also have a bearing on the envisaged EU-wide co-ordination process of national RES-E support systems. In more recent interviews, some major stakeholders said that it would, first of all, be helpful to undertake actions aimed at setting up more similar rules on key issues such as plant permitting procedures, market access, grid-connection codes, RES-E priority in dispatching etc. in the various EU Member States. Without previously bringing these aspects to more uniform conditions, other efforts for co-ordinating national RES-E support systems might be thwarted.

In conclusion, Italian RES-E stakeholders as a whole seem to be aware that the RES-E sector is still in a weaker position as compared to the conventional electricity industry and call for more long-lasting certainties in the legislative, financial and regulatory framework to keep up the confidence of prospective investors (whose number is steadily on the rise) and deploy the full potential of national resources.

### ***3.3 Findings from the German hearing***

#### **3.3.1 State-of-the-art of Electricity System and RES-E Production**

In the domestic electricity generation the most striking characteristic is the high share of coal, which accounted for nearly half of the whole production (47% in 2005). In the EU-25, Germany is the second largest coal producer behind Poland and the world's leader for lignite production.

Germany strongly relies on energy imports to cover its energy demand. In 2005 the share of energy imports amounted to over 65% of the gross domestic energy consumption, which was above the already high EU-average of 56.2%. Apart from coal, Germany has very little fossil resources and imports account for the largest part of oil (approximately 97%) and gas (around 85%) (Eurostat 2006).

**Table 3.3 Net electricity production in Germany (2005)**

Energy Carrier	%
Nuclear energy	29
Brown coal	26
Hard coal	21
Renewable Energies	11
Natural gas	10
Mineral oils and others	3

Source: (VDEW 2006)

Since 2004 the largest fractions of green electricity supply in Germany comes from wind power. According to VDEW, electricity generation from RES rose from 25.5 bn kWh during 2004 to 30.5 bn kWh (+ 19.6%) in 2006. Renewable electricity generation amounting to 73.2 billion kWh reached a share of 11.9% of gross electricity consumption. Wind Energy ranked first, while hydro power from run-of-river and storage water ranked second, while the biomass share has been increasing steadily since 2004.

**Table 3.4 Green Electricity production in Germany (2006) in TWh and share of gross electricity consumption in %**

	2004	2005	2006*	Share 2006 in %
Hydropower	21.7	20.8	21.6	3.5
Wind energy	25.5	27.2	30.5	5.0
Biomass	8.4	11.2	15.5	2.5
Waste**	2.1	3.0	3.6	0.6
Photovoltaic	0.6	1.3	2.0	0.3
<b>total</b>	<b>58.3</b>	<b>63.5</b>	<b>73.2</b>	<b>11.9</b>

\* preliminary

\*\* only renewable fraction

Source: Verband der Elektrizitätswirtschaft (VDEW), Berlin 2007

### 3.3.2 State of the Art of Liberalisation of the Electricity Market

The evaluation of the situation in the electricity and gas sectors relating to market opening presented in the 4th Benchmarking report of January 2005, placed Germany in a middle position, as some progress has been made. One of the crucial aspects of the New Energy Act has been the

specification of rules on legal, operational (management and information) and accounting unbundling, according to the provisions of the EU Directive.<sup>16</sup>

The new German Law of 2005 improved unbundling rules, but implemented only minimal European requirements (VIK 2005). In fact, it does not foresee separate accounting for power generation and marketing activities and does not envisage the creation of a national independent Transmission System Operator. It is expected that the new rules will reduce conflict of interest, cross subsidies, and alleged discrimination by network operators. However, given the level of vertical integration of the grid operators, the market is far from being competitive. According to VIK it will take time for new players to build confidence and enter the market. A more watchful competition policy is needed so that proposed horizontal and vertical mergers can be carefully scrutinised. Measures and mechanisms to decrease the degree of concentration and increase the number of market participants on the supply side need be developed on the national as well as on the EU-level (VIK 2005)<sup>17</sup>. The new Energy Law also established the Bundesnetzagentur -BNA (Federal Grid Agency), as the regulatory authority with competences in the electricity and gas sector (among others). The BNA has full responsibility for the application of the new Energy Act. Together with the Federal Cartel Office (FCA), the BNA, is in charge with competition issues and controls functioning of the electricity and gas market. Whilst it is positive that the law preserved existing rules on priority to renewables and created a legal framework for feeding in biogas to the natural gas supply grid, a pitfall is that it also envisaged a watering down of requirements on (green) power source labelling for consumers. In 2006, one of the main tasks of the BNA was the supervision and authorisation of access charges to the electricity grids, resulting in considerable decreases of network charges between 8% and 18%.

In its latest communication on the prospects for the internal gas and electricity market, of January 2007, the EU Commission concluded, that the main problem in the German electricity sector still remains the high vertical and horizontal concentration (as represented by four largest electricity companies) and the insufficient unbundling. The EC pointed out that “The interest structure of TSOs still seems to be influenced by supply interests of incumbent companies “ and that independent TSOs would be beneficial to ease connection to the network.”..A high level of overall transparency in the wholesale electricity market including appropriate information on generation etc thereby creating a level playing field for all market actors is also deemed to improve the

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<sup>16</sup> The high degree of vertical integration in the German energy sector has contributed to the large number of grid access disputes since energy sector liberalisation in 1999.

(see [http://europa.eu.int/comm/energy/electricity/benchmarking/doc/4/com\\_2004\\_0863\\_en.pdf](http://europa.eu.int/comm/energy/electricity/benchmarking/doc/4/com_2004_0863_en.pdf))

<sup>17</sup> These issues are dealt with in detail in the Country Report Germany in the Appendix.

situation, as it may enable new market actors to identify quickly potential niches and market opportunities, otherwise left to incumbent companies. (EU Commission 2007: 41).”

### **3.3.3 RES-E Support Instruments**

Germany has a long tradition in promoting green electricity with feed-in tariffs. The most important German RES promotion measure – in the area of electricity - is the *Renewable Energy Sources Act* (Erneuerbare-Energien-Gesetz, EEG). In 2004 an amended version of the EEG came into force. Compared with the former EEG, the new version includes improvements concerning the tariffs for biomass, biogas, geothermal as well as photovoltaic energy (The increased rates for solar power compensate the expiry of the 100,000 roofs programme). On the other hand, small hydropower and onshore wind energy tariffs were lowered. The government increased the annual digression in the fees for new installations to strengthen the incentives for technical innovations and cost cutting, e.g. 2% for wind energy, 1.5% for bio energy and 5% for photovoltaic energy starting from 2005

### **3.3.4 Stakeholder perceptions and willingness to change support scheme**

The findings described in this section are based on the survey among stakeholders, interviews and hearings, organised by the German desk. The response to the survey was 17.5% and covered the whole range of RES-E stakeholders from producers to technology developers and federal and regional governmental organisations. All RES-E resource options were presented in the survey, with a majority of respondents active in the biomass/biogas sector.

The general appraisal of the German support system is mainly positive. Approximately 75% of the answers were in favour of this scheme. It was alleged to have made possible a market breakthrough of RES and to gain global market shares. Approximately 65% of the interviewed however also emphasised, that deficits and contradictions exist. They should be carefully scrutinised and eventually removed. The technological differentiation envisaged in the RES Energy Act was endorsed by an overwhelming majority (90%). The FIT system was rated higher than quotas/certificates systems as regards new RES-E capacity deployment, risk to investors, understanding by financing institutions, fair deal with different sources. On the contrary, its cost to the whole electrical system at large was considered higher. Quotas/certificates systems were believed by a number of stakeholders more compatible with the liberalised electricity market than the FIT mechanism.

The present remuneration rates were believed to be appropriate by a large majority. Around 11% of the respondents found the support for PV excessive. By contrast the support for biomass and biogas was considered by approximately 24% of the respondents as low.

The consulted stakeholders saw no obvious contradiction between a liberalised European market and the support scheme in use. Around 37% of the respondent stated that a fair competition in the internal market is not yet available. According to the RES Associations (EREF, BWE, and BEE), there is no level playing field so far in the electricity sector. Renewable energies need support schemes in order to counter the bias in favour of fossil and nuclear energy. As far as the degree of market conformity of the present support system is concerned, especially the RES Associations remarked that market distortions associated with the traditional energy sector are still high and need to be removed before a new support scheme based on tradable certificates can be introduced in an open electricity market.

On the whole, the evaluation of the possibilities for a fair competition in the internal electricity market shows that the majority of respondents see large deficits and a need for corrective action. It was remarked that unless the current distortions in the internal electricity market are overcome, there can be no effective internal RES-E market. There has been a general call for action especially in unbundling the major utilities. The high levels of market concentration in the power sector, and the distortions to competition need to be compensated for by fair and transparent rules for third party access, taking into account the different technologies. This is also the position of the EC. Moreover, investments need to be carried out in order to guarantee grids enforcement, interconnection and an adequate level of capabilities and infrastructure.

A small fraction of respondents to the survey and participants of the hearing advocated a change to a novel system based on quota and certificates. The main grounds justifying a change in the current support system were economic reasons (need to minimise the electricity price to end-users) and a perceived low compatibility of the German system with requirements of a liberalised EU internal market for electricity.

The majority of respondents to the survey ranked FIT systems better than alternative ones based on quotas and certificates with respect to all categories, except price competition. The quotas and certificates opponent front was very wide and, although most of them recognised that is inappropriate to generalise the performance of quota systems before they have reached maturity, their position ranges from sceptical till very critical.

Quotas and certificates schemes have been advocated particularly by conservative parties, especially the liberals, and the confederation of

the electric utilities (VDEW). It was argued that the introduction of volume based trading system of green certificates, with target quotas for all distribution companies and a penalty for not meeting these targets could provide a more efficient system. They also asserted that this instrument encourages increased competition and helps reducing prices. VDEW warned that maintaining the current system would add €10 bn to the national electricity bill by 2020.

On the whole, public opinion has shown a still rather indifferent position on harmonisation issues. The survey collected various, differentiated statements, most of which however pointed in the same direction: German stakeholders do not endorse harmonisation on account of preservation of established and favourable domestic support conditions. Yet approximately 29% of the interviewed stakeholders stressed the importance for a harmonised support system across the EU and favoured the convergence of the national systems to promote RES. It is interesting to notice that this was a somehow composite front comprising almost all stakeholder groups. It was noticed that only this path can avoid market distortion and instigate a competition among RES sources. Part of them argued that harmonisation would be preferable with a RES certificate trading system. The majority of respondents of the survey agreed that harmonisation of policies across the EU is not yet necessary and endorsed the position of Commissioner Piebalgs that it is premature to propose a harmonised European support scheme. Approximately 14% of the respondents gave two answers, thus conceding that whilst competing national schemes could be seen as the best solution, on the short and medium term a coordination of the existing systems is necessary.

### ***3.4 Findings from the Dutch Hearing***

#### **3.4.1 State-of-the-art of Electricity System and RES-E Production**

The Dutch electricity system is a fossil based thermal system. Electricity production benefited from the presence of domestic natural resources; initially Dutch coal and since the early 1960s natural gas. Dutch gas fields are expected to be exhausted around 2025. Dutch gas consumption then relies on gas imports and if available synthetic gases. Nuclear power did not develop as a serious option and was politically banded after the Chernobyl accident in 1986. Currently only one nuclear plant is operative in the Netherlands (413 MW). Nuclear power has not yet returned as a serious resource option, but the debate has been reopened in the context of the climate change policy.

In 2005 the share of renewables in electricity production was 6.4%. The target for 2010 is 9% renewable based electricity production. The major renewable options are (offshore) wind and biomass. Due to the flatness of the country, hydro is no serious option.

In the European perspective the size of the Dutch electricity market is rather small. Nonetheless, the Dutch market is attractive, because of its high density and high connectivity. The national grid system is well developed and among the most reliable in Europe. Due to good cross boarder connections to Germany, Belgium and Norway, the national high voltage grid is well integrated in the European transmission network. These connections are used for backup and for import and export. The Netherlands is a net importer of electricity, both grey and green. In the era of liberalisation the international trade function of the grid has become more important.

**Table 3.5 Dutch electricity system key data (2005)**

Total installed capacity	21,719 MW
Maximum load high voltage grid	15,224 MW
Length of the grid	267.271 km
Number of customers	7,524,000
Consumption (mil. kWh)	
Small consumers	37,661
Large consumers	72,525
Average household tariff electricity	21 €ct/kWh

Source: EnergieNed, 2006

### **3.4.2 State of the Art of Liberalisation of the Electricity Market**

The Netherlands have liberalised the national market along the path described by the liberalisation directives. Actually, the implementation of the required changes in the organization of electricity supply proceeded quite fast. Energy companies were unbundled and the market was opened stepwise. The market for green electricity was opened before the full opening of the grey market. By the end of 2006, the Dutch debated the ownership unbundling of energy companies. The Balkenende coalition considered ownership unbundling necessary for a really competitive market and to prevent any abuse of market power by energy companies. In November 2006 the unbundling law was approved with certain restrictions. Ownership unbundling became conditional to the international expansion of Dutch energy companies which replaced the initial unconditional ownership unbundling of all Dutch electricity companies.

In the fourth benchmark report of the EU, the evaluation of the Dutch progress in liberalisation showed that concentration of the market, like in many other Member States, is still substantial in the Netherlands. Furthermore, Dutch electricity consumers are not eager to switch supplier. In the large user segment, for instance, not more than 35% of the consumers has switched.

### **3.4.3 RES-E Support Instruments**

The Dutch policy list of options for support of renewables has been and still is rather complex. Between 1999 and 2004 policy support concentrated on energy tax exemption for consumers and producers of renewable electricity. The tax exemption tempted many consumers to change from grey to green electricity, but did not really help increasing the installed capacity in the Netherlands. Contrary to the expectation, Dutch energy companies did not invest in domestic green production facilities, but as an alternative they imported green electricity. Consequently, the green certificate trading system in combination with the energy tax exemption was stepwise replaced by the MEP law in 2003 and 2004. The MEP provides a production subsidy to Dutch based green production capacity established after 1996. The idea of the MEP is financial compensation of the non-competitive costs of green electricity production, differentiated according to resource and technology and guaranteed for ten years. The MEP support is linked to the guarantee of origin (GO) in accordance with the RES-E directive.

