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### **D4 Report**

**Design options for cooperation mechanisms  
between Member States under the new European  
Renewable Energy Directive**

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# Design options for cooperation mechanisms under the new European Renewable Energy Directive

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*In June 2009, a new EU directive on the promotion of renewable energy sources (RES) entered into effect. The directive 2009/28/EC, provides for three cooperation mechanisms that will allow member states to achieve their national RES target in cooperation with other member states: statistical transfer, joint projects, and joint support schemes. This article analyses the pros and cons of the three mechanisms and explores design options for their implementation through strategic and economic questions: How to counterbalance the major drawbacks of each mechanism? How to reflect a balance of costs and benefits between the involved member states? The analysis identifies a number of design options that respond to these questions, e.g. long term contracts to ensure sufficient flexibility for statistical transfers, a coordinated, standardised joint project approach to increase transparency in the European market, and a stepwise harmonisation of joint support schemes that is based on a cost-effective accounting approach. One conclusion is that the three cooperation mechanisms are closely interlinked. One can consider their relation to be a gradual transition from member state cooperation under fully closed national support systems in case of statistical transfers, to cooperation under fully open national support systems in a joint support scheme.*

## 1 Introduction

In December 2008, the European Parliament and the Council of the European Union agreed on a new EU directive on the promotion of the use of renewable energy sources (RES), which was formally adopted in April 2009 (2009/28/EC). It sets binding targets for all EU member states to reach the European target of 20% RES

share in EU gross final energy consumption by 2020. The allocation of differentiated national targets is based on a flat rate approach (same additional share for each country) adjusted to the member state's GDP. This target allocation approach does not necessarily correlate with the member states' RES potentials. The available biomass, wind, hydro, tidal, wave and solar resource base varies significantly across the different member states. In order to account for these differences, the RES directive introduces "flexibility" or "cooperation"<sup>1</sup> mechanisms which allow those member states with low or expensive RES potential, to partially fulfil their RES target in other countries with higher RES potential or lower production costs. The three intra-European cooperation mechanisms are: statistical transfer, joint projects, and joint support schemes. Additionally there is the option to physically import RES electricity from third countries outside the EU ("joint projects between member states and third countries"), an option which is not discussed in this paper.

Statistical transfer means that renewable energy which has been produced in one member state is ex-post and virtually transferred to the RES statistics of another member state, counting towards the national RES target of the latter member state. The directive does not specify if this renewable energy is electricity, heat or fuel. Joint projects are RES electricity or heating/cooling projects that are developed under framework conditions, jointly set by two or more member states; one member state may provide financial support for a RES project in another member state and count (part of) the project's energy production towards its own target. RES fuel projects are not eligible for joint projects. In the case of joint support schemes, member states combine (parts of) their RES electricity or heating/cooling support schemes to achieve their national RES targets jointly. The produced RES energy (only electricity or heat/cold, not fuel) can be allocated to the member states via statistical transfer or a distribution rule agreed by the participating member states. The directive defines general accounting rules for using the mechanisms, but does not give any specification of their design. The detailed design and practical implementation of the mechanisms are left to the member states. Member states have begun to discuss the implementation of the mechanisms (e.g. BMU 2009a), but no results have yet been presented in public. According to the member state forecasts that had to be submitted to the European Commission in December 2009, only a comparatively small quantity of energy is expected to be subject to the

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<sup>1</sup> The final RES directive uses the term "cooperation mechanisms" instead of "flexibility mechanisms", in order to distinguish these mechanisms from the Kyoto flexible mechanisms (BMU 2009a).

cooperation mechanisms: Only five member states expect to have a deficit of in total 2 Mtoe in 2020, less than 1% of the total renewable energy needed in 2020; ten member states expect to have a surplus of in total 5.5 Mtoe in 2020, around 2% of the total renewable energy needed in 2020 (European Commission 2010).

This article explores principle design options for implementing the three cooperation mechanisms. So far, very limited research has been conducted on this issue. Most analytical attention has been given to the design of joint support schemes, which have already been considered for several years, independent of the RES directive; e.g. Ragwitz et al. 2007 analyse the distribution of costs and benefits under common quota or feed-in schemes; Muñoz et al. 2007 suggest a harmonised methodology for defining modular feed-in premiums; Sensfuss et al. 2007 propose a minimum European feed-in tariff combined with a country specific premium. Klessmann (2009) evaluates the new cooperation mechanisms under the RES directive against a set of qualitative criteria, but does not look into practical design features. Conclusions can be drawn on the economic challenges of flexibility from the evaluation of European guarantees of origin (GO) trade as proposed by the European Commission in 2008 (e.g. Ragwitz et al. 2008, Toke 2008). Further lessons may be drawn from the flexible mechanisms under the Kyoto Protocol, i.e. the implementation of the Clean Development Mechanism (CDM), Joint Implementation (JI), and International Emission Trading. There are several similarities between the flexible mechanisms introduced under the Kyoto Protocol and those outlined in the EU RES directive. Just as Parties to the UNFCCC which have ratified the Kyoto Protocol and form part of the list of Annex I countries, have binding emission reduction targets, EU member states also have binding RES targets. EU member states are entitled to implement joint projects between EU member states (analogy to JI) and with third countries (analogy to CDM). In addition, RES units can be statistically transferred between EU member states, just as the International Emissions Trading allowed the transfer of Assigned Amount Units (AAUs) under the Kyoto protocol. On the other hand, the practical comparability of the Kyoto and the RES cooperation mechanisms is limited. In the case of International Emissions Trading, AAUs were assigned to the Annex I countries. Countries that hold a surplus of AAUs (i.e. transition countries in Eastern Europe and the former Soviet Union) can sell them to other countries at no (current) cost (see discussion on "hot air", e.g. Point Carbon 2009). On the contrary, RES transferred under the RES directive must originate from newly installed RES plants. The transferred RES amount is thus verifiable and related to respective costs in the

selling country. A major challenge of CDM and JI is the “additionality”<sup>2</sup> of the projects compared to a baseline that is defined according to predefined guidelines. The RES joint project mechanism does not require the definition of a baseline; it only measures the energy production of specified RES installations, independent of the overall energy production and consumption. The additionality of joint RES projects between member states is safeguarded by the eligibility requirement that only new plants that started operation after the entry into force of the RES directive can qualify for such projects, and that all member states have binding national RES targets. For joint projects with third countries, the additionality of the projects shall be safeguarded by the requirements that only new installations are eligible and that an equivalent amount of the electricity produced in these new installations needs to be physically imported into the EU<sup>3</sup>. A lesson that might be learnt from Kyoto, however, is the importance of simple administrative frameworks: JI did not attract a lot of projects, because the international emission trading proved to be much easier from the administrative point. This may also apply to statistical RES transfers compared to joint projects.

All three cooperation mechanisms have to be agreed upon bi- or multilaterally between member states. It can be expected that member states will make use of the mechanisms only if the economic and non-economic benefits are larger than the associated costs and risks. Therefore, a mutually beneficial situation needs to be created for both, the country statistically providing renewable energy and the country statistically receiving renewable energy. To create the framework conditions for such a mutually beneficial situation, a number of questions need to be answered from the perspective of the member states:

1. Strategic: What are the political advantages and drawbacks of each mechanism? How can major drawbacks be counterbalanced?
2. Economic: How can costs and benefits of the transferred renewable energy be balanced between the involved countries? How can this balance be reflected in the design of the cooperation mechanisms?

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<sup>2</sup> Qualifying for additionality implies that the project has to demonstrate that it goes beyond the business-as-usual (BAU) scenario.

<sup>3</sup> One may question if the import criterion and the sub-criteria for proving import to the EU are sufficient to judge such joint projects “additional”, but this issue would need further discussion.

3. Legal and administrative: How can the mechanisms be designed in a legally sound and reliable way? How can the transparency and practicability of the mechanisms be ensured?

