Assistance in view of the setting up and implementation of the Union renewable energy financing mechanism

ENER/C1/2018-568

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KEY FINDINGS

Basic structure: The "Union renewable energy financing mechanism" (the mechanism) as provided in Article 33 of the Governance Regulation is one instrument to support the achievement of the binding EU-wide RES target of at least 32% in gross final energy consumption by 2030. Based on voluntary financial contributions paid into the mechanism by contributing Member States (potentially complemented by EU and private sector funds), the mechanism implements tenders which determine support levels and allocate grants to RES projects in one or more host Member State(s) (or third countries), which participate on a voluntary basis. The host Member States transfer the RES statistics from these installations back to the mechanism which then redistributes the RES statistics to the contributing Member States according to their share of contributions. Parts of the RES statistics may be redistributed back to the host Member State.

Motivation for Member States' participation: For contributing Member States, key motivations include reducing the costs for RES deployment (compared to domestic deployment) and lower transaction costs compared to the implementation of Cooperation Mechanisms. Member States acting as hosts will benefit e.g. from the creation of local jobs and a transition towards a decarbonized national energy system resulting in GHG emission reductions and improved air quality. These benefits come free of support costs for hosts, and hosts may keep a pre-determined share of the statistical benefits.

Synergies with other EU funds: Creating synergies between the mechanism and other EU funds should be envisaged. Two main options are feasible: First, the mechanism having direct access to capital from other EU funds (if envisaged in the MFF), and second, a simpler coordination of work programmes and calls for proposals between funds.

Technology-neutrality and technology specificity: The mechanism may tender grants in three windows: the technology-neutral (aiming at a least-cost selection across technologies), the technology-specific (aiming at a least-cost deployment of most acceptable technologies) and the project-specific window (focusing on strategic large-scale projects). Support should not be restricted to RES-E but include RES-H&C and RES-T sectors as well.

Support scheme design: The envisaged design of the support scheme ultimately depends on the objectives of the participating Member States and the Commission. If the ease of practical implementation is key, technology-specific tenders for RES-E allocating investment support (tendered item expressed in MW) is the most viable option, despite there being less international experience with this type of support. Upfront investment support, in this context, implies major administrative and practical advantages as it avoids the collection and payment of funds over longer periods of time and since it is applicable to all sectors and provides for effective market integration. If cost-effectiveness is key, the design package may combine technology-neutral window with operating support in form of a fixed premium (tendered item expressed in MW). Alternatively, technology-specific auctions focusing on a least-cost technology may be used in combination with investment support (tendered item expressed in MW), in which case the selection will be restricted to least-cost projects within a mature technology (e.g. solar PV or wind onshore) and therefore cost-effectiveness would be ensured.

Support for RES-Heating and cooling and RES-Transport sectors: The functioning of the mechanism applies equally to tenders to support the deployment of renewables in all three sectors, electricity, heating and cooling, as well as the transport sector. However, the forms of support may differ. Investment support is common in heating and cooling, which makes this form of support more suitable for this sector. Project-specific tenders are the most suitable solution to organize tenders in the transport sector. A cross-sectoral approach can be taken for single technologies that have an end-use in various sectors, such as solar CHP, or biomass.

Determining the financial contribution of participating Member States: The European Commission cannot pre-finance Member States' contributions. Member States, however, need to know the budgetary implications of their participation in a specific tender round of the mechanism before making financial commitments. Therefore, the Commission needs to calculate a maximum

price per MWh (or per MW per technology) for each tender round as part of an iterative process and share it with the Member States before they commit to the mechanism.

Allocation of costs and benefits: Statistical benefits based on energy generated by installations financed by the mechanism will be attributed relative to financial contributions by Member States. To account for the fact that hosting Member States forego part of their domestic RES potential and bear system integration costs for such installations, we recommend a (flat-rate) splitting of statistical benefits between contributing and hosting Member States (e.g. 80/20), which may be re-negotiated per tender round.

Methodology for the sharing of additional system costs in host countries: System costs should not be calculated and compensated on an individual cost-basis. Instead, the share of the statistical RES benefits that are retained by the host country should be regarded as a compensation. In addition, host countries may internalise some of the system costs to RES projects through their regulatory framework (e.g. by applying deep connection charges).

Practical implementation and process: Procedures and the distribution of responsibilities need to be contractually determined between the European Commission and hosting countries to ensure that responsibilities and liabilities are properly defined between all parties involved and to ensure a smooth functioning of the mechanism (e.g. related to the disbursement of support payments or monitoring of project implementation). In addition, minimum elements need to be contractually defined as part of the binding commitments with hosting (e.g. in terms of applicable restrictions) and contributing Member States (regarding their financial contribution and the allocation of statistical benefits). With a view to processes, we propose a procedure following several stages: the elaboration of work programmes, the tender preparation, including an expression of interest phase and the binding commitments of participating host and contributing Member States, the tender implementation as well as monitoring of project implementation, accounting of statistical benefits and support payment disbursement.

EXECUTIVE SUMMARY

In the 2030 framework the European Union has established a binding European Union-wide RES target of at least 32% in gross final energy consumption by 2030. This target is not the sum of national binding RES target, rather it is to be achieved through voluntary contributions of Member States, adding up to the EU 2030 target. One instrument to support and ensure the target achievement at European Union level is the “Union renewable energy financing mechanism” (the mechanism) as provided in Article 33 of the Governance Regulation. This report aims to assist the European Commission in preparing the implementing act foreseen by Article 33 (4) of the adopted Governance Regulation. This implementing act will set out the provisions necessary for the establishment and functioning of the mechanism.

Basic structure: The basic function of the mechanism is simple: Member States may choose to make voluntary financial contributions to the mechanism, which are pooled together as part of a dedicated budget line within the overall EU budget (potentially complemented by EU and private sector funds).The mechanism subsequently implements a tender which determines support levels and allocates grants to RES projects in one or more host Member State(s) (or third countries), which choose to participate on voluntary basis as well. The host Member State(s) transfer(s) the RES target statistics from these RES installations back to the mechanism which then redistributes the RES statistics to the contributing Member States according to their share of financial contributions. Parts of the RES statistics may be redistributed back to the host Member State.

Motivation for Member States to participate: The key motivations to participate as a contributing Member State include reducing the costs for RES deployment (compared to domestic RES deployment), lower transaction costs compared to the implementation of individual Cooperation Mechanisms, legal compliance with the requirement of the Governance regulation to stay above the individual 2020 RES target and compliance with the requirement to open national support schemes for RES installations abroad (which several Member States are subject to). Member States acting as hosts will benefit from a structural transition of the national energy system towards a decarbonised one, the modernisation of the local economy, the creation of local jobs, greenhouse gas emission reductions (which, in contrast to RES statistics, are not transferred to the contributing Member State), and reduced import dependency. These benefits come free of support costs for hosting countries, as the support costs for the RES projects are ultimately covered by funds provided by the contributing Member States (or EU and/or private sector funds) to the mechanism. Furthermore, host Member States may receive a share of the statistical benefits. In some cases, Member States may seek to act in a mixed role, i.e. as a contributing and hosting Member State at the same time, for example when contributing to renewables deployment in one sector (e.g. electricity) while hosting projects in another sector (e.g. heating and cooling).

Synergies with other European Union funds: Creating synergies between the mechanism and other EU funds should be envisaged. Two main options are feasible: First, the mechanism having direct access to capital from other EU funds (if envisaged in the MFF), and second, a simpler (and more realistic) coordination of work programmes and calls for proposals between funds. A close coordination of funds (and not just of the work programmes) may be more suitable in this context but would need to be foreseen both in the upcoming Implementing Act of the mechanism and in the context of the MFF 2021-27. In any case, making effective use of financial instruments (such as low-interest loans, junior loans or guarantees) will require additional attention in the implementation of the mechanism, since these could lower the amounts of non-repayable support.

Technology-neutrality and technology specificity: The mechanism may tender grants in three windows: In the technology-neutral window, projects are selected on a least-cost basis, organised in tenders. All RES technologies as defined in the RED II would in principle be eligible. This window includes the options to allocate support across the electricity, transport and heating and cooling sectors or to allocate support across technologies, but within each sector. The latter option seems more suitable from an energy end-use perspective and could also be defined as “technology-neutral, but end-use specific” tender. The objective of the technology-neutral window is to maximise the cost-effectiveness of RES support.

In the technology-specific window, tenders for specific technologies and technology classes are implemented. The objective of this window would be to trigger least-cost deployment per technology. It may focus on technologies which are most acceptable to the participating Member States, for instance to ease the system integration of the respective RES capacities in host Member States. In addition, this window may support less mature technologies which supports their market entry. The choice may also focus on known least-cost technologies. While the technology-specific window does not introduce competition between sectors and technologies, it may avoid some of the adverse effects and uncertainties discussed under the technology-neutral window.

In the case of the project-specific window, projects would be selected according to the lowest bid for a specific project or site. In the case of selection between different projects and different sites, the lowest bid per type of project would decide or a multi-criteria assessment. Project-specific support most likely aims for supporting large-scale projects of strategic relevance (related to innovation, European Union technology leadership, etc.). It may also be the most suitable solution for organising tenders in the heating and cooling and transport sectors.

Forms of support: Grants may be offered either in the form of operating support (fixed premiums, floating premiums/asymmetric contracts-for-difference or symmetric contracts-for-difference) or upfront investment support. Operating support implies advantages in terms of effectiveness and can be tendered in a technology-neutral manner. If operating support is chosen, fixed premiums result in comparably good market integration whilst limiting the administrative burden. Floating premiums and Contracts-for-difference schemes (CfDs) limit market risk for bidders but are more difficult to implement cross-border and do not incentivise the choice of project locations with highest market value. Upfront investment support implies major administrative and practical advantages in the context of the mechanism as it avoids the collection and payment of funds over longer periods of time. It is applicable to all sectors and provides for effective market integration. However, it is difficult to apply in a technology-neutral tender, as it does not automatically account for the full-load hours generated, which may reduce its cost-effectiveness compared to operating support in the form of a fixed premium payment. While there is limited experience with investment support in the electricity sector than with operating support, this does not hold for the heating and cooling sector.

Tender design: In terms of tender design, we recommend defining the auctioned good and its volume in terms of capacity (MW) for all RES-E and RES-H support windows, in line with internationally established practice. Alternatively, the total auction volume may be defined in terms of budget and capacities may be tendered until the budget is depleted or in terms of energy generation. Multiple-item auctions, whereby a divisible good such as capacity, energy or a budget is awarded and support is allocated to several bidders at sites selected by the latter, are generally preferable in the technology-neutral and technology-specific window, where individual projects are usually smaller in size than the targeted overall volume of a tender round. For the project-specific support window, we recommend the use of single-item auctions, whereby several bidders compete for one project or one site that is usually pre-developed by the auctioneer to a certain extent, i.e. only one winner exists. In principle, static auctions are easier to implement than dynamic auctions. In line with the Governance regulation, tender rounds should primarily implement price-only ranking of projects. However, we recommend that in the project-specific window, additional qualitative ranking criteria may be implemented. Technology-specific ceiling prices in each of the mechanism's support windows will avoid excessive support costs and too high bids. The use of uniform ceiling prices across Member States should be the default option to maintain simplicity of the design. Auctions should be implemented as late auctions to ensure quick project realisation. We advise against the implementation of European Union-wide material pre-qualification requirements as part of the mechanism due their lack of comparability across participating countries. Alternatively, we recommend the sole use of adequate financial guarantees (bid bonds) and penalties to select serious bids and ensure project realisation.

Support for RES-Heating and cooling and RES-Transport sectors: Support under the mechanism should not be restricted to the electricity sector but include the heating and cooling and transport sectors, as this allows Member States to tap into unused RES potential. There is no structural difference in the functioning of the mechanism to tender support for the deployment of renewables in all three sectors, electricity, heating and cooling, as well as the transport sector. However, tenders must be carefully designed for heating and cooling, as well as the transport sector, since they are less

common in these sectors, especially in the case of smaller units. Investment support is common in heating and cooling, which makes this form of support more suitable for this sector.

Project-specific tenders may be the most suitable solution to organise tenders in the transport sector. However, since key technologies in RES-Transport (RES-T) are still in early stages of market development and various accounting issues are not yet fully solved, the transport sector currently presents limited potential for the mechanism's objective of simple and low-cost RES expansion. In the future (towards the mid-2020s), legal clarity on RES-T accounting should be established, therefore, actual consumption from RES-T infrastructure will be more predictable and consumption monitoring should be more advanced. In this case, RES-T tenders could become a more suitable and attractive option for the mechanism to fulfil its objectives. A cross-sectoral approach can be taken for single technologies that have an end-use in various sectors, such as solar CHP, or biomass.

Summary of support scheme design: The envisaged design of the support scheme ultimately depends on the objectives of the participating Member States. The specific design set-up would be valid for one auction round and thus for all winning projects in that auction round, and will be decided by the European Commission together with the Member States.

If ease of practical implementation is the focus, the technology-specific window may be implemented, and RES-E technologies may be selected to start with, as these are used in tenders across the European Union. The tendered item would be MW, in line with established practice in the Union. The type of support would be, in contrast to the dominant practice on national level, investment support to avoid the challenges related to implementing operational support over a longer time-period via the mechanism. The ease of practical implementation may be a particularly relevant objective when organizing tenders under the mechanism due to its overall administrative complexity and challenges pertaining to the necessity of swiftly implementing such tender rounds.

If the effective delivery of the gap-filling obligation under the Governance Regulation is the key objective, Member States and the Commission may opt to conduct auctions under the technology-neutral-window, in which case the tendered item should be defined in terms of energy volumes, i.e. MWh (due to the ex-ante security for participating Member States regarding the attribution of statistical benefits) and providing operating support (given that investment support is not feasible here as investment costs per capacity unit differ between technologies). Moreover, the tendering of energy volumes would have to be combined with banking and borrowing options to keep volume risks manageable for variable RES technologies. Nonetheless, this design set-up entails major risks for projects having to commit to the delivery of certain energy amounts, which may in turn result in higher bid prices and thus support costs. At the same time, international experience with this design option is relatively scarce. As an alternative, we therefore recommend a more well proven design option to effectively ensure the delivery of the gap-filling function, namely the implementation of technology-specific tenders, preferably with well-known technologies. The tendered item may be expressed in MW and either operating support or investment support may be provided.

If cost-effectiveness is key, the design package would combine the technology-neutral window to introduce competition between technologies with a tendered item defined as MW. It would need to be combined with operating support as investment support does not automatically account for the differences between technologies in terms of full-load hours generated, which may reduce its cost-effectiveness compared to operating support. More specifically, it would need to be implemented with a fixed premium to make use of the best market values next to RES potential, even though this would increase cost of capital compared to a floating premium. A simpler option to maximise cost-effectiveness may be to implement the technology-specific window and focus on a least-cost technology. The tendered item may be expressed as MW and investment support may be implemented.

Local market conditions and the level playing field: Local market conditions and regulatory frameworks impact the competitiveness of projects from different hosting Member States. Member States may seek to create a level-playing field between their markets. But aligning all market and regulatory conditions is unrealistic and not desirable with the means currently available for setting up the financing mechanism (from a legal perspective, mainly an implementing act under the Governance Regulation). One option may be to adjust the tender bids according to the distortive

effects that they are exposed to. However, we suggest avoiding such adjustment given that the exact estimation of the distortive effects is burdensome and related to uncertainties. More importantly, the cost-effectiveness of support allocated through tenders will improve if the tender participants are fully exposed to these conditions and their cost impacts.

To avoid disadvantages for countries with structurally high cost of capital, providing access to financial instruments is the most suitable option. In addition, the tender needs to be designed in a way that does not discriminate against projects in certain hosting Member States in a structural manner.

Determining the financial contribution of participating Member States: The process of determining the size of the contributions of the Member States to the mechanism is primarily bound by the condition that the EC cannot pre-finance Member States' contributions. Member States, however, need to know the budgetary implications of their participation in a specific tender round of the mechanism before making financial commitments. These conditions require to establish *ex-ante* a "maximum price" for the participation. For each tender the EC needs to calculate a maximum price per MWh (or per MW per technology) and share it with the Member States before they commit to the mechanism. As estimating a maximum price is only possible once both the level of supply and the level of demand are known, we suggest applying an iterative process per tender round that makes the conditions of participation transparent before contributing Member States enter into binding commitments.

Allocation of costs and benefits: Article 33 (5) of the Governance Regulation stipulates that "every year, renewable energy generated by installations financed by the mechanism shall be statistically attributed to the participating Member States, reflecting their relative payments". Statistical benefits will only be attributed to the non-repayable forms of support, i.e. grants. We suggest that the allocation of costs and benefits is limited to the re-distribution of statistical RES benefits in return for financial contributions.

The rules on the allocation of statistical benefits need to ensure that both contributing and hosting Member States have an incentive to participate in the mechanism. To account for the fact that hosting Member States give up part of their domestic RES potential and may bear costs for integrating such installations in their system, we suggest providing for a splitting of statistical benefits between contributing and hosting Member States. The splitting rule may be adapted per tender and/or technology, but it needs to be clear to all participants before they enter a binding commitment for a specific tender. Ideally, in each tender round the same splitting rule should apply to all host countries. For example, a flat rate split that applies across all Member States could be suggested at the beginning of the consultation with hosting countries (e.g. 80/20, whereby 80% of the statistical RES benefits are transferred to the contributors and 20% are retained by the hosting countries). This split may be renegotiated per auction round. Whether or not a flat rate split or individual splits per host country will be applied in a specific tender round depends on the potential to reconcile deviating views by the Member States. Differentiated splitting rules may be more acceptable to hosting countries but reduce the transparency and efficiency of the mechanism. For the tender this implies that bids are ranked and awarded on the basis of "€ per MWh transferred to the contributing Member State" to guarantee cost-effectiveness from the contributors' perspective.

Methodology for the sharing of additional system costs in host countries: System costs should not be calculated and compensated on an individual cost-basis, as this would be burdensome and not reflect the host countries' willingness to sell. Instead, the share of the statistical RES benefits that are retained by the host country ("splitting rule") should be regarded as a compensation. This splitting rule reflects the host countries' selling price rather than their actual system costs. If the requested share is too high, it will not be acceptable to contributing Member States, i.e. supply and demand cannot be matched. Independent of the statistical compensation, host countries may internalise system cost to RES projects through their regulatory framework. This particularly applies to grid extension and reinforcement costs that can be internalised through deep connection charges (i.e. RE projects are charged the entire costs for grid connection, extension and reinforcement related to the project), even though such charges reduce the attractiveness for RES project developers and the competitiveness of the respective projects in the tender relative to RES projects in other host countries.

Private sector contributions: The mechanism mentions “private sector contributions” that may contribute to the enabling framework function. They may take the form of direct contributions to the mechanism by the private sector. In this case, RES target achievement based on these payments will not count towards Member States’ contributions but genuinely towards the overall European Union RES share. Private sector contributions may also be related to power purchase agreements (PPAs). PPAs can contribute in three ways. First, unsubsidised PPAs effectively address the revenue gap (if it exists at all) and revenue stability and, as a result, additionality. Second, PPAs with previously subsidised installations can ensure that RES installations running out of support after 15 or 20 years continue operation, thus keeping capacities online and operational. Third, subsidised PPAs can support new RES installations by improving revenue stability for projects receiving fixed premiums or upfront investment support. Therefore, the amount of support required can be reduced. Such contributions may be incentivised by a Union-level RES sourcing label, confirming the sustainable and European Union engagement of the company providing either direct contributions or sourcing energy from an installation. In this case, the label would have to clearly state what the contribution was by the company using it and which share of the RES production is based on this contribution. Such a label may be developed by the European Commission, as Article 19 of the REDII provides for the development of such a label.

Practical implementation and process: With a view to the management and the implementation of the mechanism, procedures and the distribution of responsibilities need to be contractually determined between the European Commission and hosting Member States (and potentially third countries) to ensure that responsibilities and liabilities are properly defined between all parties involved and to ensure a smooth functioning of the mechanism. These arrangements mainly relate to the monitoring of project implementation, the disbursement of support payments (in the case of operating support) and the collection and transfer of production data. In general, the distribution of responsibilities can follow a more decentralised approach (i.e. mainly national bodies are responsible for a specific task) or tasks can be centrally controlled at European Union level. Regarding the collection and transfer of production data, it is advisable to make use of (or align with) procedures that are already established at national level to the extent possible. The responsibility for the awarding of bids and the disbursement of funding should lie with the European Commission or a responsible implementing agency.

In addition, minimum elements need to be contractually defined as part of the binding commitments with hosting and contributing Member States intending to participate in specific tender rounds under the mechanism. Host countries need to contractually commit to the European Commission to allow projects located on their territory to receive support under the mechanism, including potential restrictions (e.g. in terms of sites and maximum capacities) as well in terms of the allocation of statistical benefits (i.e. the share of statistical benefits to be received). Contributing Member States must at some point enter into a binding contractual agreement with the European Commission regarding their financial contribution defined in terms of budget, capacities or generation amounts (on the basis of the previously announced maximum price), as well as regarding the allocation of RES statistics.

With a view to processes, we recommend a procedure following several stages: the elaboration of multiannual work programmes, the tender preparation, including an expression of interest phase and the binding commitments of participating host and contributing Member States (also informing updates of the work programmes), the actual tender implementation as well as monitoring of project implementation, accounting of statistical benefits and support payment disbursement.