In the middle of 2006 the MEP support was stopped for new subsidy requesting installations. The decision was motivated in reference to the expectation that the Netherlands would attain the 2010 indicative goal by the approved and ongoing RES-E projects. The Dutch Parliament heavily criticised the decision to stop direct support of RES-E production and forced the government to compensate in particular smaller investors who heavily suffered from the instant stop of production support.

### **3.4.4 Stakeholder perceptions and willingness to change support scheme**

This section is based on the results of the online survey of the Dutch stakeholders and interviews with representatives of the major stakeholders in the Netherlands. The interviews predominantly served to deepen the understanding of the information of the online survey. The producers, supplier, investors and traders take the largest share in the response. Furthermore, wind and biomass are the most prominent resources used by the producers in the survey. The dominance of both resources reflects the national position in this respect. Thus the

response is rather representative in this respect. A little more than half of the respondents entered the Dutch green market before 2000, the rest entered the market after 2000. Thus the majority of the respondents has been present in the Dutch green electricity market already for several years and thus might have experience with support policies in the Netherlands. About three quarter of the respondents operates on foreign (green) electricity markets next to the Dutch market. The rest operates on the Dutch market only.

### ***Assessment of the Dutch grey and green market***

Stakeholders were asked to evaluate four core aspects of the Dutch grey and green electricity market. Respondents turned out to be rather sceptical on the current state of the Dutch grey and green electricity market. The evaluation of all four aspects (competitiveness of production, profitability, accessibility and commercial attractiveness) of the Dutch market does not exceed the grade of 6. This counts both for the grey and the green market. Overall, the assessment of the Dutch grey and green market is rather modest.

### ***Assessment current support scheme***

At the time of the survey, support of renewables was organised according to the MEP, meaning that the amount of support was technology dependent and the duration of support 10 years at the longest. We found modest enthusiasm among stakeholders for the current Dutch support for renewables. The average score for the amount of support is 6.3 and the average for the duration of the support only 5.4. Actor groups are not satisfied with the current support in the Netherlands. Support is rather unpredictable and changes too often. This makes the Dutch investment environment highly uncertain, whereas investors are looking for a clear and consistent investment environment. Furthermore, respondents are not pleased with the duration of support, which is guaranteed for ten years, whereas the technical and economic lifecycle of many renewable based production sites is much longer. The problem for investors is that they are uncertain about the profitability of the renewable production site after ten years.

There is agreement among respondents on the market conformity of the current Dutch support scheme. The larger part of the respondents is quite convinced of this feature of the Dutch support scheme. Some 30% of the respondents disagrees. Further analysis showed that the fraction dissatisfied respondents is relatively high in the group of producers, suppliers and branch organisations. Consequently, those directly financially dependent on the support are relatively more dissatisfied than the other groups. This “dissatisfied” group can be expected to be well informed about the Dutch support of renewables, because they work with the scheme every day. However, according to a clear majority of the respondents, the current support scheme is market conform.

### ***Willingness to change support system***

First, it should be stressed that Dutch stakeholders in general have no passionate preferences regarding a change of current RES-E support. According to the respondents, the current MEP feed-in based system is feasible as was the previous system based on certificate trading. All understand the change of the previous system because of the financial consequences. There is some kind of consensus regarding the stability and quality of the current support, apart from all kinds of specific wishes for improvement. In general, actors are quite satisfied with the consequent way the Dutch have organised and regulated the Guarantee of Origin. Respondents all agree on the necessity of such a robust and reliable system for the further penetration of renewables in electricity production. They do consider the strict way the Dutch have organised the GO as the reference model for the EU in this respect. The big advantage of the Dutch GO system is that it prevents for double counting and therefore is very reliable. This gives confidence to the Dutch consumers. While buying green electricity they know that they are not cheated. In other countries double counting still cannot be excluded due to a less mature system of GO as compared to the Netherlands.

On average stakeholders are 'neutral' when it comes to change of support for the benefit of EU harmonisation. They say either yes or no to a change of the length and amount of support for the benefit of harmonisation and the same holds for a change to an EU wide quota/certificate system.

In conclusion, there is consensus among Dutch stakeholders that quality of support system is far more important than harmonisation of support. Moreover, none of the respondents has a clear position when it comes to change of support for the benefit of EU harmonisation. The type, amount and duration of support still differs too much between member states, which makes harmonisation in the short term rather unrealistic according to the Dutch respondents.

The online survey of 2005 was repeated in 2006 to assess any impact of the EU Commission' December communication on the support of renewables in the EU.<sup>18</sup> Compared to 2005, respondents did not modify their willingness to change the current support system for the benefit of EU harmonisation. On all statements on this topic the average position of respondents clustered around the middle, indicating a neutral position about the need and opportunity to change support for the benefit of EU harmonisation. Therefore the 2006 consultation confirmed the consensus among Dutch stakeholders that quality of support system is far more important than harmonisation of support.

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<sup>18</sup> Communication of the EU Commission COM (2005) 627.

## 3.5 Findings from the Slovenian Hearing

### 3.5.1 State-of-the-art of Electricity System and RES-E Production

In the European perspective, the Slovenian electricity system is a small scale system in terms of installed capacity and in terms of production and consumption of electricity. The system is connected to the neighbouring countries (except for Hungary) and is playing an important role in the transmission of electricity from South East Europe to North Italy. In 2005 the domestic electricity demand was 12.5 TWh. Almost the entire country's electricity demand is covered by domestic production, basically hydro based. Around 2.5 TWh is imported energy. Imports equal the amount of electricity produced by the only Slovenian nuclear power station that has to be delivered by contract to the Croatian shareholder. The electricity system is further characterised by relatively balanced structure of generation between hydro and nuclear. The usage of natural gas for electricity production is negligible.

By far the largest share (around 98.5%) of RES-E in the country is generated in large (larger than 10 MW) and small (less than 10 MW) hydro power plants. The share of the latter in the total hydropower production varies around 10%. Due to relatively large oscillations of the volume of flow of water - conditioned by annual variations in the amount, form and pattern of precipitation - the generation of electricity from power plants is varying substantially as well.

**Table 3.6 Basic data of the Slovenian electricity system (2005)**

		Electricity
<b>Peak capacity</b>	<b>2,797 MW</b>	
- hydroelectric power		886 MW
- thermolectric power		1,241 MW
- nuclear power		670 MW
<b>Production of electricity</b>	<b>13,667 GWh</b>	
- hydroelectric power		3,036 GWh
- thermolectric power		4,601 GWh
- nuclear power		5,613 GWh
- independent and qualified producers		417 GWh
<b>Length of transmission network</b>	<b>2,534 km</b>	
- 400 kv		507 km
- 220 kv		328 km
- 110 kv		1,699 km
<b>Length of distribution network</b>	<b>59,317 km</b>	
- 110 kv		793 km
- 35, 20 and 10 kv		15,851 km
- 0.4 kv		42,675 km
<b>consumption of electricity</b>	<b>12,389 GWh</b>	
- direct customers		2,775 GWh
- eligible customers		6,539 GWh
- tariff customers		3,075 GWh
<b>Annual consumption per person</b>	<b>6,176 kWh</b>	
<b>Average household consumption per month</b>	<b>314 kWh</b>	

Source: Companies' data

In recent years a trend of slight increase of RES-E generating capacities in general and especially from wood biomass and sewage gas can be identified. In spite of this, the share of RES-E is actually shrinking due to over proportional increase of total electricity consumption in the country. Between 2000 and 2004 the average increase in electricity consumption was 4.2% annually. Even taking into account that in the year of 2002 and 2003 the generation of RES-E was reduced by unusually dry spring and summer seasons, the trend suggests that Slovenia is not on its way to meeting its RES-E target. The same trend is observable when looking at the share of RES in Slovenia's total primary energy consumption.

### **3.5.2 State of the Art of Liberalisation of the Electricity Market**

The legal basis for market restructuring originates in the Energy Act of 1999 imposed by the EU accession process. The governments chose a "minimum of the minimum" approach in following the EU directives on opening of the electricity and gas market. The considerations for this approach were economical and political. The country was facing high inflation, which required direct governmental control of electricity prices. Moreover, the government did not want to lose political support of voters and interest groups in the country who were against strong liberalisation reform of the national electricity sector. The degree of market liberalisation did not exert expected influence on the market competition. According to the Energy Agency of RS, the number of eligible customers in 2004 did not exceed 100,000, or 12% of all electricity customers in Slovenia.

The electricity supply to eligible customers is concentrated. HSE has a dominant position on the market not only in terms of the share of generated electricity but also on the system services market. In this terms Slovenia is comparable with other EU countries (France, Greece and the Netherlands) with a highly centralised electricity sector prior to the EU liberalisation. Most of the trading is based on bilateral contracts. The retail market is concentrated, too with five predominately state owned distribution companies and HSE as main suppliers.

The perception of the state of the art in the liberalisation of the electricity market seems to be very much determined by the position stakeholders take in the market. Stakeholders that are part of the state owned or public utilities consider market opening and access to the market substantial, whereas private companies disagree on this point. They see a lot of access barriers.

### **3.5.3 RES-E Support Instruments**

Presently, a feed-in tariff is the main support instrument for RES-E production. Modifications of the current scheme are however only possible with consent of the EU Commission because the scheme is under EU investigation for being non-declared state aid since the beginning of 2006. In August 2006 the Government increased the amount of support for biomass and CHP due to rising fuel prices. The government also removed the differentiation of tariff/premium for solar electricity generation installation below/above installed 36 kW by unifying tariff/premium to the upper level.

After the introduction of the feed-in tariffs, there have been no additional subsidies available for RES power plants. The availability of soft-loans at the beginning of the 90's spurred a wave of construction of small hydro power plants. In that period interest rates were very high, up to 12% above inflation, and credits were difficult to obtain. The state owned bank, using also a budgetary subsidy, offered loans to investors at more reasonable rates, typically "inflation + 5%". Contracts provided investors with a hedge so they could postpone payments under specified conditions.

Presently, subsidies are available for biomass- and solar heating installations. An internationally sponsored (GEF) programme addresses biomass district heating systems. Subsidies of up to 50% of the total investment value have been granted to pilot projects. The active scheme includes a 25% subsidy and 25% of investment cost as soft loans.

Additional to the feed in based support of qualified production, other direct (subsidies) and indirect (co-financing of project preparation, awareness raising, training and education etc.) instruments have been in place in Slovenia.

### **3.5.4 Stakeholder perceptions and willingness to change support scheme**

The core activities of the Slovenian Desk focused on discussions and workshops with key target groups, e.g. RES-E generators from biogas and wood biomass and nature protection NGOs. Three national desk workshops with the representatives of these different groups were organised in November and December 2005 whereas individual in-depth interviews followed in spring of 2006. Within the 2nd international conference of REALISE Forum in Maribor in May 2006 a national consultation on RES-E potential of the various RES-E technologies took place. Based on above mentioned activities preliminary findings, conclusions and recommendations were distributed to the stakeholders

in the beginning of September of 2006 and discussed together with the presentation of the draft of the new feed in scheme during a final national hearing, held in Ljubljana on September 20, 2006.

The three meetings showed that the type of support scheme is considered a minor issue by Slovenian stakeholders. The majority of involved stakeholders were indifferent to type of support scheme. Feed in tariffs are seen however as one of the few stable parameters in broader unstable and (over)complex investment framework for RES-E in Slovenia. Next to discussing differentiation of the tariff support scheme, the participants focussed on issues concerning the administrative framework and public acceptance of RES. Also general energy policy themes were tackled, especially issues concerning energy efficiency as a general precondition to any new investment in RES-E. The main obstacles for a balanced, consensual dialogue on RES-E were identified and discussed. These are: non-coordinated and opposing goals of different governmental sectors; unwillingness or lack of capacities for public participation; lack of support to marginal stakeholders; monopoly position of state owned supply; and lack of clear and prioritised goals and objectives of the national energy policy.

The majority of stakeholders are considering the present feed in system in Slovenia to be in accordance with principles and rules of the liberalised electricity market. A large majority of interviewed stakeholders has little or no knowledge on quota/tradable certificate RES-E schemes. However they all agree that, taking into account the size of the market and limited number of market actors, a national quota/tradable certificate scheme would not be feasible, if not for other than for the reason of very low liquidity of such a market. Moreover stakeholders agree that the amount and duration of the financial support in Slovenia could improve.

While all investors are claiming spatial planning and environmental impact assessment procedures as large barriers for dissemination of the new RES-E generation capacities especially small scale private investors are claiming that the burden of time consuming non-integrated - and sometimes even contradictory - procedures can jeopardise their very existence. A kind of integrated policy and support for diminishing administrative barriers is demanded as urgent in the views of (potential) investors to pave the path to more standardised and faster administrative and technical procedures.

After the increase of feed in/premium for RES-E in 2004, the interest for investments in the RES-E increased considerably especially for biogas CHP and PV installation below 36 kV. Harmonisation of legislation in the area of agriculture and treatment of animal residuals (that are not intended for human nutrition) and bio-degradable wastes as well as removal of all import duties for goods from the EU after accession in 2004, contributed positive synergies for the RES-E investment climate

in the country. Nevertheless many projects have been slowed down or even cancelled, due to uncertainties respectively high costs of obtaining all required administrative and technical requirements.

Taking into account the substantial annual growth in electricity consumption and the administrative and technical restrictions for the new RES-E investment, none of the interviewed stakeholders believed that Slovenia can meet its indicative RES-E target. Stakeholders hold this opinion despite ongoing construction of the new hydro power chain on the lower Sava river basin and the other recently started investments in new RES-E generation capacities.

