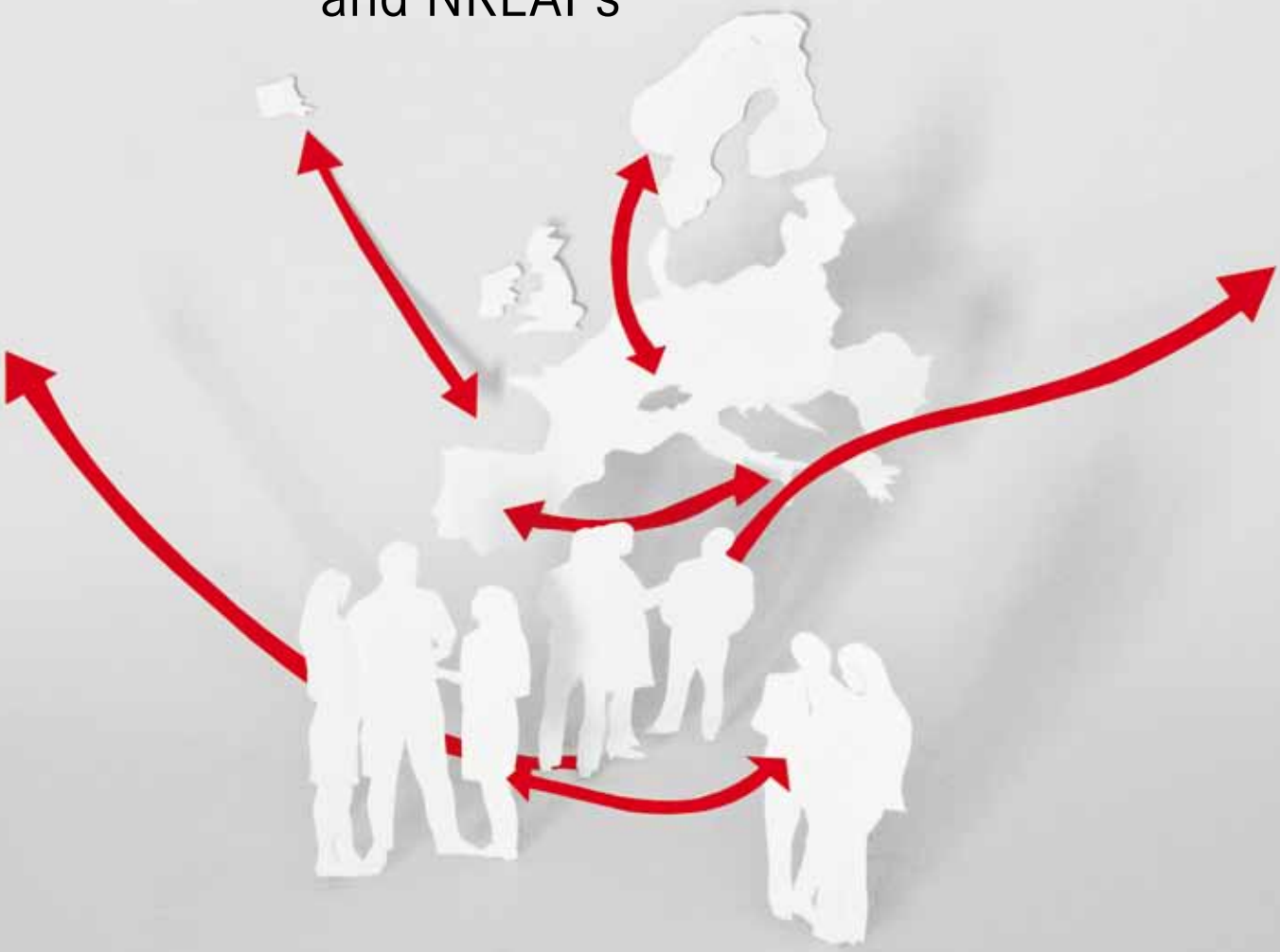
CA-RES

WORKING GROUP 1

Cooperation mechanisms and NREAPs



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CA-RES CONCERTED ACTION RENEWABLE ENERGY SOURCES DIRECTIVE

In a Nutshell

The topics covered within CA-RES Working Group 1 (WG1) comprise two main pillars: the first being support schemes for renewable energy sources (RES) and the second focusing on the implementation of the Cooperation Mechanisms (CoopMechs) set up in the RES Directive 2009/28/EC. Furthermore, particularly at the beginning of the project, WG 1 also discussed the National Renewable Energy Action Plans (NREAPs) which Member States had to submit to the EU Commission after the adoption of the RES Directive outlining their plans to implement the directive and to achieve their national RES target.

With regards to RES support schemes, WG 1 proved to be an excellent forum for best practice exchange among Member States on means for how to best support RES.