The first two questions are fundamental, and will be qualitatively investigated in this paper for each of the three cooperation mechanisms of the RES directive.

The third group of questions concern design details that will become very relevant in the future, but require the predefinition of a basic framework by the member states. Therefore, they will only be briefly touched upon, and not examined in detail.

The first step is to investigate the direct and indirect costs and benefits of RES installations that need to be defined and balanced under all three mechanisms (section 2). Secondly, the strategic pros and cons and economic design alternatives will be discussed for each mechanism (sections 3-5). Based on this analysis, conclusions and recommendations for the effective and efficient design of the mechanisms will be derived (section 6).

## 2 Direct and indirect costs and benefits of RES deployment

The basic concept that underlies all three cooperation mechanisms of the RES directive, is allowing member states with low or expensive RES potential (“receiving” or “importing” member states) to use renewable electricity or heat produced in other countries with higher RES potential and lower production costs (“host” or “exporting” member states) to comply with their national target, thus leading not only to overall cost savings for reaching their national RES targets, but also for the overall European target for 2020. A question that arises under all mechanisms is, how to share the costs and benefits of this RES deployment.

This section gives an overview of direct and indirect costs and benefits that are linked to RES deployment and might therefore be reflected in the cooperation mechanisms.

Under current energy market conditions, most RES technologies are competitive, only if they receive some financial incentive through a RES support scheme. In fact, the European RES directives 2001/77/EC, 2003/30/EC and 2009/28/EC oblige member states to introduce RES support schemes that facilitate the market

introduction of renewables and, in the medium or long term, the competitiveness of RES technologies in the energy markets. With the exception of RES building and fuel obligations, all of these support schemes provide some kind of financial support to RES installations (e.g. investment incentives, feed-in tariffs or premiums, tradable green certificates) that is paid by energy consumers, suppliers, or the state budget. If another member state wants to count the renewable energy production of a RES installation located abroad towards its own target, it indisputably needs to cover the financial support costs, either indirectly, by paying money to the host member state or directly, by providing support to the RES installation. The direct costs reflected in a cooperation mechanism are the primary support costs and the direct benefit of the RES installation that is transferred to the receiving member state, is its contribution to RES target compliance.

In addition to these direct, transferrable costs and benefits, RES deployment is also linked to indirect domestic costs and benefits that occur in the host country. Such domestic, indirect costs and benefits cannot be transferred directly through a cooperation mechanism, but they might still be reflected in the RES transfer price and, possibly, also the design of the mechanism.

Domestic, non-transferrable benefits in the host country include increased security of supply, local job creation, innovation and added value as well as reduced local air pollutants and other environmental benefits, depending on the applied RES technology. Other indirect benefits for the host country are reduced CO<sub>2</sub> emissions and the gradual transition into a low-carbon energy system,

There are also domestic costs that occur only in the host country and which are not reflected in the direct RES support. Significant domestic cost elements are the cost for integrating RES electricity or heat in the electricity or heating network (grid reinforcement, balancing, system capacity costs, etc.); however, they appear to be relevant only if they are then passed on to energy consumers and not paid by the RES producer itself. Relevant are also the indirect support costs that are not part of the primary support scheme (e.g. tax rebates, subsidised loans etc.). The exporting country may also consider the potentially increased costs in order to reach its national target, due to "sell-out" of low-cost potentials (this would depend on the available potentials and their cost curve). Further domestic, indirect costs include the cost of regulation (permits, political decision making, programme management, etc.) and the societal and environmental costs (e.g. impact on landscape or biodiversity).

With the increasing importance of renewable energy and related support costs for society, governments are more inclined to become interested in quantifying these indirect costs and benefits (see e.g. Breitschopf et al. 2009 for Germany).

Theoretically, in order to come to a “fair” price for the RES transfer, all the above mentioned costs and benefits would need to be taken into account within the price setting for RES transfer. In practice, many of them can hardly be quantified and monetarised. This is particularly true for the value of local benefits. Nevertheless, it can be expected that member states will implicitly reflect them when negotiating the price of RES transfer or when setting up a mechanism to determine the price. Simultaneously, costs and benefits that are difficult to quantify bear the highest potential for conflicts between the involved negotiation parties.

Another price that is difficult to determine, is the price of non-compliance with the RES directive. The European Commission is expected to start an infringement procedure against member states that do not comply with their binding national targets (or, as previously established, against member states that do not comply with the requirement to install effective RES support instruments). The penalty resulting from such an infringement may be regarded as the upper price ceiling of any RES transfers. One should be aware, however, that this penalty does not only consist of a financial penalty (which may be set by the European Court, but is difficult to predict) but also of the moral penalty of being publicly “pilloried” by the European Commission.

Figure 1 presents some of the aspects of price determination for cooperation mechanisms discussed above. Important elements in this process will be the anticipated cost of infringement (acting as an upper price ceiling)<sup>4</sup>, the total demand from importing countries as well as the net demand / supply curves from importing / exporting countries considering costs and benefits of national RES generation. As there are significant uncertainties in the determination of any of these parameters, the future price for the implementation of the cooperation measures is difficult to predict. In particular the price setting mechanism, which will actually apply in practice, is unclear. In the case of a trading platform, where both sides are price takers, a supply and demand curve as depicted in Figure 1 can be applied. In a

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<sup>4</sup> An infringement procedure will normally result in a certain amount of fine to be paid. Assuming that these costs of the infringement will be linked to the amount of energy that is missing for target compliance, the amount could be expressed in relative terms, i.e. €/MWh. It is however speculative whether there will be a linear relation between the amount of target non-compliance and infringement fine.

situation where bilateral contracts might be the dominating instrument for the transfer such price setting mechanism as shown in Figure 1 would not apply.

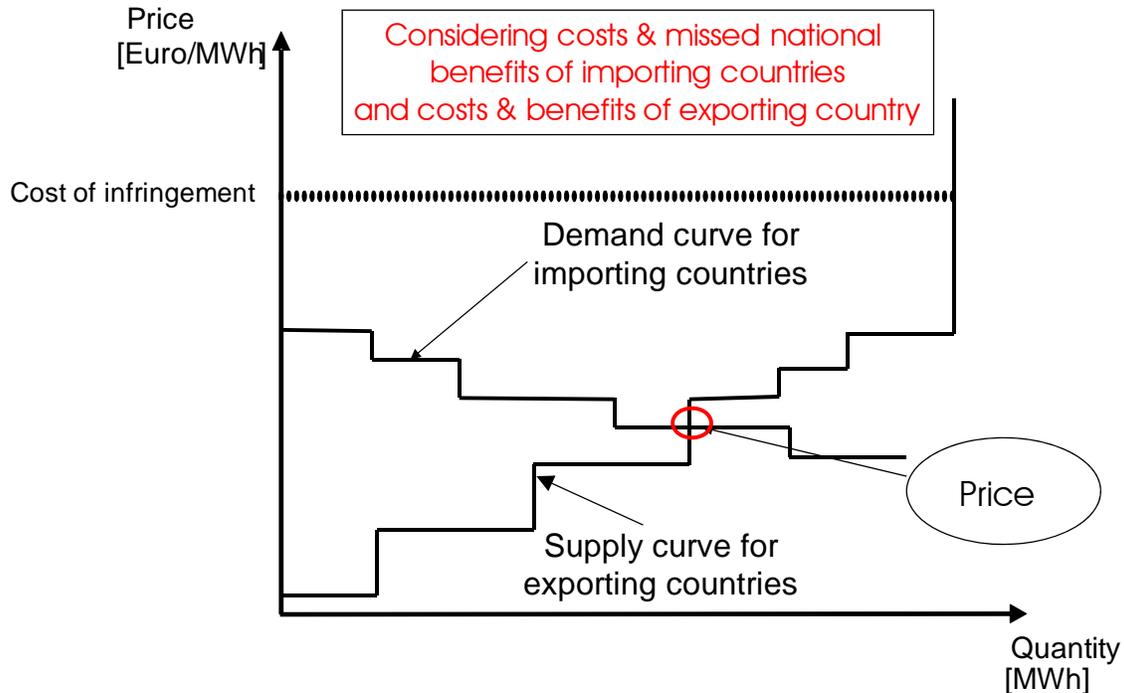


Figure 1. Possible price determination for cooperation mechanisms

### 3 Statistical transfer between member states

#### 3.1 Definition

In the case of **statistical transfer** between countries, the member states are themselves responsible for trading. Any surplus of RES generation which is not required for a country's own target compliance could qualify for such trade. Article 6 of the RES directive defines the option of statistical transfer for target achievement. It states that "*member states may agree on and may make arrangements for the statistical transfer of a specified amount of energy from renewable sources to be transferred from one member state to another member state.*" Therefore, surplus or deficit of renewable energy generation are exchanged between member states by subtracting the corresponding amount from the statistical figures of the "exporting"

member state and adding it to the official RES statistics of the "importing" member state.