NGO representatives are claiming that excessive growth of electricity consumption (above the growth of GDP) is undermining any attempts of “greening” the electricity sector by new RES-E capacities, even if they were not situated in environmentally sensitive areas. Thus, in their opinion, a decrease of energy intensity and an increase of energy efficiency should have priority over support to the RES-E generation in the country. This statement can be attributed to the environmental NGOs in general and not only to nature/landscape protection organisations or citizens’ initiatives against large(r)-sized RES-E installations that are planned in sensitive areas in terms of nature and landscape protection.

When the investment in the new RES-E generation will predominately be carried out by existing para-state owned large companies (that are at the same time planning substantial increase of fossil and nuclear capacities) this will most probably undermine the image of the RES-E as a carrier of social innovation and greening of the electricity sector, even if the majority of investment would not be situated within non urbanised/industrialised areas. This can on the other side undermine the dynamics of growth of different RES-E based products on the electricity market.

## ***3.6 Findings from the Scandinavian Hearing***

### **3.6.1 State-of-the-art of Electricity System and RES-E Production**

The Nordic region and particularly in Norway and Sweden, is fairly special in so far as they have large volumes of hydropower available to offer a bulk supply of large quantities of renewable electricity. The underlying production system in the Nordic countries consists of an installed capacity of about 92.6 GW whereof about 57 GW comes from renewables, dominantly from hydropower. 8.8 GW comes from other

renewables than hydropower, and includes biofuels 4.3 GW and wind 3.8 GW.

In addition to traditional energy sources including hydro-based electricity, the Nordic countries have a considerable portfolio of new renewable energy totalling about 29 TWh for the Nordic region as a whole in 2001. This includes wind power, particularly in Denmark, bio-fuel, particularly in Finland, and small-scale hydro particularly in Finland, Norway and Sweden. In Sweden more than 90% of the electricity generation is derived from hydropower and nuclear power. It is assumed that the shut down of nuclear power plants will commence after the year 2010. Replacing generation would primarily be composed of combined cycle plants firing natural gas and plants using renewable energy sources. The Norwegian supply of new renewables in 2010 is based on forecasts by the energy industry association EBL.<sup>19</sup> This forecast assumes that regulated hydropower generation will not increase much in the future. However, it is possible to increase the hydropower capacity by 10-15 TWh by bringing on stream additional capacity provided by the modernisation and extension of existing hydropower plants. In addition to this, Energiutvalget (a government committee), has as part of its analysis of the energy- and power balance up until 2020, estimated a potential of biomass and heat pumps to 10 TWh and wind power to 6 TWh. The Danish estimates are based on the two government plans Energy 2000 (1990) and Energy 21 from 1996. These plans have had CO<sub>2</sub> reduction as a main objective and have focused on renewable energy development as main pillars in the Danish strategy. The official Danish long-term energy plan, Energy 21 set a target of achieving 20% of electricity consumption (6.8 TWh) from renewables in 2003, this target has already been surpassed. Forecasts indicate that Denmark will reach 27% electricity (9.2 TWh) coming from renewables by 2003.<sup>20</sup> It is assumed that most of the new electricity generated in Denmark up until 2010 will come from wind power.

### **3.6.2 State of the Art of Liberalisation of the Electricity Market**

The Nordic market is considered to be the pioneer in liberalisation. Liberalisation is well developed, among others by a well developed and good functioning trading system (Nord Pool). Major energy companies are still publicly owned but they all have a well developed commercial outlook and business orientation. Competition in the Nordic market is developed.

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<sup>19</sup> Norwegian Electricity Industry Association ([www.ebl.no](http://www.ebl.no)).

<sup>20</sup> [www.windpower.org](http://www.windpower.org) Wind Energy News from Denmark, February 10, 2003.

### 3.6.3 RES-E Support Instruments

One may observe considerable change in Nordic green electricity policy in the early 2000s. The general trend has been towards more market based policy instruments, led by Sweden's development of a certificate market, which was supposed to be followed by Norway. However, also the Danish policy has implicitly taken a stronger market twist, as a feed in system has been partly dismantled under the liberal-conservative Fogh Rasmussen government leaving a combination of CO2 markets and high electricity prices to be the major drivers for renewables. In addition, offshore wind parks and replacement of existing old facilities are receiving ad hoc support. Finland has continued a policy of tax relief and production subsidies.

The Danish renewable energy policy is dominantly based on exemption from energy levies and indirectly on the price lifts in the energy market created by CO2 quotas on fossil fuels. Further development of wind power is supported through reinforcement and expansion of the electricity grid. The liberal-conservative government has also maintained some support to generators. In addition, funds amounting to around 30 million DKK per year are allocated to research and development.

The Swedish Electricity certificate trading system initiated May 2003 marked a major shift in the Swedish support system for renewable electricity generation. It targets electricity generated from: photovoltaics, wind power, biomass, geothermal energy, wave energy and small-scale hydro (under 1.5 MW, with some exceptions). In the first round, the objective was to achieve a 16.9% share of RES-E in electricity consumption by 2010.

The system included a quota obligation, ranging from 7.4% in 2003 to 16.9% in 2010, it obliged consumers to have this percentage of their electricity consumption as 'renewable' through certificates. In practice, the suppliers handled the quota, and could charge their customers for the electricity certificates. Energy-intensive industries were exempted from the obligation.

A new specialised support scheme for wind comes in addition to traditional measures. Since 1994, small-scale RES-E production has been partially or totally exempted from the energy tax. This is beneficial for small-scale electricity producers. Furthermore, producers and consumers of biomass-based electricity have traditionally been exempted from various environmental taxes, such as the CO2 tax, the sulphur tax and the NOx levy.

The major shift in renewables policy in the 2000s in Norway has been the creation of ENOVA with a general and flexible support programme

and the preparation for a Norwegian association to a joint Swedish-Norwegian certificate market.

The establishment of Enova signals a shift in Norway's organization and implementation of its energy efficiency and renewable energy policy. By gathering strategic policy responsibilities in a small, flexible and market oriented organization, Norway has wanted to create a pro-active agency that has the capacity to stimulate energy efficiency by motivating cost-effective and environmentally sound investment decisions.

Norway opts for a feed in system, but combined with a long term new renewables target of 30 TWh in 2016, including also energy efficiency measures. Hence the renewables target is de facto considerably lower. The feed in system will be financed through a government fund of 20 billion NOK, with an expected return of 880 million NOK. The operative management of the system is largely left to ENOVA.

The new Norwegian feed in system will provide 4 øre, or about 0.48 €ct for small hydropower, 8 øre, or about 0.96 €ct/kWh for wind power; 10 øre, or about 1.20 €ct/kWh for bioelectricity and immature technologies.

The Finnish support system has remained fairly stable. They have continued a policy of investment subsidies and tax refunds from the 1990s and there seems to be a broad agreement that this policy approach has worked well. This policy apparently rests on a broad industrial and energy-industrial consensus.

The main policy instruments used in Finland for renewable support are fiscal incentives - a refund for RES-E producers from tax revenues - and investment subsidies. The most important programmes before 1997 were the Bio energy Promotion Programme, approved by the Government in 1994 and the Wind power Programme drawn up by the Ministry of Trade and Industry in 1993. The objective of the Bio energy Promotion programme was to increase the use of Bio energy by 25% between 1992 and 2005. The wind power programme aims at construction of 100 MW of wind power capacity by 2005.

In addition, wind and other renewables may be supported by investment subsidies. The Council of State decision 29/99 sets maximum percentages of subsidy of 40% for wind power investment and 30% for other investments in renewable energy.

### **3.6.4 Stakeholder perceptions and willingness to change support scheme**

In the Nordic context, the willingness to change support system concentrates on the establishment of a common Nordic certificate market. However, the establishment of such a market is difficult for several reasons. In Denmark the positions of the stakeholders are

mixed. Some are against a certificate market because offshore wind power parks are not adequately financed over certificate markets and the certificate market does not play well together with the auction arrangement for the wind power parks. Others think that the certificate market could be established since the technical and physical conditions are met. The question is a political one. The certificate market opens large possibilities for the Danish wind industry, but this depends to a large extent on the capacity to accommodate technology in local area planning.

In the stakeholder interviews before the policy reversal of the Socialist government, the Norwegian Electricity Industry Association (EBL) clearly preferred a joint Swedish-Norwegian certificate system and did not wish guaranteed prices, like in Germany, because they see that this limits the market-dynamics. According to EBL, the system of investment support and some production support that has been promoted by ENOVA has not attracted investment in renewables.

### **Barriers for renewables in the Nordic market**

Denmark:

- “liberal fatigue” with high feed in rates and frontrunner policy of previous governments.
- Political commitments to general non-increase of all public tariffs make for a stiff system.

Sweden:

- Longer term commitments to goals for renewable consumption may unleash longer term investments
- Disagreement with Norway on details prevented expansion to a common Norwegian-Swedish market

Norway

- A revision of support policy from the new Social democratic-socialist –centre party government has ended negotiations with Sweden on a common certificate market and introduced a feed in system with low tariffs. This has put on halt great expectations and numerous investment projects into new renewable electricity lined up by energy industry.
- Public debate around siting-issues may limit windmills and hydro-projects.
- Grid access issues may have to be solved in some locations.

Finland

- Concern with possible competition for biomass between traditional paper and pulp industry and new renewable energy industry may limit renewable energy engagement.
- The Finnish acceptance of the nuclear option may slow down engagement in renewables to fulfil Kyoto targets.
- Development of green electricity mainly for political reasons as household consumers shows little interest. Some commercial customers, however, are more interested.

## **4 Comparative Results**

### **4.1 Introduction**

Whilst the preceding chapter described the core findings of the national hearings, this chapter comparatively analyses the national findings on what can be labelled as ‘the degree of actor cohesion’ in the EU on support of renewables in the context of different (national) electricity markets. The chapter starts with the eight national contextual settings being the characteristics of the electricity markets, in particular the state of liberalisation and ecologisation of these markets. This is then followed by a comparative analysis of the different actor positions in the markets and their willingness to change the support scheme and ends with concluding remarks.

### **4.2 The context: National Electricity Markets**

In the original set up of the project the harmonised support scheme was expected to match with the liberalised and harmonised electricity market. The certificate trading scheme was supposed to be the best alternative in this respect, because of its market based architecture and its potential to develop from a national to the European level. A market oriented type of support could easily be integrated in the internal (competitive) electricity market. Expectations regarding the establishment and performance of the competitive internal electricity market were rather high in 1996, the year of the enactment of the electricity market liberalisation directive (96/92/EC) and became even higher in the following years. The certificate trading system met similar high expectations when it came to support of renewable resources for electricity production.

In 2006, after the fifth benchmark report on the establishment of the internal electricity market, it can be inferred that the promises and expectations have not been met. The establishment of a competitive internal electricity market is still facing serious barriers, as summarised in the following passage taken from the latest EU benchmark report on the establishment of the internal electricity market: *The most important persisting shortcoming is the lack of integration between national markets. Key indicators in this respect are the absence of price convergence across the EU and the low level of cross-border trade. This is generally due to the existence of barriers to entry, inadequate use of existing infrastructure and - in the case of electricity – insufficient interconnection between many Member States, leading to congestion.*

Moreover, many national markets display a high degree of concentration of the industry, impeding the development of effective competition.<sup>21</sup>

On the increase of renewables in electricity production, too the Member States accepted a directive summarising their agreement on the topic.<sup>22</sup> Member States only agreed on goals, but not on the type of support schemes. Consequently, several different means of support came into operation, with the feed-in scheme being the one with the largest diffusion. Currently 20 of the 25 EU countries have feed-in types of support.<sup>23</sup> According to the evaluation described in the communication of the Commission of December 2005, feed-in schemes are rated as more effective and efficient than the certificate scheme.<sup>24</sup>

So both the liberalisation and ecologisation of the internal electricity market developed differently than initially expected. The next section, will look more closely at the state of the art of liberalisation and ecologisation of the electricity markets involved in the project.<sup>25</sup>

#### 4.2.1 Liberalisation, Ecologisation and RES-E support

Figure 4.1<sup>26</sup> below places the eight countries according to their resource portfolio for electricity production. In case of mixed resources (most countries), the positioning has been decided by the ranking of the share of sources in the national fuel mix. Norway is a clear case with its hydro dominated electricity system. Sweden combines nuclear and hydro, Finland combines all four sources in almost equal amounts, Italy combines fossils and RES (mostly hydro), whereas in Germany the resource mix is nuclear, fossil and RES. In Slovenia the ranking of resources is thermal, hydro and nuclear. Both Denmark and the Netherlands have a fossil dominated electricity system combined with RES, but in Denmark the share of RES is already higher than in the Netherlands.

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<sup>21</sup> Communication from the Commission to the Council and the European Parliament, *Report on progress in creating the internal gas and electricity market*, Brussels, 2005.

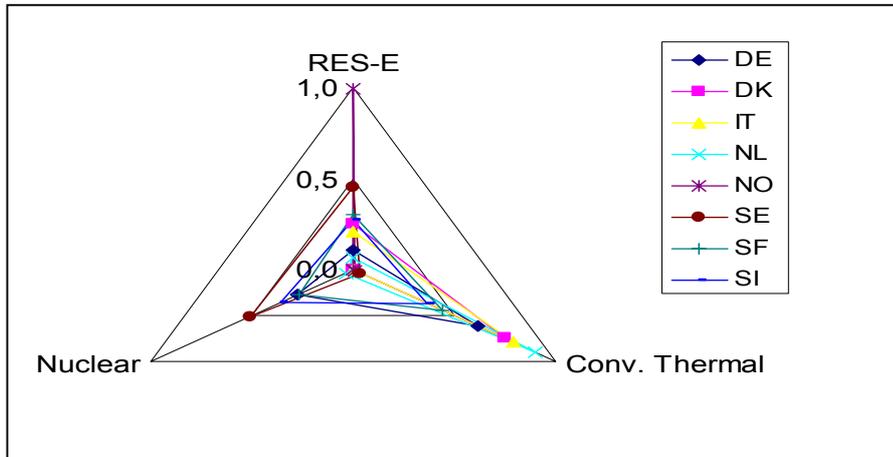
<sup>22</sup> Directive 2001/77/EC on the promotion of renewable energy sources in electricity production. Member States agreed on an indicative target being a share of 21% renewables of gross electricity consumption in 2010 in the EU. Each country takes an individual share in this effort.