Expert meeting: An expert meeting was held during the project with industry and Member State representatives. Industry stakeholders and Member States commented on a range of issues, including on impacts of project failure on the reported RES statistics, the distribution rules for the RES statistics (who decides and what to do with system costs), the issue of respecting different market and regulatory conditions in the various markets, the use of European Union funds for the mechanism, support for sectors other than electricity and various other elements.

Moreover, Member States addressed in detail the issues of tender design, types of support, the allocation of costs and benefits and the sector and technology focus of the mechanism. Member

States expressed their technical preferences and views during the interactive sessions. Feedback form the meeting was carried through into all tasks.

1. INTRODUCTION

1.1 Policy context

In the 2030 framework the European Union has established a binding European Union-wide RES target of at least 32% in gross final energy consumption by 2030. This target is not the sum of national binding RES target, rather it is to be achieved through voluntary contributions of Member States. Achieving the binding European Union target and respecting Member States' political will to establish non-binding national contributions (in contrast to binding national targets) requires a smart and robust governance system. A key element to support and to ensure that the target achievement at Union level is the "Union renewable energy financing mechanism" (the mechanism) as provided in article 33 of the Governance Regulation (EU 2018/1999).

According to the regulation, the mechanism fulfils two functions: first, the mechanism can fill a potential gap between Member States' contributions and the binding European Union RES target. It relates to the 'delivery gap' between actual RES deployment in the European Union Member States and the indicative European Union renewable energy trajectory (leading to at least 32% RES in gross final energy consumption by 2030). The delivery gap-filler is a corner stone of making sure that the binding European Union target is effectively met in a system based on voluntary contributions by Member States and it operates next to a range of other elements of the governance, such as the National Energy and Climate Plans (NECPs) submitted by Member States, their assessment, subsequent recommendations and progress monitoring. The basic functioning of the mechanism is that Member States can make voluntary payments to the mechanism and the mechanism subsequently implements tenders for RES support.[1] The resulting RES target statistics are then transferred from the various host Member States to the contributing Member States, thereby counting towards their European Union target contribution. Support provided within this function of the mechanism will be grants (as investment support or operating support).

Second, the more broadly defined function of the mechanism is to contribute to the enabling framework as defined in Article 3 of the new Renewable Energy Directive (EU Directive 2018/2001) (REDII). This enabling framework extends well beyond the Governance Regulation and the mechanism itself and includes the use of existing and new European Union funds with a focus on reducing the cost of capital, projects to integrate RES into the energy system, grid infrastructure and enhancing regional cooperation. Under this function, the mechanism can receive voluntary payments from Member States but also private sector contributions. Support under the enabling framework function will mainly comprise financial instruments (low-interest loans, junior loans, guarantees) available to projects applying in national tenders or tenders under the financing mechanism upon prior assessment of their financial viability. At the same time, the enabling framework may also provide grants based on voluntary payments made by Member States, resulting in practical terms in an overlapping instrument with the gap-filling function.

As a result, the practical implementation of the two functions will not differ significantly because the way in which funds are collected, projects are awarded support and support payments are disbursed does not differ in each of the functions.

Ultimately, Member States have various options to implement their planned contributions, including:

- National RES deployment, resulting from nationally organised support schemes or RES installations being built without support.
- Cooperation mechanisms, i.e. statistical transfer (and the Union renewable development platform) according to Article 8, joint projects between Member States according to Article 9, joint projects between Member States and third countries according to Article 11 and joint support schemes according to article 13 of the REDII.

[1] Note that the report refers to "tender" and "auction", always meaning "competitive tender".

- The Union renewable energy mechanism according to article 33 of the Governance regulation.

Thus, the mechanism is one of several options for Member States to deliver their planned contributions to the European Union RES target. As a result, the mechanism has to be more attractive for Member States compared to the other options to be effectively used. Its attractiveness depends mainly on its ability to effectively reduce support costs, its ease of use and its reliability.

The proposed design aims to address these and other key challenges:

- **Keeping transaction costs limited:** The implementation of a new support scheme spanning across (potentially all) Member States will necessarily induce initial transaction costs, e.g. to set up the required legal frameworks between the mechanism (i.e. the European Union and the European Commission) and the participating Member States. In the subsequent and repeated implementation of the mechanism, additional transaction costs will occur, for instance, to identify preferences, implement the tender, monitor its outcomes, etc. We suggest a practical implementation that limits these transaction costs to the extent possible. One example is the use of existing national entities and established processes for the monitoring of projects and transfer of information such as production data.
- **Providing flexibility to reflect Member State preferences:** Many choices on how to ultimately implement the mechanism in tender rounds depend on the preferences of the participating Member States. At the same time, some of the design options interact with each other and may result in adverse effects (for instance, on efficiency or effectiveness). Against this background, we propose different design options, identify the functioning and impacts of each design option and relate them back to the objective that Member States may relate to the use of the mechanism. We provide, clear recommendations for specific design options where these are independent from individual preferences and at the same time we ensure full coherence between the multiple design options and resulting recommendations where they depend on preferences.
- **Ensuring applicability across Member States:** RES support schemes are so far mainly applied within the boundaries of national legislation. They have been applied in a cross-border context only with exception (e.g. the German-Danish PV tender) and so far not in a multilateral (rather than bilateral) context. As a result, the design needs to be able to work in practical terms for all Member States wishing to participate as a contributing or hosting Member State (or in a mixed role). In our recommendations we aim for full applicability of the proposed design to all Member States in the recommendations on the support scheme design (i.e. form of support and tender design) as well as in the practical implementation. One example is avoiding material pre-qualifications but recommending financial pre-qualification requirements in the tender design, which is applicable across Member States.

1.2 Structure of the project and of the report

The objective of this project is to assist the European Commission in preparing the implementing act foreseen by Article 33 (4) of the adopted Governance Regulation. This implementing act will set out the provisions necessary for the establishment and functioning of the mechanism. The specific objectives of the contract result directly from the Governance Regulation and include assisting the European Commission in (see Figure 1 Structure of the project):

- Defining the general structure of the mechanism, including its legal and financial form, its areas of intervention and the form of support provided (Task 1)
- Deciding on the design of tenders for the allocation of support (Task 2)
- Defining methodologies for calculating contributions to the mechanism and allocating the statistical benefits of participation in the mechanism (Task 3)
- Deciding on practical implementation issues, such as management of the mechanism, implementing bodies, and processes (Task 4)

- Organising an expert meeting discussing main issues related to the implementation of the mechanism (Task 5).

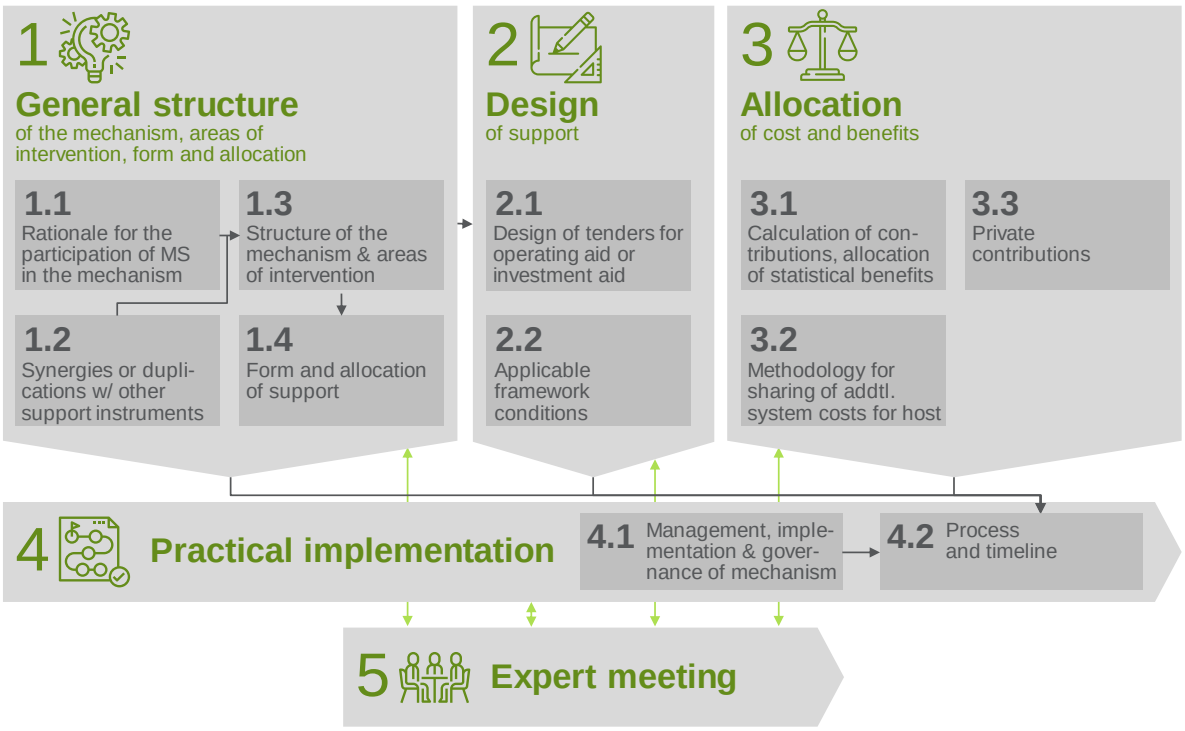

Figure 1 Structure of the project

The report structure deviates to some extent from the order of tasks as provided in the terms of reference. This restructuring aims to reflect the outcomes of the project.

The next chapter explains the structure of the mechanism, the rationale for the participation of Member States and synergies and duplications with other support instruments (at Member State level as well as at European Union level). Chapter 3 describes various aspects of the design of support, namely the form of support (grants and financial instruments), the detailed tender design and support for sectors other than the heating and cooling and transport sectors. The chapter includes a discussion of which main objectives of participating Member States may lead to which support scheme design and closes with an assessment of applicable market conditions. Chapter 4 discusses in detail the allocation of costs and benefits, paying specific attention to the calculation of contributions to the mechanism and allocation of statistical benefits (including additional system costs). The chapter also discusses the role that private sector contributions may play in the mechanism. Chapter 5 elaborates in detail on the practical implementation of the mechanism, including its management and governance as well as the required processes and resulting timelines. Chapter 6 recaps the format of the expert meeting which was implemented on 13 June 2019. The outcomes of the workshop have informed the final work on all previous chapters. The report closes with a short conclusion (a summary of the outcomes and recommendations is to be found at the beginning of the report).

2. GENERAL STRUCTURE OF THE MECHANISM, AREAS OF INTERVENTION, FORM AND ALLOCATION OF SUPPORT (TASK1)

2.1 Structure of the mechanism and areas of intervention (Subtask 1.3)

2.1.1 Basic function of the mechanism

Article 33 of the Governance regulation introduces the European Union renewable energy mechanism: its core is "to tender support for new renewable energy projects in the Union". The basic functioning is based on Member States making voluntary financial contributions to the mechanism. The mechanism subsequently implements a tender and thereby determines support levels and allocates support to projects in host Member States (or third countries acting as host countries under Art. 11 of RED II). The host Member States transfer the RES target statistics from these RES installations back to the mechanism which then redistributes the RES statistics to the contributing Member States according to their share in the financial contributions used in the respective tender round. The RES statistics are thus pooled per tender round (see Figure 2 for an overview of the basic functioning of the mechanism).

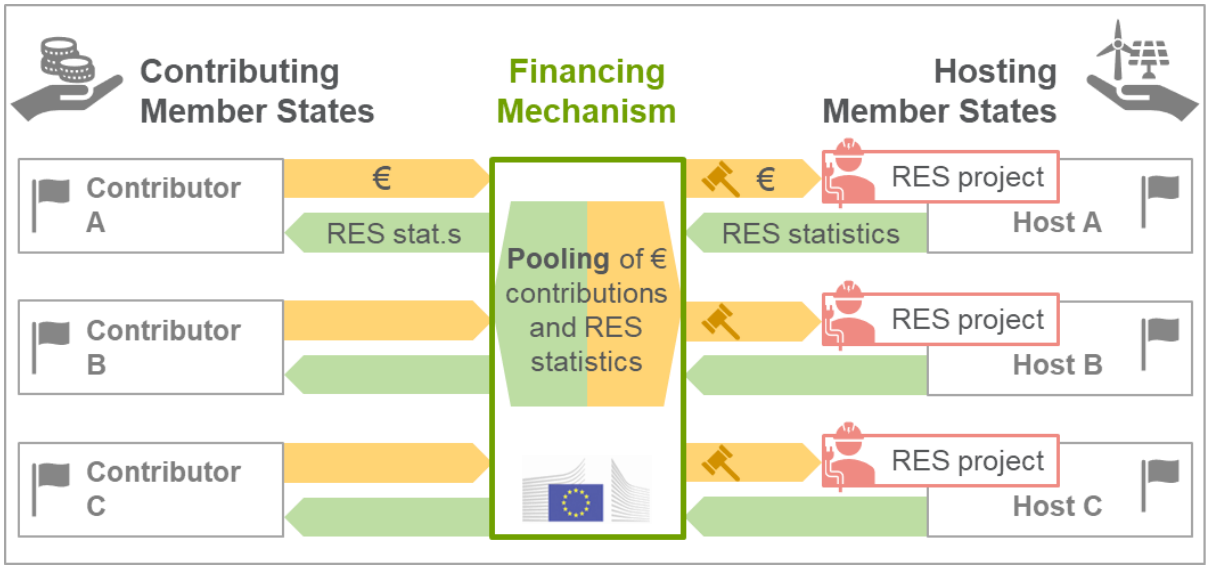

Figure 2 Basic structure of the mechanism

Article 33 introduces two basic functions of the mechanism: the "gap filler" function and the "enabling framework" function. The gap filler is activated in case Member States' collective contributions do not add up to the European Union RES target of at least 32% RES share in final energy consumption in 2030 (or to the reference point before that). The enabling framework function can be activated regardless of any gap, depending on the availability of funds. It may be used by Member States in the same manner as the gap filler, i.e. to implement tenders on their behalf, based on voluntary financial contributions. Ultimately, both functions will not be clearly distinguished in the implementation of the mechanism: in practice, a tender implemented by the mechanism may serve both functions at the same time and thus provide RES target statistics for Member States to fill a gap, to avoid a future gap or to simply fulfil their national target contribution through the European Union-wide mechanism.

The mechanism will primarily provide grants (i.e. non-repayable forms of support) which directly trigger RES investments and which result in the transfer of RES statistics (see for an overview Figure 3). The source for non-repayable support will primarily be voluntary financial contributions from Member States. In addition, the fund may also receive funding from other European Union funds (such as Connecting Europe Facility / CEF or others). Moreover, it may act in a coordinated manner

with other funds, e.g. the Innovation Fund, to allow for coordinated calls for proposals. However, whether other funds are available to provide grants under the mechanism is unlikely, as those funds in principle do not foresee such contributions[2] (for a detailed discussion of options for leveraging existing or new European Union programmes, see section 2.3.2). Moreover, private sector contributions may be used in the mechanism to finance tenders for RES support (see section 4.3 for options to incentivise private sector contributions to the mechanism).

In addition, the mechanism may provide or be linked to financial instruments (i.e. repayable forms of support), such as low-interest loans, junior loans, and guarantees, available to projects upon prior assessment of their financial viability. On the one hand, European Union funds, voluntary Member State contributions or private sector contributions may be incorporated into and used by the mechanism (which appears to be unlikely in the case of financial instruments). On the other hand, the mechanism may coordinate with existing and new European Union programmes (as in the case of grants). For a more detailed discussion on options for leveraging existing or new European Union Programmes for the mechanism, see section 2.3.2.

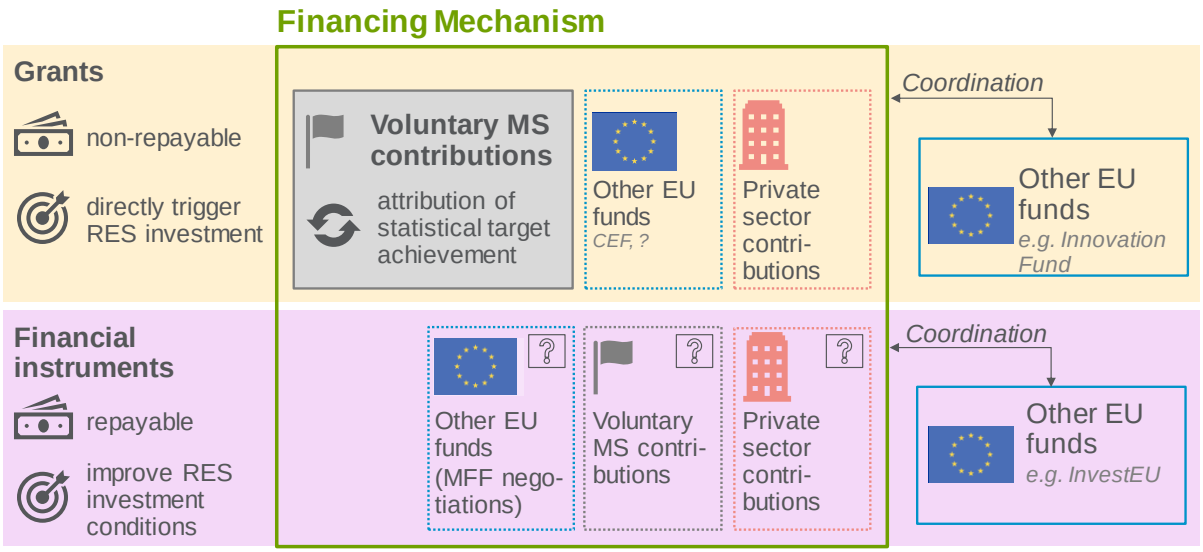

Figure 3 Overview of types of support and potential funding sources for the mechanism

The European Commission's proposal for the multi-annual financial framework (MFF) for the period 2021-2027 does not include any option to structurally incorporate existing or new funds into the mechanism. At the time the MFF was proposed, the Governance Regulation had not been agreed and adopted. The option of transferring funds other than voluntary contributions from Member States into the mechanism would have to be introduced by Member States and agreed upon in the ongoing co-legislation procedure of the MFF. If this option is not included into the MFF, the mechanism will remain with the option to coordinate (to varying degrees) with the existing and new funds.

[2] An exception is the agreed CEF regulation, which states that "in the absence of sufficient market uptake of cross border renewable energy projects", CEF funds "may be used to co-fund the Union renewable energy financing mechanism".

2.1.2 Technology windows

The mechanism includes various technology-windows: a technology-neutral window, a technology-specific window and a project-specific window (see for an overview of the windows Figure 4).

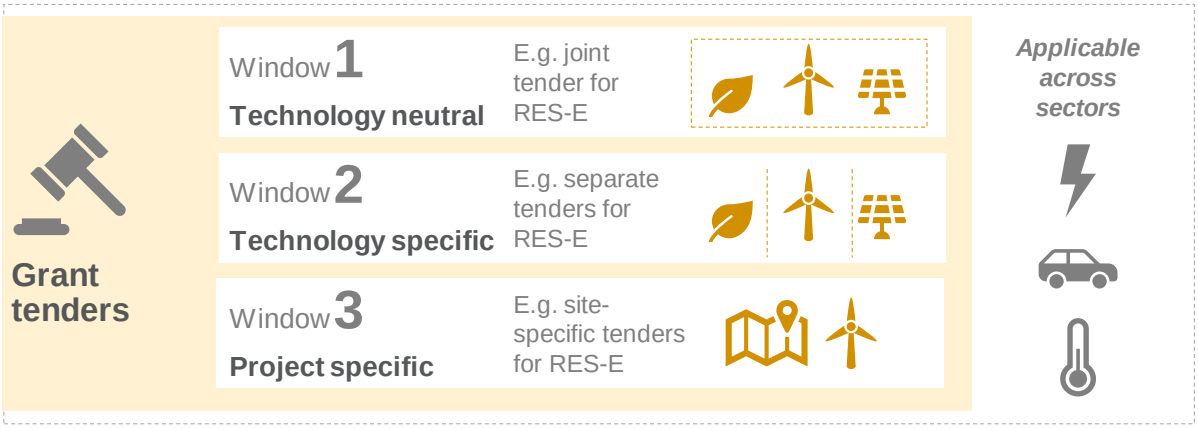

Figure 4 Overview of windows

In the **technology-neutral window**, projects are selected on a least-cost basis organised in tenders. All RES technologies as defined in the RED II would in principle be eligible. This window includes the options to allocate support across the sectors electricity, transport and heating and cooling or to allocate support across technologies but within each sector ("end-use specific" tender). The key objective of the technology-neutral window is to maximise cost-effectiveness of RES support.

In principle, the technology-neutral window creates competition between technologies and may improve the efficiency of support provided. However, if tenders are introduced across sectors, the comparability of bids from various sectors may be difficult. This occurs mainly in two cases:

- The value of each kWh in the heating sector is lower compared to the electricity sector due to different exergy levels: electricity can be fully converted into heat, but heat cannot be fully converted into electricity.
- In the case of upfront investment support, comparability of bids is challenging even within each sector: investment costs per capacity unit differ substantially between technologies. As a result, the technology with the lowest specific investment cost would win, but it may produce less energy than a technology with higher investment costs, resulting in higher support costs per energy unit and increased uncertainty regarding the energy output. This problem could be solved by tendering operating support or by requesting the delivery of certain energy volumes, even though the latter seems problematic for other reasons (for a more detailed discussion of different forms of grants and their applicability for each of the windows, see section 3.1.1 and the design of tenders in section 3.2).

In addition to that, technology-neutral tenders across sectors entail an increased risk of windfall profits for relatively cheaper technologies.