### **3.2 Pros and cons of the mechanism**

The pros and cons of RES transfers on member states level in comparison to transfers on company level, have been analysed in the discussion on GO trade, originally proposed by the Commission (see e.g. Neuhoff et al. 2008, Ragwitz et al. 2008, Klessmann 2009).

The **advantages** of this cooperation mechanism in comparison to the other cooperation mechanisms of the RES directive include: Statistical transfer is a simple and straight forward mechanism that does not require the definition of a new and potentially complex cross-border support framework. Contrary to the other cooperation mechanisms, statistical transfer between member states does not have a direct effect on the efficiency of national RES support schemes. Furthermore, member states that act as sellers can recover costs for supporting their domestic RES production and, in doing so, may also benefit financially; this may strengthen their national support scheme. There is no need to apply a regulation that takes into account technology-specific requirements, because the exporting member state only sells the RES technology mix it used to produce the virtually transferred energy.

The **disadvantages** of such a cooperation mechanism include: The mechanism depends strongly on the proactive behaviour of member states that develop additional RES potentials which they can sell to other member states (and of the expressed demand of other member states). If only few member states show such initiative, the mechanism will provide limited flexibility for cross-border target compliance; RES energy is only transferred ex-post, after its production, and member states will still need to ensure that they achieve their national (interim) targets<sup>5</sup>. Consequently, potential buyers face the risk that no country will be willing or able to sell in 2020. Potentially, there will also be a lower market dynamic than under a flexibility regime involving private actors,, as private RES producers have a

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<sup>5</sup> See Article 6.1 of directive 2009/28/EC: "A statistical transfer shall not affect the achievement of the national target of the Member State making the transfer." This clause is less strict than the earlier proposal by the European Commission, which foresaw that only those member states "whose share of energy from renewable sources equalled or exceeded the indicative trajectory" would be allowed to transfer renewable energy to another member state (COM 2008).

less active role than they may have under joint projects<sup>6</sup>. Private project developers do not have an incentive beyond the national support scheme to look for the lowest-cost RES projects throughout Europe. The RES development depends substantially on the *national* support scheme in place in the exporting country. Therefore, in countries offering low or ineffective support, comparatively cost-effective RES potentials would remain untapped, which could limit the overall cost-efficiency of RES support and RES target fulfilment, respectively, from the European perspective.

### 3.3 Design options and critical aspects

The principal regulations of statistical transfer have been introduced in the Directive: RES volumes that exceed a member state's interim target can be virtually transferred to another member state and can contribute towards that member state's target. Nevertheless, a number of detailed design features so far remain largely undefined, and these need to be elaborated upon in the future.

Addressing the key questions which have been developed in section 0, the following questions will be discussed for the design of statistical transfers:

- Strategic: Counter-balancing major drawbacks of the mechanism
  - How to increase flexibility? - short term versus long term agreements
- Economic: Balancing of costs and benefits
  - trading platform versus individually negotiated contracts
  - mechanisms for price determination
- Legal and technical aspects
  - transfer of the risk of non-compliance to the exporting country
  - bilateral versus multilateral agreements
  - agents responsible for the transfer activities
  - procedures for incorporating statistical transfers into the national renewable energy statistics

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<sup>6</sup> Joint projects do not necessarily allow the active involvement of private developers in the project design.; this will depend e.g. on the tender specification defined up-front by the government, see section 4.

### **3.3.1 Counterbalancing major drawbacks of the mechanism**

#### **Short term versus long term contracts**

One may consider short term (e.g. one year) versus long term (e.g. 15 years) contracts for statistical transfers. The preferred option is closely related to the way in which the mandatory targets as well as the interim targets (defined by the indicative trajectory) set in the Directive will be interpreted. Formally the mandatory targets are set only for the year 2020. Therefore, importers would be most interested to import virtual RES for the target year. As this year is the relevant year for all exporting and importing countries, however, parties will scarcely be interested (or able) to offer surplus generation for only one year. In particular, in the instance that Europe as a whole is short in reaching the 20% target, exporting countries would be in the position to ask for a price that reflects the additional support costs for the lifetime of the plant. In the instance that Europe as a whole would have an excess of RES generation in 2020, exporters may not be able to request the full additional costs for generation to be sold. By closing a transfer agreement well before 2020, the importing country could hedge its price risk for reaching its 2020 target. This would also bring the importing country in a better position to reach its interim targets. These interim targets, even though they are not of a binding nature, may create a relevant demand also before the year 2020<sup>7</sup>.

### **3.3.2 Balancing of costs and benefits**

#### **Trading platform versus individually negotiated contracts**

The establishment of contracts may be done based on individually negotiated bilateral or multilateral contracts or by the establishment of an open trading platform.

A European trading platform may take a similar form as trading desks for other commodities in the energy market, e.g. wholesale electricity or CO<sub>2</sub> emission

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<sup>7</sup> This is particularly due to the fact that not complying with the respective indicative trajectory can be regarded as evidence that the member state failed to comply with its general obligation according to Article 2 of the RES directive to introduce effectively designed measures to ensure compliance with the indicative trajectory. The same approach was followed by the Commission under the 2001/77 directive and is now expressly codified in Article 2 of the RES directive.

allowances. The obvious advantage of such a procedure is the transparency of the approach. A disadvantage may be that it would be difficult to create a liquid market in a situation with a very limited number of actors in that market (probably only few member states will be able to sell excess RES volumes). Only the theoretical possibility to abuse market power in such a market (e.g. by a large exporting country) may lead to significant acceptance problems in a market with an artificially created demand, based on politically negotiated targets. Therefore, in order to have the necessary acceptance, any price bids in such a market would probably need to be based on the support costs in the exporting countries.

Statistical transfers are initiated and conducted by member states. Therefore, it is most likely that contracts will be negotiated individually between the governments of the involved member states. In this case the price would need to be settled based on the specific objectives of the negotiating countries. It is an open question whether or not the prices levels resulting from such negotiations would become generally disclosed and transparent. Experience from government based International Emission Trading shows that little price information is publicly available<sup>8</sup>. In the case of RES, such missing price transparency could create public acceptance problems, because the RES transfer costs are paid in one way another, by consumers or tax payers in the buying or selling country<sup>9</sup>. On the other hand, national parliaments could also force governments to disclose this price information.

### **Mechanisms for price determination**

Different mechanisms for price determination can be considered. Generally, the price may be negotiated between the contracting parties, or it may be determined in a sort of auction, or it may be based on a transparent price rule. Where the first option is

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<sup>8</sup> International Emission Trading only came to life with entering the first compliance period of the Kyoto protocol (2008-2012) in 2008. On the demand side, it was initiated by government entities from Annex I countries whose economies are expected to exceed their emission allowances by 2012. Countries that were reportedly involved in transactions include Japan, Austria, the Netherlands, Belgium, and Spain (see Capoor and Ambrosi, 2009). On the supply side, surplus AAUs were offered by countries from the former Eastern Bloc whose emissions have declined since the basis year 1990 – mainly due to historical economic events. Sales of AAUs in 2008 and 2009 were reported from Ukraine, Czech Republic, Slovakia, Hungary, and Latvia. General information on the likely surplus units and interested buying countries seems to be available on the market. However, little information is available on the price and structure of transactions (Capoor and Ambrosi, 2009).