<sup>23</sup> With some of the EU Member States applying feed-in schemes only for one RES-E technology like the Belgian region of Flanders or Italy (both for PV).

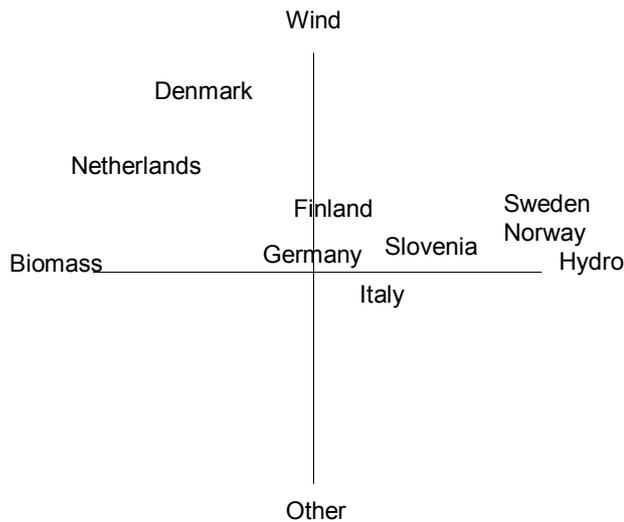
<sup>24</sup> EU Commission, *The support of Electricity form Renewable Resources*, COM (2005) 627, Brussels 2005.

<sup>25</sup> The following text is predominantly based on the country reports of Realise Forum.

<sup>26</sup> Please note that the axes of the figures in this chapter do not refer to any numerical values, except otherwise indicated.



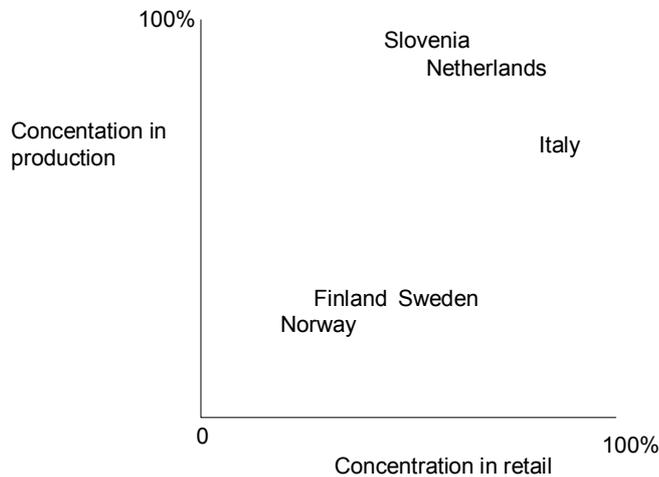
**Figure 4.1 Resource base of Realise Forum countries**



**Figure 4.2 RES-E profiles of Realise Forum countries**

Figure 4.2 positions the countries according to their RES-E profile. Except for Italy, all other countries are in the upper half of the figure in the hydro/wind square or in the biomass/wind square. Countries with hydro resources all use this RES-E potential. Italy possesses hydro too, but the country's second RES-E resource is geothermal energy, reason to position Italy in the lower half of the figure. The RES-E mix of Italy is

(large) hydro, geothermal, biomass and wind, apart from some minor other renewable resources.



**Figure 4.3 Degree of concentration in production and retail market**

Source: EU fifth benchmark report

Figure 4.3 shows the country positions on market concentration based on the market share of the three largest companies in the country. Denmark and Germany are not included because scores on retail markets for these countries were missing in the latest EU benchmark report. In production the position of Denmark is the same as the other three Nordic countries, because the production figure is based on the Nordic market. In Germany the concentration in production is 72%. So on concentration in production the country would position in the upper half of the figure. The markets in Slovenia and the Netherlands are most concentrated, and the Nordic markets less, with Italy in a middle position. The EU benchmarking reports consider the high degree of market concentration among the top barriers for establishing real competition in the electricity market. Moreover, concentration seems to increase instead of decreasing. Compared to the results of the third benchmark report, concentration in production in the fifth benchmark report has increased in Germany, Italy, the Netherlands and Norway and only decreased in Sweden (Glachant 2004: 170).

A recent evaluation pointed out that the circumstances have not improved there since. The degree of competition in the electricity markets of Continental Europe has not made much progress. Almost all wholesale and retail markets of Continental Europe have too few competitors. Most electricity markets are still characterised by oligopolistic or monopolistic structures on the supply side. Some

countries continue to support national champions. The paper concludes that real competition requires: *(i) a complete separation of ownership of the transmission grid and the generation and supply in all countries and sub-markets; (ii) sufficient transmission capacity for creating a larger market; (iii) adequate margins in generation capacity; (iv) a sufficiently large number of generators to share this capacity. Therefore the prospects for a vibrant competition in Continental Europe are bleak.*<sup>27</sup>

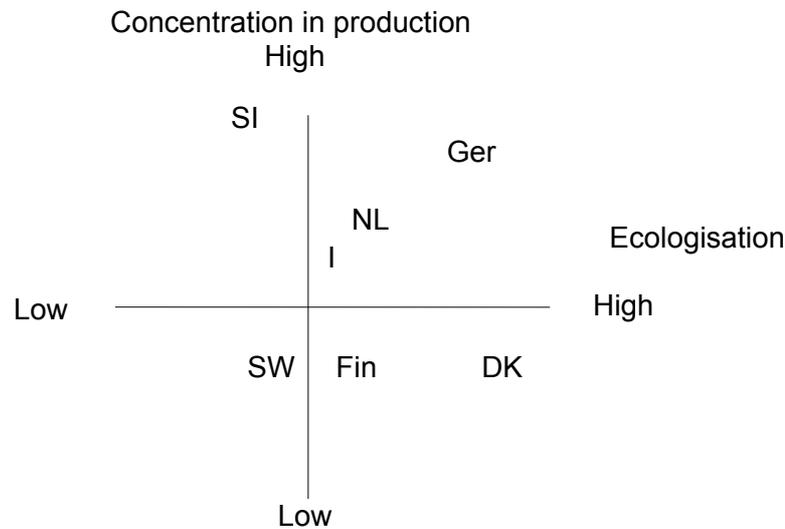
Thus in the liberalisation of electricity markets, the EU is still facing serious barriers and problems which seem to increase rather than diminishing. The findings of the national consultations are in line with several analyses of the barriers in maturing competition in the European electricity markets. For instance, according to a substantial part of the German stakeholders, the conditions for fair competition are not yet given and there is a call for substantial action. Dutch stakeholders rated the competitiveness, profitability and the commercial attractiveness of both the electricity market in general and the green electricity market in particular, as insufficient. So the incomplete state of liberalisation is not only visible in the statistics of the market, but also in the mind set of stakeholders.

Figure 4.4 below positions the countries in the two dimensional space of market concentration in production and ecologisation of the electricity market. The percentage of the national RES-E goal for 2010 realised has been taken as the basis for the positioning of the countries on the ecological dimension.<sup>28</sup> Norway is not included in the figure because as a non-EU member it has no 2010 target for RES-E increase.

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<sup>27</sup> Haas, Reinhard et al., Competition in the Continental European Electricity Market: Despair or work in progress, Paper presented at the IAEE conference, Potsdam 2006.

<sup>28</sup> Degree of goal attainment is based on EU Communications from the Commission, The support of electricity from renewable energy sources, {SEC(2005) 1571}.



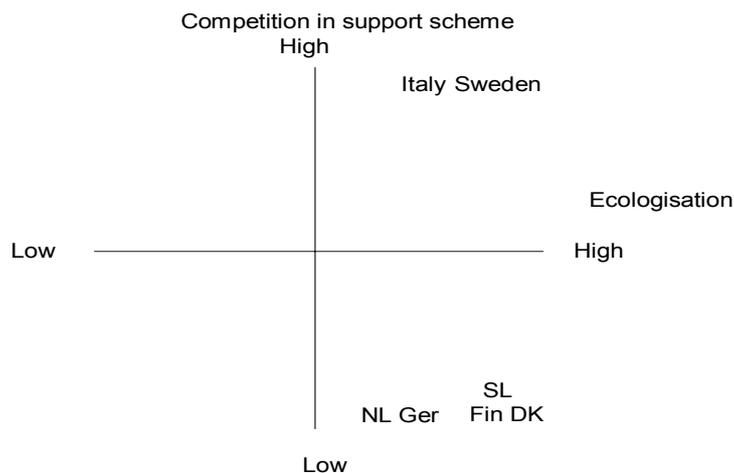
**Figure 4.4 Degree of market concentration and ecologisation in Realise Forum countries**

Denmark and Finland perform best on both dimensions. These two countries combine a low degree of concentration (rather well developed competition in the electricity market) with a good track record in the greening of electricity production, taking the development of the 2010 RES-E goal attainment as the basis for the positioning of the countries on the ecological dimension. Denmark heavily invested in wind technology whereas Finland relies on hydro and biomass. Sweden also shows a low degree of market concentration, but decreased its total RES-E during the past years, because of reduced rainfalls and lower hydropower production (although with some increases mainly in the biomass field). Slovenia and also Germany still have a relatively high concentrated electricity production. Even though Slovenia increased its total RES-E production during the last years (predominantly by hydropower), the overall RES-E share decreased because of a fast growing electricity consumption. Germany strongly increased its RES-E share (basically by wind power) with relatively stable electricity demands at the same time. The Netherlands and Italy prove lower market concentration as Germany and Slovenia. Whereas the Netherlands also increased its overall RES-E share, Italy experienced stagnation with regard to goal attainment.

A next aspect of national context of the countries involved in the project is summarised in Figure 4.5. The figure positions the countries on the degree of competition in support scheme and the ecologisation of the electricity market. Only Italy<sup>29</sup> and Sweden have adopted the

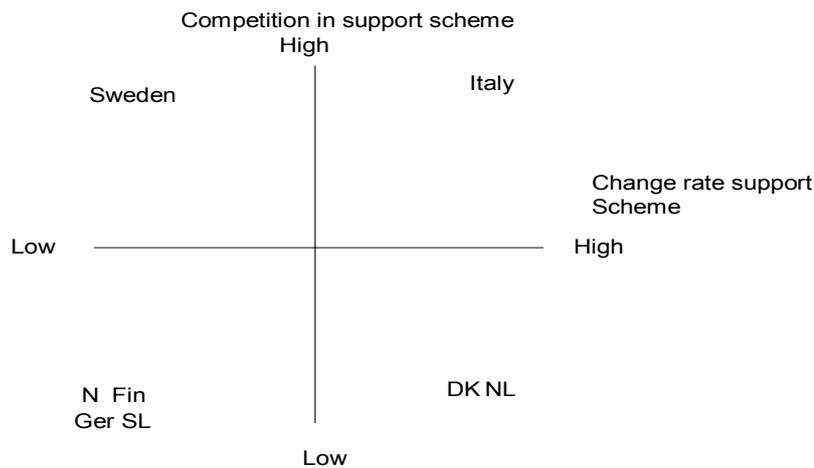
<sup>29</sup> Italy has introduced in July 2005 a feed-in scheme for PV along the line with the German support.

competition oriented green certificate trading system, the other countries have feed-in based support schemes. The figure clearly shows the progress made in the greening of electricity production in hydro based electricity systems. As far as the support schemes are concerned, the Nordic countries do not present a homogeneous pattern because of the Swedish choice of the quotas and certificate scheme. This is remarkable, since the Nordic countries tend to take similar and joint decisions in almost all other electricity market topics.



**Figure 4.5 Degree of competition in national support scheme and degree of ecologisation of the electricity market**

Another aspect of the national context is summarised in Figure 4.6. The figure positions the countries according to the change rate of the support scheme for renewables and the degree of competition in support scheme. The change rate of support scheme has been classified as high if the support scheme changed one or more times since 2001, the year the RES-E directive was enacted. Figure 4.6 below illustrates a change of support schemes in only three countries. The Dutch promotion of RES-E has been adjusted once, but quite radically. Changes in the Netherlands became even more drastic when the government in August 2006 decided to stop instantly the support of new RES-E investment projects under the MEP. Denmark announced a similar change, but without effectuating it. In the other countries support has been rather consistent since 2002. Except for Norway and Finland, the other countries have feed-in or certificate based systems. Norway and Finland combine fiscal measures with tax incentives. Italy and Sweden also changed support for renewables before 2002. Italy changed from the feed-in to the certificate scheme.



**Figure 4.6 Change rate and degree of competition in support system**

A final aspect of the context is the country's position in the EU debate on the renewable directive and the way countries conceive the role of renewables in their future resource portfolio. As far as the ambition to increase the share of renewables in 2010 as compared to 1997 is concerned, the three countries with predominantly thermal based electricity systems set much higher targets if compared to the countries with hydro power. In the EU negotiation about the renewables directive both Germany and Denmark took advanced positions, because both countries already followed ambitious domestic programmes for increasing the share of RES-E. Denmark is generally recognised as the European forerunner in this respect. The country started relatively early with large scale investments in onshore wind technology. In Germany, following the coming into office of the red green coalition in 1998 an ambitious programme was initiated and reinforced the already existing feed-in system. This turned out to be effective in initiating investments in new production capacity. Germans are the forerunners in feed-in based support of renewables. The commitment of the Netherlands was also substantive, but without being based in a dedicated domestic renewables programme. In the EU negotiations the Dutch tried to end up as close as possible to the domestic target for renewables, which was already considered fairly ambitious, despite the small figures in absolute terms (see Dutch country report for further details).