Within the WG 1 meetings Member States were able to benefit from the valuable experiences that have used different concepts and ideas for supporting RES. A particular emphasis was also put on achieving more coordination among Member States as well as identifying areas and elements that could be suitable for a more common application. Most importantly Member States pointed out that all national support schemes should ensure further and continued degression of support levels as well as introducing one element of making renewables responsive to market signals (market integration, either by FIPs, quotas or tenders). Some other areas include a common methodology for RES cost assessments, common duration of support as well as installation categories. For certain parameters within the RES cost calculation ranges were discussed. Overall, discussions showed that there is considerable scope for further coordination and also stepwise alignment of RES support schemes. Whilst emphasising the benefit of such a more coordinated approach with regard to the means for supporting

RES, WG 1 participants clearly underlined the need to allow for sufficient flexibility to adapt support schemes, particularly support levels, to different national RES potentials as well as different energy policy preferences.

As regards the CoopMechs, WG 1 participants highlighted the value of the CoopMechs as instruments that give Member States flexibility in reaching their RES target by voluntarily supplementing national RES deployment with exploring RES potential in other Member States. Discussion within WG 1 revealed that the different CoopMechs serve different interests: whilst statistical transfers appear to be a suitable means to reach short term target compliance at lowest cost, joint projects can be more beneficial when interest focuses on long-term energy policy goals such as energy security and diversity as well as technology innovation coming from flexibilising the whole energy system (energy system transformation). Furthermore, the discussion showed that many of the indirect benefits and costs are closely linked to physical electricity transfer. As regards the implementation of the CoopMechs WG 1 developed many valuable approaches and design options for the different CoopMechs and discussed their respective pros and cons. These insights will be explained in more detail in the following chapters and provide valuable information for stakeholders interested in making use of the CoopMechs.

2 Topics in the Spotlight

2.1. Enhancing RES Market Integration and System Responsibility

With continously increasing RES shares in the overall electricity mix, market integration of RES electricity becomes more and more important. In other words RES electricity production needs to become more responsive to market signals in order to adjust electricity production to meet demand. In particular when considering the internal energy market, physical electricity production should increasingly follow the European market signals and flow unhampered across Europe. This requires grid and interconnection reinforcement and further market liberalisation. This, however, needs to be separated from the question as to where RES installations are being built and supported. Discussion showed, that when considering the internal market the question of “how” renewables are being supported is much more important than “where”.

Against this background, WG 1 looked intensively into means to enhance RES market integration. Participants underlined the benefits of instruments that require RES installation operators to sell their electricity directly at the electricity wholesale market. With such instruments RES installation operators are incentivised to react to the market price signal which fosters a more demand-orientated electricity production.

Possible support instruments implying such direct participation at the wholesale electricity market include feed-in premium (FIP) models, quota schemes or tendering systems

With 9 Member States having moved towards feed-in premiums in recent years (either coming from fixed feed-in tariff systems or from quota systems), WG 1 took a closer look at this instrument in particular. Discussions showed that FIP models might be an advantageous option for market integration, ensuring on the one hand that the market signal reaches the operator of a RES installation and on the other hand keeping investment risk at a reasonable level and avoiding over-subsidisation.

Furthermore, the discussion revealed that market integration at the same time sorts out many issues in terms of enhancing RES system responsibility. One of the key aspects discussed in this context are balancing responsibilities.

With market integration instruments balancing responsibilities are borne by the RES. By selling the electricity directly at the market, RES installation operators need to forecast and register RES electricity production and take over responsibilities for balancing deviations.

The discussions in WG 1 highlighted that these balancing responsibilities should relate to the financial balancing responsibilities. Participants pointed out that renewables should not be required to ensure the physical balancing since this would transfer an unjustified risk to renewables and would also lead to inefficiencies since the physical balancing seems to be most cost-efficient if done by the market.

However, it was also clarified that RES installations should be allowed to take part in the balancing market themselves, since they can also deliver physical balancing power.

This would require adapting the prequalification requirements of the balancing power markets. This could increase the efficient use of RES electricity and minimise must-run from conventional power plants.

Another aspect discussed in this context were other system services such as reactive power, frequency response etc. Discussions showed that such system services should be provided in the most efficient way. Consequently, it was indicated that RES should provide system services when efficient. In addition it was emphasised that online registration and remote control of RES installation can help integrate RES into the system.

2.2. Implementation of Joint Projects

The Cooperation Mechanisms (CoopMechs) were introduced to give Member States more flexibility in reaching their national RES targets by joining efforts with other Member States. WG 1 participants stressed that the CoopMechs are valuable instruments to lift cost-efficient RES potential in other Member States as a supplement to national RES deployment. Within different CA-RES meetings WG 1 participants assessed the pros and cons of joint projects compared to other CoopMechs and discussed different design options. Some of the main insights on joint projects can be summarised as follows:

Reaching long-term energy policy goals such as energy diversity and security

While statistical transfers can be a favourable means to reach short term target compliance at lowest cost, deploying cost-efficient RES potentials in other Member States is only one aspect of joint projects. By engaging in joint projects, Member States can also pursue more long-term energy policy goals such as energy diversity and security. One main advantage of joint projects is that Member States obtain the opportunity to get access to RES technologies that are not applicable in their territory due to geographical conditions, such as wind offshore or concentrated solar power (CSP). Through access to these technologies Member States can diversify their energy supply thereby contributing to energy security.