In the **technology-specific window,** tenders for specific technologies, technology classes or technology types are implemented. It may focus on technologies which are most acceptable to the participating Member States, for instance to ease the system integration of the respective RES capacities in host Member States. In addition, this window may support less mature technologies and thus support their market entry, even though it still triggers least-cost deployment per technology. The technology-specific window may also focus on least-cost technologies. While the technology-specific window does not introduce competition between technologies – and in principle also not between sectors –, it may avoid some of the adverse effects and uncertainties discussed under the technology-neutral window (especially when upfront investment support is implemented). Single technologies that potentially have an end-use in various sectors can be auctioned technology-specific and across sectors. Such approach in the technology-specific window could explicitly be considered for solar CHP, biomass CHP, or geothermal which can be used to supply both electricity and heat. Combined

use-cases, where a project delivers both electricity and heat can for example support the uptake of renewables' technologies to supply industrial processes.

In case of the **project-specific window**, projects would be selected according to the lowest bid for a specific site or project configuration. In the case of selection between different projects and different sites, the lowest bid per type of project or the best (multi-criteria) cost-benefit ratio would be the deciding factor.[3] Project-specific support most likely aims for supporting large-scale projects of strategic relevance (related to innovation, European Union technology leadership, etc.). It may also be the most suitable solution to organise tenders in the heating and transport sectors (see more details on support for sectors other than electricity in section 3.3). Specific tenders under the project-specific window may also focus on facilitating sector coupling and thus combining technologies from different sectors. One example of such a cross-sector approach under the project-specific window would be the use of renewable electricity generation capacities for direct electrification of nearby mobility solutions.

Recommendation

The selection of the technology window largely depends on the preferences expressed by contributing and hosting Member States. In the case of the technology-neutral window, we recommend limiting the technology-neutrality to sectors and technologies which are comparable (i.e. not across sectors). In the technology-neutral window we recommend not applying upfront investment support (see below).

2.1.3 Options to locate the mechanism

Based on discussions with the European Commission, several options have been elaborated to "locate" the mechanism in the European Union funding landscape:

- Option 1: New fund outside of MFF
- Option 2: Funding line within MFF
  - Option 2a: part of CEF
  - Option 2b: new funding line
- Option 3 (fall-back only): Light structure - pure match making mechanism

This section provides a quick and high-level assessment of pros and cons of each of these options. This short discussion serves to introduce the options and to enable brief assessments of whether the embedding has any impact on subsequent design options of the mechanism (e.g. in terms of form and allocation of support, tender design, etc.).

Option 1: New fund outside of MFF

The fund may be located "outside" the MFF and thus become a budget independent from the MFF procedures and negotiated allocations. In this option, the fund may receive contributions from Member States, potentially from the MFF and the private sector.

The advantage in this option is that it would be very flexible: the design of the mechanism and the underlying rules for allocation of support can be specifically tailored to the needs of the mechanism. In addition, the fund might be decided on and administered by the European Commission DG Ener, which is going to play a key role in implementing the mechanism and support RES target achievement.

[3] Note that the Governance regulation requires in Article 33 an allocation of support to "projects bidding at the lowest cost or premium". For the project-specific window we recommend, if legally feasible, to include in the implementing act the option to also make use of additional evaluation criteria where applicable.

A challenge when setting up the mechanism out the MFF is that setting up a new legal structure for the fund includes significant transaction costs; the related procedure is lengthy and burdensome compared using existing legal structures. The option is not practical given the envisaged timeline, i.e. to provide a design of the mechanism still under this Commission and to have the mechanism in place and ready to operate as of 1 January 2021 (as requested in the Governance regulation).

Option 2: Funding line within MFF

If located within the MFF, the mechanism may be located in the Connecting Europe Facility (CEF) regulation (and thus the related budget line) or in a new budget line.

Option 2a: Part of CEF

If embedded into the CEF, Member States may provide voluntary contributions on top of their regular contributions via the MFF as external assigned revenues.

The advantage of this approach would be that the mechanism would be fully embedded in existing CEF rules and the subsequent specific rules defined in the Implementing Act. There would be no need to design rules from scratch (as in a newly set up fund).

The major challenge would be that existing CEF rules may not be suitable for the mechanism: the CEF regulation focuses on a procedure to allocate grants based on a thorough project selection procedure which is informed by a full cost-benefit analysis for each project. It does not refer to "tendered support", i.e. it does not include a market-based mechanism to determine support levels (as requested in the Governance regulation), but it is founded on a cost approach, whereby the level of support is administratively determined based on transparent cost elements. In addition, the CEF regulation does not mention financial instruments.

On 8 March 2019, the European Parliament and the Council reached a common understanding on the proposal for a revised CEF Regulation for 2021-2027, which does not make reference to the mechanism being embedded in the CEF fund.

Option 2b: new funding line

A new funding line (similar to CEF but potentially with less financial volume at first) could be established in the MFF. This would require a Member State to propose this additional funding line in the ongoing MFF negotiations, as it has not been part of the Commissions MFF proposal.

The advantage is that, depending on the political will of Member States, substantial MFF volumes might be reserved for the mechanism, circumventing the dependence of the mechanism on unused CEF funds. Moreover, the additional inflow of money into the mechanism (from CEF, from other MFF parts, through additional contributions by Member States, from the private sector) might be more flexibly used than if embedded into the CEF. Also, the rules for project selection and the design of support may potentially be drafted specifically for the context of the mechanism, thus following rules provided in the financial regulation but avoiding limitations implied by the CEF regulation.

A challenge is that it is unclear whether political will exists among Member States to establish a new funding line in the MFF. In addition, rules of the financial regulation would have to be followed, allowing for more flexibility than the CEF regulation, but still implying limitations as to how quickly Member State contributions would have to be used and under which conditions.

Option 3: Light structure – pure match making mechanism

In the case that none of the previous options can be realised, the mechanism might still serve as a match-making platform, however without any direct financial implications. In this case financial flows would stay entirely between Member States and projects.

On the one hand, this option is the easiest and least complex one to implement. Even in this very light version of the mechanism it might add value by creating transparency around demand and supply for cooperation between Member States. On the other hand, such a light version would not fully implement the initial concept of the mechanism and would rather represent a modest enhancement of the Cooperation Mechanisms. Such a version of the mechanism might not be attractive to Member States and private contributors as its added value would be very limited.

Recommendation

We recommend option 2b, i.e. locating the mechanism in a newly established budget line in the upcoming MFF.

2.2 Rationale for the participation of Member States in the mechanism (Subtask 1.1)

The objective of this sub-task is to analyse and present key motivations and benefits for Member States to participate in the mechanism. This section also explores barriers related to the participation in the mechanism and, where possible, how they can be overcome. In our assessment structure we largely conflate the two functions mentioned in the Governance Regulation, i.e. the gap-filling function and the enabling framework function: we assume that in terms of the design of the mechanism the largest differences appear based on motivation for Member States to participate (to fill a gap or to avoid it). This also entails that tenders allocating grants are generally organised to serve the two functions simultaneously, i.e. both those Member States participating to fill a gap as well as countries aiming to contribute outside any gap-filling obligation may participate. More specifically, this chapter analyses rationales and barriers to participate

- as contributing Member State, i.e. paying into the mechanism (section 2.2.1);
- as hosting Member State, i.e. hosting projects supported by the mechanism on its territory (section 2.2.2);
- in a mixed role, i.e. as contributing and hosting Member State (section 2.2.3).

For the first two categories, we will further differentiate our assessment based on whether the mechanism allocates grants or financial instruments. If applicable, the assessment additionally differentiates between whether the gap-filler and/or the enabling framework function is used.

2.2.1 Contributing Member States

Potential benefits

There are various benefits related to participating in the mechanism as a contributing Member State (which constitute the key rationales):

RES attribution for each € paid: The first and obvious benefit of contributing to the mechanism is to receive RES statistics, counting towards the contributor's national RES share.

Access cost-effective RES potentials and resulting support cost savings (compared to national deployment): Accessing RES potentials in other Member States may lead to support cost savings compared to purely national RES deployment. Member States may be ambitious in their planned contributions to the European Union RES target and their back-up benchmark may suggest such ambition, for instance, if a Member State has a comparably high GDP per capita. In addition, the likeliness of effectively accessing cheap RES potential in other Member States is higher when using the mechanism rather than relying on individual cooperation mechanisms, given that the traditional cooperation mechanisms have proven to be burdensome to implement. In addition, through the

mechanism, various host countries (and their RES potential) may be available rather than only individual cooperation partners.

Contributing Member States may also benefit from the European Commission's (or a respective implementing body's) better credit rating compared to their own rating in case they participate in the mechanism, potentially further decreasing the cost of support. In addition, the potential use of financial instruments (loans and guarantees) in the framework of the mechanism may further decrease the required support costs, thereby maximising this effect.

Lower transaction costs (compared to the individual cooperation mechanisms): The mechanism directly competes with other options as these Member States may either choose national RES deployment, implement cooperation under the individual Cooperation Mechanisms, and/or use the Union renewable development platform for Statistical Transfers (Art. 8 of the REDII). The mechanism is a potentially attractive option, if it is designed in a way that it is easy-to-use. The mechanism can reduce transaction costs compared to the traditional cooperation mechanism, given that it does not require a bilateral or multilateral negotiation of, for instance, support schemes, allocation of costs and benefits and contracts.

Compliance with 2020 baseline: The Governance Regulation states in Article 32(4) that from 1 January 2021 onwards the RES share shall not fall below the 2020 target. According to the most recent renewables progress report, this is not ensured for all Member States.[4] This may constitute a relevant rationale for some Member States to consider participating in the mechanism, since an adequate financial contribution to the mechanism meets the requirement of Article 32(4) for Member States to take additional measures and, therefore, may be a suitable solution to stay above the baseline.

Solution for the requirement of opening support schemes (to be confirmed by the Commission): The approval of RES support schemes in various Member States by the Commission (in particular DG Competition) is related to the condition of partially opening their support schemes for installations abroad. The Commission has stated at various occasions that adequate contributions to the mechanism may serve as a way to fulfil this condition.

Addressing adverse developments in Member States: Participating in the mechanism may be necessary in case certain developments and/or structural challenges make national RES deployment more challenging than anticipated, such as negative trends in local planning and permitting or macroeconomic developments impacting a country's general economic situation and its energy demand. For instance, an increase in energy demand due to economic growth above initial expectations may trigger participation.

Potential barriers

Lack of political acceptance: A key barrier to participate in the mechanism as a contributing Member State may be the lack of political acceptance. Supporting RES deployment outside of its national territory and missing the benefits of domestic RES deployment has been a barrier for participating in the cooperation mechanisms in the 2020 framework. This barrier can be expected to be relevant for the mechanism as well. The two remedies in this respect are, first, to explore the benefits of contributing to the mechanism (mainly support cost savings and legal compliance) and to communicate them clearly throughout the process. Another option is to participate in a mixed role (i.e. as a contributing and hosting Member State), see section 2.2.3.

Transaction costs: Another barrier results from transaction costs incurred when participating in the mechanism. Transaction costs may result from identifying and communicating exact preferences for the participation in the mechanism, setting up the legal framework between the mechanism and the Member State, implementing legal changes on national level to allow for the participation in the

[4] See Ecofys (now Navigant), Eclareon, Fraunhofer ISI, TU Wien 2018: Final Report: Technical assistance in realisation of the 4th report on progress of renewable energy in the EU, available at: https://ec.europa.eu/energy/sites/ener/files/documents/technical_assistance_in_realisation_of_the_4th_report_on_progress_of_renewable_energy_in_the_eu-member_states-factsheets.pdf, accessed on 4 July 2019.

mechanism as well as the practical implementation on national level (making the payments, reporting the adjusted statistics, etc.). Hence, the limitation of transaction costs through a sufficiently simple design of the mechanism and its governance will be a crucial factor in overcoming this barrier. In any case, the transaction costs will be relative to the use of increased national RES deployment and/or the alternative use of the individual cooperation mechanisms.

2.2.2 Hosting Member States[5]

Potential benefits

The benefits of participating in the mechanism as a hosting Member State are similar to a domestically driven RES deployment, including*:*

Structural transition of national energy system: The long-term perspective defined in the Governance regulation (Article 15) is to fulfil the objective of the Paris Agreement. This requires, among other things, a decarbonisation of the energy system in each Member State. Adding RES capacities beyond the capacities triggered by national support schemes is an additional step towards this structural transition. This aspect may be particularly relevant in Member States which have to replace existing capacities in the short term, for instance, because of a planned coal phase-out or because aging energy conversion assets have to be replaced.

Modernisation of the local economy: A decarbonised energy sector (and more broadly, a decarbonised economy) implies structural economic changes. New and innovative business models have to be developed and implemented. Increasing the RES share beyond the national trajectories for the contribution towards the Union-wide 2030 target as outlined in the Governance Regulation helps moving faster towards this structural change. In concrete terms, participating as a host triggers additional investments in the respective Member State and has positive employment effects.

Greenhouse gas emission reductions: RES deployment reduces greenhouse gas emissions and the effect is increased if RES beyond national planning is deployed. Statistical and actual benefits from GHG emission reductions that result from projects implemented under the mechanism are not transferred to the contributing Member State(s), constituting a direct benefit for the host.

Reduced import dependency: RES deployment beyond initially planned volumes decreases import dependency by reducing the share of imports in total energy consumption and by diversifying energy sources.

Improved air quality: Especially when aging fossil fuel power plants are substituted with RES capacities, this usually leads to improved air quality. Participating in the mechanism as a host is thus likely to provide such effects beyond the initial NECP baseline.

Improved environmental security: RES deployment improves environmental security, especially in case (aging) nuclear capacities are replaced. Member States with aging Nuclear capacities may consider using the mechanism to replace those capacities.

Political cooperation: Hosting Member States may use their participation to foster political cooperation with other Member States, including to leverage their cooperation in other policy fields.

The major additional benefit of participating as a hosting Member State in this respect is that all the above-mentioned benefits come free of direct support costs, as these are fully paid for by the contributing Member State(s).

Potential barriers

[5] Or third countries acting as host countries according to Art. 11 of RED II.

At the same time, several challenges can be expected for hosting Member States to participate in the mechanism, potentially turning into barriers if not properly addressed.

Use of national potential for the mechanism: Tenders implemented by the mechanism may make use of a host country's RES deployment potentials. Potential sites are, as a result, no longer available for national deployment supported under a national support scheme and the national contribution to the EU target. Support costs for future domestic RES deployment may increase if a country decides to participate as a hosting Member State compared to a situation in which it simply relies on national deployment. However, participation in the mechanism is voluntary and Member States can define the volumes they want to participate with (also per year), the technologies they prefer to be built on their territory, the regions where to build RES, types of sites to be eligible for participation or even specifically identified sites. This tailored approach will allow Member States to maximise the benefits from participation and to minimise adverse effects.

System integration: Member States may experience system integration costs due to increased RES deployment. These costs relate to grid reinforcement/extension and - in countries with high RES penetration or structural gird congestion – increased re-dispatch costs. These costs may be reflected in the allocation of costs and benefits or internalised to RES projects (for a detailed discussion of allocation of costs and benefits, see chapter 4). Also, capacity additions resulting from the mechanism need to be adequately reflected in national infrastructure planning if they are significant.

Transaction costs: Hosts may experience some transaction costs related to setting up the legal and administrative framework and carrying out related tasks. This mainly relates to the monitoring and communicating of production data and potentially payments (only if payments are organised through national entities; for a detailed discussion of the required elements, see chapter 5 on the practical implementation). As the mechanism will create a learning curve on how those elements are implemented in the most efficient manner, transaction costs are expected to decrease over time. In addition, hosts will set up a framework when they first participate which can be used for subsequent rounds of tenders.

Lack of political and public acceptance: The elements discussed above may limit public and political acceptance of acting as a host and potentially induce resistance against additional RES deployment. By and large, these barriers can be addressed through regular and sufficient updates of planning instruments (i.e. NECPs and national infrastructure planning) and by an adequate communication strategy, including a clear communication of the net benefits of RES deployment combined with a proactive management of local concerns. For instance, national consultations should specifically assess the option to act as a hosting Member State.

2.2.3 Mixed role: participation as contributing and hosting Member State

A key rationale for Member States participating in the mechanism in a mixed role as contributing and hosting Member State may be to overcome some of the key barriers to participating as a contributing Member State alone, i.e. political resistance against financing RES deployment abroad. In this context, a solution could be to simply ensure that at least part of the deployment is realised on the contributing Member States' territory.

An additional rationale is the fact that a mixed role can be considered a truly cost-effective approach towards RES deployment: contributing financially without an ex-ante determination of plant locations would allow for the most cost-effective RES deployment throughout the European Union.

Apart from these efficiency gains, Member States may engage in a mixed role because it allows them to reconcile their participation in the mechanism with the pragmatic requirements of their political decision-making process. More specifically, the political discourse surrounding the participation in the mechanism is likely to include a compromise between those favouring a purely national approach towards RES deployment, i.e. through national support schemes, and others arguing for a truly European approach, i.e. payments into the mechanism without geographical preconditions.

A barrier for engaging in a mixed role can be seen in the fact that it might distort clear decisions on whether national RES deployment needs to be fostered or not. The above-mentioned rationale for exchanging direct national support for RES deployments with RES deployment triggered as part of the mechanism might be more complex to communicate to the public than simply transferring funds to the mechanism. Additionally, such an approach may be seen to undermine the national ambition level, which might receive substantial opposition from RES associations that are still largely organised nationally. Lastly, the possibility for circumvention of state aid decisions on national support schemes shall be excluded when Member States participate in a mixed role.

Whether a Member State chooses to participate in a mixed role is a matter of preferences and not something which needs to specifically overcome.

2.2.4 Overview of potential contributing Member States

Based on two specific benefits of and rationales for participation described above, several potential contributing Member States may be identified: meeting and maintaining the 2020 baseline and the opening of support schemes.

Potential negative deviations from the 2020 target as identified in the latest RES progress report[6] may imply a rationale to use the mechanism as a means to stay above the 2020 baseline after 2021 (see Table 1 for an overview of expected, planned and required RES shares in 2020 excluding cooperation mechanisms). The report shows that Belgium, Ireland, Greece, France, Cyprus, Luxemburg, Malta, Netherlands, Poland, Portugal may miss their 2020 target: even the more optimistic scenarios in the PREBS report do not forecast their target achievement. In addition, also Germany, Latvia, Romania, Slovenia, Slovakia, and the UK may run risk of not meeting their 2020 RES target. All these Member States can accelerate national RES deployment, use the individual cooperation mechanisms or the platform for statistical transfer, but the mechanism will likely be one of the options for them to consider once the mechanisms functionality and design is known.

[6] See Navigant, Eclareon, Fraunhofer ISI, TU Wien 2018: Final Report: Technical assistance in realisation of the 4th report on progress of renewable energy in the EU, available at: https://ec.europa.eu/energy/sites/ener/files/documents/technical_assistance_in_realisation_of_the_4th_report_on_progress_of_renewable_energy_in_the_eu-member_states-factsheets.pdf, accessed on 4 July 2019.

Table 1 Expected, planned and required RES shares in 2020 excluding cooperation mechanisms

RES share in gross final energy demand by 2020	Expected RES share 2020 (CPI scenario)		Expected RES share 2020 (CPI+PPI scenario)		Binding RED 2020 RES targets -	2020 NREAP target	Deviation of expected from binding RED 2020 RES targets (CPI and CPI+PPI scenario[28])		Deviation of expected from 2020 NREAP target (CPI and CPI+PPI scenario)	
	Min.	Max.	Min.	Max.			Min.	Max.	Min.	Max.
Member State	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
Belgium	8.8%	10.6%	10.6%	10.6%	13.0%	13.0%	-32.0%	-18.1%	-32.0%	-18.1%
Bulgaria	21.0%	22.1%	22.2%	22.2%	16.0%	16.0%	31.2%	38.9%	31.2%	38.9%
Czech Republic	15.7%	16.7%	16.6%	16.7%	13.0%	14.0%	20.5%	28.8%	11.9%	19.6%
Denmark	31.2%	34.9%	35.0%	35.0%	30.0%	30.4%	4.0%	16.6%	2.6%	15.0%
Germany	16.4%	18.3%	18.2%	18.4%	18.0%	19.6%	-8.8%	2.2%	-16.2%	-6.2%
Estonia	29.7%	35.3%	35.3%	35.3%	25.0%	25.0%	18.7%	41.1%	18.7%	41.1%
Ireland	13.8%	14.3%	14.3%	14.4%	16.0%	16.0%	-13.7%	-10.0%	-13.7%	-10.0%
Greece	15.6%	17.8%	17.7%	17.9%	18.0%	18.0%	-13.4%	-0.5%	-13.4%	-0.5%
Spain	18.3%	19.9%	20.0%	20.0%	20.0%	20.8%	-8.5%	0.2%	-12.0%	-3.7%
France	16.6%	20.4%	20.5%	20.5%	23.0%	23.0%	-27.9%	-11.0%	-27.9%	-11.0%
Croatia	28.7%	29.7%	28.7%	29.3%	20.0%	20.1%	43.5%	48.6%	42.7%	47.9%
Italy	18.9%	21.2%	21.4%	21.6%	17.0%	17.0%	11.2%	26.8%	11.2%	26.8%
Cyprus	11.0%	11.4%	11.4%	11.5%	13.0%	13.0%	-15.7%	-11.9%	-15.7%	-11.9%
Latvia	33.2%	40.2%	40.3%	40.3%	40.0%	40.0%	-17.0%	0.6%	-17.0%	0.6%
Lithuania	28.9%	34.1%	34.1%	34.1%	23.0%	24.0%	25.8%	48.2%	20.6%	42.1%
Luxembourg	5.7%	7.4%	7.5%	7.5%	11.0%	11.0%	-48.5%	-31.9%	-48.5%	-31.9%
Hungary	16.5%	16.5%	16.5%	16.5%	13.0%	14.7%	26.6%	27.3%	12.4%	12.9%
Malta	8.1%	8.5%	8.1%	8.1%	10.0%	10.0%	-18.9%	-14.7%	-19.2%	-15.1%
Netherlands	7.1%	9.3%	9.3%	9.3%	14.0%	14.5%	-49.0%	-33.6%	-50.8%	-35.8%
Austria	33.5%	36.4%	36.6%	36.7%	34.0%	34.2%	-1.4%	8.0%	-2.0%	7.4%
Poland	10.6%	13.7%	13.8%	13.9%	15.0%	15.9%	-29.1%	-7.1%	-32.9%	-12.0%
Portugal	25.7%	29.5%	29.5%	29.6%	31.0%	34.5%	-17.0%	-4.4%	-25.4%	-14.1%
Romania	23.3%	26.7%	26.7%	26.8%	24.0%	24.0%	-2.7%	11.8%	-2.7%	11.8%
Slovenia	21.8%	25.5%	25.6%	25.6%	25.0%	25.3%	-13.0%	2.3%	-14.0%	1.1%
Slovakia	11.2%	14.4%	14.4%	14.4%	14.0%	14.0%	-19.8%	2.8%	-19.8%	2.8%
Finland	43.0%	44.4%	44.4%	44.5%	38.0%	38.0%	13.1%	17.0%	13.1%	17.0%
Sweden	58.2%	60.3%	59.9%	60.3%	49.0%	50.2%	18.7%	23.0%	15.9%	20.0%
United Kingdom	11.5%	14.1%	14.1%	14.1%	15.0%	15.0%	-23.1%	-5.7%	-23.1%	-5.7%
European Union	18.1%	20.6%	20.7%	20.7%	20.0%	21.3%	-9.3%	3.5%	-14.7%	-2.7%

Several Member States have received European Commission approval for their support schemes based on the condition that they partially open their support schemes, as shown in Table 2. These Member States may consider the use of the mechanism to meet this requirement.