All three EU Member States with hydro (Italy, Sweden and Finland), had footnotes on the 2010 target in the appendix of the renewables directive. Except for Finland, both other countries made the fulfilment of their target for 2010 conditional upon the increase in gross national

electricity consumption (Italy) or upon the variations in pluviometry, timing of rainfall during the year and inflow (Sweden).<sup>30</sup>

Italy basically assumed an absolute target of domestic RES-E production by 2010 and stated that its percentage target, as set in the Directive, would hold only if gross national consumption would be of a given value. This position was likely due to the awareness that large hydropower resources had mostly been exploited and a further substantial RES-E growth should depend upon other sources (wind, biomass, solar) of more uncertain potential.

#### **4.2.2 Conclusions on context**

The previous overview showed the state of the art of the Realise Forum countries on liberalisation, ecologisation and RES-E support. The picture is diverse on all three major issues of reform. If the selection of countries involved in the Realise Forum project is representative for all EU countries, than one can conclude that there still exist major cleavages on the three topics within the EU, separating countries basically in two groups:

- On resource position: Countries with and without hydropower
- On liberalisation: Countries with less and with more concentrated electricity markets
- On ecologisation: Relatively fast and relatively slower moving countries
- On RES-E support: Countries that did or did not change support scheme since the RES-E directive came into force.

Only the Nordic countries combine a relatively good state of liberalisation of the electricity market with a relatively good track record in RES-E<sup>31</sup> increase. The track record of the other countries in particular on the liberalisation dimension is still bad. Markets are still far too concentrated and there are no clear signals that circumstances will improve shortly. Market and business dynamics seems to point in the direction of more instead of less concentration in the electricity markets of the EU.

All countries are making progress in increasing the share of renewables in electricity production, but some are more far reaching than others in this respect. Ambition seems to be more related to the type of support scheme than to degree of liberalisation. Denmark and Germany are the most ambitious countries where RES-E increase has been realised under feed-in based systems of support, whereas their concentration of the electricity market differed. Both countries made progress in RES-E increase thanks to political commitment. In both the German and the

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<sup>30</sup> See footnotes 1 and 6 in the Annex of EU Directive 2001/77/EC.

<sup>31</sup> Except for Sweden regarding RES-E increase.

Danish case governmental decisions instead of market dynamics underlies the progress made in RES-E increase. Such a strong political commitment seems to be lacking when it comes to establishing adequate conditions for competition in the electricity market. On this topic the performance is less impressive than on ecologisation, except in the Nordic countries.

Against the background of the market context of the countries involved in the Realise Forum project, the next section compares the findings of the stakeholder consultation in the eight countries.

### ***4.3 Stakeholders viewpoints and stakeholder preferences***

Realise Forum had eight national consultations. Stakeholder consultation was the common activity but each of them was organised in a specific way. Interviews with representatives of the major stakeholder groups were part of the consultations in all countries. In Italy, Germany and the Netherlands the interviews were combined with (online) surveys and in Germany, Italy and Slovenia with one or more (thematic) meetings with groups of stakeholders.<sup>32</sup> This diverse structure of the eight national consultations give a reasonable combination of stakeholder viewpoints on the support of renewables in the countries, their willingness to change the support scheme and indicates the various problems stakeholders are facing in their every day practice. This section compares the findings of the stakeholder consultation in the eight countries.

#### **4.3.1 Who was involved?**

The Realise Forum consultation has tried to cover the large majority of actors active in the electricity market. The consultation has included:

- Producers of (renewable-based) electricity
- Investors in renewable-based electricity production
- Producers of (renewable based) technology
- Traders
- Grid companies
- Certifying organizations (Guarantee of origin)
- Electricity supply industry
- Consumer (associations)
- Relevant NGO's (environmental groups)

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<sup>32</sup> See chapter 3 for details. In the Netherlands the stakeholders have been questioned twice during the project in 2005 and in 2006, before and after the evaluation report of the Commission on the progress in the support of RES-E.

- Public agencies responsible for renewable electricity policies and support
- Financing and research institutions.

Each survey had its own accent in participation.<sup>33</sup> The findings discussed in this section illustrate opinions and perceptions of the variety of stakeholders currently involved in electricity markets in Europe. The next sections comparatively analyse the major topics discussed in the national consultations.

### 4.3.2 Perception of the market

The individual analyses carried out by the country desks points to a rather negative perception regarding the opening of the electricity market. The rather modest evaluation refers to both grey and green electricity market. The project's findings on this point are in line with the EU assessment in the latest benchmark report on the establishment of the internal energy market. In particular, the Dutch stakeholders ranked all four features of the grey and green electricity market (competitiveness in production, profitability, access of newcomers and commercial attractiveness) rather low. Each country is facing its own problems in this respect, but a general problem still is the high degree of market concentration, both in production and in retail. The degree of competition in the national electricity markets is still unsatisfactory and in need of improvement. This is even stressed by the Nordic stakeholders, who operate in the most competitive market setting of the EU. Nordic stakeholders plea for more competition both at the national and the European level. In particular, the majority of them claim that a European level playing field is not yet in sight but highly needed.

The majority of stakeholders perceive that the EU still has a way to go in improving the conditions for adequate competition in the grey and the green electricity market. Markets are still predominantly nationally oriented. The regionalisation of the electricity market, as suggested in the latest benchmark report, is proceeding very slowly. Even in the Nordic region with the integrated electricity market of the four countries, stakeholders still see a lot of problems with competition and the improvement of the green electricity market. Even in this rather integrated region, differences in circumstances are still substantial.<sup>34</sup>

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<sup>33</sup> The response of the surveys in Germany, Italy and the Netherlands did not exceed 50%, which is quite normal for surveys of this kind.

<sup>34</sup> In June 2006 the national governments of Germany, France and the Benelux countries decided to join forces for a stronger integration of their national electricity markets. This is a second initiative to establish regional electricity markets in the EU additionally to the Nordic market. Regionalisation of electricity markets is one of the major strategies suggested by the Commission to take next steps in the harmonisation of the grey and the green electricity market.

### 4.3.3 Perception of the national support system

The surveys showed agreement among stakeholder groups about the type of support currently provided by the countries of the project. Italy and Sweden provide support by the quota and certificate system, the others by (variations) of the feed-in model. The Italian survey asked stakeholders to compare features of the previous feed-in system and the new certificate system. In Italy both types of support schemes have been applied. Italy changed the main support system from a feed-in scheme to a certificate scheme in 2001-2002. The scheme started in 2001, but the first RES-E production obligation was set for 2002, even though a feed-in system has recently been reinstated specifically for the support of photovoltaics. Dutch support also changed, but in opposite direction. The Dutch scheme has moved from certificate trading to feed-in.<sup>35</sup>

A large majority of stakeholders appears to accept the type of support schemes in use in their country, nonetheless the level of satisfaction varies from one group to another. The satisfaction refers to the amount, duration as well as technology specificity of the support. But RF analyses also showed that the specific design of the support mechanism and the way support schemes are administrated to a large degree determines stakeholder's opinions in this respect. Stability of investment context and the magnitude of investment risk is without any doubts the number one condition of a productive investment climate in the perception of stakeholders. This has been stressed by the stakeholders in almost all countries involved in the project. The country analyses pointed to a relationship between the stability of the support system and stakeholder's satisfaction with the support scheme. The more stable the support, the greater the agreement of stakeholders about the quality of the support. Germany and Denmark are two clear examples in this respect. The majority of German stakeholders consider the amount and duration of support adequate. According to them, magnitude and duration of support should be provided in correlation to the type of technology, since some technologies are still far from being competitive on the market than others. Dutch stakeholders are still rather critical about the national support system. This attitude goes back to the early period of RES-E support in the Netherlands, when support systems too often changed. The frequent changes made the Dutch investment climate rather unpredictable and investors quite uncertain. Investments in new Dutch green production capacity started increasing first in 2002, before that date growth stayed behind expectations. Part of the problem was a loophole in the Dutch support system till 2003, which made the import of renewable electricity much more attractive and profitable than domestic production. Consequently, import instead of

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<sup>35</sup> See the Dutch country report in the Annex for the reasons of changing the support scheme.

domestic production became the dominant activity under the Dutch certificate trading scheme.

The Italian and German desks learned more about the stakeholder perceptions on differences and similarities between the feed-in and quota & certificate system. According to the Italian stakeholders, the feed-in system was more effective in increasing the share of renewables in the Italian electricity production. The risks of the feed-in as perceived by investors and financial organisations were assessed lower than the risks of the certificate system. A significant risk of the certificate system is connected with the too low quota and the insecurity of the length of support period; this increases the investor's risks. According to the Italian stakeholders, the certificate system is perceived to be more compatible with a competitive electricity market. But both systems, the old feed-in scheme and the current quota/certificate scheme, were considered to perform rather poorly in fostering technological variety. Some technologies are felt to be discriminated, with those technologies at the greatest distance from the market in a backward position.

The German stakeholders held similar opinions. They only considered quota & certificate systems better on price competition. On all other aspects, including transaction costs they considered the performance of the feed-in system superior to the certificate trading system. The findings from the Italian and German desk on the comparison of both dominant systems of support are in line with the outcomes of the Commission in the 2005 report on the progress in the national support of RES-E. The report analysed the similarities and differences of both support systems in technical terms. The findings of RF stakeholder consultation are also conform with the outcomes of this technical comparison of the performance of the feed-in and the certificate trading system.

In general the debate on the support of renewables in the Nordic countries is also consistent with the above findings, but added two interesting points:

- The connection between renewables, energy saving and heat production
- The establishment of a regional certificate market.

The first point also has been mentioned by stakeholders in other countries and involves a plea for developing a closer connection between energy saving and renewable electricity. This connection should also be established at the level of support schemes, meaning that stakeholders would consider it wise to have some connection between support of renewable electricity, CO<sub>2</sub> trade and energy saving. A closer match between the mechanisms of support is quite difficult, because the support of renewables is dominated by feed-in based systems whereas CO<sub>2</sub> trade is dominated by quota scheme based

systems and for energy saving also a quota/certificate based system is considered. Thus despite the strong connection between the three topics in terms of problem perception, there are some difficulties to develop closer relationships between the policy mechanisms for RES-E support and CO<sub>2</sub> reduction. These problems are not caused by differences in the details of both types of support mechanisms, but by fundamental differences between the mechanism to support RES-E on the one hand and to reduce CO<sub>2</sub> on the other.

The second topic addressed in the Nordic dialogue is the ambition to establish a Nordic green certificate trading market, with the integration of the Nordic market into the Swedish green certificate market. According to the Nordic stakeholders this is a promising idea, but difficult to effectuate even among countries as close in culture and language as Sweden and Norway. This debate as well as the scepticism about the establishment of a regional green market holds an important lesson when it comes to next steps in the EU wide support of renewables. There are other non economic reasons that might keep countries from participation in common support schemes.<sup>36</sup>

As a relatively young country, Slovenia is facing typical problems in domestic support of renewables. Despite the improvements perceived by Slovenian stakeholders after the introduction of the feed-in system, the support is still facing problems. One of the core problems is the amount and duration of the financial support which is considered insufficient to initiate investments in new production capacity. In Slovenia the amount of support does not follow annual inflation rates and in particular the duration of support for PV is considered far too short to initiate any investments in this technology at all. Consequently, the larger part of domestic RES-E production comes from existing (hydro) power plants and some biomass. Hardly other types of renewable based technology have come into operation in Slovenia yet. These problems are difficult to solve, due to other socio-economic problems the young country is coping with.

On support schemes it can be concluded that the national consultations showed quite some agreement among stakeholders regarding quality of support of RES-E. All stakeholders want a reliable and predictable investment context free of high risk. Such an investment context is still best assured by a clearly defined and managed support scheme guaranteeing price and investment support for a certain number of years. The featuring of such an investment and production context in the countries is different. Most stakeholders do not care for these differences and prefer the support scheme of their country as long as this scheme guarantees a stable and reliable investment and production climate for RES-E.

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<sup>36</sup> Norway recently decided in favor of a feed-in based type of support.

#### **4.3.4 Compatibility of national support scheme with competitive electricity market**

This topic has been addressed in almost all national desks and everywhere the findings are different. A major finding on this aspect of the consultation is that both types of support schemes are considered compatible with the (internal) competitive electricity market. It showed that the majority of the German stakeholders (with exception for the electric utilities) holds this opinion, in spite of the fact that the German feed-in system is based on tariffs and not on the more market conform feed-in premiums. Moreover German stakeholders stressed the need to first improve competition in the national and the European electricity market before any new initiative to improve coordination or harmonisation between national support schemes in the European electricity market.

The majority of the Italian stakeholders are convinced that the Italian quota/certificate support system, despite its market-based design, is not yet compatible with the European-wide internal competitive market. Indeed, some of its features as the reciprocity clause and the obligation to feed all the supported green electricity into the Italian grid to obtain certificates can be seen to clash with the conditions of an internationally competitive electricity market.

Dutch stakeholders hold the opinion that the Dutch support is compatible with the competitive market. However, those most experienced with the support system, the producers of green electricity, were most sceptical on this point.

By summarising the EU challenge on this point, German stakeholders claim that a harmonised EU wide support system is only possible if the competition on the internal electricity market is adequate. First the current distortions in the internal market should be removed and then national support schemes can be harmonised. According to the Germans, such a harmonised support scheme does not necessarily need to be based on a quota & certificate scheme; the harmonisation could also occur on the basis of a feed-in type of support.

#### **4.3.5 Willingness and need to change support scheme**

On this point the results of the national consultations are rather similar. Stakeholders all stressed the need to continue public support of renewables after 2010. This means that the realisation of the EU ambition on renewables after 2010 continues to be dependent on public financial support. Stakeholders do not foresee any market pull of renewables yet; all expect the political push to be necessary at least in the coming decade.