Joint projects can promote joint learning and joint efforts

Moreover, discussion showed that joint projects are also a valuable instrument for Member States to share experiences of the implementation and deployment of RES technologies. In particular with regard to innovative technologies, joint projects can involve a process of joint learning in successfully implementing such technologies and overcoming challenges together. Furthermore, such common efforts can bring down technology costs faster leading to cost reductions in the long run.

Joint projects require tailored solutions

Discussions and also role plays undertaken within WG 1 showed that there are many questions that need addressing to overcome the challenges involved when implementing a joint project. Design elements to be defined among Member States include for instance the adequate share of costs and benefits among the hosting and the receiving country, adequate financing instruments, and means of selecting the project. Overall, discussions revealed that joint projects require tailored solutions in order to avoid over-subsidisations and allow for a real win-win. It appears that there is no “one-size-fits-all”. Therefore designing balanced approaches for different joint projects was highlighted by WG 1 participants to be very important.

Many indirect benefits and costs are linked to physical electricity transfer
Despite the fact that the RES Directive does not require physical electricity transfer of joint projects between EU Member States, the discussions among CA-RES participants showed that the indirect benefits and costs of joint projects are closely linked to physical transfer. This relates to both, the receiving (supporting) country as well as the hosting country. Enhanced energy security and transforming the energy system in the receiving country by flexibilisation of supply and demand can only be achieved if an equivalent amount of the electricity is actually being transferred.

The exchange among WG 1 participants showed that from a hosting country's perspective physical transfer is also important. Many Member States with very favourable RES sites already have rather high shares of RES in their electricity mix. Consequently, for the time being, these countries often face challenges with regard to grid restrictions and RES grid integration. Therefore, joint projects with physical transfer of RES electricity often correlate with the receiving countries interest to "decongest" the (hosting countries') grid capacities. In this context, it also became clear that reinforcement of grids and interconnectors are essential for triggering joint projects on a larger scale.

3 Challenge Meets Solution

3.1 RES Support Systems

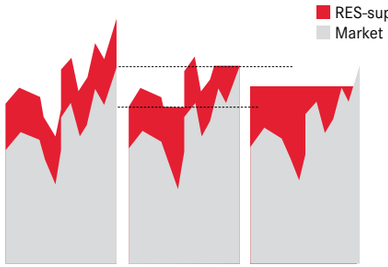
3.1.1 Enhancing Coordination and Alignment of National RES Support Policies
Member States have different RES potentials and follow different RES policies. However, it was underlined that there is considerable scope for coordination of support schemes. This relates particularly to the questions of how to support renewable energies in terms of calculating adequate support levels and also the design elements of support schemes. Throughout the CA-RES, WG 1 participants discussed and explored very valuable approaches for means to enhance coordination and alignment of several aspects of national RES support schemes. Discussion showed that more coordinated approaches on support schemes would strongly enhance transparency and thereby reduce transaction costs for investors.

Some of the main elements that WG 1 participants identified to be particularly suitable for enhanced coordination include:

Making RES more responsive to market signals
Discussion in WG 1 shows, that with increasing shares of RES it becomes ever more important that RES react to the market signal. By market integration (FIP, quota, tender) RES also become responsible for deviations from their weather forecasts.

Coordination of different Feed-in Premium models
Nine Member States have moved from fixed feed-in tariff systems or quota systems towards FIP models in recent years as a tool to enhance RES market integration.

During the CA-RES meetings, participants presented and discussed different FIP models implemented among Member States. The Member States' experiences with different concepts and ideas provided valuable insights. It was recalled that the variety of different concepts and ideas being applied provide valuable experiences that all Member States can benefit from. Nevertheless, discussion revealed that on a mid-term perspective it could be beneficial to further scrutinize which of the FIP design elements could be suitable for a more common application among Member States. Some of the areas discussed in this context were: suitable RES technologies/ installation types (inclusion of all RES technologies or only more mature technology; exceptions for small scale installations); methodology of determination of the premium level and electricity reference price as well as the support period.

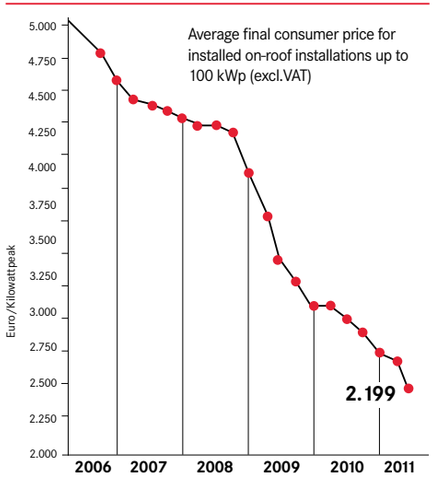


1 Figure: Overall support levels in different RES support instruments (Source: Fraunhofer ISI, Karlsruhe, Germany)

Overall, discussion showed that there is considerable scope for coordination and stepwise alignment of design elements of national support schemes. However WG 1 participants clearly underlined the need to have the flexibility to adjust support levels to national RES potentials and national RES policy preferences.