<sup>9</sup> Public interest in RES support costs and their legitimisation tends to be high once the financial volume is perceived as significant, see e.g. the discussion on the cost of the Renewable Energy Sources Act in Germany (e.g. Welt Online 2009 based on RWI 2009, BMU 2009b). There is no evidence about a similar public interest in AAU sales prices.

rather straightforward, the second one is related to the option of a trading platform as elaborated above. The third option deserves some explanation. A price rule could be based on the level of support for the renewable energy portfolio in the exporting countries. This would provide a good level of transparency and would include the request of "fairness" for these transfers. "Fairness" has always been a condition during the target setting process and may therefore also be perceived as an important criterion for the design of statistical transfers. In contrast to negotiated prices, where the use of market power (also through governments) can never be excluded, prices set by a transparent rule have a lower risk of being perceived as "unfair". One possible option would be that the average support level for all new RES plants supported in the exporting country serves as the price basis for any transferred RES generation in the following year. Of course, other rules for determining the price for the transfer are also possible, e.g. based on the average support level in the EU-27.

The RES directive already establishes a certain degree of transparency as article 6 (3) requests that "Transfers shall become effective only after all member states involved in the transfer have notified the transfer to the Commission" and furthermore article 24 stipulates that "The Commission shall make public on the transparency platform the following information: [...] member states' offers to cooperate on statistical transfers or joint projects, upon request of the member state concerned." If member states would provide price information to the transparency platform, this would increase the level of transparency and public acceptance.

### **3.3.3 Legal and administrative aspects**

#### **Transfer of the risk of non-compliance to the exporting country**

A critical legal question for long-term contracts, is how to deal with the risk of non-compliance, in the situation that the exporting country fails to produce the RES volumes it agreed to transfer. Generally, the risk of non-compliance of the importing country may be borne solely by the exporting country (complete transfer of the compliance responsibility) or to an agreed fraction by the importing country also. The precise definition of the risk sharing between importing and exporting country needs to be defined between the contracting parties.

## **Bilateral versus multilateral agreements**

One may consider agreements between only two countries, or between three or more member states<sup>10</sup>. The motivation for multilateral agreements could be a risk sharing between countries, e.g. in case more than one exporting country is involved, and underperformance of one exporting country could be compensated by others. Risk mitigation and stability could be arguments in favour of multilateral agreements. Conversely, the complexity of multilateral agreements also seems to be much higher. This then creates the question of responsibility, in the instance that the group of countries does not achieve the mutual target. Of course one possible solution, combining the advantages of both alternatives, is the option that a country signs several bilateral agreements with different member states. In this case, the complexity of the individual contracts is still small but the risk of non-compliance for the importing country can be mitigated. This latter option may be easier to implement if the available surpluses are published on the transparency platform, or if a European trading platform was established. In conclusion, several bilateral contracts for a member state might be the preferable solution.

## **Spending of the revenues from statistical transfer**

The exporting country needs to decide how it spends revenue from the statistical transfer. Since the domestic RES support has been paid by consumers or tax payers, it would seem advisable to reinvest the revenues either in the national support scheme or in additional green projects, in order to increase the public acceptance of the transfer both in the exporting and importing country.<sup>11</sup> On the other hand, governments need to consider that reinvesting their revenues into a consumer financed support scheme could create state aid problems. The question, how revenues from statistical RES transfer are spent, also applies to joint projects and joint support schemes, but will not be separately mentioned there.

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<sup>10</sup> Whereas statistical transfers are only defined for bilateral agreements, joint projects and joint support schemes can be defined based on bilateral or multilateral agreements.

<sup>11</sup> This is also a lesson that can be learned from International Emission Trading under the Kyoto Protocol; responding to public concerns about the climate effectiveness of AAU trade, Green Investment Schemes have been introduced to ensure that sellers of AAUs invest the revenues in projects or measures that reduce emissions, see Atur et al. 2004, Ürge-Vorsatz 2008, Point Carbon 2009.

Additionally, a number of less substantial administrative aspects need to be defined, e.g.

- Who is the responsible agent for the transfer activities? The transfer may e.g. be handled by the government itself or by accredited agents (state owned banks, agencies, etc.) authorised by the government.
- Procedures for incorporating statistical transfer into the national renewable energy statistics; generally the amounts transferred by the member states should appear as an additional element in the national statistics of exporting and importing countries. It should not be directly added to / subtracted from the domestic production figures of the importing / exporting country because the domestic production figures should not contain any imports or exports. Rather the statistical transfers could be included as an additional category in the national consumption figures.

### **3.4 Conclusions**

In a nutshell, statistical transfers between member states can be easily applied without negotiation of e.g. a long-term support framework. This appears as both a strength and a weakness because the mechanism could be used for short-term transfers in 2020 that allow member states to achieve their national RES target; a weakness because such short-term behaviour does not ensure long-term planning by the member states. Consequently, there might be only very limited RES volumes available for statistical transfer. One option to avoid this deadlock would be the negotiation of early, long-term agreements between member states, in order to give the exporting member state an incentive to produce excess RES volumes. A key challenge of such agreements is the ex-ante price setting and the risk transfer arrangement, in the instance that the exporting country will not be able to offer the agreed amount of energy. As only very few detailed implementation rules are given in the RES Directive (e.g. with respect to the notification to the European Commission), there is significant amount of freedom for the member states to implement statistical transfers. One important aspect to be considered by both member states concerns the fact that “A statistical transfer shall not affect the achievement of the national target of the Member State making the transfer.”

## 4 Joint projects between member states<sup>12</sup>

### 4.1 Definition

The RES Directive does not provide a detailed definition of joint projects between member states. It only states that *“two or more member states may cooperate on all types of joint projects relating to the production of energy from renewable electricity, heating or cooling”* (Council of the European Union 2008). The terms of the joint agreement and the design of the joint project mechanism are defined by the involved member states.

The directive defines the basic accounting rules for joint projects, however, the host member state on whose territory the RES installation is built shall notify the Commission regarding the proportion or amount of renewable energy that shall be attributable to the national target of another member state (in the following this is called the receiving member state). It shall also specify the period of this transfer. Only RES installations that become operational after the date of entry into force of the directive (i.e. 2009) are eligible to become joint projects. After the initial notification, the host member states are required to send an annual letter of notification to the Commission and to the receiving member state, stating the total amount of renewable energy that has been produced in one year and the share that counts towards the target of the receiving member state. Obviously, this share is then deducted from the RES volumes counting towards the target of the host member state and added to those of the receiving member state.

Figure 2 depicts the institutional framework for joint projects.

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<sup>12</sup> As mentioned above, the directive also provides for the option of joint projects between member states and third countries outside the European Union. For this option, additional requirements apply. Joint projects with third countries are not discussed in this article, because they open up a new range of opportunities and problems.