Stakeholders also agree on the necessity to develop and improve a European level playing field both in the grey and the green electricity market. But having said that, they continue stressing the problems involved in coordination and harmonisation of support of renewables. Consequently, stakeholders do not want to swap the current certainty of national support for an uncertain EU wide type of promotion. They all stress the differences between the countries on electricity market development in general and the support of green electricity in particular. Stakeholders want stability and consistency of support and fair play rules. This means no double counting, clear and transparent definitions in combination with reliable certification of resources, products and procedures. The Dutch case provides a clear example how such a system could look like, with the Guarantee of Origin at the heart of it and a financial compensation based on the non competitive costs of the renewable electricity. But the Dutch case also shows the problems involved in such a system with politically decided compensation tariffs. It is very difficult to determine the non-competitive costs for each technology, which causes a lot of disagreement and discussion. Moreover it is quite realistic to assume other considerations than costs to be part of the political decisions on the compensation rate for the non competitive costs of renewables. This is exactly what the Dutch stakeholders' blame Dutch government for: budget considerations instead of real costs decide the compensation for the non competitive part of the costs of producing renewable electricity. A second problem of politically decided compensation tariffs is the technology choice. Here, too the Dutch case is a good example. The Dutch government based the financial compensation of PV on priority considerations instead of cost compensation with the ultimate result that investments in PV based production of electricity instantly went down to zero.

These kinds of politically motivated decisions cause a lot of uncertainty and hesitation among investors, financial organisations and producers. These stakeholders put lots of energy in lobbying to influence the political decisions on compensation. However, if getting actively involved in decision making at the level of the national government is already extremely difficult; these difficulties are even larger when the EU should take these kinds of decisions. Harmonised political decision making at the EU level on cost compensation for renewables is probably the most "horrifying" scenario in the mindset of stakeholders and reason for them to be very sceptical and hesitant on harmonised or even coordinated RES-E support in the EU.

Next to reasons of harmonisation and coordination, the German and Italian stakeholders were asked for their willingness to change support anyhow. In Germany, a change to quota and certificates schemes has been advocated by conservative parties, especially the liberals, and the confederation of the electric utilities (VDEW). It was argued that the introduction of volume based trading system of green certificates, with

target quotas for all distribution companies and a penalty for not meeting these targets could provide a more efficient system. They also asserted that this instrument encourages competition and helps reducing prices. VDEW warned that maintaining the current system would add €10 billion to the national electricity bill by 2020.

All other German stakeholders prefer the current system, which they consider reliable and effective. Although the survey is not representative, the picture given of the comparative evaluation of advantages/disadvantages of the two systems illustrates convincingly the position of the various stakeholders and pressure groups.

They admitted that the current feed-in system is perhaps not the most efficient one, but they do not think that the overall support scheme would improve by a change to a certificate trading system. Thus according to German stakeholders the current feed-in system integrates better the differentiated aspects of RES-E support (effectiveness, efficiency, transparency, etc.). Finally, the majority of German stakeholders, especially the RES associations, stressed the good performance of this system as the reason for the dominance of the feed-in system in the EU. German stakeholders did not endorse harmonisation on account of preservation of established and favourable domestic support conditions. Yet approximately 29% of the interviewed stakeholders stressed the importance for a harmonised support system across the EU and favoured the convergence of the national systems to promote RES. This was a somehow composite front comprising almost all stakeholder groups. The majority of respondents of the survey agreed that harmonisation of policies across the EU is not yet necessary. They endorsed the position of Commissioner Piebalgs that it is premature to propose a harmonised European support scheme. Approximately 14% of the respondents gave two answers, thus conceding that whilst competing national schemes could be seen as the best solution, on the short and medium term a coordination of the existing systems is necessary. The popularity of the feed-in system should be taken more seriously in the debate on coordination/harmonisation of support schemes. It is worthwhile to explore the feasibility of EU coordination/harmonisation of RES-E support on the basis of feed-in in stead of certificate trading. The architecture of such a feed-in based system was not communicated in the German hearing, but should be explored in more detail according to German stakeholders.

The Italian stakeholders also expressed low willingness to change their current quota & certificate based support system. This works in such a way that certificate prices are not set merely by the interplay between supply and demand, but is somehow “controlled” to give more guarantees of income to RES-E investors. Changes were advocated only as far as could decrease further investor’s risks. As in other countries, the willingness to change the national support scheme in

favour of EU harmonisation or to establish a European level playing field was almost zero in Italy, too.

Although not explicitly written down in the Nordic chapter, the willingness to change support in favour of EU harmonisation in these countries is also negligible. Stakeholders stressed the need for harmonisation, in particular to compensate for imbalances between national investment contexts. At the same time they do not want to change support, which is most clearly shown by the failed integration of the Norwegian and Swedish support scheme. The unwillingness to change the national support system for the benefit of taking next steps in EU coordination and harmonisation is perhaps the most clear indication how strongly energy continues to be a national topic.

The case of Slovenia shows how different the position of the new member countries is regarding their willingness to change support in favour of EU harmonisation. Change of support is definitely an issue in the country, but the debate is certainly not motivated by harmonisation. The Slovenian debate is actually a debate on the development of the support system and the improvement of the support conditions for investors and producers, in particular new and small ones. Incumbent companies are still powerful in Slovenia, and newcomers face difficulty to enter the market.

#### **4.3.6 Stakeholder consultation: Conclusions**

The findings of the national stakeholders consultations show much more similarities between the countries than the findings on liberalisation and ecologisation of the electricity markets. The consulted stakeholders in the different countries share similar views on a number of topics addressed in the national hearings. Without exception all consulted stakeholders are rather dismal on the quality of competition in the electricity market of their countries. They are quite pessimistic on the prospects of competition in the EU electricity markets and on the establishment of a competitive internal electricity market in the short term. All national consultations stressed the challenge that the EU is still facing on this topic. The stakeholders views on this topic are in line with the findings on market analyses in the EU region.

A second topic stakeholders agree on, indifferently of contextual national setting, is satisfaction with the RES-E support system currently in use in their countries. No matter the state of liberalisation and ecologisation of the market, and no matter type of support system, feed-in or quota and certificates, stakeholders are mostly satisfied with the type of support they are currently experiencing. As far as performance is concerned, stakeholders expect support mechanisms to provide for a stable investment climate for a certain period of time and for acceptable and manageable investment risks. On this point the RF consultation

confirms the findings of more technical and economic analyses of the functioning and performance of national support systems in the EU region.<sup>37</sup>

A third major topic stakeholders agreed on is the compatibility of both types of support systems with the competitive electricity market. A particular interesting finding of the national consultations is that the stakeholders in a feed-in type of setting are more convinced on this topic than the stakeholders in a certificate type of support setting. Compare for instance the findings of the German and Italian hearing on this point. The findings on compatibility of support system are very important for taking next steps in harmonisation of RES-E support in the EU. The majority of the stakeholders are under a feed-in system. If the EU keeps to the idea of harmonised support on the basis of certificate trading then it is facing an extra barrier in the mindset of stakeholders all over Europe. Most stakeholders prefer the feed-in system which they consider compatible with a competitive electricity market. This is quite the opposite of what the Commission initially had in mind for harmonisation of support in the EU region.

The fourth and final major topic of the consultations stakeholders agree upon is the willingness to change the support system currently in use. The agreement on this topic is indifferent of contextual national setting. This topic has been addressed in all national hearings and stakeholders are rather determinate on the issue: no change of the current support system except when change will improve the stability of the national investment climate and will reduce investment risk. For the rest, change is not acceptable. Stakeholders in particular reject change of support for the benefit of EU harmonisation. They fear a loss of stability when it comes to EU harmonisation of RES-E support in the short or medium term. The whole setting for RES-E in the European context is considered still too fragile and immature for making any next steps in harmonisation of RES-E support. In particular the national settings are considered too diverse and still too different for making any move on the harmonisation track. Stakeholders stressed the need of further institutionalisation of RES-E at the EU level as a necessary condition for any further harmonisation in support.

In several consultations stakeholders stressed the need first to improve the conditions for competition in the EU electricity market and then consider the need to harmonise RES-E support. If harmonisation is required, of which stakeholders are not yet convinced of, for them it is no question that harmonisation with feed-in is as likely as harmonisation on the basis of quota and certificate schemes. Stakeholders preference in this respect depends on the type of support they are experiencing. Since feed-in is the most widespread system in use it cannot be

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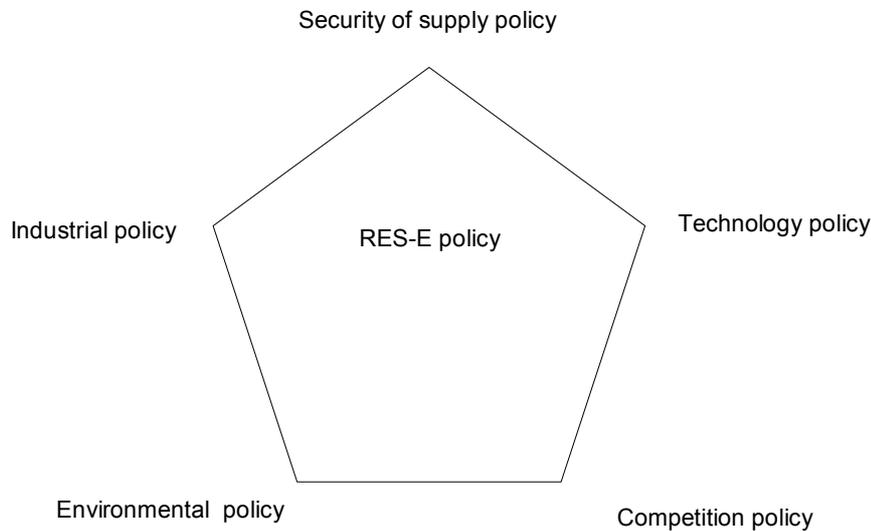
<sup>37</sup> See for instance Huber, Claus, et al, Final Report of the project Green-X, Vienna, 2004.

expected that stakeholders change their mindset in favour of quota and certificate based type of harmonisation. The efforts of the German-Spanish feed-in cooperation is a convincing first step for an initial transnational coordination of systems.

#### **4.4 Conclusions**

The results of the national consultations show the high complexity involved in RES-E support in the EU. The range of opinions and preferences is highly diverse and does not stop at national borders. They vary within and between national and international stakeholder groups. It is very difficult to generalise from the richness and variety of stakeholder positions and preferences, without harming the detailed analyses of the country reports and the diversity and nuances in the stakeholder positions. This makes it difficult to draw general conclusions in terms of stakeholder positions or stakeholder preferences. This also makes it hard to draw any guidelines or recommendations on the stakeholder consultation as such. Despite this hesitation, the stakeholder consultation exercise was very valuable. It showed in a very detailed and varied way the complexity of the current RES-E debate in the EU. The stakeholder consultation demonstrated that the current RES-E debate actually is a multidimensional space that can be visualised as a pentagon. The corners of the pentagon list the dimensions involved in the RES-E debate. The debate on RES-E support is related to liberalisation and ecologisation of the EU electricity market, and thus includes concern with competition policy as well as environmental policy. The debate is also about security of energy supply and about industrial policy and technology policy considerations and interests. The debate is further complicated by the fact that some issues, like security of supply are primarily focused at a European level, whereas other issues, like industrial and technology policy are still focused on the national agenda.

Stakeholders consider the current state of liberalisation of the electricity markets in Europe as disappointing. In particular, adequate conditions for competition are still lacking and the progress and the expected positive effects of liberalisation are lagging behind. Electricity markets in the EU region are still concentrated and concentration tends to increase instead of decreasing.



**Figure 4.7 Multidimensional space of RES-E support in EU**

Member States also show a different degree of commitment to liberalisation of the electricity market. Some countries have been reforming their markets with a European focus on competition; others continue to focus on national interests (national champions). Part of the problem of these differences in foci is disagreement on electricity market liberalisation and harmonisation. Disagreement on this point is growing in Europe. RF stakeholders consultation indicate that there are two dominant orientations currently emerging in the EU: one focusing on the competitive harmonised market and one focusing on national interests. This emerging differentiation in policy beliefs also affects the debate on RES-E support. Emerging disagreement on this topic “contaminates” the climate for harmonisation and even coordination of RES-E support.

The short term challenge of *ecologisation* is to attain the indicative national goals on RES-E increase and the overall EU goal in 2010. At the latest with the publication of the EC communication of the Commission on the support of RES-E in December 2005, it became clear that the EU will only attain the 2010 goal if countries are willing to take additional support measures. Without intensified policy efforts only a very few Member States will be able to meet their indicative target in 2010. But the greening of the European electricity system is expected to continue after 2010. In January 2007, in its road map for renewables the EU has finally considered new goals for 2020. This issue will also affect next steps in RES-E support. However, the national attitude vis-à-vis

ecologisation and renewables seems to be rather defensive and reluctant. Additional to the indicative targets, most national governments do not have any clear longer-term ambition regarding the ecologisation of electricity supply or any dedicated national programme supporting such an ambition.<sup>38</sup> Similar ambitions are lacking in the market, too. The market seems to consider investments in RES-E innovation and new production capacity as a prime responsibility of politics. Without a clear and substantial support, market actors are not willing to invest in the ecologisation of electricity supply in Europe.

The national consultations showed that the debate on RES-E support is also about the *security of supply* position of Member States in the longer term. Renewables are assumed to contribute to the future energy resource portfolio in the EU and all Member states want a beneficiary position in this respect. From this perspective, all have specific interest to have RES-E production capacity within the national borders.

This means that there are country specific considerations at stake in *industrial and technology policy*. Domestic industry and domestic technology development are expected to benefit so as to create positive industrial and technological effects. Country interest could therefore easily come into conflict with the idea of coordinated or harmonised RES-E support in the EU if such support would lead to distribution bias across nations. These country specific industrial and technological considerations therefore intervene in the current debate on RES-E coordination and harmonisation.

Indifferently of national setting, therefore, the willingness to change current support systems is very low, except when change improves the investment and production conditions. There might be fractions of stakeholders who favour a change of support in the future, but these fractions are minorities everywhere. The majority of the stakeholders want to keep to the current support system, independent on the type of support scheme and national setting.

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<sup>38</sup> Only Germany and the United Kingdom have formulated and accepted long-term RES-E objectives.

## **5 Policy Recommendations<sup>39</sup>**

### **5.1 Introduction**

This chapter presents the lessons that have been learned from the Realise Forum project and their accompanying recommendations. The lessons learned and the recommendations are based on the national consultations, on the two international workshops and on the final conference that have been organised in the context of the Realise Forum project.