3.1.2 Continuous Cost Degression of RES Support – Automatic Cost Deigeression

Beyond market responsiveness, Member States hold continuous reduction of support levels of utmost importance in all support schemes. In order to reflect technology learning curves and economies of scale, constantly reviewing and reducing support levels is crucial in order to provide adequate support levels and to avoid over-subsidisation.



Source: independent representative survey of 100 installers by EUPD-Research by order of BSW-Solar; further infos: **www.solarwirtschaft.de/preisindex**

Reducing support levels, in particular, has been an issue in the PV sector which has shown a very dynamic development in the past years. The installed PV capacity has increased strongly in recent years in several Member States. In line with the enhanced production of PV installations worldwide the price for PV modules has decreased considerably. Support instruments that include mechanisms that automatically reduce tariffs depending on the capacity installed can be a suitable option to address this challenge. For instance in Germany, PV tariffs were reduced from 32-43 ct/kWh to the current level of 11-16 ct/kWh in a few years only. With such automatic measures support levels can be adapted swiftly without involving individual parliamentary procedures for each tariff adjustment.

Within the CA-RES, WG 1 participants have therefore taken a closer look at such automatic tariff reduction mechanisms and shared best practice examples of these. The boxes below give an overview of the German and French examples which have been presented in WG 1.

Germany – "The Flexible PV Cap"

In 2000 the installed PV capacity in Germany was still rather small at around 76 MW. In recent years, however, PV installations literally boomed from an installed overall capacity of 9.914 MW in 2009 to approx. 32.000 MW at the end of 2012. At the same time prices for PV systems dropped by about 60 % from 2009 to 2012. These figures illustrate the need to adjust tariff levels according to market developments.

The German Renewable Sources Act (EEG) of 2009 stipulated a basic degression of 9 % towards the end of each year. However, given the highly dynamic market development and a steep cost reduction due to the overcapacities of the industry, corresponding adaptations of PV feed-in tariffs were needed earlier. Therefore, Germany undertook an additional tariff degression step and introduced the so called "flexible cap".

The flexible cap (or "breathing cap") is an innovative instrument that automatically adapts PV feed-in tariffs according to the newly installed capacity. The more new PV installations were being installed in the previous month the more the PV tariffs for new installations are automatically reduced for the next month. Due to this automatic mechanisms tariff adaptations take place without involving individual parliamentary procedures for each adjustment.

The defined annual target corridor of the flexible cap is 2.500 to 3.500 MW. Within this corridor an annual degression of 11,4 % per year takes place. Above a 3.500 MW-corridor PV tariffs decrease by an additional 3-4 % for every 1.000 MW of newly installed capacity.

With this mechanism, the annual degression can amount up to 29 % (degression cap). On the other hand, a development of a newly installed capacity below 2.500 MW would lead to decreasing the annual degression rate for each 1.000 MW below the 2.500 MW corridor.

At first, the yearly automatic degressions took place twice a year which led to significant pull-forward effects. Therefore, this was adapted to a monthly degression. Consequently the newly installed capacity in one month is being projected to one year and the projected annual degression is being reduced to a corresponding monthly one.

per year		per month
29% above 7.500 MW	→	2,8%
26% above 6.500 MW	→	2,5%
23% above 5.500 MW	→	2,2%
19% above 4.500 MW	→	1,8%
15% above 3.500 MW	→	1,4%
Target Corridor 11,4 %	→	1%
9% up to 2.500 MW	→	0,75%
6% up to 2.000 MW	→	0,5%
0% up to 1.500 MW	→	0%
-6% up to 1.000 MW	→	-0,5%

By introducing this mechanism PV tariff levels have been reduced down to between 16 ct/kWh (< 30 kW) and 11 ct/kWh (free-standing PV) as of April 2013. The main advantages of the flexible cap are that cost control and dynamic cost degression can be achieved quickly and without parliamentary action and hence reduces bureaucratic procedures and possible lobby influence.

France

During the year 2012, more than 1.000 MW of photovoltaic capacity has been installed in France. The cumulative installed capacity in France exceeded 4.000 MW at the end of 2012. These figures confirm the rapid development of solar photovoltaic in the country.

The current support scheme for PV in France makes use of two different mechanisms depending on the size of the installation:

- Flexible feed-in tariff for PV installations on buildings less than 100 kWp;
- Tendering procedures for PV installations on buildings and ground installations over 100 kWp.