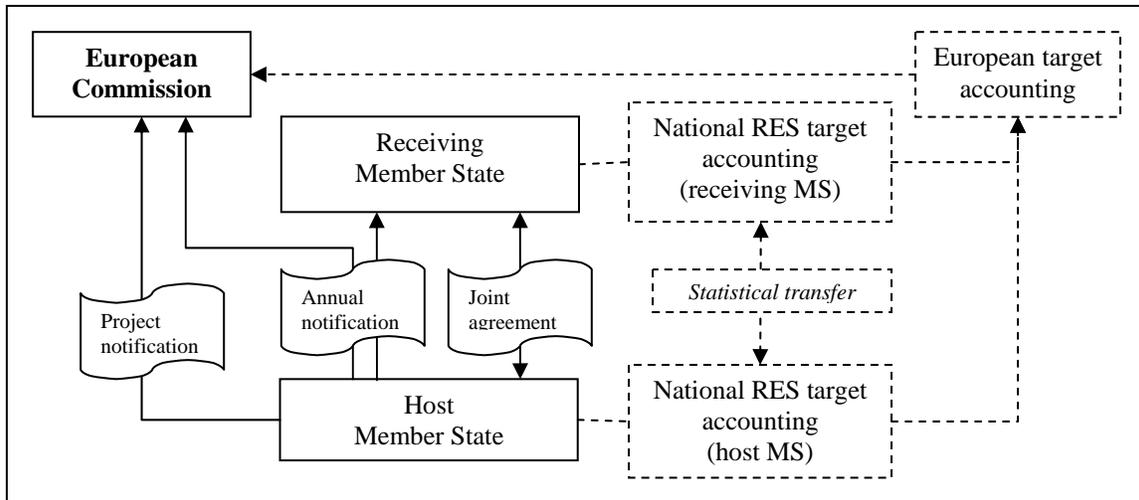


Figure 2. Institutional framework for joint projects

## 4.2 Pros and cons of the mechanism

Major pros and cons of joint projects compared to the other cooperation mechanisms have been evaluated by Klessmann 2009.

Joint projects offer a range of generic benefits. They provide the opportunity to develop additional RES potentials in countries which are neither interested nor obliged to develop these potentials themselves via their national support scheme. Hence, they allow an additional deployment of (low cost) RES within Europe, which may reduce overall costs of reaching European 2020 targets. Furthermore, joint projects increase the requested flexibility for member states in achieving their national RES targets. Member states can actively initiate a joint project framework to ensure sufficient renewable energy production to meet their targets. They are not dependent on the effectiveness of other countries' support schemes. Joint projects in principle also allow involving private RES project developers in the choice of suitable projects, who are inclined to be more proactive in realising their opportunities than governments. However, governments need to set the joint project framework before private actors can become involved. While this might be a barrier to quick project development, it also ensures that public and consumer interests are preserved. Joint project also have several disadvantages. One disadvantage is that many different joint project arrangements tend to complicate the European support conditions for RES project developers. In addition, if the joint project arrangement and the domestic support scheme in the host country overlap, the effectiveness and efficiency of the domestic support scheme could decrease. Investment in innovative technologies with higher costs, but potentially needed for fulfilling the 2020 targets,

is likely to be unattractive for joint project agreements. The development of these technologies might therefore be delayed, unless supported by national support schemes.

### **4.3 Design options and critical aspects**

The following subsections discuss design options for the setup of the joint agreement between member states.

Addressing the key questions which were developed in section 1, the following aspects will be analysed for the design of joint project agreements

- Strategic: Counter-balancing major drawbacks of the mechanism
  - How to avoid the complication of European RES support conditions
  - How to avoid interference between the joint project support and the national support scheme
- Economic: Balancing of costs and benefits
  - By which mechanism can the receiving member state provide financial support to joint projects
  - How can the host member state secure sufficient local benefits
- Legal and administrative aspects
  - How to avoid legal complications between the joint project scheme and the national support scheme of the receiving country
  - Handling and control of financial transactions

#### **4.3.1 Counterbalancing major drawbacks of the mechanism**

##### **How to avoid the complication of European RES support conditions?**

The accumulation of many different joint project arrangements in the EU member states could inhibit transparency and complicate the support conditions for RES project developers. From a European and project development perspective, a coordinated approach between several member states would therefore be preferable. In order to achieve coordination, member states should exchange their views and requirements on the joint project design at an early stage and explore options for

model agreements that can be adopted by several member states and, if necessary, adjust it to their specific needs. Options for coordination could be to use the same type of support mechanism (e.g. tender, standardised feed-in premium) and / or the same type of cost sharing approach for joint projects in several member states. Regardless if member states manage to coordinate their approaches, they should design the joint project mechanism in a transparent manner in order to make it attractive for other member states, as well as project developers. Important transparency criteria are:

- Clearly defined limits and eligibility criteria of the mechanism
- Appoint a central information desk
- Limit the number of authorities and procedures involved.
- Reflect the split of costs and benefits in the agreement of the involved member states

#### **How to avoid interference between the joint project support and the national support scheme?**

By creating a separate support mechanism that co-exists with the primary national support instrument in the host country, the two mechanisms compete with each other. In order to avoid that, the effectiveness and efficiency of the national support instrument decrease, member states may limit the joint project agreement to certain RES technologies or regions or even ex-ante identified technology-specific sites that are not covered by the national support scheme. In the instance that the host country has set a volume cap for domestic RES support, the mechanisms could be used to increase that volume. Also, the host country and the receiving country could coordinate their schemes by implementing the same type of support mechanism for the domestic and joint projects. Such a coordinated approach might already instigate progression toward a joint support scheme.

#### **4.3.2 Balancing of costs and benefits**

Before setting-up a joint project framework, both the host country and the receiving country need to reflect on their costs and benefits (see section 2). Within the joint project arrangement, they need to agree:

- a) By which financial mechanism, and at what budget, the receiving member state supports the joint project

- b) If and by which mechanism the receiving member state compensates the host country for local costs.

The following paragraphs explore different design options for these two questions.

### **Design options for the direct financial support of RES installations in other member states**

In order to receive RES credits for a joint project, the receiving member state needs to provide financial support for RES installations in another member state. This support can be organised in different ways:

1. On a project-by-project basis
2. Through a special support framework for joint projects

The difference between the two options might be gradual. Nevertheless, one can distinguish pros and cons.

#### *Option 1: The support conditions are defined on a project-by-project basis*

The support conditions for joint projects could be negotiated for single projects. This procedure could be initiated by the receiving country's government (e.g. launching a tender for a certain RES volume) or by the host country (looking for a cooperating country to participate in a large RES development). Probably, in order to guard public procurement law, financial support would need to be provided via a public tender, in which RES project developers could participate. The tender specifications (minimum requirements, technology specification, payment period, etc.) would therefore be critical for the success of the joint project.

#### *Option 2: The involved member states define a special support framework for joint projects*

An alternative is that the involved member states agree on a special support framework for joint projects, under which the receiving member state supports certain types of RES installations in the host member state, against statistical RES transfers towards its own target. One can also think of a setup where the support costs and resulting RES production are shared between the host and the receiving member state. This special support for joint projects could be organised in many different ways, e.g. as investment subsidy, loan, tender, feed-in premium etc<sup>13</sup>.

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<sup>13</sup> The difference between such a joint project support framework and a joint support scheme seems gradual. The main distinction may be that the joint project support only applies to RES projects in the host country, while the national support scheme of the receiving country is maintained. In the case of a joint support scheme, the same support framework would apply to both countries.

The project-by-project support approach tends to be less complex than setting up a general support framework that applies to many types of RES projects. One can therefore expect that it would be quicker to implement. Also, it allows experimentation with the set-up of joint projects and so seems particularly suitable for the pilot phase of implementing joint projects. Designing the framework for a support mechanism may take more initial effort than for a single project, but once operational, it is available to a larger number of projects, without any further negotiations on a project-by-project basis. The framework support approach therefore seems more suitable on the medium term, and when many joint projects shall be developed. Furthermore, it allows the support of small scale RES installations, while the project-by-project support seems suitable only for large RES projects, e.g. offshore wind farms or large biomass power plants. One issue that needs more consideration for a support framework than for the support of a single project is the potential overlap and interaction with the existing support scheme in the host country.

### **Design options for the host member state to recover indirect costs**

The direct financial support provided by the receiving country is paid to the RES projects. Simultaneously, the RES projects generate domestic costs and benefits for the host country (see section 2). One can expect that the host country will only allow certain technologies, regions or volumes to qualify for joint projects, in order to avoid undesired domestic costs (e.g. additional infrastructure costs or the “sell-out” of low-cost RES potentials which the host country would like to keep for own target achievement). Alternatively, if the domestic costs are higher than the domestic benefits, the host country might ask for some kind of compensation for these indirect costs. In order to be acceptable for both the receiving and the host country, this compensation should be settled within a transparent rule or regulation.