Table 2 Overview of obligations to open national support schemes

Member State	Volume	Decision
Germany	5 % of the yearly new installed RES-capacity, i.e. roughly 300 MW per year as of 2017	SA.38632 (23.07.2014), SA.45461 (20.12.2016)
Luxembourg	At least 13% of new installed RES-capacity	SA.37232 (16.09.2014), SA.43128 (26.08.2016)
Estonia	No restriction	SA.36023 (28.10.2014)
Romania	Annual quantity of electricity from renewable sources imported, set at the level of the volume of total electricity imports to Romania in 2013	SA.37177 (04.05.2015), SA.46894 (16.12.2016)
Greece	Estimated share of around 3.5% of the total annual new RES and HECHP capacity	SA.44666 (16.11.2016)
Italy	Certain percentage will be established by a formula.	SA.43756 (28.04.2016)
Portugal	12.4 MW (=6,2% of the scheme)	SA.41694 (04.05.2016)
Belgium	Up to 2.64 % of new installed RES-capacity	SA.45867 (08.12.2016)
Hungary	Around 12 % of the total annual new RES-e capacity. The percentage to be opened to producers outside Hungary will be updated each year.	SA. 44076 (11.07.2017)
Spain	86.45 MW to remedy discrimination caused in 2007-2017.	SA.40348 (10.11.2017)

2.3 Synergies and duplications with other support instruments (Subtask 1.2)

The mechanism serves as a supranational support framework that will be operating in an environment with various other, somewhat similar support instruments. On the one hand, this is an opportunity since synergies between instruments could increase the overall effectiveness of support. On the other hand, duplications and unintended interactions between the mechanism and existing support schemes need to be avoided.

This chapter therefore assesses interactions between the mechanism and national support schemes as well as interactions with existing and upcoming European Union programmes. Building on this assessment, principles and guidance are presented outlining how to create desirable synergies and where action needs to be taken to avoid negative consequences.

A common example of synergies between support schemes is the simultaneous provisions of both financial instruments and grants (as discussed more in detail in section 3.1.2). Negative impacts can arise if parallel funding programmes lead to over-subsidising, meaning that the total support project developers receive from different support schemes is more than they would need to realise the project. Distortive effects may also emerge when the volume of support programmes in a specific region at a specific point in time is too large. In this case, project developers might be “cherry picking” between funding schemes, thus increasing strike prices in tenders.

In this chapter, two general types of possible interactions of the mechanism with other instruments are discussed:

- whenever the mechanism **co-exists** with national and European Union support instruments, but their support is exclusive (i.e. projects cannot receive support from both the mechanism and the co-existing support scheme);
- whenever different types of support at European Union or national level are effectively **combined** into one stream (or package) of support together with the mechanism. The combination may be designed by the European Union or simply be implemented by project developers, if permissible.

Figure 5 shows a high-level framework of these types of interaction. Each type is discussed in detail for the European Union / Member State and European Union / European Union interfaces in the following chapters, including "red flags" to be considered when implementing the mechanism and guidance on how to approach them. The only interaction that will not be discussed in further detail is the *co-existence* of the mechanism with other European Union support instruments. This is because (as described earlier) most European Union funds relevant for RES projects *can be combined* with the mechanism. Therefore, it is expected that there will be few projects which are eligible for mechanism and another European Union support scheme but cannot combine the two. Taking into account the large number of potential RES projects across the European Union, "cherry picking" of these few projects is not expected have significant impact on the outcome of European Union support programmes.

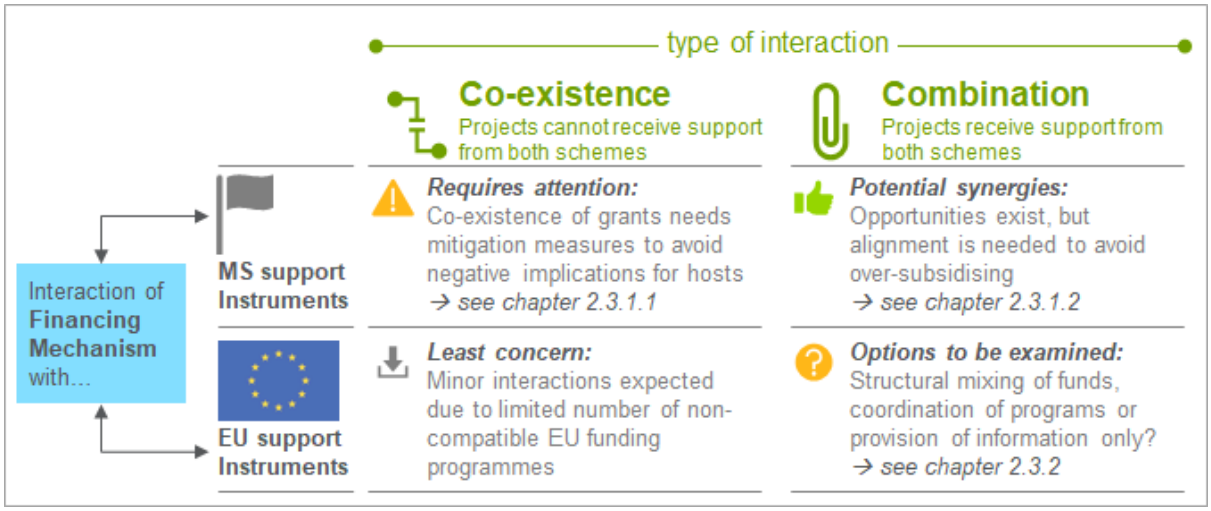

Figure 5: Potential interactions of the mechanism with European Union or Member State support schemes and their implications for mechanism design

It should be noted that the concept of "combining" mentioned above differs from the concept of "blending" as used in European Union legislature. For instance, the Invest EU regulation proposal 2018/0229 refers to "blending" as "combining non-repayable forms of support or repayable support or both from the Union budget with repayable forms of support from development or other public finance institutions, as well as from commercial finance institutions and investors". In other words, blending means combining support financed through the MFF with financial instruments from outside the MFF. The financial regulation (EU, Euratom 2018/1046) establishes a similar notion of "blending" in its definition of a "blending facility or platform" when referring to "combining non-repayable forms of support and/or financial instruments and/or budgetary guarantees from the budget and repayable forms of support from development or other public finance institutions, as well as from private-sector finance institutions and private-sector investors".

Blending may also be defined more strictly in the sense that a structured framework for the process of bundling financing streams is also required rather than just the fact that financing streams end up blended in the end. In this case, support must be combined upstream to the final recipient to constitute blending. Regarding the mechanism, this would be the case if, for example, the EIB would

be responsible for implementing support through financial instruments under the mechanism and simultaneously provided recipients of mechanism support with non-mechanism EIB credit facilities.

The blending of support under the mechanism with financial instruments from financial institutions should be enabled and encouraged since it improves access to finance for projects supported by the European Union and therefore increases the cost-effectiveness of support from the MFF. At the same time, the mechanism is not thought to establish a blending facility with instruments outside the MFF, e.g. conducting a blending call as in CEF transport. The mechanism should ease blending by coordination with the respective institutions (e.g. EIB) and by enabling projects to combine funding from the mechanism with funding from other Union or national, public or private repayable forms of support.

2.3.1 Interaction of the mechanism with national support schemes

When designing and implementing support under the mechanism, it is crucial to recognise that the mechanism will co-exist and interact with national support schemes. This analysis distinguishes between the type of support provided by the European Union mechanism and the national support scheme, which could be grants or financial instruments. Also, two types of interaction are distinguished as described above:

- the **co-existence** of support instruments that are not combined are discussed in chapter 2.3.1.1, and
- the **combination** of support instruments from European Union - and national level is discussed in chapter 2.3.2 .

2.3.1.1 Co-existence of European Union and national support: synergies and duplications

The effects of the co-existence of European Union and national support are analysed along the basic cases shown in Table 3. Each case is discussed in more detail below.

Table 3 Overview of effect from co-existing support schemes at European Union and national level

	National level		
EU level		**Grants** (e.g. investment support, operating support)	**Financial instruments** (e.g. low-interest loan, guarantee)
	Grants (e.g. investment support, operating support)	Case **1:** Potential negative effects need mitigation	Case **2:** No negative effects expected
	Financial instruments (e.g. low-interest loan, guarantee)	Case **3:** No negative effects expected	Case **4:** No significant interaction expected

This table shows the basic cases. Further hypothetical combinations of cases may occur where, for example, financial instruments at European Union level meet a combination of financial instruments and grants at national level. However, the analyses of these additional cases do not reveal further insights, as these types of variations do not change the logic and dynamics of interactions discussed in the basic cases.

Case 1: Grant support schemes co-existing at European Union level and at national level

This case is highly relevant since it potentially produces strong interactions. Also, as most Member States will have support schemes for RES in place, this situation is very likely to occur whenever a Member State participates in the mechanism as a host.

Interactions between grant schemes can arise in various ways:

- European Union tenders and national tenders can take place in close temporal succession;
- the same technologies may be eligible for support
- the same market segment may be supported, e.g. similar sized projects are eligible for support.

The magnitude of the interaction must be kept in mind: if the share of projects and capacities supported by the European Union is small compared to the national volume, the impact on the national support scheme is limited; it increases with an increasing share of European Union -funded projects.

Interactions between co-existing grants at European Union -level and at national level may result in the following **challenges:**

Simultaneous bidding: In case projects are allowed to bid in both tenders (national and European Union), it is important to ensure that bids in both tenders have a binding character. Otherwise this would undermine the credibility and price determination of either tender.

Reduced site availability: Co-existing tenders will lead to competition between European Union and national tenders for good RES sites: National RES potential used by projects supported with grants from the mechanism will not be available for national support schemes. Resulting higher costs for national deployment creates a disincentive to increase national ambition level and may even lead to a lowering of the national RES deployment in the long-term (see Figure 6).

Reduced competition: The pipeline of projects in a country sufficiently advanced for bidding is likely to reflect national support availability. If supply of support is suddenly increased by European Union funds and the national market does not adapt quickly, the level of competition in the national tender may decrease. Assuming that European Union level tenders will be taking place in various hosting Member States, the European Union level tenders are less likely to be affected by lower levels of competition resulting from additional national tender rounds.

Price convergence: Project developers will bid for the tender that offers the highest expected price. Since price levels vary greatly across Member States, the European Union tender will offer higher prices than national tenders in some cases. This would lead to a shift of bidders from national to European Union tenders, increasing prices in national tenders. The European Union tender would therefore define the lower price limit for national tenders.

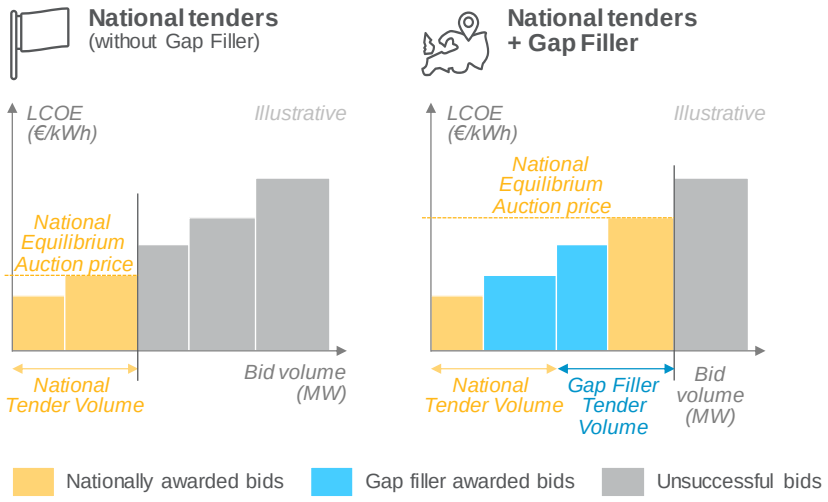

Figure 6: Potential effects of the mechanism on national tenders

In the worst case, the implications from the co-existence of grants on European Union and Member State level could effectively undermine the functioning of national tenders. This would have to be

addressed to make sure that acting as a host country is sufficiently attractive for Member States. **Measures** to this end could include:

Coordination of tenders: If tenders conducted at European Union and national level are aligned properly, interactions can be avoided or reduced in the first place. This alignment would mitigate potential negative effects of co-existence and reduce the necessity to introduce further measures. Key to the coordination would be to ensure that European Union and national programmes are complementary. This complementarity can be achieved, for instance, on a temporal level (different timing of tenders), technology level (address different RES technologies), segmentation level (address different project sizes) or a geographical level (select specific sites which would otherwise not be used or even eligible in the national tender).

Maximum volumes per host: A host country could set a capacity limit for awarded projects on its own territory for a European Union tender round. Projects exceeding this limit will not be awarded, even if their bids were lower than the (highest) strike price. If hosting countries set their limit reflecting the national RES project pipeline, available sites and price spread to other hosting Member State, the negative consequences described above can be avoided to a large extent.

Combining gap-filler tenders with the enabling framework: Offsetting the price increase in national tenders described in Figure 6 through deployment of the enabling framework may significantly increase the willingness of Member States to participate as hosts. The enabling framework would have to offer low-interest loans and/or guarantees for “national” projects and gap-filler projects at the same time. This would reduce the cost of capital for projects (which is potentially significant in the context of high Weighted Average Cost of Capital / WACCs) and therefore lower the overall price level of national tenders (see Figure 7). It should be noted though that financial instrument support can only be awarded to projects fulfilling the usual conditions of financial eligibility, e.g. creditworthiness, financial viability, etc. This means that if enabling framework support is offered to a national tender round, participating bidders would need to close corresponding pre-agreements with the mechanism’s implementing agency to factor the support into their bid. Once awarded in the tender, the projects can receive the financial instrument.

Creating a “European Project Pipeline”: The mechanism may incentivise project developers to pre-develop projects that would not have been developed in the absence of the mechanism and register them as a potential project for the mechanism, e.g. through a Letter of intent (LoI). This would lead to the mechanism tenders being fed from additional projects, so that national tenders in host countries would not suffer from reduced competition as shown in Figure 6. As a side-effect, project developers participating in the pipeline would be motivated to approach their national government to act as a hosting Member State.

Binding bids: Temporal coordination of national and European Union tenders may not be sufficient to prevent projects from bidding in both tenders. To maintain credibility of tender awards, penalties for non-realisation can ensure that bids have a sufficiently binding character.

A “European Project Pipeline” would, however, be associated with several practical obstacles. Firstly, the concept of projects being developed for European Union tenders without affecting the national pipeline might be artificial, since any site that participates in the European Pipeline might have participated in national tenders, if only at a later point in time. Secondly, the legal nature of the European Pipeline is difficult to design. If the status of a “European Pipeline Project” has a binding nature, less projects would apply since most developers prefer to keep financing options available until a late stage. If, on the other hand, the status would not be associated with a legal commitment, the European Pipeline would have a rather symbolic character and likely not yield any of the desired effects for national tenders described above.

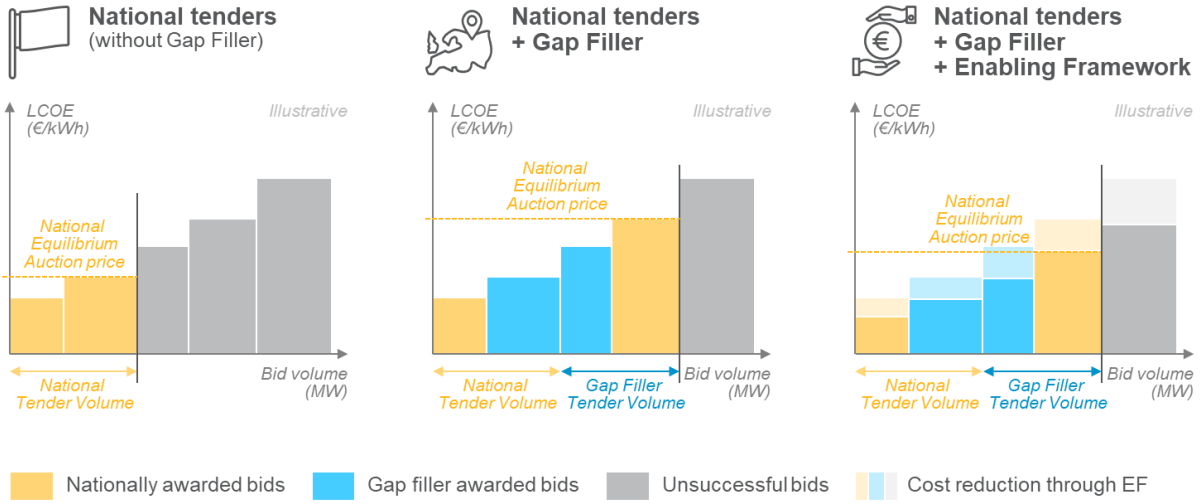

Figure 7 Effects of combining enabling framework and gap-filler of the mechanism for national tenders

Furthermore, co-existing grant support at European Union and national level may have positive side-effects for hosting countries that would justify accepting minor disadvantages that stem from being a host. The implementing bodies of the mechanism will need communicate the advantages to motivate Member States to participate. The potential benefits include:

- RES markets with good potential may be activated based on the additional demand created by European Union support;
- the European Union scheme may establish a technology that is not yet deployed/established in the host Member State;
- the European Union support may help to avoid disruptions in national supply chains and project pipelines in case of difficulties in the national support scheme;
- possible lessons learnt for the national grant scheme as a result of spill-over from good practice applied in the European Union -level support scheme/tender design;
- transparency may be created regarding positive effects of improved financing conditions, resulting in incentives to create better financing conditions under national support schemes.

Case 2: Co-existing grants at European Union level and financial instruments at national level

Case 2 describes the situation that a Member State has financial instruments such as low-interest loans in place that project developers could not tap into if they also apply for European Union grants. This might be the case if the Member State intends to lower national grant payments though financing support but does not want to provide capital for assisting European Union support schemes. Assuming that these financial instruments at the national level are not sufficient to trigger RES deployment alone, no negative interactions are expected from the co-existence of grants at European Union -level and financial instruments at national level, because the financial instrument itself would be in addition to a potential national grant scheme.

Case 3: Co-existing financial instruments at European Union level and grants at national level

This case may occur in a situation in which projects are increasingly close to “grid parity”, i.e. commercially viable with financing support but not requiring grants. In this case the financing support from the European Union level may help to phase out national grants to the extent that this is not needed anymore for effective RES deployment. However, in most cases financial instruments at European Union -level will typically be provided under the enabling framework function of the mechanism and therefore will be combined with existing grant schemes at national level (see combinations below).

Case 4: Co-existing financial instruments at European Union and national levels

Case 4 describes a situation where project developers can tap into financial instruments provided at European Union or at national levels. In this case no negative interactions are expected, since a crowding out of national support by European Union support would not lead to an outflow of statistical RES generation from the host country. On the contrary, an increased availability of financial instruments might support the transition into a market situation were RES can be deployed without non-repayable forms of support.

Recommendation

The potential negative effects from co-existing national grant support schemes and competitive tenders by the financing mechanism could create reluctance by Member States to act as a host. Proactive mitigation measures such as tender coordination and financing instrument support should be taken and communicated to potential hosts. Where these measures are not available, hosts can always introduce a “backstop” maximum capacity to be deployed on their territory under the mechanism. This would to a large extent guarantee that negative effects on national tenders are limited.