The French flexible feed-in tariff system, which is a volume based instrument and not a price based instrument, is provided by a ministerial decree. At the end of each quarter, the energy regulator (Energy Regulation Commission) estimates the volume of PV installations which have applied for connection within the last three months. According to this volume, the level of the feed-in tariff applicable for the next three months is automatically set up:

- If the volume of PV installations which have applied for connection is in line with a predefined target, the quarterly feed-in tariff degression is 2,6% (target of 10% per year);
- If the volume of PV which have applied for connection is above the target, the quarterly degression is higher than 2,6%. The maximum degression can be 9,5%;
- If the volume of PV which have applied for connection is below the target, the quarterly tariff degression is lower and could even be zero.

The target is defined in the ministerial decree for two different categories of installations, according to the size of the installations:

- 50 MW/quarter for full BIPV installations, whose size is less than 9kWp (target of 200 MW/year)
- 50 MW/quarter for simplified BIPV installations, whose size is less than 100 kWp (target of 200 MW / year)

For each of the two above categories, the automatic degression is set up according to the following table:

Volume of PV which have applied for connection within the last three months	Percentage of feed-in tariff degression
> 130 MW	-9,5 %
Between 110 and 130 MW	-7,5 %
Between 90 and 110 MW	- 6,0 %
Between 70 and 90 MW	-4,5 %
Between 54 and 70 MW	-3,5 %
Between 46 and 54 MW	- 2,6 %
Between 30 and 46 MW	- 2,0 %
Between 10 and 30 MW	- 1,5 %
< 10 MW	-

Moreover, the feed-in tariff degression cannot be more than 20 % on an annual basis.

Under this mechanism, the level of feed-in tariffs is not calculated through cost assessment, which could be difficult to assess precisely due to asymmetry of information and rapid cost evolution, but through the quantity of PV projects developed on the territory. The main advantages of this system are providing sufficient visibility for investors and to adapt automatically the support level to the PV market. It also enables automatic degression without parliamentary process.

A common methodology of RES cost assessment

Discussion showed that a common methodology on RES cost assessment appears to be a particularly suitable area for further coordination. Participants highlighted the need to decide individually a concrete tariff level for their country, based on their different RES resources. It was underlined that a common methodology could assist Member States to find the appropriate level of support and prevent over-subsidisation while incorporating the national RES potential and specific energy policy goals of their country.

In different meetings WG 1 looked into RES cost assessment based on the methodology of determining levelized cost of electricity (LCOE) in the examples of photovoltaic (PV) and wind offshore. Thereby, WG 1 participants were able to get a common understanding of calculating adequate RES support levels. With experts from different research institutions in Europe being present at the meetings, information asymmetries across Member States could be reduced, thereby leading to a process of best practice exchange and coordination among Member States.

Elements in RES support scheme suitable for a similar application

Besides the calculation methodology, WG 1 participants went a step further and discussed the suitability of a more common application of different elements of RES cost assessment. At first, for some elements the discussion showed that common figures could be potentially applied. These include duration of support periods, e.g. 20 years, common installation categories (Member States would then decide which capacity categories for which technologies to include in their national support schemes) as well as a common EU wide data base for RES potential. Other elements can vary more strongly among Member States; however, defining certain ranges for figures was cited as being potentially useful. Such ranges could e.g. be used for technology cost – based on an EU-wide cost assessment -, a percentage for operation and maintenance (O&M) costs based on the overall investment costs or ratios of equity and debt capital. Overall, it became clear that wherever labour costs are involved – such as construction costs – involved cost tends to differ more strongly among Member States. The same applied to interest rates for capital costs which therefore appear to be harder to commonly apply.

3.2 Implementation of Cooperation Mechanisms

3.2.1 Choosing the "Right" Cooperation Mechanisms

The CoopMechs set out in the RES Directive give Member States flexibility in reaching their national RES targets. Throughout the CA-RES WG 1 participants emphasised that the CoopMechs are valuable tools to give Member States the opportunity to voluntarily supplement national deployment by tapping cost-efficient foreign RES potential in cooperation with other Member States.

The RES Directive includes three different CoopMechs:

Statistical Transfers (Article 6)

Member States may agree on a statistical transfer of a specified amount of energy from renewable sources from one Member State to another Member State

Joint Projects

Two or more Member States may cooperate on all types of joint projects relating to the production of electricity, heating or cooling from renewable energy sources (Articles 7 and 8). Member States can also engage in a joint project producing electricity from renewable sources with one or more third countries (Articles 9 and 10). In this case the electricity is required to be physically transferred into the EU.

Joint Support Schemes (Article 11)

Two or more Member States may decide to join or partly coordinate their national support schemes.

Which instruments serve which interest best?

Member States may seek different objectives when engaging in CoopMechs with other Member States. While some Member States might look for least cost short-term compliance with their RES target, others follow more long-term energy policy goals such as technology development or enhanced energy security and diversity.