The following section will examine two options of how host countries could recover their indirect costs from joint projects:

1. The host country retains a share of the RES production for its own target:
  - a. Cost-reflective split between the involved countries
  - b. ‘Commission’ fee
2. The host country directly profits financially through transfer premiums:
  - a. Fixed transfer premiums
  - b. Tendering of transfer premiums

*Option 1: The host country retains part of the renewable energy share for its own target*

*a) Cost-reflective split between the involved countries*

If the host country is interested in the joint project's renewable energy production for its national target achievement, the host and the receiving country might agree to share the financial support costs and the renewable energy production of the joint project. The host country could receive a higher RES share for its target than the share of financial support it provided, to account for local costs.

*b) 'Commission' fee*

Another option could be that the full amount of produced renewable energy is supported by the receiving country, and a certain proportion of the production, counts toward the target of the host country (as a 'commission' fee). The host country fixes this share for all joint projects between the two countries, or even for all joint projects hosted. It could also introduce technology-specific shares; for instance, as the system integration costs of wind energy are usually higher than those of biomass electricity, the RES share retained by the host country for wind energy installations might be set at a higher level than that for biomass installations.

*Option 2: The host country adds a financial premium per transferred renewable energy unit to recover indirect costs*

*a) Introduction of fixed transfer premiums*

Another option for the host country to recover its indirect costs, is to add a financial premium (e.g. €/MWh) on to the transferred renewable energy volume. The premium would have to be paid by either the receiving country or by the project developer. It could be set e.g. technology specific or differentiated according to the grid environment.

*b) Tendering of transfer premiums*

The host country or its accredited agent could also determine the premium in an auction or tender. Project developers that want to benefit from foreign support for joint projects would need to present bids for covering the indirect costs of the host country. The premium would thus be determined by a market mechanism.

In option 1 (compensation for indirect costs by target shares) the receiving country's investment contributes directly to the host country's target fulfilment. This approach seems attractive if the host country is uncertain if it will meet its own national RES target. Depending on its need, the involvement of the host country can be significant (case a) or small (case b). Furthermore, this approach is easy to communicate and may increase the acceptance of joint projects in both the host and the receiving country. A disadvantage from the European policy perspective may be that the system does not provide the host country with any further incentive to improve its domestic support scheme; on the contrary, one could theoretically think of a situation where the host country could fulfil its target mainly through keeping RES shares of joint projects.

Option 2 (financial compensation for indirect costs) provides direct financial revenues and therefore quantifiable benefits for the host country. This option might be particularly interesting for host countries that are likely to meet their national target and therefore are less interested in additional RES target shares. However, the definition of the transfer premium might be subject to substantial debate and complicate the joint project negotiation. The receiving country could face problems to justify such payments to its tax payers or consumers. In this respect, an auction or tender would hold the advantage that prices are defined by supply and demand and paid by project developers. On the other hand, if not aligned well with the joint project support, the tendering or auctioning process for determining the premium for indirect costs could cause disproportionate transaction costs. Also, large market players could exercise market power, creating market entry barriers for smaller players.

Both options give the host country an incentive to engage in joint project activities with other countries. The host country is, however, advised to keep the retained RES share or the financial compensation at a moderate level to ensure the attractiveness of joint project investments for receiving countries; both types of compensation make the statistical RES import more expensive and thus less attractive for the receiving country. As mentioned above, one can also think of a situation where the host country judges the local benefits of a joint project higher than the resulting benefits and thus will not ask for any compensation.

An issue that needs to be considered under all above mentioned arrangements is the local acceptance of joint projects. Governments need to carefully examine if the "not-in-my-backyard" (NIMBY) opposition against RES projects increases for RES

projects which count towards a foreign RES target. They should ensure that local communities participate sufficiently in the benefits of joint projects.

### **4.3.3 Legal and administrative aspects**

Joint project arrangements can be designed as a special type of support scheme, or possibly even as extension of an existing national support scheme. An important legal question is how to combine the two schemes without creating legal complications (see discussion on legal problems of guarantees of origin trade, Johnston et al. 2008). This complex issue cannot be further investigated here, but it is a question of design detail and does not challenge the implementation joint project in general.

## **4.4 Conclusions**

Joint project arrangements can be considered a versatile cooperation mechanism: They can be implemented as short or long term and allow many different design variants. Private project developers will probably have considerable interest in the use of such mechanisms that allow them to tap additional RES potentials in other countries. Conversely, the interest of different lobby groups also poses a challenge to governments: they need to provide a framework that provides open access to all commercial parties. Governments may find it complicated to define a suitable framework. The main risk from the project developer's perspective is that the joint project framework is complicated to apply in practice.

Designing joint project frameworks for single projects (project-by-project approach) may help initiate the process and gain experience. In the medium term, a broader support framework for joint projects seems more favourable with regard to avoiding bureaucracy and reaching significant RES volumes.

Whether the host country will ask for compensation, for allowing joint projects on its territory will depend on the project specific balance of local costs and benefits. If so, retaining part of the project's RES production for its own target seems to be the most straightforward solution, but asking for financial compensation would also be possible. It is expected, however, that the definition of a direct financial premium will be more controversial or complicated than an agreement to split the project's RES production.

A considerable risk of joint project arrangements is that they complicate the European RES support conditions and interfere with national support instruments.

Therefore it is important that member states will exchange and coordinate their design approaches at an early stage.

## 5 Joint support schemes

### 5.1 Definition of joint support schemes

Article 11 of the renewable energy Directive, defines the option of mutual target achievement between two or more member states, based on *joint support schemes*. It states that "two or more member states may decide, on a voluntary basis, to join, or partly coordinate their national support schemes. In such cases, a certain amount of energy from renewable sources produced in the territory of one participating member state may count towards the national overall target of another participating member state."

Article 11 provides two alternatives how to implement the reallocation of RES volumes. Member states concerned may, according to §1 (a), "make a statistical transfer of specified amounts of energy from renewable sources from one member state to another member state"; or, according to §1 (b), "set up a distribution rule agreed by participating member states that allocates amounts of energy from renewable sources between the participating member states". Such a distribution rule needs to be "notified to the Commission no later than three months after the end of the first year in which it takes effect".

In practice, the two options are likely to be quite similar: In the case of option (a), using statistical transfers in a procedural manner as necessary for joint support schemes would require some sort of at least internal distribution rule as specified explicitly for option (b). In both cases, the involved member states would also need to agree on some internal distribution rule for costs and benefits of the transferred RES (see below).

### 5.2 Pros and cons of the mechanism

Major pros and cons of joint support schemes have been evaluated by Ragwitz et al. 2007, Sensfuss et al. 2007 and Klessmann 2009.

**Advantages** of joint support schemes in comparison to the other cooperation mechanisms include: They inherently allow a better relation of the available RES potentials with the agreed RES targets by establishing (partly) equal financial incentives for RES projects in all participating countries, and, consequently, it can be

expected that deployment takes place at the most cost-efficient sites. Furthermore, joint support schemes have strong future perspectives by paving the way to a more coordinated and potentially harmonised EU support framework. They may create an added value in addition to the sole flexibility between member states, e.g. by creating larger markets for RES, which improves economies of scale for investors.

**Disadvantages** of joint support schemes may be: They require an intense coordination between member states that need to share their sovereignty to design joint support schemes, e.g. parliaments of two member states have to jointly agree on a law. Despite the overall willingness to follow such an approach, long lead times for their practical implementation can be expected. Joint support schemes also provide less flexibility to adjust imports or exports of (virtual) RES generation to the member states' actual level of target achievement. In other words, member states using a joint support scheme still face the ex-ante uncertainty if they produce the right amount of renewable energy needed to achieve their targets. Adjusting the incentive of the joint support scheme to the required level may take a relatively long period, and thus fail to become effective in the allocated time frame. Finally, joint support schemes require intense debates regarding the cost and benefits of different renewable technologies among the participating member states, which, in addition to differences in their national support schemes, may also have different cultures and attitudes with respect to certain technological choices.