2.3.1.2 Combination of European Union support and national support

A combination of support from the European Union level with support from Member State level will most likely apply for support granted under the enabling framework function (e.g. low-interest loans, guarantees or junior loans). There are two structural design options for combining national and European Union -support:

- single/unified payment streams to project developers;
- project developers may also access various funding schemes at national level and at European Union level, ultimately receiving different parallel payment streams.

The disadvantage of keeping payment streams separate is that the various funding schemes would be hard to monitor for each project. In addition, ensuring that excessive subsidies are avoided will be more difficult. Finally, establishing various payment streams from various funding mechanisms will increase transaction costs for RES producers, which may decrease the use of certain funds. Therefore, unifying Member State and European Union payment streams would in principle be desirable.

However, unifying payment streams in this context would have to be designed and implemented with all participating Member States separately, which appears to be prohibitively complex. The priority should therefore be to unify different European Union payment streams as this would provide larger value to project promoters and less transaction cost to the European Commission.

Table 4 Overview of effects from combinations of support schemes at European Union and national levels

	National level		
European Union level		**Grants** (e.g. investment support, operating support)	**Financial instruments** (e.g. low-interest loan, guarantee)
	Grants (e.g. investment support, operating support)	Case **1:** Should not be combined	Case **2:** Positive effects from combination expected
	Financial instruments (e.g. low-interest loan, guarantee)	Case **3:** Crucial combination for enabling framework	Case **4:** Needs to be properly aligned

Case 1: Combination of grant schemes at European Union and national levels

Grant schemes, which by definition should be sufficient to provide full support, i.e. fill the gap between market revenues and levelised cost of energy (LCOE), should not be combined. Any combination of grants would, by definition, result in an overcompensation and is not in line with the State Aid guidelines.

Case 2: Combination of grants at European Union level with financial instruments at national level

One important design element in the mechanism is whether European Union level grants can be combined with financial instruments at national level, i.e. projects being able to combine e.g. low-interest loans provided by the host Member State with grants at European Union level. The advantage is that it would reduce the amount of European Union level payments since projects would have lower financing costs. A disadvantage is that it might distort competition in the European Union level tender: in a European Union tender with several host Member States, bidders from host Member States with financial instruments available may have an advantage. On the other hand, such host countries would not receive target achievement in exchange for their support as they do not provide the grant. The nationally provided financial instrument may therefore be viewed as part of the overall investment conditions. Equally, Member States may provide very beneficial site definitions, permitting procedures, etc. to support RES deployment in their territory as hosting Member States. Against this background, a combination of grants at EU-level with financial instruments at national level does not seem problematic.

Case 3: Combination of financial instruments at European Union level with grants at national level

This case is key, as combining financial instruments at European Union level with grants at national level will be among the main use cases of the enabling framework function as discussed in Case 1 in chapter 2.3.1.1. In this case, the mechanism does not affect the sites available to national RES deployment, as these are still counted towards the national contribution. Instead, the financial instruments reduce the support costs of the national schemes (i.e. it reduces the strike prices in the tender or green certificate prices).

If financial instruments are available for a tender, all bidders should have the opportunity for receiving these and should, prior to making their bids, have certainty that they will be supported in order to account for it in their calculation of the bid. This ensures that the enabling framework function is effective. Therefore, the evaluation of financial eligibility of projects for financial instruments under the

enabling framework should be conducted prior to a tender, e.g. through pre-agreements between bidders and the mechanism's implementing agency.

The financial instruments may therefore be granted for individual tender rounds in a Member State. This would create an effective limitation of the use of funds for the enabling framework, which might be necessary if a larger number of Member States seek to profit from the enabling framework function at the same time. The disadvantage would be that the attractiveness of single tender rounds compared to the others may increase, resulting in very volatile levels of competition between the tender rounds. An alternative is to offer the financial instruments to Member States for a period of time (a defined number of years) or for certain volumes / capacities.

Case 4: Combination of financial instruments at European Union level with financial instruments at national level

In this case, European Union level financial instruments may be combined with national financial instruments, e.g. a European Union guarantee with a national low-interest loan. One possible interaction is that the increased use of attractive support under the enabling framework function of the mechanism might undermine the use of the national enabling instruments. In contrast, the mechanism will not be used if its terms and conditions are less attractive than the ones at national level. This aspect underlines the importance of properly aligning and coordinating the support options of the various funds. Alignment and coordination of financial instruments at European Union level and at national level may ensure complementarity in terms of eligibility criteria, technology focus, funding volumes and types of support. In the case that they are properly aligned, a range of financial instruments may effectively support RES deployment in a Member State by improving access to private financing in such markets.

Recommendation

While combining grants from the mechanism with national grants bears the risk of overfunding and should be avoided, combinations involving financial instruments can enhance support effectiveness and should be promoted.

2.3.2 Options for leveraging existing or new European Union Programmes for the mechanism

The combination of funding from the mechanism with other European Union instruments can take different forms. This chapter will discuss three options for combining support. In reality, the mechanism will likely be administered using approaches from two or three of the described options depending on circumstances e.g. demand from Member States to act as host or contributor; availability of capital in other European Union instruments, or general political considerations. The three options that will be discussed in the following chapters are (see also Figure 8):

- **Option 1: Structural mixing:** In this scenario, the mechanism would have direct access to funds from other European Union instruments and would be responsible for awarding and disbursing these funds. This would also include an effective consolidation of application processes, payment streams, monitoring and reporting processes and could lead to a significantly increased level of effectiveness of support.;
- **Option 2: Coordination:** The mechanism would not have direct access to other funds, but would coordinate its activities with other European Union instruments, for instance in terms of work programme, tender schedules, tender application processing etc. Processes would, however, not be fully consolidated as in option 1.;
- **Option 3: Providing information**: In case options 1 and 2 were not feasible, the mechanism would only cooperate with other European Union funds through a streamlined offering of information on funding streams for project promoters. While this option has the least

requirements regarding governance set-up, it might also lead to these offerings being less regarded and hence a reduced demand for participation in the mechanism.

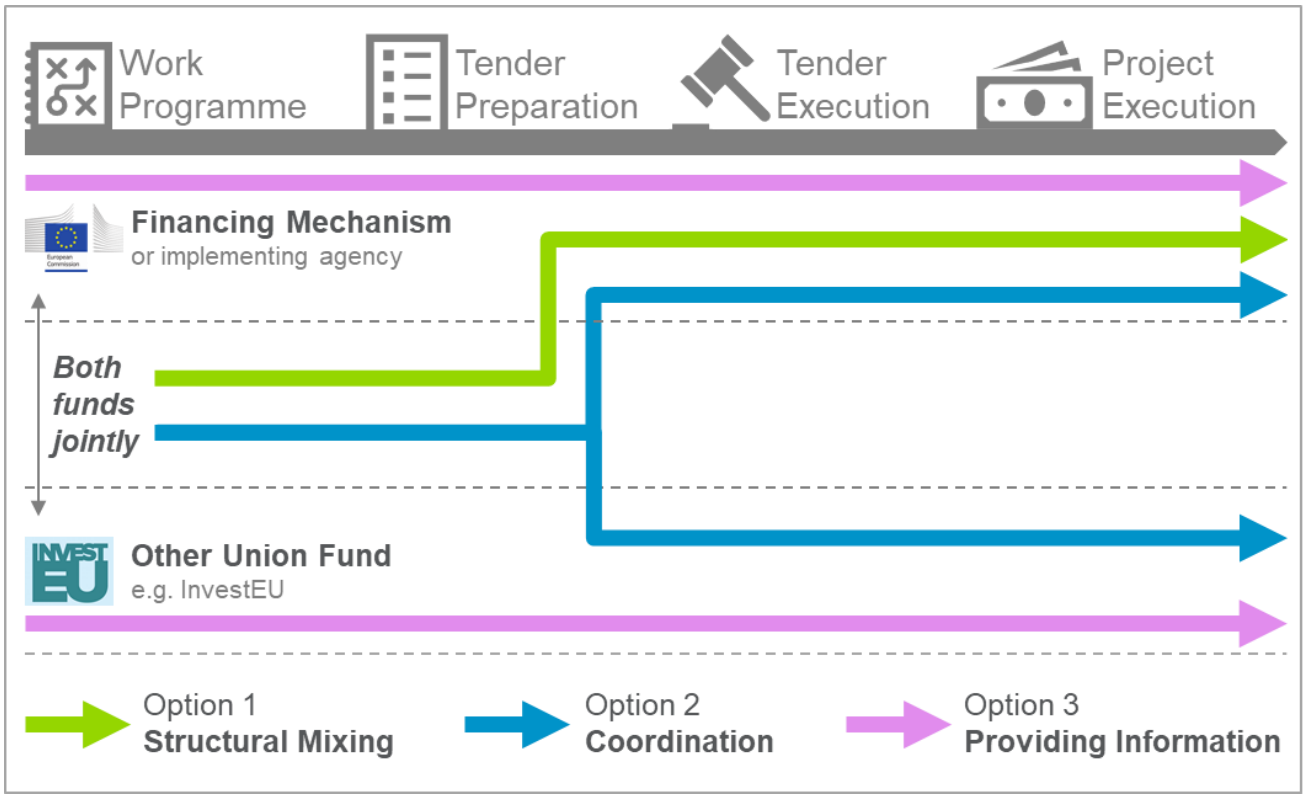

Figure 8: Schematic overview of how support by the mechanism and a second European Union fund (InvestEU for illustration purposes) would be organised under the three options discussed in this chapter

When discussing these options, the following funds which might serve as sources for support under the mechanism will be regarded:

- InvestEU[7];
- ETS Innovation Fund[8];
- Connecting Europe Facility (CEF)[9];
- The European Structural and Investment Funds (ESIF), in particular the European regional development fund (ERDF) and the cohesion fund (CF)[10].

[7] Analysis in this report is based on the Proposal for a Regulation of the European Parliament and of the Council establishing the InvestEU Programme from 27 March 2019

[8] Analysis in this report is based on the supplementing Directive 2003/87/EC of the European Parliament and of the Council with regard to the operation of the Innovation Fund of 26 February 2019

[9] Analysis in this report is based on the March 13, 2019 Proposal for a Regulation of the European Parliament and of the Council establishing the Connecting Europe Facility and repealing Regulations (EU) No 1316/2013 and (EU) No 283/2014

[10] Analysis in this report is based on the European Parliament legislative resolution of 27 March 2019 on the proposal for a regulation of the European Parliament and of the Council on the European Regional Development Fund and on the Cohesion Fund (COM(2018)0372 – C8-0227/2018 – 2018/0197(COD))

2.3.2.1 Option 1: Structural mixing of various European Union funds in the mechanism

The rationale of this option is to create a “one stop shop” for project promoters by consolidating the application processes, selection process, payment streams as well as reporting and monitoring processes of different European Union instruments into one procedure under the mechanism. This would reduce the transaction costs for project promoters, leading to more combination of different European Union instruments which would increase the effectiveness of European Union support schemes. The following activities would, for instance, be handled solely by the mechanism (i.e. European Commission or the implementing body):

- the preparation and execution of tenders for support;
- the design of support packages provided for projects (e.g. standardised combinations of grants and low-interest loans or guarantees for specific tender rounds);
- the preparation and signature of contracts for support with awarded projects;
- the disbursement of support payments to awarded projects, and
- the monitoring of project implementation.

A high-level process of the management of this option is outlined in chapter 5.2.4.

For the funds listed above, this chapter evaluates whether they could theoretically participate in a structural mixing with the mechanism. Specifically, this chapter examines whether

- the scope and objectives of the funds apply to the type projects envisaged by the mechanism;
- the type of support of the funds matches the needs of the mechanism;
- the funds allow for blending;
- the funds allow for combination of support with the mechanism, and whether
- the funds allow for structural mixing of support with the mechanism.

Figure 9 shows an indicative overview of the assessment of these criteria for the most relevant funds. A combination of support from the mechanism with support from InvestEU, CEF, ERDF or CF could in principle be feasible, whilst a combination with the Innovation Fund seems to be limited to special cases. However, combination in the form of structural mixing of funds with the mechanism as discussed in this option is not explicitly mentioned in any of the regulations of the funds considered. This does not necessarily mean that structural mixing is not permissible but demonstrates that this option has not been regarded in detail so far. It will therefore need to be discussed within the European Commission and with the Member States in the context of ongoing MFF negotiations.

A more detailed analysis of the respective funds can be found below.

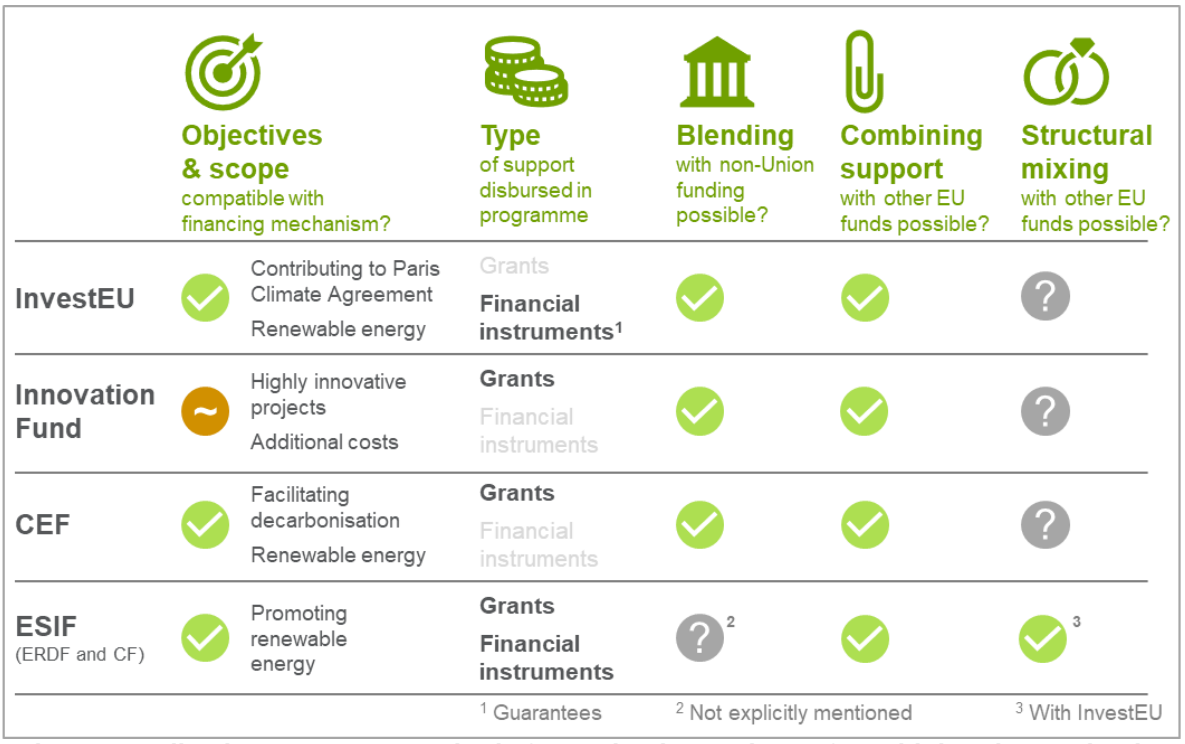

Figure 9: Indicative assessment criteria for evaluating options of combining the mechanism with other European Union funding programmes

InvestEU Programme

The InvestEU Programme aims to draw conclusions from the experience from the MFF 2014 – 2020 and replaces the European Fund for Strategic Investments (EFSI). A key lesson learnt is the need to streamline the governance structure of the programme by means of better coordinating the available financial instruments, reducing number of agreements and setting a single set of rules which simplifies the access to support for the final recipients.

The current version of the InvestEU Regulation (i.e. the Common Understanding of the Council on 27 March 2019) defines an objective of the fund as contributing to "the objectives of the Paris climate agreement"[11] which would therefore cover projects in the mechanism. The "sustainable infrastructure policy window" is specifically suitable for application in the context of the mechanism, due to its emphasis on "energy, in particular renewable energy"[12]. Support is to be provided in the form of guarantees[13], which in practice can be monetized into low-interest loans by financial institutions. As European Union resources are primarily suited to the demands of the enabling framework, which in turn is designed to provide support mainly through financial instruments, this presents an appropriate match. Also, the recitals demand "smooth, seamless and efficient blending"[14].

The combination of InvestEU guarantees with support from other European Union funds is laid out in Article 6. Whilst the combination, e.g. with the Innovation Fund, is explicitly mentioned, the option of structural mixing of funds is not. Article 6 (2) a), however, states that combined support must, inter alia, "comply with the eligibility criteria set out in the rule on the EU programme under which the support is decided". This might allow for guarantees by InvestEU to be awarded by the mechanism, as long as the InvestEU regulation is respected, which would in principle constitute the option of structural mixing described in this section. Still, a legal evaluation would have to be conducted

[11] Article 3 (1) b), available online at: https://www.consilium.europa.eu/media/38901/st07939-en19.pdf
[12] Article 7 (1) a)
[13] Article 4
[14] Recital 33.

regarding whether structural mixing needs to be explicitly foreseen in the InvestEU regulation in order to be allowed.

Therefore, the InvestEU programme appears to be highly compatible with the mechanism – if not in the form of structural mixing, at least through strong coordination. The specific rules for allocating support under InvestEU will be developed in the form a delegated act and they need to maintain a sufficiently broad approach to allow for specific adaptation in the mechanism.

ETS Innovation Fund

The ETS Innovation Fund takes into consideration lessons learnt from the NER 300 Programme. It aims to complement the Horizon Europe Programme, supporting eligible technologies which are effectively carried over into the market.

One issue is that the objective and funding scope of the Innovation Fund does not exactly match the mechanism's needs:

- the Fund is set up to support "highly innovative technologies"[15], while the mechanism's goal to increase RES shares in a cost-effective way may largely be achieved with mature technologies such as PV or onshore wind;
- the Fund provides application-based grants for additional costs associated with the innovative technology which is not compatible with the mechanism's set-up of awarding grants through tenders.

Since the funding demand for the fulfilment of the Fund's objectives is expected to exceed the revenues generated by the ETS, the explanatory memorandum explicitly states that "the Innovation Fund support should be combined with the support provided by other EU programmes". The current version[16] also foresees that the Innovation Fund will be able to contribute to blending operations under InvestEU and, according to the EC proposal, it shall also be combined with the support provided by other European Union programmes and by the Member States.

As with InvestEU, the option of structural mixing is not explicitly mentioned in the regulation. Regardless of that it can however be concluded that the objectives and funding vehicles of the Innovation Fund have little overlap with the intended design and requirements of the mechanism. Therefore, at first sight, there are hurdles related to using resources from the Innovation Fund for most of the activities of the mechanism, such as tenders for grants. However, in specific cases such as the project-specific window, a combination could be permissible and create value. For example, combining support from the mechanism with an Innovation Fund grant for additional costs for an innovative feature to the project could allow for RES expansion using mature technologies while simultaneously scaling up new technologies.

European Structural and Investment Funds (ESIF)

The proposed European Structural and Investment Funds (ESIF) regulation for the forthcoming MFF contains different funds and different funding instruments which will be based on simplified and common rules. The ESIF fund family contains some funding lines which are not particularly relevant in the context of RES financing, e.g. the European agricultural fund for rural development or the European maritime and fisheries fund. Therefore, this analysis focuses only on the **European Regional Development Fund (ERDF)** and the **Cohesion Fund (CF)** which support the investments in renewable energy sector.

Policy Objective 2 in the Proposed ERDF and CF regulation applies to both the ERDF and CF and contains, inter alia, the objective of "promoting sustainable renewable energy"[17], making the funds

[15] Article 3 a)

[16] Supplementing Directive 2003/87/EC of the European Parliament and of the Council with regard to the operation of the Innovation Fund of 26 February 2019

[17] Article 2 (1) b) ii)

highly compatible with the mechanism's objectives. The type of support that may be provided is defined in the ESIF Common Provisions and is very broad, including "grants, financial instruments or prizes or a combination thereof"[18].

Blending is not explicitly mentioned in any of the two regulations, however in line with the general strategy of European Union funding to leverage public support with private capital, it would be expected that blending is possible also under ERDF and CF. Combining European Union funds in contrast is explicitly foreseen in the Common Provisions: "Support to final recipients may be combined with any form of EU contribution"[19]. Furthermore, the Common Provisions do allow for structural mixing of ESIF funds with InvestEU, stating that Member States "may allocate […] the amount of ERDF, […] the Cohesion Fund […] to be contributed to InvestEU and delivered through budgetary guarantees"[20].

Generally, these principles make ERDF and CF highly compatible with the mechanism and potentially even allow for the option of structural mixing. ESIF is however not a centrally managed fund but disbursed through Member States or regions. Consequently, obtaining ESIF resources for financial instruments under the mechanism that are not associated with the transfer of statistical RES production seems less realistic. It might be more likely that ESIF resources would be provided under the gap-filling function of the mechanism (including a statistical attribution to the Member State shares in the ESIF resources).

Connecting Europe Facility (CEF)

The energy sector is a focus area of the CEF objectives, including "cross-border cooperation in the area of energy, including renewable energy"[21]. Since the mechanism focuses cross-border cooperation in the energy sector, CEF funds are in principle eligible to be disbursed through the mechanism.

Article 6 of the political agreement on the Regulation suggests that support will be primarily disbursed through grants, while blending is explicitly allowed. Additionally, combination of support with "any other EU programme"[22] is permitted. Structural mixing of funds is not explicitly mentioned.

A challenge in mixing the funds, however, is the very different allocation procedure of grants. In the mechanism, grants primarily ought to be awarded in tenders. For CEF in contrast, projects will receive grants through an over-the-counter, application-based process on cost basis.