Against this background, WG 1 participants indicated and discussed which instrument serves the different interests best. Results of the respondents can be summarised as follows:

Statistical transfers may be the most suitable option when seeking:

- Low administrative complexity
- Short-term target compliance (implementation before 2020) at lowest cost
- Achieving interim target trajectory compliance

Joint projects seem to be a favourable means when aiming at:

- Broad public acceptance of the cooperation
- Adequate sharing of costs and benefits
- Defining tailored solutions for common projects

- Diversifying energy sources (sites/ technologies)
- Energy security and transforming the energy system (physical transfer of electricity)
- Joint efforts (common technology development)
- Joint learning (making experiences, in particular with innovative technologies)

Responses regarding joint support schemes were more diverse:

- The NO-SE case showed: this is suitable when Member States have similar RES potentials Win-Win for involved Member States
- However, in case of Member States with more divergent potentials, a joint scheme can lead to an unbalanced share of costs and benefits at the expense of one Member State
- In the case of more divergent RES potential defining a joint support instrument for specific projects (or a framework agreement for several joint projects) appears to be more suitable for finding balanced approaches

3.2.2 Design Options for the Different Cooperation Mechanisms

Over the course of the CA-RES, WG 1 participants looked into different design options for the CoopMechs and possible elements of bilateral or multilateral agreements. Some of the design options discussed by participants include: duration of the agreement, method of selection of the project, determination of direct and indirect costs and benefits, distribution of RES amounts, and liability clauses.

A joint wind offshore project served as an example for discussions among WG 1 participants with regard to design options for a joint project. It was highlighted that the field of wind offshore appears to be particularly suitable for the implementation of a joint project and a great area for joint learning and efforts. Member States face similar challenges with this innovative technology regarding not only technical aspects but also the high financing costs involved.

3.2.3 Design Options for Statistical Transfers

Some of the design options for statistical transfers include:

Time period of the agreement - splitting can allow for more flexibility

- One period over whole period until 2020 or
- Two agreements e.g.: 2013-2016, 2017-2020 (give more flexibility to address MS different interests)

Agreeing on RES amounts to be transferred – fixed vs. flexible

- Fix over entire period/ different amounts for different period
- Point of time of determination (ex ante for entire period, annually etc.)
- Guaranteed vs. non-guaranteed (option)

Determining the transfer price: starting points and options for dynamic elements

- Possible starting points e.g.:
  - Highest cost technology (e.g. PV)
  - Lowest cost technology (e.g. hydro/ wind)
  - Average costs (overall (RES-E, -H, -T), sector specific (just RES-E) or most dominant RES technology in the RES mix
  - However, need to also consider indirect costs (infrastructure, system integration) and indirect benefits (innovation dynamics due to flexibilising the whole energy system, jobs etc.)?

- Point of time of price determination, e.g.:
  - Ex ante (for entire period)
  - Annually
  - Adaptation formula
  - Alternating for different time periods

Liability clause, special right of cancellation, etc.

3.2.4 Design Options for Joint Projects

Duration of agreement – short-term period vs. long-term period beyond 2020

- When the RES project is a new project especially developed in the framework of the joint project, financial long-term commitment over the entire (economic) life time of the project appears necessary.
- Where the RES project would have been built by the hosting country anyway, with another country only joining in and financially contributing, then a short-term period for the agreement could be possible.

Distribution of RES amounts

- In principle any split of generated RES amounts is possible (e.g. 50/50 or 60/40 or 100/0). Most likely the distribution of amounts would depend on the financial contribution of the countries involved. Nevertheless, indirect costs (grid reinforcement, balancing costs, etc.) and benefits (job creation, innovation, and environmental benefits) will most likely need to be taken into account within the calculation.

- Also a varying distribution of RES amounts differentiating between different time periods could be a suitable option. This might give involved parties more flexibility to correspond to their actual needs of RES amounts for target compliance.

Selection of the project

- Discussion showed that using a project tender brings different advantages:
  - Transparent, competitive procedure
  - Both countries involved can jointly define tender criteria
  - Possibility to limit amount of projects/ support either by project-specific tender or a volume tender (x TWh/a)

Designing the Support Mechanisms

One option to finance the project could be by granting access to the hosting or receiving countries' support schemes. However, discussion showed that this would involve difficulties. When granting access to the buying country's support schemes the question of how to limit the support to only this project was raised in particular. Furthermore, from an economic point of view, over-subsidisation of the project was a key issue discussed: assuming better resource conditions in the host country, the joint project should probably receive less financial support than under the domestic support scheme. With regard to the hosting country the lack of influence of the receiving country on the support level/ design was emphasised as being problematic due to an uncontrolled boost in the host country driven by unlimited and over-subsidised support.

- In order to be able to tailor support to the specifics of the project WG 1 participants emphasised that a separate support mechanism could be a suitable option. Support from participating countries could then be defined jointly and pooled in a common fund. Discussion revealed that such an approach would have several advantages: (1) Ability to design project specific tailored support (2) Involved countries would be able to commonly design the support, giving all of them equivalent influence. (3) Furthermore, support funds could be pooled efficiently in the fund, which would then serve as a "one-stop-shop" for remuneration towards the project operator as opposed to having to approach several different bodies.