### **5.3 Design options and critical aspects**

For implementing a joint support scheme, different principal decisions are necessary with respect to the overall design of the system.

Addressing the key questions which were developed in section 1, the following aspects will be analysed for the design of joint support schemes:

- Strategic: Counter-balancing major drawbacks of the mechanism
  - Achieving an agreement on the joint support instrument and its detailed design. Measures to speed up its implementation
  - Assuring sufficient flexibility for actual target achievement
- Economic: Balancing of costs and benefits
  - Inclusion of different cost elements and benefits into the joint support scheme
  - Principal variants for the accounting of costs and benefits
- Legal and administrative aspects
  - Accounting RES deployment
  - Establishment of a common fund

### **5.3.1 Counterbalancing major drawbacks of the mechanism**

#### **Achieving an agreement on the joint support instrument and its detailed design. Measures to speed up its implementation**

Initially, member states are required to select and design the joint support system. Most criteria that are important for a bilateral or multilateral implementation are similar to those needed for a national implementation. Therefore, it can be expected that less discussions are necessary on the choice of the system itself, because all participating member states have already expressed their implicit commitment by voluntarily opting for a joint support system. Discussions may well occur, however, with respect to the detailed design e.g. due to differing technological preferences etc. Additionally, member states need to define a set of regulations for the accounting of RES volumes and corresponding cost and benefit prior to the start-up of the system itself. At first glance, this appears to be less important in the case of a joint quota system accompanied by a certificate trading scheme as both RES volumes (by means of certificates) and corresponding support cost are balanced between the countries by the system implicitly. However, in the case that besides support costs also other

cost elements and benefits shall be taken into account, a distribution rule needs to be set up which will be discussed in further detail in the subsequent section 5.3.2. In order to speed-up the practical implementation, a clear ranking of necessities is recommended, where decisions on accounting variants may be given priority. A stepwise implementation of the joint support system may appear beneficial. In a start-up phase, only a partial harmonisation of RES support could be implemented. For instance, in the case of a joint premium system, equal technology-specific feed-in premiums could be applied only for a set of low- to intermediate-cost RES technologies (e.g. wind energy, biomass, biogas, biowaste, hydro). For more costly, innovative RES technology options (e.g. photovoltaic, solar thermal electricity, tidal and wave power), financial support would be defined in accordance with national circumstances, but generic design criteria (i.e. guaranteed duration of support, technology coverage) would be applied for all participating countries<sup>14</sup>. This could then become a more harmonised system in the future.

#### **Assuring sufficient additional flexibility for actual target achievement**

As stated above, a possible disadvantage of joint support systems is that they may provide less flexibility to adjust imports or exports of (virtual) RES generation to the actual level of target achievement in time. A pragmatic solution for solving this may be to leave sufficient authority to the individual member states for applying additional cooperation measures. Another possibility would be the ex-ante inclusion of implicit correction measures in the policy design of the joint system itself – e.g. by opting for periodic assessments and corresponding amendments if the predefined criteria are not met.

### **5.3.2 Balancing of costs and benefits**

As joint support schemes are the most comprehensive and long-lasting cooperation mechanism, we consider the clear rules for sharing costs and benefits to be the most crucial aspect for establishing a joint support scheme. We will elaborate on such rules in some detail in the subsequent paragraphs. Before defining the accounting

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<sup>14</sup> The harmonisation of support conditions would also require the harmonisation of electricity market conditions that interact with the support scheme, see Klessmann et al. 2008 and Ragwitz et al. 2007.

rules, however, the involved countries need to agree on the considered cost elements and benefits. This is discussed below.

### **Inclusion of different cost elements and different benefits into the joint support scheme**

Before the administrative development of a joint support scheme can be started, participating countries have to reach an agreement which costs and benefits can be attributed to renewable energies supported by this scheme. Only after such a general agreement on the costs and benefits caused by RES is reached, options may then be discussed regarding how these costs and benefits will be attributed to each party. Both costs and benefits may involve significant uncertainties and may be subject to substantial debate (e.g. this point was the reason for the unsuccessful attempt to set up a joint quota system between Norway and Sweden<sup>15</sup>).

### **Principal variants for the accounting of costs and benefits**

Also in the case of joint support schemes, one can identify importing and exporting countries, based on a statistical transfer of electricity and heat generation. The additional costs of the exporting country have to be covered in a well defined manner by the importing country. In order to achieve this, clear rules for accounting need to be set up. In the instance of a joint quota system accompanied by a certificate trading scheme, such a rule would be implicitly set – i.e. a harmonised sharing of support costs would occur where obliged actors face equal specific cost (i.e. the certificate price) per unit of RES (virtually) consumed. However, with this approach no redistribution of benefits or other cost elements besides the direct support costs would occur.

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<sup>15</sup> The only existing experience with the attempt to introduce a joint support scheme in Europe is the example of the joint green certificate scheme between Norway and Sweden, which was discussed between the two countries between 2001 and 2006. Despite the fact that the two countries had very favourable framework conditions for the introduction of such joint system (e.g. common power market, similar attitude towards the manner of RES-E support) the attempt failed in 2006. The main reason was that it was very hard to find a final agreement how to share the costs and benefits in such system. The reason the Norwegian Ministry gives in its press release of February 26, 2006, for the failure of the plans is that the support system “would become too expensive for the Norwegian consumers and the industry” (Norwegian Ministry of Petroleum and Energy 2006). The question of how to finance the system became the final and insurmountable political barrier to the introduction of a common system. Although both countries had the best preconditions for the introduction of a common support system, the plans could not be carried out. Mari Hegg Gundersen from the Norwegian Water Resources and Energy Directorate stated it was a question of “how to split the bill” (Hegg Gundersen 2007).

We have identified five feasible principles for accounting for costs and benefits which are addressed briefly below. These accounting approaches are exemplarily illustrated for the case of a joint feed-in premium system:

– Accounting approach I: Average premiums for RES surplus

Approach I describes a methodology to share the cost for RES support between the involved countries solely for the surplus / shortage of RES. Cross-border exchange (i.e. financial transfer and reallocation of RES volumes) takes place only for the country-specific deployment of new RES installations which is not needed for target fulfilment in the country of origin. Therefore, average premiums arising for the support of new RES installations in the exporting country are used for pricing.

– Accounting approach II: Marginal premiums for RES surplus

Similar to approach I, the cost sharing methodology is applied solely for the surplus / shortage of RES. In contrast to approach I, however, the price (per unit of RES generation) used for cross-border exchange is set by the additional RES generation that is not required for the domestic target fulfilment in the exporting country. Therefore, the average premium of the additional basket of RES technologies is applied for price setting. Casually speaking, this represents a sort of marginal pricing.

– Accounting approach III: Negotiated premiums for RES surplus

Participating countries agree on a uniform minimum premium for all RES options (aiming to reflect the international benefits of RES generation) which is then shared equally between all countries in accordance with the national RES exploitation. Similarly to accounting approach I and II, a cross-border monetary exchange occurs only for the surplus / shortage of RES. The main difference to both approaches discussed above, is that the price of cross border exchange is determined by an ex-ante negotiation process.

– Accounting approach IV: Harmonised sharing of costs (neglecting pure national benefits)

In this variation, a “full harmonisation” with regard to the resulting support costs for RES takes place. The arising expenditures are equally distributed among all participating countries in accordance with the national RES targets - independent from where the actual RES deployment takes place. For establishing the financial transfer, a common fund could be a suitable option,

even though legal aspects (e.g. state aid) need to be considered. This fund would be fed by the individual countries in accordance with their RES targets (or more precisely the corresponding required new RES deployment). The redistribution would then be completed in accordance with the realised new RES exploitation. The local / national benefits of RES are neglected in this approach because only (support) costs are taken into consideration for the monetary cross-border exchange.