An option for the structural mixing of the two funds might exist after 2024. The political agreement's recital 20aa states that "in the absence of sufficient market uptake of cross border renewable energy projects", i.e. if some CEF resources remain unused, "use for EU renewable energy mechanism" may be considered, however CEF projects relating to the trans-European energy networks objectives would enjoy higher priority. Therefore, there is a possibility that from the mid-2020s, there will be a structural mixing of CEF funds into the mechanism's grant schemes.

Recommendation

Structural mixing of funds could yield a highly effective support package. Due to the mechanism's regulation having entered the legislative procedure substantially later than the other funds' regulations however, this option is associated with legal and political uncertainties. Wherever possible, the basic requirements for this option should be created in the ongoing MFF negotiations while not relying on a full roll-out of this option in the near-term.

[18] Article 47
[19] Article 52 (4)
[20] Article 10 (1)
[21] Article 3
[22] Article 18 (1)

2.3.2.2 Option 2: Coordination of work programmes and calls for proposals between funds

Since the structural mixing of funds outlined in option 1 (chapter 0) is associated with legal uncertainties and may not be feasible to the full extent, this design option follows the principle of aligning funds as much as possible without structurally mixing them. Similar to the effect described in option 1, this would reduce the transaction costs for project promoters and likely increase the effectiveness of European support schemes. However, the effect would probably be weaker than in option 1 due to the less pronounced consolidation of processes.

Specifically, the following activities would need to be coordinated between the mechanism and the respective other funds to warrant sufficient alignment of support processes:

- the schedule of tenders for support by the mechanism should be aligned with the availability of funds from the other European Union instruments;
- eligibility criteria in tenders for support by the mechanism should be coordinated with the other European Union instruments to ensure that all projects awarded by the mechanism in the respective tender will also receive support from the respective other European Union instrument;
- the process of tendering, including invitation for bids, receipt of bids, eligibility checks, ranking of eligible bids and communication of award decisions, should be consolidated wherever possible. This could, for instance, mean that the mechanism would be solely responsible for receiving and reviewing application documents that are required by both funds rather than obliging projects to submit identical documents to two implementing bodies, and
- the required monitoring, reporting and accounting after project commencement should be executed by the mechanism.

Since the respective other European Union fund would structurally still be responsible for its part of the support scheme, contracts with awarded projects and disbursement of support would be handled by the other fund. The practical process of the coordination described here is discussed in more detail in chapter 5.2.4.

It should be noted though that the implementation of this option and option 1 is not static over time. Initially, a soft interpretation of option 2 where only “low hanging fruits” are coordinated between funds might be most realistic. The coordination might then be increased over the tender rounds to ultimately yield in a structural mixing as in option 1 towards 2030.

Based on the analysis of the (proposed) regulations of relevant funds in chapter 0, the feasibility of this option for the respective funds is outlined below.

- The proposed **InvestEU** regulation foresees the combination of support from different European Union funds. Hence, the coordination of InvestEU with the mechanism as described above appears not be an issue from a legal point of view. The main challenges will most likely lie in the administrative roll-out of a strong coordination;
- Combining grants from the **Innovation Fund** with other support instruments is highly desired according to its regulation. A strong coordination with the mechanism is however difficult for many mechanism activities due to the differences in objectives and funding design; combination of the two support schemes is therefore mostly limited to option 3. However, for some applications, e.g. support in the project-specific window, coordination of the two funds could yield strong synergies for RES deployment and innovation;
- **ERDF** and **CF** are highly compatible to be combined with the mechanism. The challenge of achieving a strong coordination mostly lies in the need to coordinate this with each Member State since ESIF are not centrally managed but at Member State and regional levels, and
- Due to **CEF**’s different approach of awarding grants, a strong coordination is less likely for most parts of the mechanism’s activities.

Recommendation

Coordinating funds has the potential for noticeable increases of support effectiveness and is not associated with fundamental legal or political requirements. Also, coordination does not need to be fully in place instantly but can be strengthened gradually over time. The European Commission and the funds' implementing bodies should therefore be take steps to achieve the described coordination when setting up the financing mechanism.

2.3.2.3 Option 3: Provision of information on blending and mixing options through the mechanism

This option constitutes a fall-back option with minimal requirements regarding coordination or joint governance between different European Union funds. The mechanism would merely inform project promoters interested in support from the mechanism about financial instruments available in other European Union funds. The objective would be to advertise existing opportunities so that project promoters are fully aware of the advantages of combining European Union support.

The mechanism would however not be involved in the application process of for financial instruments at other funds; this would be handled bilaterally between the project promoter and the respective fund. There would be no alignment of schedules, eligibility criteria or application technicalities. This might lead to high transaction costs for project developers intending to apply for support from the mechanism and also other European Union funds, potentially reducing the combined usage of funds and limiting support effectiveness.

However, the largest risk of this approach is that without direct access to resources from other European Union funds, the enabling framework might ultimately not be equipped with significant financial resources at all since there is little incentive for Member States to contribute. In this case, the enabling framework would not be able to carry out central tasks such as offsetting negative effects in national tenders conducted by host countries (see chapter 2.3.1.1, Figure 7). This could reduce incentives for Member States to participate as hosts in the worst case and eventually threaten the effectiveness of the mechanism. Therefore, obtaining capital for the enabling framework, at least partly through option 1 or 2, could be crucial for the success of the mechanism as a whole.

Recommendation

Communication of synergies between European Union funds to project promoters is a no-regret measure that should be taken in any case. Still, option 2 and 1 should be pursued as main priorities since the mechanism's effectiveness might be at risk if only option 3 is realised.

3. DESIGN OF SUPPORT (TASK 2)

3.1 Form of support (Subtask 1.4)

This chapter discusses various forms of support and provides guidance on which forms of support are most suitable to ensure the mechanism's overall effectiveness and efficiency.

Article 33 of the Governance Regulation mentions different types of support that may be provided, including (but not limited to) "a premium additional to market prices". Such support shall be "allocated to projects bidding at the lowest cost or premium". In addition, the mechanism may provide "low-interest loans, grants, or a mix of both".

In this section we broadly categorise the types of support according to the financial regulation ((EU, Euratom) 2018/1046)). We discuss on the one hand "grants", meaning a financial contribution by way of donation, i.e. a non-repayable form of support. It can take the form of operating support (as a floating or fixed premium) or of an upfront investment support (for a graphic representation of the support scheme, see Figure 10).

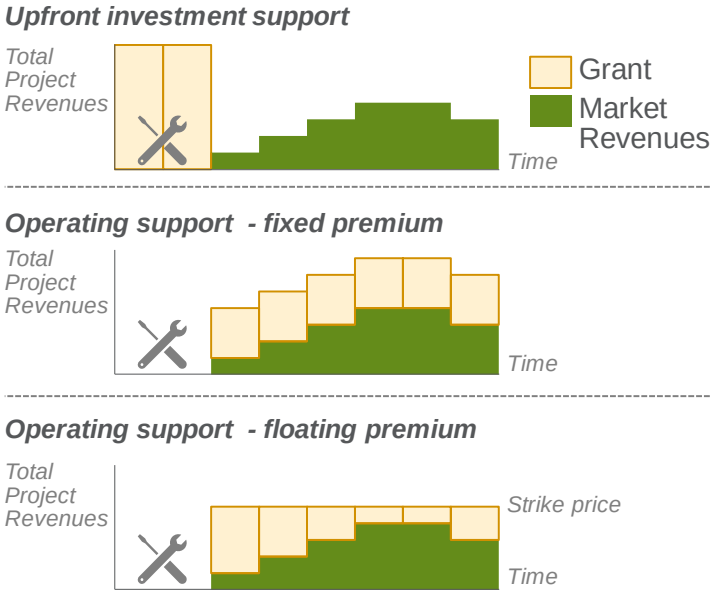

Figure 10 Overview of support instruments

In addition, we add the category of "financial instruments", meaning financial support provided from the budget […] which may take the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments.

The discussion is based on identifying advantages and challenges (or disadvantages). These are derived from a range of criteria, which are applied where feasible but not explicitly discussed for each support option to keep the assessment focussed and concise.

- **Effectiveness:** the degree to which the support scheme effectively ensures the envisaged RES deployment;
- **Cost-effectiveness of the support scheme:** the degree to which the support scheme can achieve the envisaged RES share at the lowest (support) cost; sub-criteria of cost-effectiveness are
  - Risk reduction for RES investors (reducing cost of capital)
  - Cost minimisation (e.g. through competition and cost-reflectiveness)

- **Market integration:** the degree to which the support type incentivises market response and minimises system and market integration costs;
- **Administrative burden / transaction costs**: the degree to which the support type is burdensome for the supporting entity and/or the participants/recipients

The following sections give an overview of the different forms of support for RES-E and discusses their pros and cons against the above-mentioned criteria. An assessment of adequate forms of support for the sectors heating and cooling and transport is provided in section 3.3.

3.1.1 Grants

The two principal forms of grants are operating support and investment support.

Operating support is the more common form of RES support in the European Union and several variants exist. Common applications of operating support include fixed premiums, floating premiums and Contracts for Difference (CfD).[23] While the evaluation of pros and cons compared to upfront investment support largely depends on which of these schemes is applied as well as their specific design (see below), several general characteristics can be assessed.

Advantages: The main commonality of these schemes is that operating support is paid on top of the market revenues. As such, operating support generally incentivises plant output, since support is paid per kWh. In contexts where support payments make up major parts of the project revenues, this increases the *effectiveness* in terms of (generation) target achievement compared to investment support and thereby also the cost-effectiveness of support. However, as support shares in total revenues continuously decrease in the European Union, this argument becomes less relevant. This is specifically true for variable RES which tend to maximise production in any case, as they have close-to-zero operating costs. For dispatchable RES (e.g. biomass) this is not always the case: operating costs include fuel costs and are therefore higher compared to variable RES technologies. As a result, production will be stopped when market prices fall below the (comparably higher) operating costs. In this context, operating support may still further maximise production, as also at times of market prices below operating costs dispatch will continue. In terms of *cost-effectiveness*, no general effect of operating support can be observed compared to upfront investment support, as the impacts on cost-effectiveness depend on the detailed design of the support. An advantage in the context of the mechanism and compared to upfront investment support is that there is no risk of paying support without receiving the benefits in case of unexpected project failure. Another advantage in this context is that, at least in the electricity sector, a lot of experience exists with operating support compared to upfront investment support.

Challenges: A general disadvantage of operating support is that it has a distortive effect on the dispatch of RES installations and therefore creates adverse effects in terms of *market integration*. In the case of variable RES, negative prices would in principle incentivise to stop electricity infeed. However, when operating support is paid, this incentive applies only if prices fall below the value of the premium payment, since any prices above this level would still generate net benefits for the producer. In the case of dispatchable RES, distorted feed-in is also incentivised at positive prices (as without support the feed-in would stop at positive market prices, which are below the operating costs) [24]. Specifically, in the context of the mechanism, another challenge related to operating support is that it typically must be paid over longer periods of time than investment support, e.g. 15 or 20 years, thereby exceeding both the timeframes of the MFF and the 2030 framework. Thus, money would have to be reserved beyond this time frame. It is unclear at this point in time how exactly this could be realised, but it would result in additional administrative burden.

[23] Mind that „floating premiums“ are sometimes also referred to as „asymmetric contracts for difference“.

[24] Note that the overall dispatch efficiency in case of support paid during times of negative prices is disputed. Efficiency depends on a range of factors, such as the flexibility of conventional power plants to react to negative prices (and an incentive to increase its flexibility if negative prices are not avoided by cutting support for RES). In the public debate, cutting support in times of negative prices is more prominent than already reducing it in times of positive prices (but below operational costs).

Applicability to support windows: In principle, operating support can be implemented in all three support windows (i.e. technology-neutral, technology-specific and project-specific). It should preferably be allocated via price-based tenders. A multi-criterion -based awarding procedure may be suitable for the project-specific window. For a detailed discussion of the tender design, see Task 3.

Applicability to the different sectors: Operating support is in principle applicable for electricity and the heating sector. However, it is much less common in the heating sector where usually upfront investment support is provided. Operating support does not appear to be suitable for the transport sector as the technical options appear to be more compatible with quotas/obligations and investment support (for a more detailed discussion of support for the heating and transport sectors, see section 3.3).

The most common forms of **operating support** are fixed premiums, floating premiums and Contracts for Difference (CfD). We discuss each in turn:

Fixed premium schemes entail a fixed payment per kWh on top of the market price.

In terms of *effectiveness*, a fixed premium performs similar to the other forms of operating support.

Advantages: A key advantage of fixed premiums compared to floating premium/CfD is that *market integration* for both operational decisions and investment decision is incentivised. More specifically, the long-term market values are relevant for producers, as they will impact the overall revenues of the project. As a result, investments are directed towards price zones promising higher market values. In addition, fixed premiums (as floating premiums as well) imply that market prices are passed on to producers also in the short term who then are incentivised to optimise the production of the plant. For fluctuating RES with no fuel costs this mainly relates to operation and maintenance issues. Another major advantage of fixed premiums, especially in the context of the mechanism, is the simplicity of their design, i.e. no time frames for market price determination or relevant reference markets for projects under the mechanism need to be defined (as is the case in the floating premium options, see below).

Challenges: In terms of effectiveness, a fixed premium has the disadvantage that it increases the risk of the winner's curse compared to a floating premium/CfD because long-term price forecasts are necessary but always related to high uncertainties. This may in turn reduce the effectiveness of support. Another disadvantage compared to floating premiums/CfD is that fixed premiums, similar to upfront investment support, almost fully expose producers to market price risks, resulting in revenue risks and increasing the cost of capital. This has an adverse effect on the *cost-effectiveness* of the support scheme. It can also have an effect on the structure of market participants and may potentially favour larger players who can deal with such risks. Fixed premiums and upfront investment support are very similar in terms of exposing market participants to price signals and the effect on investment decisions. However, fixed premiums (as described above) have a distortive effect on the plant dispatch in case of negative prices.

In a **floating premium** scheme (also called asymmetric contract for difference), the support payment is paid as difference between a strike price determined in the tender and a reference market price. The reference market price can be determined on an annual, monthly, daily or hourly basis.

Advantages: In general, a floating feed-in premium reduces revenue risks for producers compared to a fixed feed-in premium or upfront investment support. As a result, it reduces the risk of the winner's curse and thus has a positive effect on the effectiveness of the support. In addition, it has a decreasing effect on the cost of capital, resulting in improved *cost-effectiveness* of the support scheme. With an increasing length of the reference period for market price determination (i.e. seasonal or annual), the floating premium scheme becomes increasingly similar to a fixed premium system, as market participants have to optimise their production against average market prices. By contrast, the shorter the time frame, the more similar this scheme becomes to a feed-in tariff system, resulting in better revenue certainty but in less market integration. No matter which design is chosen, the floating feed-in premium scheme reduces the long-term price risk.

Challenges: A disadvantage compared to a fixed premium is that *market integration* is restricted to operational decisions. More specifically, a floating feed-in premium does not expose participants to risks of long-term market values and therefore does not create incentives for investments towards price zones with higher market values. As a result, this might negatively affect *cost-effectiveness* of the support scheme, as more support is needed for a project in a low-price area than in a high-price area. This aspect is more relevant for the mechanism than for national support schemes: while national support schemes usually apply to one single price zone and do not leave room for optimised investment decisions, the mechanism will apply across several price zones, which would allow to reflect their different market values. An additional challenge pertaining to floating premiums is that the upfront determination of necessary support payments for each installation over their lifetime is difficult, as this crucially depends on the production over the lifetime of the installation multiplied with the market values, which are difficult to determine in advance. Moreover, a floating feed-in premium entails more design elements than a fixed premium: the reference period to determine the average market prices has to be defined, as well as the price zone which is used to determine the reference value (e.g. that of the host Member State, of the contributing Member State(s) or a mix thereof). This increases the administrative burden related to the floating feed-in premium.

In a **Contract for Difference (CfD)** scheme, the difference between the strike price in a tender and the market value is paid to the producer in case the market price is below the strike price. A difference is paid from the producer to the auctioneer if the market price is above the bid price determined in the tender. Similar to a floating premium, the market price can be determined on an annual, monthly, daily or hourly basis. In practice, however, CfDs are usually determined on an hourly basis.

Advantages: An advantage of the CfD compared to e.g. a regular floating premium is that its payback scheme ensures that excessive support payments are “paid back” in times of high market prices. This may potentially improve the cost-effectiveness of support, even though this effect is not proven. In a floating premium scheme, bidders will price expected future revenues into their bids, which leads to lower strike prices than in a CfD scheme. In other words, bidders bid for a floor price under a floating premium scheme and may expect additional market revenues, while they need to bid a fully cost-reflective price under a CfD scheme. The latter reduces the winner’s curse (increasing the effectiveness of support) and may protect smaller market players.

Challenges: While a CfD works best with an hourly calculation of market prices, this implies very limited *market integration*. By contrast, a monthly or yearly CfD would result in project’s optimising against market prices. However, this also creates unintentional effects in that the dispatch signal is distorted. More specifically, a negative premium would result in installations stopping production at positive market prices, i.e. whenever the market price drops below the positive value of the negative premium. This distortion could only be avoided if the payback is determined independent of the actual infeed, which results in additional design complications, however.

Investment support usually entails a fixed upfront payment which is related to installed capacity (i.e. x € per kW). Capacity payments spread over time are another feasible option. However, since they are very similar to fixed premium payments, they will not be discussed in detail here.

Advantage: Compared to operating support, upfront investment support has the advantage of decreasing a project’s capital expenditures and thus the required financing volume. This in turn may decrease overall capital costs and, as a result, increase the *cost-effectiveness* of support. Moreover, upfront investment support incentivises *market integration* of RES-E projects: similar to a fixed feed-in premium, investors will choose price zones with higher market values (decreasing the support costs and increasing *cost-effectiveness* of support compared to a floating premium/CfD). Finally, the use of upfront investment support in the context of the mechanism may incur less administrative burden, given that support does not have to be paid over a longer period of time.

Challenges: The fact that bidders must anticipate long-term market values implies the risk of the winner’s curse, i.e. being awarded support which ultimately does not suffice to ensure commercial viability of a project. This effect decreases the *effectiveness* of support compared to a floating premium/CfD (however, not compared to a fixed premium). Another disadvantage of upfront investment payments compared to floating premium/CfD is that – as in the case of fixed premiums - RES-E projects are exposed to full short- and long-term electricity market (revenue) risks, which

increases the cost of capital, in turn negatively impacting the *cost-effectiveness* of support. Another negative effect on the cost-effectiveness of upfront investment support is that a bid selection according to the specific investment costs per capacity does not reflect actual energy production and may result in the selection of bids with comparably higher support costs. If the investment cost is slightly lower but the production is significantly lower compared to another bid, the required support per energy unit produced is higher in the selected bid. This challenge is particularly relevant in the context of technology-neutral auctions. In the context of the mechanism another challenge is relevant: if upfront investment support is disbursed but the project fails afterwards, support money may be lost. Possibly, the disbursement of investment support could be related to proven project milestones in order to avoid such losses. However, project developers are incentivised in any case to maximise their revenues, i.e. to ensure that projects operate.

Applicability to support windows: Upfront capacity payments are not suitable for the technology-neutral window, as the comparability of bids is challenging: investment costs per capacity unit differ substantially between technologies. As a result, the technology with the lowest specific investment cost would win, but it may produce much less energy compared to another technology. In practical terms it would mean that, for instance, wind technology would not be able to compete against PV on a structural level, although its LCOE may not be structurally different from that of PV. One option is to adjust the bids by average full-load hours, to make the bids from different technologies more comparable (e.g. assume a two-fold increase in full load hours in wind compared to PV and thus divide the bid from wind by two). This would make the energy-specific costs of each technology somewhat more comparable. Another option could be to require bidders to deliver an equal amount of energy (however, this would create other problems, see section 3.2). In general terms, the predictability of energy production resulting from auctioned upfront investment support in a technology-neutral manner is much lower compared to technology-specific tender for upfront investment support or for operating support in general. This implies a significant disadvantage of capacity support in the technology-neutral window with regards to the effectiveness in target achievement. This effect is largely avoided in technology-specific (or project-specific) tenders for upfront investment support.

For the project-specific window, either price-based or a multi-criteria approach may be suitable (for instance, in the case of policy objectives beyond cost-effectiveness, such as innovation).[25] In case a CBA-based selection process (and cost-based determination of the grant size) is deemed more appropriate, the latter should, where possible, be aligned with the project selection process and the CBA guidelines for c-b RES projects.

Applicability to the different sectors: Upfront investment support is in principle applicable for all sectors. In the heating and cooling sector, it is very common to use investment support.

An overview of the performance of the different forms of support is provided in Figure 11. It shows that especially floating premiums / CfD perform well in terms of effectiveness, followed by fixed premiums and then upfront investment support. Upfront investment support performs poorly in case it is applied in a technology-neutral manner, but similar to a fixed premium, if applied in a technology specific manner. The cost effectiveness depends a lot on the specific design of each form of support and there are different effects which at the same time increase and decrease a support form's performance. In terms of market integration, the fixed premium and the investment support perform best. The administrative burden is much higher with operating support compared to upfront investment support, but within operating support is lowest if a fixed premium is auctioned.

[25] Note that competitive tenders can be multi-criteria-based. Here we distinguish between competitive tenders with a price focus on the one hand and multi-criteria project selection and determination of grant size based on costs on the other hand.