### **5.2 Lessons from the international workshops and final conference**

The first international workshop entitled “Three Years of Green Certificates: Are They out of the Infancy Phase?” took place in December 2005 in Milan. The conference showed that TGC schemes can work well for the deployment of new RES-E capacity, although in a way and to an extent that vary from one country to another. Nevertheless, quota & TGC schemes are more suitable for the RES technologies closer to maturity, whilst less competitive technologies need other instruments such as FIT-schemes. It can hence be inferred that TGC and FIT-schemes can be complementary rather than competing, and the optimum set-up of RES-E support instruments can therefore vary widely from one country to another, depending on its peculiar electricity market and economic and social conditions. Therefore, making an effort to achieve better co-ordination between similar national support schemes looks, at least for the short term a more feasible path for the EU than implementing a fully harmonised support framework.

The second international workshop entitled “Experiences with Feed-in Tariffs: Lessons from the German and the Spanish Model for the New Member States”, was held in Maribor Slovenia in May 2006. The workshop aims were to present the important potential strategies of renewables for the new EU members and accessions countries in transition from a centrally-planned monopoly to a more market oriented structure of the power sector, environmental initiatives and implementation practices and review the experiences made with

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<sup>39</sup> The content of this chapter is based on Deliverable 14 Policy Recommendations

transnational coordination approaches with Feed-in schemes and with market based instruments.

Following the Directive 2001/77/EC, much discussion focused on the target to increase the share of RES-E in the EU gross electricity consumption from 13.9% in 1997 to 21% in 2010 and the adequacy of the current support systems in use to enable to achieve it. The topics of the presentations and the discussion ranged from a comparative analysis of the diffusion of support schemes for green electricity in the enlarged EU to the interaction of green certificates with green pricing and emission trading. Insights were also provided on policy diffusion and replicability of national policy paths, especially in the case of the comparative analysis of instruments in Spain and the Czech Republic. A whole section was dedicated to the question whether the Spanish and/or the German system could present a model for Europe and possible paths for a co-ordinated approach were discussed. The existing regional co-operation schemes were presented and discussed as for example the feed in co-operation between Germany and Spain and the planned Scandinavian certificate market. A number of different questions were addressed, as for example: which groups are going to gain the most benefits? Should only the most efficient technologies be stimulated or a broad range of technologies? Should the system tend to be harmonised at EU level or should take into consideration differences among member states? Should the system of RES-E support be compatible with the system of greenhouse gases emissions trade? Should different consumers bear the burden of fulfilling international obligations? Should they be exposed to those burdens at all?

The third, final, international conference of the project took place in Berlin in November 2006. The debate emphasised that it is very important to fully understand the context of the discussion and it was argued that the discussion about the supremacy of one system over another is still very circumstantial. The performance of every system relates to the detail of its design, monitoring and supervision, with the necessity to identify the characteristics of the separate RES-E technologies, and to refine the regulation by technology and by the state of its maturity. The (perceived) pros and cons of feed-in or quota support systems together with TGCs depend on the objectives of policy makers/stakeholders and national sub-targets such as industrial policy, environmental policy, competition policy, technology policy etc. This was expressed in the project by the illustration with the so called pentagon of complexity (see Chapter 4).

Scenarios for renewables in the EU until 2020 were presented and it was stated that even for conservative scenarios high investments are necessary. One of the main goals thereby is to make sure to start with these investments now and seek instruments that enable good investment conditions. Even if progress has been made at national or EU level, when discussing renewables one has to keep in mind that we

are starting out from a very low point and also consider that energy demand is increasing as well. If one excludes traditional biomass and large hydro, on a global level, the share of renewables on total primary energy supply has only slightly increased. Furthermore, developing countries as China are increasing their energy consumption steadily. The EU should not just be satisfied with own national achievements. In order to achieve the best scenario of 39% renewables in 2050 a strong political/policy change is necessary.<sup>40</sup>

Since only around 5% of the electricity supply in Europe is from new renewables, before starting the discussions on how to harmonise support-schemes for RES-E it would be necessary to harmonise the whole energy market. Thereby, the EU should make sure that there is real competition on the European electricity market, as the direct and indirect subsidies to the conventional power production are still massive and national respectively regional monopolies in the electricity supply do still dominate the market. This includes internalising external costs and forbidding further subsidies for nuclear and coal based technologies. In a better functioning European market with external costs internalised, many renewable technologies would be competitive today.

Some stakeholders, as for example the European Renewable Energy Council (EREC), asserted that quotas and certificates are not market oriented. The tradable green certificates may be superior in theory. However, official EC reports<sup>41</sup> have proven that feed-in systems in the majority of the assessed RES-E technologies work better with regard to effectiveness and cost efficiency. Although when assessing the performance of the different RES-E support schemes, the EU Commission in its communication on the support of RES-E from December 2005 already emphasised that the experience with green certificates is more limited than with feed in tariffs, the analysis showed that in the case of wind energy, small-scale hydropower and photovoltaic electricity, RES-E support schemes based on feed-in tariffs performed better than quota systems together with TGCs regarding cost efficiency and effectiveness. In the case of RES-E based on biomass and biogas, the analysis was more complex, as the effectiveness of the support system was also influenced by factors other than the choice of the financial instrument (infrastructural barriers, installation sizes, optimal forest management and the existence of secondary instruments in the case of biomass forestry and agro-economic possibilities, the choice of the size of plants as well as the existence of a complementary support scheme in the case of biogas). Concerning biomass, the Finish hybrid support system (tax relief and investment incentives) together with the Danish feed-in system clearly showed the best performance, in terms of both effectiveness and economic efficiency of support. With regard to biogas, six of the EU-15 countries performed above average,

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<sup>40</sup> See for example the presentation of R. Vigotti in the proceedings of the final conference (downloadable under [www.realise-forum.net](http://www.realise-forum.net)).

<sup>41</sup> See for example the communication of the EC COM 2005 (627) final, pp. 5-6.

whereof four used FIT schemes (Denmark, Germany, Greece and Luxembourg) and two (Italy and the UK) applied quota systems & TGCs.

Whilst stakeholders such as certificate trading companies and electric utilities believed that the European energy market is in the middle of a liberalisation process, they argued that renewables should be part of this process and that the support systems for renewables should also be as market oriented as possible. Other sustained that the EU however should promote a mix of both systems. Other stakeholders representing the interests of the RES-E producers and industry (EREC, BWE, etc.) recommended a possible harmonisation on the basis of feed-in systems or suggested that a new discussion on the tradable certificates should start only when it is demonstrated that they are more effective and efficient than the feed-in system. Greenpeace argued that changes would cause uncertainty for investors. The EU should improve the present framework and help countries which have not developed a good support system yet. The EU should also help EU member states with similar RES-E promotion schemes to reach cross border agreements (regional clustering of RES-E promotion systems).

The major deduction of the conference is that it is too early for delivering policy recommendation to the EU with regard to a harmonised RES-E support scheme. The markets are not ready for harmonisation yet. The harmonisation of the support systems on a European level should not take place yet since competition is needed on the whole energy market first. At the same time, more coordination between countries with similar support systems in order to promote cross-border trade is needed. There are a number of preconditions, which need to be met before harmonising the market. These are: effective competition, no subsidies for fossils, sufficient shares from renewables, and mandatory goals for all markets – not only for electricity but also for heat and bio fuels, grid extension, mainly with regard to the international interconnections as well as long term successful support policies.

Furthermore, Europe needs to ensure that technological diversity is given. Mandatory RES-E targets should be set for 2010 and 2020. Also administrative barriers including those related to grid access should be removed. One of the first measures for a European market is an expansion of the grid. Therefore an improvement of the cooperation of the national network operators is necessary as well as the creation of an EU grid operator. Finally it was remarked that REALISE Forum should not recommend sharp policy changes. The project should rather stress the dynamic of the issue rather than recommending one simple support system.

Summarising, major conclusions of the final conference are:

- It is still too early for harmonisation of RES-E support in the EU.
- Co-existence of feed-in and quota/certificate system provides a good learning ground on RES-E support, in particular more experience is needed with quota based certificate trading. Quota based certificate trading needs a larger market to increase market liquidity.
- There are administrative and grid barriers for RES-E, which need to be addressed.
- In too many member states the investment context is still too risky. Support is too low and too unstable. In others support is not sufficiently tuned to the development requirements of the particular technologies, giving rise to windfall profits.
- The compatibility between the RES-E market niche and the internal electricity market should be facilitated by rules on disclosure GO, redemption, trading, labelling and the like.

### ***5.3 Recommendations for a coordinated approach***

In drawing lessons for policy and formulate recommendations, Realise Forum takes the goal of European market integration and the current dominant systems for the support of RES-E as point of departure, and assumes the co-existence of both dominant systems in the coming years, together with the voluntary green market. The project considers these three development paths as complementary rather than competitive.

The recommendations of Realise Forum are addressed to the EU Commission, the Member States and specific stakeholder groups in the EU. Recommendations and guidelines at the Member State level will be restricted to the Realise Forum countries (Denmark, Finland, Norway and Sweden, Germany, Italy, The Netherlands and Slovenia). They can be however considered by all means to be representative.

#### **5.3.1 Recommendations for the EU Commission**

This section formulates recommendations for the EU Commission. The larger part of the Realise Forum recommendations addresses – not surprisingly - the Commission because of its prominent position in the EU debate on RES-E support. As in the other sections below, the numbers of the recommendations do not express any priority among them but simply the sequence of appearance in the text.

## **Pluralism of support systems and their coordination**

Lessons Learnt (LL): The pluralism of national RES-E support regimes (feed-in and quota/certificate) in combination with the voluntary green market in the EU has both positive (P) and negative (N) sides:

N: Due to the lack of common regional support systems and the co-existence of different national approaches, it is still too early for an (harmonized) internal European RES-E system

P: The diversity of national RES-E promotion schemes nevertheless represents a big potential for learning with regard to the strengths and weaknesses of the two main RES-E support instruments

LL: It is necessary to ascertain which support scheme offers better conditions for functioning at transnational level.

### **Recommendation (R)**

1. The EC should foster initiatives to strengthen transnational feed-in “discourses” to support coordination and similarisation of the rules currently applied under the feed-in systems in the EU. The German, Spanish and Slovenian Feed-in Cooperation<sup>42</sup> offers a promising point of departure.
2. The EC should identify best practice examples throughout Europe. The EC should specify design criteria for successful policy implementation of feed-in systems such as a sufficient long time period for which the tariffs are guaranteed, the application of technology-specific tariffs, the choice of a second tariff option based on a premium on top of the electricity pool price to increase market orientation, annual tariff degression for new plants to provide incentives for cost reductions, stepped tariffs in order to reflect different power generation costs within the same technology, etc.
3. The EC should discuss necessary further steps of a harmonised feed-in system at EU level on the longer run between the Member States with feed-in systems like a harmonised approach based on a feed-in law with modular and transparent tariffs or premiums (on top of the electricity pool price) for RES-E producers, which considers technology costs, some grid services (grid stability, sustaining tension gaps, etc.), political incentives and national priorities (promotion of some RES-E

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<sup>42</sup> As a consequence of the broad acceptance of the FIT scheme in Germany and the (political) will - mainly of the German Ministry for the Environment, Nature Conservation and Nuclear Safety – to improve the cooperation among EU Member States using FIT schemes and in order to promote the exchange of experiences with the national systems, the governments of Spain and Germany at the International Conference for Renewable Energies in Bonn in June 2004 (renewables 2004) initiated the so called Feed-In Cooperation. Thereafter, a joint declaration between both governments was signed on October 6, 2005 in Madrid. On January 29, 2007, Slovenia signed the joint declaration.

beyond official national target at EU level, such as additional premiums for RES-E generators, if the power plants fulfil certain criteria (i.e. for building integrated PV, high-efficient RES-E plants, plants using certain innovative technologies or types of fuels), incentives for repowering or incorporating demand orientation in the feed-in tariff level (i.e. tariff differentiation depending on the day time and season), etc.).

4. This common approach should also comprise mechanisms to update and revise the tariffs or premiums (for new installations), to avoid windfall profits for producers, and to share technology innovation benefits with electricity consumers while maintaining incentives for innovation. This might be reached with fixed degression rates combined with regular (i.e. every four years) revisions of the tariffs/premiums (for new installations) or degression rates based on a semi-linear step function (i.e. with adjustment periods every four years including a two year gap between assessment of cost per kWh of newly commissioned plants and the adjustment) as well as by setting an early trigger for revision of targets when a technology is nearing its goal (e.g. 50%).
5. The proposed common approach should also take into account other necessary considerations for harmonisation, such as grid access (explicit provisions to guarantee connection and transmission, deviations allowed for intermittent renewable sources, length of bidding window, etc.), definition and standards, ownership of rights derived from renewables, and exceptions for small non-commercial producers and energy-intensive industries.<sup>43</sup>
6. “Quota discourses” should do the same for the rules of quota systems currently in use. Such a discourse should pay special attention to the symmetry between the national quota-based systems.
7. This dialogue should focus on:
  - specifying design criteria for successful policy implementation of quota systems such as:
  - specifying symmetry conditions for integrated market operations across countries;
  - specifying balancing criteria for setting quotas that represent realistic stretching goals, but with sufficient escalation to eventually stimulate new capacities;
  - establishing transparency and liquidity;

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<sup>43</sup> These recommendations integrate the analysis and discussions carried out within the framework of the workshops of Maribor, German Desk and of the RF final conference with the results of the workshop of the Feed-In Cooperation held in Madrid on November 23-24, 2006.

- eventually securing efficient competition between suppliers of new renewables;
- establishing time horizons that allow return on investments;
- identifying best practice examples throughout Europe;
- discussing necessary further steps of a harmonised quota system at regional and EU level.

LL: Whereas many stakeholders see feed-in and quota systems as mutually exclusive, there is also the view that they could be complementary. The feed-in system gives a technology differentiated support in an early stage, the quota system then follows up with technology neutral support.