- The types of upfront support and kWh-based production support were discussed. WG 1 participants underlined the advantages of up-front support in order to reduce investment/ capital costs while at the same time reflecting on the need to incentivise maximizing plant output through production support. Ensuing discussions revealed that a combination of upfront support and production support could be a favourable option.

Physical Electricity Transfer?
Even though it is not required by the RES Directive, WG 1 participants emphasised that both the receiving as well as the hosting country often have a great interest in physical electricity transfer.

Receiving country: Discussions showed that joint projects appear to be the most suitable instrument when seeking longer-term energy policy goals such as energy diversity and security as well as innovation from flexibilising the energy system. However, these depend on actual physical electricity transfer.
Hosting country: Potential hosting countries are usually Member States with favourable RES sites. These countries often already have rather high shares of RES in their electricity mix and consequently already face challenges with grid restrictions and RES grid integration for the time being. Therefore, the hosting countries tend to have an interest to transfer the electricity out of the country in order to “decongest” grid capacities and reduce grid reinforcement and balancing needs.

3.2.5 Joint Suport Schemes
WG 1 participants also took a closer look at different pros and cons of joint certificate schemes. These discussions were based on the example of a joint certificate scheme between Norway and Sweden. Some of the main findings arising from the discussions were:

- Joint certificate schemes might be a beneficial win-win approach for Member States with very similar RES resources and similar RES policy goals. In these cases the joint support scheme can be tailored to meet these similar RES potentials and policy objectives and provide for adequate support in those Member States.

- However, the picture seems to be different and more complex for countries that have rather diverging RES potentials. Here, due to uniform certificate prices, over-subsidisation of the lower cost RES technologies and best resources is likely to occur. While RES electricity generators might benefit from lower generation costs, the consumer might pay more due to increasing support expenditures. The overall effects of joint support schemes though depend on the specific design of the system, e.g. over-subsidisation might be limited by the technology specific design of the certificate scheme.

3.2.6 Opening of Support Schemes
WG 1 participants also specifically discussed the issue of opening support schemes to foreign RES installations. Overall, discussion showed that a differentiation is needed between a voluntary opening of national support schemes through making use of the CoopMechs and an obligatory opening of support schemes.

The majority of Member States seem to be generally interested in getting access to RES deployment at the most favourable sites by making use of the CoopMechs in order to supplement their national RES deployment. However, it also became clear that many aspects need to be addressed specifically and sorted out before opening support schemes in order to avoid unbalanced effects and distortion. The main issues highlighted in this context were over-subsidisation, unbalanced distribution of direct and indirect benefits (targets, physical electricity, economic benefits) and costs (support costs, grid and system costs) as well as public acceptance issues derived from supporting RES without transforming the energy system. In this context it was pointed out that justifying public support cannot be compared with a private decision of a consumer to buy a foreign product.

From the host country’s perspective, again concerns were raised regarding an uncontrolled RES deployment on its territory driven by unlimited and/or over-subsidised support of other Member States’ opened support schemes. WG 1 participants pointed out that these issues can only be addressed in a voluntary cooperation and recalled that this was the main reason for introducing Article 3 para 3 of the RES Directive and the cooperation mechanism. In this context, a controllable opening of support schemes on a voluntary basis could be an option. In this context the legal meaning of Article 194 para 2 of the Lisbon Treaty was discussed granting Member States the right to explore their energy resources. However, the discussion showed that further analysis seems to be needed.

4

Main Findings and Achievements

Considerable scope for enhancing coordination and stepwise alignment of certain elements of Member States' RES support schemes
Even though Member States called for flexibility to adapt the RES support levels to their respective national RES resources as well as policy preferences, there remains considerable scope for aligning the way RES support schemes are designed thus enhancing transparency and comparability and reducing investors' transactions costs for investing in other countries.

On the other hand it was pointed out that the variety of different concepts and ideas being applied provide for valuable experiences that all Member States can benefit from. It appears important to allow for innovation and competition of different approaches. In this context, Member States can learn from and exchange each other's experiences.

Making RES responsive to market signals
With increasing shares of RES in the electricity system, making them responsive to market signals is of major importance in order to ensure that RES deliver their share to flexibilising the energy system and optimising supply and demand. Overall discussions showed that with respect to the internal market, the question of how to support RES should be further aligned among Member States, while the question of the actual location of the RES installation is less of an issue to the internal energy market, provided that it can be ensured that the electricity can flow freely in the EU market while following market signals.

Making RES responsive to market signals conveys reasonable risks to RES operators
Discussion showed that most of the arguments raised against renewables support could be overcome by making renewables responsive to market signals. Within direct marketing instruments, such as FIPs or quotas, RES installation operators need to forecast and register RES electricity production and take over responsibilities for balancing deviations. WG 1 participants emphasised that these balancing responsibilities should relate to the financial balancing responsibilities whereas participants pointed out that the physical balancing should be undertaken by the overall system in order to allow for the most macro-economic efficient provision of balancing power.