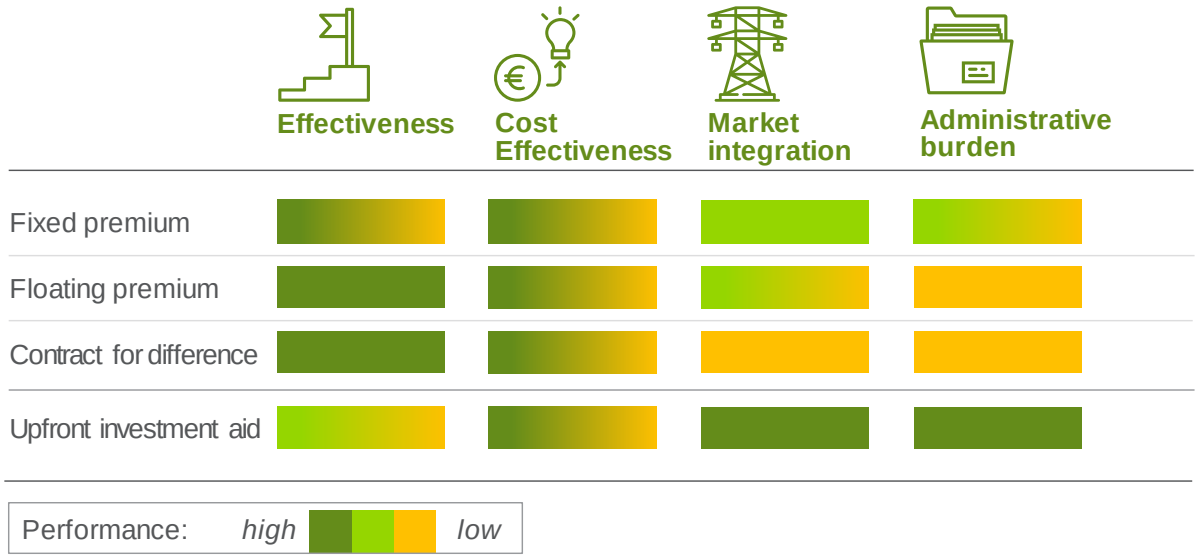

Figure 11 Overview of forms of support and their performance

Recommendation

The choice of the form of support depends on the preferences of participating Member States.

Operating support (especially floating premiums / CfD) implies advantages in terms of effectiveness compared to investment support, even if auctioned in a technology-neutral manner. It may be primarily implemented for the electricity sector. If operating support is chosen, fixed premiums result in comparably good market integration while limiting administrative burden.

Upfront investment support implies major administrative and practical advantages in the context of the mechanism. It is applicable to all sectors. In addition, it provides for effective market integration. However, it may perform less well in terms of cost-effectiveness compared to operating support in the form of a fixed premium payment as tendered investment grants do not necessarily select the projects that produce the largest amount of energy. There is much less experience with investment support in the electricity sector than with operating support. It should primarily be applied in the technology-specific and project-specific window and be avoided in the technology-neutral window.

3.1.2 Financial instruments

The mechanism may not only allocate grants but may also allocate financial instruments (or at least coordinate closely with European Union funds and programs providing financial instruments in the period from 2021-2030). This section briefly presents and discusses various types of financial instruments.

Since renewable energy projects are often highly capital intensive, cost of capital can account for significant shares of total project cost. If support consists of grants only, financing cost (e.g. interest payments, dividends) must be covered by non-repayable state support. However, if support is also provided in the form of financial instruments such as guarantees or low-interest loans, project financing costs can be reduced significantly. The amount of grants required for project realisation is therefore also reduced. Overall, the combination leads to a partial substitution of non-repayable grants by repayable support instruments, increasing the cost-effectiveness of funding (see Figure 12).

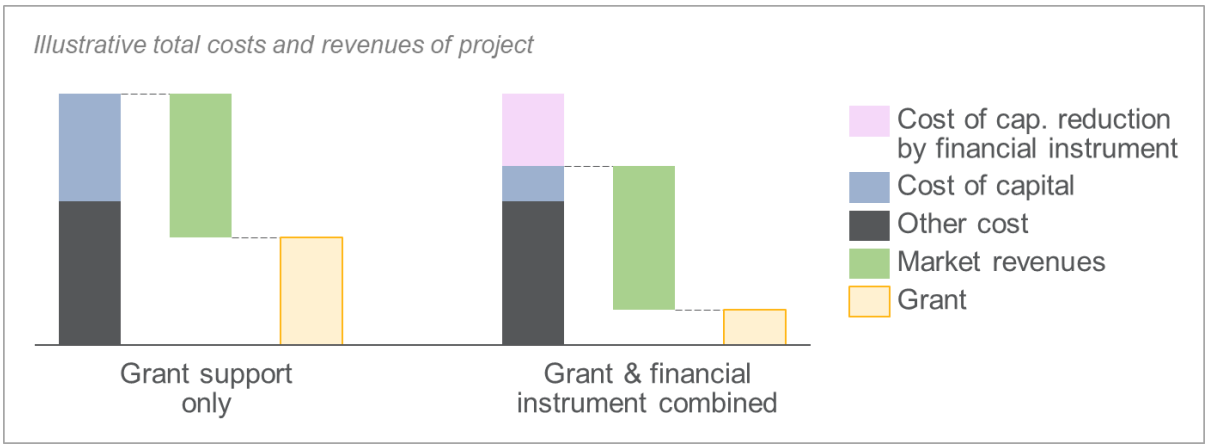

Figure 12 Basic effect of financial instruments on required support costs

Low-interest loans: Low-interest loans supplement private-sector debt finance and provide debt at below-market costs. In general, such loans are likely to be combined with national support scheme payments or other European Union support, given that while they reduce the cost of capital they might not fully close the revenue gap of RES investments. The advantage of low-interest loans is that they effectively mitigate a key challenge related to RES investments, namely lacking access to capital at sufficiently low cost. Consequently, they increase the cost-effectiveness of support schemes by lowering WACCs, e.g. in terms of significant technology risks and/or country risks. Another benefit pertains to the fact that low-interest loans entail net cash-transfers only for the default rate/share.

The main risk related to low-interest loans is their distortive effect on market signals, given that cost of capital is in itself a market signal and thus has an important steering function. It reflects risks related to investments and, ideally, attracts investors who can handle certain risks combined with the envisaged return of investment. Low-interest loans should therefore be limited to situations where some sort of market failure (i.e. lack of access to capital due to conditions outside the RES regulation) can be identified.

Senior loans vs subordinated loans: Senior and subordinate loans refer to the order in which loans have to be repaid in case of bankruptcy of a project related entity. Subordinate debt (or junior loan) is served after all other (usually private sector) debtors have been paid. This means that projects that have secured a junior loan are significantly less risky for private senior loan providers and will therefore be more attractive for private lenders (“catalytic first-loss capital”). Hence, providing junior loans improves access to lower-cost capital and is done, for instance, by the EIB.

Intermediated loans: Intermediated loans are provided by international investment banks to local banks or other intermediaries which intermediate the loan to the final beneficiaries. The intermediation consists in the delegation of the appraisal and monitoring of the transaction to the intermediary who is also responsible for final lending process. The advantage is that local intermediaries are more knowledgeable about local investment conditions than centralised entities. On the other hand, intermediated loans may imply in the context of the mechanism that the number of contact points further increases for project developers, increasing the related transaction costs (potentially up to prohibitive levels).

Investment guarantees: Guarantees from lending institutions are a form of contracts which ensure the risk coverage of the transaction by securing that in case of a borrower’s default, the bank will cover the losses of the debtor. The guarantees are provided to senior and subordinated debt in a standard form or in form of debt service guarantee where the beneficiaries can be private, public projects or partner intermediaries. In the context of the mechanism, this could mean that guarantees are provided for debtors or to intermediate banks who then can provide low-interest loans. Guarantees can be tailored to cover certain RES development and country risks to reduce the cost of capital. However, not all risks should be insured: some project development or technology risks may be insured, but this would have to be differentiated from arbitrarily instable investment contexts for

RES in Member States. Hence, the design of guarantees must differentiate between different types of risk.

The advantage of guarantees in the context of the mechanism is that it reduces financial risks related to project development and thus cost of capital. This increases the cost-effectiveness of grants under the mechanism. On the downside, investment guarantees are difficult to design, as properly differentiating different risks and delineating those that should be hedged may prove challenging. Like low-interest loans, guarantees can also lead to a distortion of market signals.

The mechanism will most likely coordinate with other funds on providing financial instruments. In principle, financial instruments from other funds will be designed and disbursed by a range of implementing bodies, such as EIB, EBRD and national development banks. Hence, the detailed design of financial instruments will most likely not be done within the mechanism (in contrast to the grant design). As a general principle, the number of contact points, application, selection, monitoring and reporting procedures should be as limited as possible for the project developer. This would enable effective access to the instruments for participants in the mechanism. Past experience with existing financial instruments has shown repeatedly that a too fragmented and burdensome process to receive financial instruments inhibits their effective use.

Applicability to support windows: Financial instruments should in principle be applicable to all support windows. The specific combination of financial instruments, their design and way of disbursement will have to be tailored to specific rounds of tenders. In competitive auction rounds with large-scale projects (e.g. in the project-specific window), more complex structuring of finance will be suitable compared to tender rounds in which smaller projects are likely to participate.

Recommendation

In general, financial instruments can be granted across all technology windows under the enabling framework function. The above-mentioned pros and cons should be considered when deciding on the specific form of support in each case. The coordination of the mechanism with other EU programs should work towards their effective accessibility.

3.2 Design of tenders for grants (operating support and upfront investment support) (Subtask 2.1)

To meet the objectives of any specific policy involving renewable energy tenders, policy makers should follow a set of principles for good tender design, prioritise their objectives and adapt the specific tender design to meet these objectives. Therefore, this chapter outlines the policy objectives of each of the mechanism's support windows, introduces basic principles for good tender design and sets out relevant design elements or parameters that the European Commission has at its disposal.

Table 5 summarises the mechanism's support windows and their respective policy objectives (see also subtask 1.3). Recommended design options need to be chosen to effectively achieve the desired outcomes in each of the windows under which support is provided.

Table 5 Summary of support windows and their policy objectives

Support window and tender	Primary Objective
Technology-neutral window (either sectoral or cross-sectoral)	Least-cost RES deployment across technologies
Technology-specific window	Least-cost deployment of most acceptable technologies; Support to less mature technologies (option)
Project-specific window	Deployment of large-scale projects of strategic relevance

Besides the primary objectives outlined above, tender design may also be made compatible with secondary policy goals, e.g. a balanced regional distribution across the European Union or the promotion of small actors. The focus of this project is on an alignment of recommended design options with the primary policy objectives outlined above. In case additional policy objectives might become relevant in the future and/or for specific tender rounds, they may be incorporated as part of the tender design. The following principles should guide the selection of tender design elements:

Tenders require sufficient competition among bidders. The rationale for conducting tenders is to increase the cost-effectiveness or static efficiency of RES support schemes by providing incentives for bidders to reduce their bids towards their true costs and selecting projects with the lowest bid price. In case the tender features sufficient competition (i.e. demand exceeds the auctioned volume), bidders can usually be expected to bid close to their true cost, which should induce efficient tender outcomes. By contrast, bidders are likely to place a strategically high bid if they are aware that demand does not or only marginally exceeds the tendered volume, which in turn would lead to a higher average award price and an increase in total support costs. Under this scenario, the tender would miss the objective of reducing costs. When setting up tenders and deciding on specific design elements, the auctioneer therefore needs to ensure that competition is sufficient to achieve a cost-effective RES deployment, i.e. if demand exceeds the tendered volume, and whether the chosen design element promotes or potentially restrains competition levels. In a similar vein, the auctioneer should consider market concentration and the related market power risks. Market concentration typically occurs if the number of bidders decreases over time. Tenders can bring about a concentrated market if the chosen auction design favours certain bidder categories over others, if some bidders are better positioned to endure periods of intensive competition, or if certain bidders have already obtained a dominating market position which they can use to strategically influence the tender outcome.

Tenders should mitigate excessive risks for bidders. Tender participants incur the risks of their bids not being selected while at the same bearing the costs of pre-developing their project (so-called bid risk). In addition, auction winners carry risks in terms of their potential inability to realise their projects or to realise it with delays, which usually leads to monetary penalties (so-called penalty risk). Since these risks are inevitable and tender participants are likely to consider these risks as risk premiums in their capital costs and thus their bid prices, tender design should aim at mitigating such risks.

Tenders should limit transaction costs for bidders and the auctioneer. These costs are associated with the necessary administrative procedures to participate in the tender (e.g. information gathering, compilation and filling of documents and forms) as well as organising the auction as the auctioneer (e.g. preparation of tender documentation, bidder selection). Should transaction costs be high relative to the anticipated benefits, potential participants may be discouraged from taking part in the tender. This reduction in competition could lead to the adverse effects outlined above such as the exercise of market power by large participants.

So far, this chapter describes the primary objectives applicable under each of the mechanism's support windows and the principles that should guide the design of tenders. The following section outlines the set of design elements that the European Commission has at its disposal to tailor

auctions under the mechanism. This is developed from insights from past tender analysis (e.g. the European Union AURES project). Table 6 summarises available design elements, which are grouped into five categories.

Table 6 Tender design elements

Category	Design element
General tender elements	Tendered good and volume
	Tendered award
	Technology-specific vs. technology-neutral auctions
	Multi vs. single item auction
Tender procedure	Tender format
	Ranking criteria
	Pricing rule
	Price caps and floors
	Tender frequency and schedule
	Tender schedule
Qualification requirements	Material pre-qualification
	Financial guarantees (bid bonds)
	Other eligibility criteria (e.g. bidder qualification, detailed technological design, available sites, project size, small actors)
Obligations, deadlines and penalties	Realisation periods
	Penalties (combined with financial guarantees/bid bonds)
	Transferability
Other relevant design considerations	Reflection of grid connection costs
	Actor diversity
	Limitation of bidders' concentration
	Budget minimum thresholds for setting up auctions
	Inclusion of hosting Member States' rights in the auction design

The remainder of this chapter follows the structure provided in Table 6. For each category the specific design elements are described in more detail by outlining general rationales and practical implementations. On this basis, detailed guidance is provided on which design options are most advisable for each of the mechanism's support windows and how they can be designed in practice. Recommendations consider the (primary) objectives of each window, the general principles of good tender design outlined above, technology- or sector-specific characteristics where applicable as well as potential interactions between design elements.

Moreover, a key challenge for all windows is how to design European Union -wide tenders that reliably and efficiently achieve the desired outcomes, whilst taking into account the diverse framework conditions (e.g. diverging RES planning procedures and timelines) in Member States with ramifications for the chosen design options and their effects on policy objectives. This comes down to the questions whether tenders organise a competition around best RES framework conditions (natural, regulatory and financial framework conditions) or whether they try to account for the divergent regulatory and financial framework conditions in the Member States. This aspect will be further discussed in subtask 2.2. To the extent possible and necessary, the recommended design options consider potentially adverse effects on tender outcome resulting from diverging natural, regulatory and financial national framework conditions.

3.2.1 General tender elements

When designing a renewable energy tender, it first needs to be determined what is on offer (i.e. the tendered good), how much is on offer (i.e. the tender volume) and how the awarded bidders get remunerated (i.e. the tender award or support tendered). Moreover, policymakers need to decide which technologies (and which sectors) will be allowed to participate in the tender (e.g. technology-specific vs. technology-neutral tenders). Finally, tenders can be designed as multi- or single-item tenders. The following section provides recommendations for each of these design elements.

3.2.1.1 Tendered good and volume

In renewable energy auctions, the tendered good and its volume can be defined in terms of capacity (in MW), energy production (in MWh) or in terms of budget (€). In practice, tender volumes in terms of capacity have been the most commonly used form. In case the target volume of a tender is expressed in terms of installed capacity, the tendered good is in most cases also defined in terms of capacity. A bidder therefore commits to install the offered capacity within the specified delivery period.

Defining the tendered good and volume in *terms of capacity (MW)* comes with the advantage that it provides a good planning environment for project developers. It also enables a fairly easy monitoring process in terms of the achievement of the European Union's RES policy goals. This is particularly important for the gap-filler function, where the precise determination of required capacities and ensuing energy production to be procured is crucial. By contrast, if volumes defined in terms of budget apply, procured amounts will generally depend on the emerging price of the tender (however, restricted by a potential ceiling price). Nonetheless, given that different RES technologies (and different installations of the same technology) differ in terms of their FLH, capacity tenders may nonetheless lead to deviations of the actual energy generation from estimated energy production based on actual FLH of awarded projects. These uncertainties are particularly prominent in case of technology-neutral capacity tenders, as the same tendered capacity may result in different energy amounts and thus different statistical benefits attributed to Member States depending on the awarded technology mix.

Alternatively, the total tender volume may be defined in *terms of budget* and capacities will be tendered until the budget is depleted. This entails the advantage that Member State budget commitments can more easily be translated into available tender volumes. In case capacity is tendered, on the other hand, available funds contributed by Member States would have to be translated into a minimum tender volume, considering a certain reference support level. Additional volumes could be tendered if the tender results in a lower price than the reference price.

Moreover, the auctioned volume may also be defined in *terms of generation (i.e. MWh)* over the course of a given time frame or an actual annual average. In this case, RES projects would receive support payments (most likely per MWh) until the generation-based target volume is reached. From the viewpoint of the auctioneer, this allows for easy monitoring of the achievement of policy goals given that European Union RES goals are expressed in terms of RES share in gross final energy consumption. Moreover, participating Member States would know ex-ante how much energy production and the corresponding statistical benefits they would receive based on their financial contribution, which is particularly relevant for the gap-filling function. On the other hand, generation-based tender volumes create problems in terms of inducing higher risks for bidders as they would have to commit to the delivery of a certain energy amount rather than delivering a certain capacity over which they have greater control. More specifically, RES technologies such as solar and wind are subject to intermittent energy production, which creates risks in terms of over- or underproduction with reference to the tender volume for which support payments are disbursed. This risk is increased if support is paid to projects based on pre-defined annual delivery, i.e. bidders are obliged to pre-determine an annual delivery amount for which they receive support. In this case, bidders may be faced with penalties in case of underproduction and do not receive additional support payments in case for overproduction. To mitigate these risks for intermittent RES technologies, banking and borrowing of energy production over a longer period may be implemented and/or a generation range (max./min.) of annual delivery amounts may be defined. For other dispatchable RES technologies, such as biomass, generation-based volumes are generally less problematic.

Recommendation

In line with international best practice, we generally recommend defining the tendered good and its volume in terms of capacity (MW) for all RES-E and RES-H support windows, as this is most transparent to bidders. Alternatively, the total tender volume may be defined in terms of budget and capacities may be tendered until the budget is depleted. Furthermore, defining the tendered volume in *terms of generation (i.e. MWh)* is also possible but would increase bidder risks for intermittent RES and therefore require additional flexibility arrangements.

For the transport and the heating and cooling sector, a number of additional challenges need to be considered (see chapter 3.3) and international best practices on competitive tender design are rare in these areas. How the tendered volume and good (as well as other design elements) are defined in these sectors should be decided on a case-by-case basis and depending on the technology in question.

3.2.1.2 Auction award (support tendered)

The Governance Regulation defines three types of support that can be granted to projects: it defines *inter alia* the option of operating support (feed-in premiums) for the "gap-filler function" and low-interest loans or investment grants under the "enabling framework function". For a detailed discussion of pros and cons of using different types of support as well the most suitable form of support for each of the windows, please refer to section 3.1.1.

3.2.1.3 Technology-specific vs. technology-neutral tenders (eligible technologies)

In principle, renewable energy tenders can be technology-specific, technology-neutral or can be organised as multi-technology tenders (or grouped tenders). Usually, the distinction between technologies is made based on resource type (e.g. wind onshore, wind offshore, PV, biomass, biogas, hydro, etc.) used for energy production.

The proposed set-up of the mechanism at hand (see section 2.1) already pre-defines the possibility of technology-neutral and technology-specific auctions as part of the respective support windows. From a tender design perspective, this is advisable, given that both types have dedicated advantages and disadvantages and can therefore complement each other depending on the respective political preferences at stake.

In *technology-neutral* tenders, technologies requiring the least support level are likely to win. As such, the tender outcome features static cost efficiency since the overall tender volume is contracted at minimal support costs. The market (rather than the policymaker) determines the awarded volume per technology. Given that the demand band is not restricted beforehand, market liquidity is relatively higher, and competition increases compared to technology-specific auctions. On the downside, technology-neutral (and multi-technology) tenders can also lead to windfall profits for cheaper technologies if the marginal price is set by more expensive technologies, resulting in higher support costs.

In the technology-neutral tenders under the mechanism potentially all technologies defined in the REDII may compete against each other, either across sectors or within sectors. Technology-neutral tenders across sectors entail certain disadvantages, however, such as the heterogeneity of the tender product (the value of one MWh electricity, heat and transport is equal for target accounting but different in energy value) and the difficulty in designing tender elements (e.g. ceiling prices) that are adequately calibrated for all technologies across sectors. Moreover, cross-sector tenders increase the possibility of windfall profits for relatively cheaper technologies. In addition, the allocation of investment support as part of technology-neutral tenders is not recommended, given that the comparability of bids would be challenging: investment costs per capacity unit differ substantially between technologies. As a result, the technology with the lowest specific investment cost would win, but it may produce much less energy compared to another technology (see also section 3.1).