LL: Part of RES-E learning in the EU could be to consider RES-E support also in a dynamic perspective<sup>44</sup>. In such a perspective the type of support scheme is a function of the learning curve of RES-E technologies with feed-in and quota based support systems considered complementary to each other.

LL: There is evidence of coexistence of both systems at national (respectively sub-national) level (Italy, Flanders with TGC in combination with PV support through feed-in).

R: The appropriateness of RES-E support mechanisms should be analysed together with the maturity of the individual RES-E technology.

### **Guarantee of Origin**

LL: Dutch actors are quite satisfied with the consequent way the Netherlands have organised and regulated the Guarantee of Origin. Respondents agreed on the necessity of such a robust and reliable system to foster the further penetration of renewables in electricity production. The advantage of the Dutch GO system is that it prevents double counting and therefore is very reliable. This gives confidence to the consumers. In other countries double counting still cannot be excluded due to a less mature system of GO as compared to the Netherlands.

R: The EC should consider the strict way the Dutch have organised the GO as the reference model for the EU in this respect.

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<sup>44</sup> See Midttun, Atle and Gautesen, Kristian, Feed in or Certificates? Competition or Complementarity? Combining a Static Efficiency and a Dynamic Innovation Perspective on Greening of the Energy Industry, in: *Energy Policy*, Volume 35, Issue 3, March 2007, pp. 1419-1422.

## **RES-E trade on the voluntary market**

LL: The voluntary market currently represents the only existing successful evidence for integration at European level, since in 2005 the voluntary trade has already developed as regional market, covering 19 countries.

LL: The compatibility between the RES-E market and the internal electricity market can be facilitated by rules on GO, disclosure, redemption, trading and so on. Standardised GO is the prerequisite for support systems preventing doubling of support and adequate target counting.

R:

1. Accelerate the introduction of a minimal set of common rules for disclosure, redemption and labeling based on the standardised GO.
2. Make a clear connection between standardised GO and national RES-E support.
3. Rephrase in terms of market expansion, connections to target counting, GO central database etc.

## **Liberalisation**

LL: Liberalisation of the pan European electricity market is still far from being accomplished, though certain regions have reached considerable liberalisation and integration. Significant problems with the liberalisation and Europeanisation of electricity markets are still:

- High Market concentration
- Vertical foreclosure – difficult new entry
- Lack of market integration – incumbent still large and dominant
- Lack of transparency
- Limited confidence how prices are set (closer look at price – setting mechanisms)
- Regulatory risk - investment certainty
- Insufficient interconnecting infrastructure between national systems
- Insufficient incentives to improve cross border infrastructure
- Inefficient allocation of existing capacities and
- Incompatible market design (e.g. differences between balancing regimes, nomination procedures, differences in power exchanges, TSO and spot market operators)
- Reduced reserve margins
- More commercial flows + “missing” transmission links
- Loss of integrated business approach
- Disappearances of regulated investments in generation
- Higher risk (on return) both for generation and transmission
- More complex transmission management (common congestion rules and data exchange)

LL: Improved competition in the internal electricity market is a precondition for harmonising RES-E support schemes on the long run. This applies especially for quota systems together with TGCs.

R:

1. The EC should consider the improvement of competition in the internal electricity market as a major target and as a precondition for harmonising RES-E support schemes on the long run. This applies especially for quota systems together with TGCs.
2. The EC should foster the transparency of cost calculations related to grid connection and grid extension to provide the project developers with tools to verify technical and cost data presented by the grid operator. This might be reached with the establishment of an EU agency responsible for the collection and verification of cost data of grid operators.
3. The EC should foster the standardised GO for approval procedures of RES-E plants.

### **RES-E Targets**

LL: Although Directive 2001/77/EC clearly states that target counting should be based on consumption, there is still confusion on target counting with respect to production or consumption. Target counting on the basis of consumption facilitates international trade more than target counting on the basis of RES-E production.

R:

1. Be as clear as possible about target counting and counting procedure.
2. New ambitious mandatory RES-E targets will act as an important guidance for corporate RES-E investment strategies. Mandatory sectoral targets should be considered in this respect.

LL: Some countries as for example Italy strive the achievement of the indicative target through import of RES-E.

R:

1. The European Commission should look with favour at the possible addition of imported RES-E as far as achievement of the national target are concerned, but clearly on the condition that the country where this RES-E amount has been produced will not count the same energy for the benefit of its own target (double counting).
2. If imported RES-E is certified by earnestly applying the Guarantee of Origin in the country where it has been produced, there can be nothing against counting it for the purposes of the achievement of national target.

LL: The January 2007 communication of the EU Commission lists an (long-term) overall mandatory green energy target of 20% RES (on primary energy consumption) by 2020 and (therein) only specifies a sectoral target for biofuels of 10%.

R: The EC should also formulate a specific mandatory target for RES-E increase as well as for RES heat and cooling in 2020.

LL: There exists a significant diversity of stakeholder positions within each country and between countries. Divergent priorities supported by different stakeholders in sub-targets (technology policy, competition policy, environmental policy, industrial policies, security of supply).

R: The EU Commission should set a binding overall target based on primary energy consumption as well as mandatory sectoral targets (for RES-E, RES heat & cooling, biofuels). The achievement of sub targets (for technology policy, competition policy, environmental policy, industrial policies, and security of supply) could be kept as national policy matter.

LL: Converging stakeholder's interests across national borders could represent a basis for pan European integration. For example big energy producers and big energy consumers tend to demand market driven international instruments and solutions.

R: The EU Commission should strengthen the harmonisation of the internal energy market.

### **Interdependencies between trading schemes**

LL: There exists a certain overlap between the trading schemes for greenhouse gas emissions, green certificates and white certificates as they all contribute to reducing CO<sub>2</sub> emission. Linking their associated environmental markets would risk undermining the objectives of the respective schemes (as for example in Italy where green certificates on the basis of CHP for district heating are admitted).

R: Trading schemes for greenhouse gas emissions, green certificates and white certificates must be carefully designed to keep the different markets separate.

### **Public procurement**

LL: Green procurement is a big driver for a stronger use of RES-E in addition to national RES-E support systems.

R: Increase the volume of renewable based electricity by a mandatory procurement for the whole EU administration.

### **5.3.2 Recommendations to Member State governments**

The recommendations in this section address individual Member States. The advancement of renewable energies in Europe depends significantly on the success of national policies and the developments fostered by each Member State. The prerequisite for the achievement of new, ambitious goals at the EU level is the fulfilment of existing national provisions and goals. Member States have their own responsibility in the support of RES-E and within their span of control they also can contribute to making next steps in furthering a coordinated approach of RES-E support. Like in the previous section, in this section too, the numbering of the recommendation does not express any priority order among them.

LL: Member States are primarily responsible for a stable investment climate. This can be assured by stable and consistent RES-E policy and by assurance of financial support for a fixed period of time.

#### **Pluralism of support system and their coordination**

R:

1. For the coordination between support schemes it is very important that countries using the feed in system for RES-E support establish a feed in dialogue as in the case of the feed-in cooperation between Germany, Spain and Slovenia and that each Member State with a feed in system joins this dialogue. Within this cooperation, the members
  - a. should specify design criteria for successful policy implementation of feed-in systems
  - b. should identify best practice examples throughout Europe,
  - c. should discuss necessary further steps of a harmonised feed-in system at EU level on the longer run between the Member States with feed-in systems
  - d. should take into account other necessary considerations for harmonisation, such as grid access (explicit provisions to guarantee connection and transmission, deviations allowed for intermittent renewable sources, length of bidding window, etc.), definition and standards, ownership of rights derived from renewables, and exceptions for small non-commercial producers and energy-intensive industries.<sup>45</sup>

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<sup>45</sup> These recommendations integrate the analysis and discussions carried out within the framework of the workshops of Maribor, German Desk and of the RF final conference with the results of the workshop of the Feed-In Cooperation held in Madrid on November 23-24, 2006.

2. For the coordination between support schemes it is very important that countries using the quota system for RES-E support, establish a quota dialogue and that each Member State with a quota system joins this dialogue. This dialogue should focus on:
  - a. specifying design criteria for successful policy implementation of quota systems such as:
  - b. specifying symmetry conditions for integrated market operations across countries;
  - c. specifying balancing criteria for setting quotas that represent realistic stretching goals, but with sufficient escalation to eventually stimulate new capacities
  - d. establishment of transparency and liquidity
  - e. eventually securing efficient competition between suppliers of new renewables
  - f. establishing time horizons that allow return on investments
  - g. identifying best practice examples throughout Europe,
  - h. discussing necessary further steps of a harmonised quota system at regional and EU level.

### **Guarantee of Origin**

LL: The coordination between support schemes in the EU could benefit from the implementation of the standardised Guarantee of Origin in all Member States.

LL: The coordination between support schemes in the EU can profit when Member States make the standardised Guarantee of Origin basis for disclosure, redemption and labelling in their home market.

R:

1. The coordination between support systems should be optimised by making the standardised GO basis for disclosure, redemption and labeling in their home market.
2. In case of involvement in the voluntary market, regulate this market in accordance with the standardised GO.
3. In case of non-involvement voluntary market: join this initiative and regulate in accordance with the standardised GO.

### **Public procurement**

R: Stimulate the increase of RES-E production by an obligatory green procurement for the whole domestic public sector.

## **Additional RES-E support measures**

R: Additionally to production support the increase of RES-E consumption should benefit from additional incentives. Consider tax reduction/rebates to stimulate the consumption of RES-E (as in the case of the Dutch tax exemption).

LL: Investors perceive national and regional permitting procedures as major barriers for increasing RES-E generation capacities; small private investors are claiming that the burden of lengthy, non-integrated and sometimes even contradictory procedures can jeopardise their very existence. A coordinated policy and support for diminishing administrative barriers is urgently needed to pave the way to more standardised and faster administrative and technical procedures.

R: Member States should take up decisive measures to overcome the technical and non-technical barriers for RES-E investments and production.

### **5.3.3 Recommendations to stakeholder groups**

The national consultations have shown the rich diversity in the positions, perceptions and opinions of the different stakeholder groups. The pentagon of complexity described in Deliverable D-10 tries to capture the multiplicity of stakeholder viewpoints which does not follow national borders. The diversity crosses borders of countries and stakeholder groups and positions are not always consistent at the EU level. Sometimes positions and perceptions are typically national. Thus national stakeholders might pursue objectives that are relevant only for that country. This section however makes recommendations to different stakeholder groups appealing to their responsibility to strengthening efforts to a coordinated approach.

#### **Energy Companies**

Energy companies are important RES-E stakeholders which are expected to contribute significantly to RES-E production. Energy companies therefore should:

R:

1. Join and support the voluntary green market in the EU as much as possible.
2. Develop a corporate strategy for the greening of the electricity supply.

3. Produce, offer and label renewable based electricity as much as possible under the standardised rules of the Guarantee of Origin and make this strategy visible.

### **Grid companies/TSOs/regulatory authorities**

One of the essential measures for a European market is an expansion of the grid. An improvement of the cooperation of the national network operators is necessary, the creation of an EU grid operator a possibility. The EC Green Paper states that it is necessary to develop a flexible European grid to support the functioning of the internal energy market, but also to enable the large scale use of wind energy and distributed generation and increase the security of supply. Grid companies could play a leading role in increasing the share of RES-E. They should:

R:

1. Standardise access conditions for renewable based electricity.
2. Address present bottlenecks with a common strategy and pursue common technical and regulatory solutions.
3. Solve technical problems of (international) grid connections.
4. Implement grid codes taking into account minimum technical standards for intermittent RES-E technologies like wind power (i.e. aggregation of production forecast requirements).
5. Give priority access and dispatching to RES-E when technical feasible.

### **Issuing bodies**

Issuing bodies are very significant stakeholders since they are expected to guarantee the reliability of RES-E production, trade and supply in the EU.

R: Issuing bodies therefore should:

1. Ascertain the reliability of GO's.
2. Use an electronic GO.
3. Use tradable GO's.
4. Commit to the standardised GO and use it for disclosure and redemption.
5. If there are several issuing bodies active in a given geographical area then the government should establish one issuing body responsible for all relevant certified schemes of disclosing electricity including renewables based CHP.

## **Producers and consumer associations**

(RES-E) Producers and consumers associations have been active members of most national desks. Consumers' organisations have been mostly active in the national Desks in Germany and Slovenia. Up to now the degree of involvement of Consumer organisations in this field has been rather limited and it appears that the potential benefits of disclosure and labelling have not been clearly identified as a means to facilitate the international trade of RES-E, to increase the share of demand for RES-E, to avoid duplication of support and to make the market more transparent.

R: Producers and consumers' associations of renewable based energy technology should:

1. Support actively the standardised GO in the EU for RES-E.
2. Should improve the transparency of RES-E labeling in EU.
3. Intensify consumers' campaigns for the transparency in the (green) electricity market and create awareness of consumers.
4. Push the standardisation of labelling of renewable based electricity production. This labelling system should be linked with GO and disclosure classification of electricity.
5. Intensify consumer campaigns to increase consumption of renewable based electricity.

## **NGO's and environmental groups:**

NGO's are indeed important stakeholders of RES-E everywhere in Europe. NGO's in particular are concerned with the siting of RES-E production facilities and for that reason have a special responsibility on these issues.

LL: NGOs often face conflicts of interest between nature protection and general sustainable development targets.

R:

1. In order to achieve a coordinated approach, especially towards abatement of siting and administrative barriers, NGOs should intensify cooperation at national and EU level.
2. NGOs should aim at the establishment of general criteria for siting of RES-E installation at national and possibly European level.
3. NGOs should have a more proactive attitude towards a standardised GO.

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## Annex

Updated Country reports of Germany, Italy, Scandinavia, Slovenia and The Netherlands downloadable from the project’s website [http://www.realise-forum.net/front\\_content.php?idcat=55&idart=1394](http://www.realise-forum.net/front_content.php?idcat=55&idart=1394)