Continuous support degression needed - automatic degression mechanisms could be one option
Continuous RES cost reduction and adjustments of tariff levels are key in order to prevent over-subsidisation. Cost degression mechanisms that automatically adapt tariffs according to the capacity installed can help Member States to react swiftly to the dynamic market developments while providing transparency for investors and avoiding lengthy parliamentary procedures. This was particularly seen in the context of the significant and very dynamic cost reductions in the PV sector in past years. A more common application of such instruments across Member States could be beneficial.

Different CoopMechs match different interests (short term target compliance vs. long term energy policy goals)
It was clear from the exchanges among WG 1 participants that the different CoopMechs serve different interests. While statistical transfers can be a favorable option for short term lowest cost target compliance, joint projects can contribute to more long-term energy policy goals such as technology development, energy security and diversity. Discussions also showed these benefits of joint projects are nevertheless closely linked to physical transfer of electricity. Furthermore, it was emphasised that joint projects can spark a valuable process of joint learning and efforts which was found to be particularly valuable with regards to innovative technologies such as wind offshore or CSP.

Joint projects allow as well as require tailored solutions
When looking into design options of joint projects WG 1 participants emphasised that there are many questions to address and challenges involved when implementing a joint project. Some of the main aspects relate to the adequate share of costs and benefits among the hosting and receiving country, adequate financing instruments and means of selecting the project. Furthermore, means of how to ensure an equivalent flow of physical electricity – often highlighted as desirable– needs to be developed by the parties involved. Overall, it was emphasised that joint projects ask for tailored solutions. Therefore, it appears that there is no "one-size-fits-all". Designing balanced approaches for different joint projects was highlighted by WG 1 participants to be very important.

An obligation to open support schemes leads to unbalanced effects. Voluntary opening could be one option if difficulties are being addressed properly.
During the discussions in WG 1 it became clear that there are many issues that need to be addressed in more detail and sorted out prior to opening support schemes. Otherwise major unbalanced effects and distortions are likely to occur to the expense of Member States. Some of main issues highlighted by WG 1 participants in this context were uneven distribution of direct and indirect benefits (targets, physical electricity, economic benefits) and costs (support costs, grid and system costs), over-subsidisation as well as unbalanced effects on the electricity price of the host country. Furthermore, when Member States lack possibilities to limit and control access by foreign RES plants to national support public acceptance is likely to be put at risk. WG 1 participants pointed out that these issues can only be addressed in a voluntary cooperation.

Consequently, WG 1 participants welcomed further efforts to foster the use of CoopMechs via guidance and additional tailored EU support for Member States in order to make more use of the CoopMech. Opening of support schemes on a voluntary basis and in a controllable way could be an option for the future. However, possible implications and problems clearly need further analysis and suitable solutions found first in order to avoid major distortions.

5 The Way Ahead

Within the first phase of the CA-RES from 2010 to 2013, WG 1 was able to address a number of different challenges both regarding defining adequate support instruments as well as the implementation of the CoopMechs. Many suitable approaches to address these challenges have been developed and shared among WG 1 participants.

Nevertheless, numerous aspects still need further analysis and solutions developed to effectively address respective challenges. Building on the valuable work done so far, Member States will be able to address these challenges. Benefitting from the experiences made with different concepts and ideas, the focus of future work should be laid on identifying best practices and looking into elements that could be applied more commonly among Member States, while at same time providing for sufficient flexibility for Member States to adjust support to their respective RES potentials and energy policy preferences.

Some of the challenges to be addressed in the future include:

- Further facilitation of RES market integration, i.e. finding the most suitable options/ instruments (or combination of instruments) for making RES more responsive to market signals

- Stepwise enhancement of RES system responsibility (balancing responsibilities, provision of control energy and other system services, remote control and online registration of RES plants)

- Discussion and analysis of options for a voluntary and controlled opening of support schemes to foreign RES projects for RES imports or in the framework of joint projects i.e. assessing the legal, technical and economic implications and possible solutions

- Accelerating the use of the CoopMechs by looking further into design options and possible model agreements

- The post-2020 perspective: assessing most suitable ways to set clear investment signals and stable framework conditions for RES also for the time beyond 2020

6 Abbreviations

Abbreviation	Full name
BIPV	Building Integrated Photovoltaics
CA-RES	Concerted Action on the Renewable Energy Sources Directive
CoopMechs	Cooperation Mechanisms
CSP	Concentrated Solar Power
EEG	German Renewable Sources Act
EU MS	European Union Member States
FIP	Feed-in Premium
LCOE	Levelised Cost of Electricity
O&M Costs	Operation and Maintenance Costs
PV	Photovoltaic
RES	Renewable Energy Sources
WG 1	Working Group 1