- Accounting approach V: Harmonised sharing of costs & benefits (considering pure national benefits)

This accounting approach can be described as a “full harmonisation” of both the resulting costs, as well as the benefits of RES support. In contrast to accounting approach IV, only an agreed share of the total support costs occurring at cluster level are equally distributed among all cluster countries in accordance with the national RES targets. The remaining part of the costs, representing pure national benefits, has to be retained by the country of origin – i.e. where RES deployment actually takes place. Again, in order to establish the financial transfer, a common fund may be a suitable option.

### **5.3.3 Legal and administrative aspects**

#### **Accounting RES deployment**

Before any accounting of support expenditures can take place, an agreement on the accounting of the RES deployment has to be found, in case of joint solutions for the fulfilment of national RES targets. Obviously, a crucial situation occurs when there is non-compliance with binding RES targets at the aggregated cluster level (i.e. comprising all participating countries of the joint support system). In the following paragraph, a few ideas and remarks are discussed in this respect.

- Initially, the accounting problem appears to be resolved in the case of a joint quota system accompanied by a certificate trading scheme. In practice, however, this changes if technology banding is included for certain reasons (e.g. to assure the required contribution of more costly RES options, and / or to avoid over-support of low-cost RES options). Consequently, a further

agreement still needs to be taken, as a deviation of certificates and RES volumes appears feasible.

- The cost accounting principle does not predetermine the use of a certain accounting scheme with regard to RES deployment.
- Jointly tuned action plans describing the expected future RES deployment in accordance with future targets represent a necessary tool in this respect. Accompanying this with a binding bi- or multilateral agreement (involving e.g. also financial penalties in case of non-compliance against the agreed trajectory) might already be sufficient to determine country-specific RES accounting (where the financial cross-border transfer would then be determined by the corresponding cost accounting scheme).
- Besides, positive encouragement by means of providing technical and / or administrative assistance might be soft tools to ensure delivery of the agreed objective.

#### **Establishment of a common fund**

In order to create a mutual component of the support system, i.e. an equal premium, which can then be equally distributed among all participating countries, a common fund may be appropriate. This common fund needs to be based on an agreement between the participating countries. However, legal aspects in the context of establishing and administrating such a common fund (e.g. state aid) need to be taken into account.

#### **5.4 Conclusions**

From a theoretical view, a joint (harmonised) support system inherently allows a better utilisation of the RES potentials available in the involved member states by establishing (partly) equal financial incentives for RES projects in all participating countries. Consequently, it can be expected that deployment takes place at the most cost-efficient sites.

Furthermore, joint support schemes may provide valuable experience to the discussion on a more coordinated and potentially harmonised EU support framework for RES. In addition, they may also create an added value besides the sole flexibility

between member states, e.g. by creating larger markets for RES, which improves economies of scale for investors.

Compared to the other cooperation mechanisms, a joint support scheme represents the most extensive option, which need intensive coordination and debate, whereby e.g. parliaments of all participating countries have to jointly agree on a law.

Consequently, regardless of the general willingness to utilise such an approach, long lead times for its practical implementation can be expected. Several agreements on e.g. clear accounting rules need to be taken well in advance to the actual implementation of a joint system. There is a need for such agreements even in the case of at first glance simple solutions – compare e.g. the discussion above on the use of statistical transfers for reallocation of RES volumes (as defined in Article 11, §1 (a)), or the implicitly solved reallocation of (support) costs in the case of a joint quota system (accompanied by a certificate trading scheme).

## 6 Overall conclusions and recommendations

The RES directive introduces the cooperation mechanisms to account for the uneven distribution of RES potentials across member states, allowing those member states with low or expensive RES potential, to partially fulfil their national RES target in other countries with higher RES potential or lower production costs. According to the current member state forecast documents, most countries prefer to rely on their national support schemes for target compliance, reflecting their desire to reap the economic, social and environmental benefits of developing RES nationally (European Commission 2010). This picture may still change in the coming years, however, depending on the success of national support policies. In any case, the cooperation mechanisms have a strategic relevance from the European policy perspective: experience gained from implementing cooperation mechanisms might contribute to the discussion on a more coordinated European RES support framework.

From a policy design perspective, none of the three cooperation mechanisms can be identified as a preferable or superior option. Instead, one should consider these options as a gradual transition from member state cooperation under fully closed national support systems (in case of statistical transfers) to cooperation under fully open national support systems (in a joint support scheme). Joint projects can be implemented under fully closed support schemes, but their standardisation heralds the implementation of joint support schemes.

All three mechanisms have their specific benefits and disadvantages:

- Statistical transfers between member states can be applied easily, without the negotiation of a complex framework, but if applied solely (i.e. not as part of joint projects or joint support schemes), they tend to be an ad-hoc instrument that might not help developing additional RES potentials.
- Joint projects provide the opportunity to develop additional RES potentials in Europe and allow the active involvement of private RES project developers, but pose the risk of complicating the European RES support conditions and interfering with national support instruments.
- Joint support schemes could expose the prospects for the medium to long-term future – potentially leading the way to a more coordinated EU support framework, but they also need intensive debate and coordination between individual member states. For this reason, long lead times for their practical implementation can be expected.

Design options to counterbalance the major drawbacks are:

- The set-up of long-term arrangements for statistical transfers, in order to promote the development of additional RES potentials and ensure sufficient flexibility
- A coordinated joint project approach of several member states to increase transparency for project developers
- Measures to speed up the implementation of joint support schemes, e.g. a stepwise harmonisation for different technologies

Another key issue for the design of all three cooperation mechanisms is the balance of costs and benefits between the involved member states. Besides the direct support costs, member states should consider the indirect costs and benefits for RES deployment in their cooperation. We have proposed several options to transparently reflect the direct and indirect costs and benefits in the design of the three mechanisms. The final balance, however, will be the result of a negotiation process between the involved member states.

To this day, it remains unclear whether member states will start negotiation processes in time to actually implement the cooperation mechanisms. It therefore

seems practical and significant that some member states assume a leading role to initiate the first implementation steps. Within such initiatives, they should consider the different time perspectives of the three cooperation mechanisms. Statistical transfers can be realised within relative short timeframes, e.g. to meet the interim targets or to compensate for unforeseen forecast deviations. However, in the case that member states want to use them as a reliable cooperation instrument in 2020, they should negotiate long term agreements at an early stage. Joint projects and joint support schemes allow for a more intense and long-lasting cooperation, but they require longer lead times and potentially more complex agreements. If member states decide to go for this route, they need to start negotiating soon, preferably before the Commission will evaluate their efforts in 2014. Joint pilot projects could be used as testing grounds for a broader cooperation framework between two or more member states, if the latter does not find political support at such early stage. Experimenting with statistical transfers may also provide valuable experience in this respect.

A blueprint for cooperation agreements, derived from first common experiences, could help overcome the inertia connected to the lack of national experience and the initial hesitation to implement the new mechanisms on a larger scale across Europe. A first step towards practical cooperation should be the exchange of views and (national) interests between interested national governments, as well as the exchange between governments and RES industry representatives.

While some lessons can be drawn from the RES support policy design and the flexible mechanisms under the Kyoto protocol, the current lack of national experience and supporting scientific evaluation of any of the three mechanisms will most likely create uncertainty regarding the effect of the first cooperation initiatives. It is therefore important to continuously monitor the development and evaluate the performance of the cooperation mechanisms in the future. Scientific support of government actions taken to implement the mechanisms should prioritise the balancing of costs and benefits. In addition, the impact of the cooperation mechanism chosen on the manner in which countries assist each other in reducing non-economic barriers will be interesting.

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