In *technology-specific* tenders the volume to be procured from each technology is determined beforehand. Awarded projects are the most cost-efficient within their technology class, not across all technologies. This can potentially lead to increased support costs and decrease static efficiency compared to technology-neutral tenders. On the other hand, technology-specific tenders can contribute to dynamic efficiency by supporting currently less mature technologies with significant potential for future cost reductions (among other considerations such as local industry development, actor diversity or system integration which are not further elaborated here). More specifically, such mature and less competitive technologies would usually not be successful in a technology-neutral set-up but may be awarded in a technology-specific tender.

For the mechanism, technology-neutral tenders are therefore usually most suitable to reliably achieve a gap at lowest cost, while technology-specific tenders are more relevant to provide support to specific technologies (e.g. to reduce system integration costs in hosting countries or because the strategic relevance of certain technologies). As outlined above, the decision on technology-neutral or technology-specific set-ups strongly interacts with the type of support that is allocated to projects. In particular, technology-neutral tenders should be combined with operating support and avoided if investment support is allocated (see section 3.1). The decision on the tender's technology set-up and the type of support should therefore be aligned.

Recommendation

In general, all technologies as defined in the REDII should be eligible to participate in the mechanism. In the technology-neutral competitive tenders, at least two or all of these technologies may compete against each other. However, we advise against the use of technology-neutral competitive tenders across sectors. In the technology-specific and project-specific window, competitive tenders within one technology and site (for the project-specific competitive tenders) are organised.

Both technology-neutral and technology-specific competitive tenders are advisable and should be used in line with their specific advantages. To fill a gap at least cost, technology-neutral competitive tenders should be used. To only provide support to preferred technologies, technology-specific competitive tenders should be used. The decision on the tender's technology set-up and the type of support that is tendered should be aligned. In case operating support is tendered, technology-specific and -neutral tenders are feasible. In case investment support is allocated, technology-neutral tenders should be avoided due to the lack of comparability of bids (see section 3.1).

3.2.1.4 Single- vs. multi-item tenders

In *multiple-item tenders*, a certain capacity (MW), energy amount (MWh) or budget (€) is awarded. This amount is a divisible good, i.e. support is allocated to several bidders/projects. Bidders compete with their pro-jects at sites selected (and potentially pre-developed) by themselves. Winning projects are accepted until the target tender volume is reached.

In *single-item tenders*, several bidders compete for one project/site (e.g. the area for constructing an offshore wind farm), i.e. only one winner exists. Single-item tenders usually require the auctioneer to pre-develop the site to a certain degree (e.g. including environmental evaluations, measurement of resource availability, evaluations on geological structure). Bidders then compete for the right to construct their renewable installations at this specific site. Usually the grid infrastructure is also developed and constructed in parallel to the renewable energy project.

Given its focus on quick and least-cost RES deployment, multiple-item auctions should generally preferable in the technology-neutral and technology-specific window, where individual projects are usually smaller in size than the targeted volume. In such a set-up, multi-item tenders are able to create competition between many smaller projects, which in turn creates incentives for lower bid prices compared to single-item tenders and therefore serves the overall purpose of these support

windows better than single-item tenders. Moreover, multi-item tenders entail the advantage that the market, not the auctioneer, identifies suitable low-cost sites. This allows for competition between different sites and should therefore lead to support cost reductions compared with single-item tenders that pre-define sites. For the European Union -wide tender, these efficiency gains are particularly relevant given that the effect of tapping into the best sites across the European Union can be leveraged. Finally, multi-item tenders have been the norm for technology-specific tenders for e.g. solar PV, onshore wind and biomass.

For the *project-specific support window*, in addition to multi-item tenders, single-item tenders may be implemented to adequately account for this window's focus on large-scale projects of strategic relevance, such as offshore wind parks or large hydro projects. For these types of projects, a couple of unique characteristics create a case for centralised control and coordination of the initial planning stages exercised by the auctioneer. These include substantial infrastructural requirements (e.g. grid planning and development, site selection), the potential for significant conflicting interests due to the large-scale nature of the planned installation (e.g. in terms of societal and ecological concerns) and the existence of small tender volumes and/or project pipelines (e.g. innovative technologies with immature industries). It should be noted, however, that single-item tenders entail a risk for the awarded bidder to suffer the winner's curse due to the similar cost and revenue expectations involved for competing bidders. Auctioneers can mitigate the winner's curse through appropriate pre-qualifications and penalties.

Recommendation

Multiple-item competitive tenders are generally preferable in the technology-neutral and technology-specific window, where individual projects are usually smaller in size than the targeted volume. For the project-specific support window, we recommend the use of single-item or multi-item competitive tenders.

3.2.2 Tender procedure

The tender procedure is the core design element of the tender. It sets the rules of the market and determines the type of competition between bidders. The most important components are the tender format, the criteria which determine the ranking, the pricing rule, the optional determination of ceiling and floor prices as well as the frequency and scheduling of tender rounds. In the following section are recommendations for each of these design elements.

3.2.2.1 Tender format and pricing rule

The organisation of tenders should fulfil three general principles: the submitted bids are binding; the bidders with the best bids win and the winning bidders receive at least their bid price. Three fundamental types of tenders (static, dynamic and hybrid) fulfil these criteria, all of which have been used in tenders for renewable energy. In principle, each of these types can be further segmented by their payment rule which is either discriminatory (i.e. pay-as-bid) or has uniform prices (i.e. uniform pricing, pay-as-clear).

The most common tender formats for RES are *static or sealed-bid tenders*, i.e. all bidders simultaneously submit their bids and bid prices are unknown to all other bidders. The auctioneer ranks and awards projects until the cumulative volume equals the tendered volume. This tender format is called "static" as all bids are submitted only once, making it impossible for competitors to react to other bid decisions.

Static tenders can have different *pricing rules*, i.e. pay-as-bid tenders or uniform-price auctions. In a *pay-as-bid tender*, winners receive their offer price (also known as a discriminatory price auction). In a *uniform-price tender*, winners receive the market clearing price (also called pay-as-clear auction). Figure 13 illustrates these pricing rules.

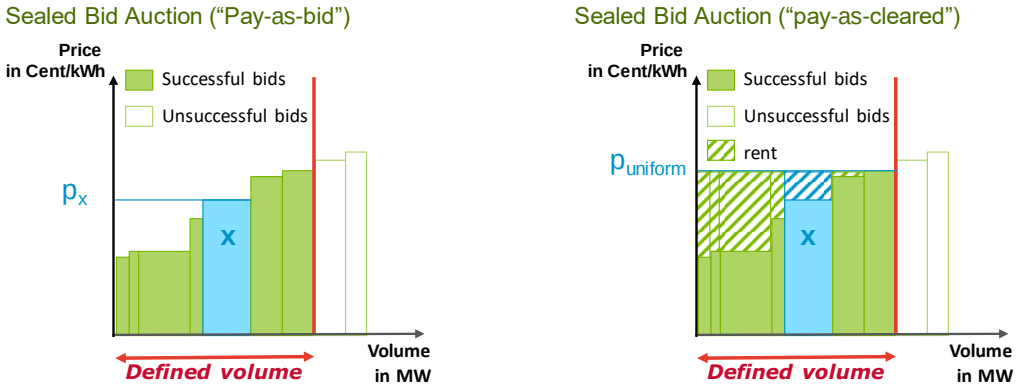

Figure 13 Pay-as-bid versus pay-as-cleared pricing rule

In contrast to the sealed-bid one-shot situation in static tenders, *dynamic tenders* offer bidders the opportunity to observe the development of the auction price and other bidders' bids during several phases and hence to adapt their bidding strategies during the tender process. Two major types can be distinguished: ascending and descending clock tenders.

In an *ascending clock tender*, the auctioneer declares the maximum remuneration in each phase. The first phase starts with a comparatively low price. Bidders willing to realise a project at this price submit a bid and receive an award, under the condition that the tender volume has not been exhausted. The price is then increased continuously within predefined fractions of time across the different tender phases and bidders signal successively their acceptance of the recent price. Hence, bidders are awarded one after another until the demanded amount of RES-E is reached. Bidders that wait until later rounds must weigh the benefit from receiving a higher remuneration against the risk that the tender will be closed before they are awarded.

In a *descending clock tender*, the auctioneer begins the process by announcing a price that is considered high. Bidders reveal the quantities which they want to offer at the stated price. If the offered quantity is higher than the tender volume, the auctioneer announces a lower price, and bidders reveal the quantities which they want to offer at the new lower price. This process continues until supply meets demand, which results in the clearing price. Consequently, those bidders are awarded who still offer volume at a remuneration level at which supply equals demand.

In addition, tenders sometimes represent *hybrid* structures, i.e. they combine characteristics of both static and dynamic auctions. A hybrid tender may, for example, implement a first phase with an ascending or descending clock tender, followed by a second phase using a sealed bid tender. This hybrid structure would aim to provide some price discovery for bidders in the first phase, while the second phase would be limit opportunities for collusion. For renewable energies, such hybrid tenders have for example been implemented in Brazil. However, hybrid tenders are usually more complex than their non-hybrid counterparts.

For the European Union -wide mechanism, it is crucial to select a tender format that leads to efficient tender results and minimises transaction costs for all parties involved. Moreover, given the inherent complexity of organising European Union -wide tenders, simplicity should be an important criterion when selecting the tender format and the applicable pricing rule.

In this respect, static tenders are generally more advisable under each of the mechanism's technology windows compared to the more complex dynamic tender formats. This is because the simplicity of static tenders reduces participation costs as well as bid preparation and auctioneer administration. Moreover, opportunities for collusion among bidders is low, as participants are not able to use bidding to signal or communicate (which is the case for dynamic tenders).

With respect to the chosen pricing rule, pay-as-bid tenders entail several dedicated advantages relevant for tenders under the mechanism. The main advantage of the pay-as-bid tender is that

bidders have no uncertainty as to their award price in case of winning, because they receive exactly their bid. This pricing rule is also relatively robust against unfavourable, strategic bidding behaviour even under specific market conditions such as immature markets, or markets with inexperienced bidders. Moreover, the simplicity of this pricing rule also pertains to the fact it is relatively easy to understand and usually perceived as "fair" by tender participants and the public, and therefore enjoys high acceptance.

However, as this pricing rule leads to different remuneration levels for different bidders, it provides incentives to place bids above their true costs (i.e. "bid shading"), the extent of which depends on their assessment of the level of competition. Hence, in a pay-as-bid tender, bidders with good market knowledge (e.g. bidders with larger portfolios or better market intelligence) are generally favoured over less informed competitors. This effect should be adequately considered and monitored when conducting the tender.

In theory, pay-as-clear tenders can somewhat mitigate the risk of bid shading. This is due to their characteristic of producing one uniform price across all actors, whereby bidders are incentivised to submit bids at their true cost, i.e. their indifference value.[26] However, the uniform pricing rule is the only incentive compatible under particular assumptions that are rarely present in realistic tender implementations, including in the mechanism's tender rounds. As soon as bidders participate with more than one bid per round (i.e. multi-item auction) or in more than one tender round (i.e. multi-round tender) or their costs have some common components (e.g. PV-module prices), their incentives alter, and the advantage of the uniform pricing rule becomes less prominent.[27] Under these common tender scenarios likely to be found in the mechanism (e.g. multi-item tenders), uniform pricing will not necessarily lead to lead to superior results in terms of its tendency to reveal bidders' true costs as compared to a pay-as-bid pricing rule.

In the context of the mechanism, the pricing rule should also be assessed in terms of administrative simplicity. Here, the uniform pricing rule has one specific advantage, namely that by producing a common award price, the allocation of support payments to Member States' contributions is more straightforward compared with the pay-as-bid pricing rule. More specifically, the allocation of support payments within one tender round can be done per unit (e.g. MW or MWh), irrespective of the individual project being supported, given that remunerations are equal across projects. Nonetheless, the allocation of support payments under pay-as-bid is of course possible (e.g. via average award prices), even though this creates a somewhat increased administrative burden compared to uniform pricing, as reference values would e.g. change whenever awarded projects are not realised.

Hence, uniform pricing carries several advantages which can make its use more advisable in specific tender rounds. Such scenarios may exist, for example, in the presence of a multitude of contributing and hosting Member States, in which case the simple administration of support payment allocation may be more relevant, or in case the market structure demonstrates a large asymmetry between large and smaller actors, increasing the risk of bid shading.

Recommendation

We recommend the implementation of static competitive tenders under each of the mechanism's support windows. However, the mechanism should allow for a flexible change between pay-as-bid and uniform pricing between tender rounds.

[26] This means that every bid receives an automatic mark-up on their bid price which corresponds to the difference between the clearing price and their bid price. In case they win the tender, they can be certain to not set the price level. Hence, if a bidder places a bid above its true cost, he only reduces its chances of winning without increasing its chance of receiving a higher remuneration. No information on the level of competition is needed.

[27] For example, in multi-round competitive tenders, bidders have an incentive to increase their bids above the indifference value in all but the very last round. In multi-item competitive tenders, the second bid can set the price for the first one, if bidders submit more than one bid, i.e. the dominant strategy would be to bid the indifference value for the first bid and submit a price above it for the second bid.

3.2.2.2 Ranking criteria

Ranking criteria determine the order of bids. Besides a price-based selection, whereby projects are selected on the basis of lowest bid price, qualitative criteria such as environmental benefits, local content, system integration benefits or envisaged commissioning date may be implemented as part of the tender design. Price-only evaluation is the most common method of bid evaluation in Europe (e.g. used in Denmark, Germany, Ireland, Italy, the Netherlands and the UK) and is associated with lower support and transaction costs, whereas the inclusion of other criteria imposes restrictions that might lead to higher costs and decreased transparency.

A purely price-based ranking carries the advantage that only bids with the lowest prices will be awarded, which leads to a cost-effective selection of eligible projects and is in line with the primary objectives under the mechanism's support windows. Should the inclusion of additional policy objectives be considered necessary, such criteria may also be reflected in the applicable pre-qualification requirements or measures outside the tender system rather than the ranking procedure itself. However, in the project-specific window, additional qualitative criteria (e.g. environmental benefits or innovation) may be implemented as part of the ranking of bids to account for the specificities of certain large-scale projects.

Recommendation

We generally recommend the use of a price-only ranking criteria in all support windows. In the project-specific window, additional qualitative ranking criteria may be implemented.

3.2.2.3 Price caps and floors

A price cap or ceiling price is a maximum price in a tender, where bids above the ceiling price will be disqualified. A price ceiling can reflect the auctioneer's willingness to pay or limit the risk of high cost due to limited competition or collusive behaviour. A *price floor* or *minimum price* can set a lower bound bid price, whereby bids below the minimum price will be rejected. The rationale behind is to e.g. limit the risk of the winner's curse. Price caps and floors can be revealed in advance of the tender to create more transparency for bidders or remain undisclosed to avoid strategic behaviour. Moreover, maximum or minimum prices can be differentiated by technology or sector in multi-technology tender rounds or a uniform ceiling price may apply.

Setting adequate price caps under each of the support windows within the mechanism is recommended, if appropriately calibrated to reflect the respective market conditions in each tender round, as well as the costs of participating technologies in each case. Especially in multi-technology tenders (e.g. as part of the technology-neutral window) and uncertain competitive situations (e.g. in the project-specific window or for certain technologies in the technology-specific window), ceiling prices can help to differentiate between bidder groups and orient stronger bidders towards the ceiling price instead of weaker bids, which is beneficial for competition. If less bids are offered than there is tender volume, ceiling prices can 'save' the tender by providing an objective award price. Hence, ceiling prices should not be seen as the mechanism by which RES prices are driven downwards – that should be achieved through competition in the tenders. The main purpose of ceiling prices is to protect against the risk of inadvertently awarding very high-priced bids. Ceiling prices also set a cap on total support costs (in case capacities or energy amounts are tendered) and thus increase budget certainty, an important point for the mechanism in question, given that it relies on Member States' contributions to and their acceptance of the mechanism. In section 4.1 we further elaborate the process for determining ceiling prices and Member State contributions.

By contrast, price floors appear problematic, as they are only needed if do not work properly (e.g. as a result of an inadequate tender design) and because it is difficult to determine the minimum price. This is especially true for RES where a very low bid price may indicate that projects can almost solely rely on market revenues, which should usually not be penalised.

Ceiling prices also come with some disadvantages under certain conditions, which have to be considered. They can limit competition and work as a focus point of bids. More specifically, bidders will not orient their bids towards their true costs but towards the expected clearing price in the case of too low competition, which distorts the market signal. In addition, overly aggressive ceiling prices can also be distorting as they may make a tender unattractive for investors, potentially resulting in a situation where not all tendered volume is awarded (i.e. no "market clearing"). Nonetheless, the potential distortion introduced by a ceiling price should usually be compensated in case of enough competition because bidders still have the incentive to place competitive bids. Hence, ceiling prices should refrain from overly restricting competition, e.g. by avoiding ceiling prices that are too low for most bidders. As such, ceiling prices require adequate calibration to reflect market conditions and technology costs, even though this might entail additional administrative costs for the auctioneer.

Disclosing ceiling prices in advance of each tender round organised as part of the mechanism prevents otherwise qualifying projects from being rejected simply because bidders did not know the ceiling price. The disclosure of the ceiling price also gives bidders more planning security, increasing the acceptance of the tender.

For the technology-neutral window, more specifically, either a common ceiling price can be implemented for all technologies or ceiling prices can be differentiated according to different technology cost. Since technology-neutral ceiling prices create an incentive for lower cost technologies to bid above their true cost, close to the ceiling price, technology-specific ceiling prices as part of the technology-neutral support window are recommended to account for cost asymmetries between technologies and to limit windfall profits for lower-cost technologies.

The exact determination of the level of price caps and floors is another important question. Here, the Governance Regulation requires the European Commission to include in the act “the methodology for the calculation of the maximum level of the premium for each tender”. There are two main options for calculating ceiling prices, one approach based on an assessment of levelised cost of energy (LCOE) and one approach based on opportunity costs. Compared to an opportunity cost approach, a LCOE-based approach provides a realistic production cost assessment and thereby increases the chance of reliable RES deployment while reducing the risk of windfall profits. When applying the LCOE-based approach, the ceiling price should be calculated from the perspective of a typical investor. Therefore, the methodology should usually take the broader regulatory framework and transaction costs into account, or at least leave room for projects under different regulatory settings. Implementing country-specific ceiling prices may be an obvious remedy in this respect. However, differentiated ceiling prices may reduce transparency for bidders and decrease competition between regulatory framework conditions in Member States.

Note that in this context the calculation of ceiling prices for investment support and fixed premiums requires an estimation of market revenues (i.e. a projection of electricity price development in the case of RES-E) which are to be deducted from overall costs. When estimating these market revenues and considering applicable market values, conservative scenarios should generally be preferred to avoid overestimating market revenues which could otherwise result in setting too ambitious ceiling prices. Such a calculation could be complemented by a risk factor to provide an additional margin in case actual market revenues turn out to be lower than projected. Moreover, in case of investment support, an average amount of full-load hours needs to be assumed to calculate the ceiling price. In case of operating support (i.e. fixed or floating premiums), the ceiling price may need to be combined with a maximum amount of eligible full-load hours to limit overall support costs to contributing Member States.

Finally, adjustment of ceiling prices on a regular basis is likely to be required as LCOEs of renewables evolve. This can be done as part of three principle approaches. First, an administrative authority could recalculate the LCOE and the ceiling price on a regular basis. Second, the ceiling prices could be indexed to economic indicators (such as steel or module prices etc.) and changed automatically, or by discretion of the tendering authority. Third, ceiling prices could be adjusted based on the tender outcomes of previous rounds. The European Commission’s implementing agency as the responsible auctioneer seems best placed to adjust ceiling prices as part of elaborating the specific tender details. While this creates additional administrative burden for the auctioneer, an administrative approach seems best suited to ensure reflective ceiling prices, whilst at the same time taking into account the

varying set-ups across tenders rounds due to changing participation of hosting and contributing Member States (and changing framework conditions).

Recommendation

We recommend the use of disclosed, technology-specific ceiling prices in each of the mechanism's support windows. Price floors should not be set. The use of uniform ceiling prices across Member States should be the default option.

The calculation of ceiling prices should follow an LCOE-based approach from the perspective of a typical investor. Ceiling prices for different RES technologies for each competitive tender round (assuming investment support is tendered) should be based on the following calculation**:**

$$\frac{\sum_{t=1}^{n} \frac{I_t + O_t + F_t - M_t}{(1+r)^t}}{C}$$

For a floating premium (in case operating support is preferred), the following calculation applies:

$$\frac{\sum_{t=1}^{n} \frac{I_t + O_t + F_t}{(1+r)^t}}{\sum_{t=1}^{n} \frac{E_t}{(1+r)^t}}$$

I_t = Investment in the year t; O_t = Operations and maintenance expenditures in the year t;

F_t = Fuel expenditures in the year t; M_t = Expected market revenue in the year t;

r = Discount rate; n = economic lifetime of the plant; C = capacity in MW; E_t = Energy production in the year t

Ceiling prices should be adjusted on a regular basis by the European Commission or a responsible implementing agency.

3.2.2.4 Tender frequency and schedule

The tender frequency determines the number of tender rounds taking place within a given period. Tenders consisting of more than one tender round are called multi-round tenders.

A low frequency reduces administrative burden for the auctioneer and increases the liquidity in one round, but it creates risks in terms of a less continuous business development for project developers and manufacturers. Bidders may refrain from participating in a single-round tender, because this might be perceived too burdensome and or entailing too much risks because of the inability to resubmit their bid in another round. On the other hand, a high frequency typically leads to greater continuity for project developers and manufacturers, which increases planning certainty but may create problems in terms of a lack of competition in each tender round.

For the mechanism, establishing a long-term tender schedule and defining an appropriate tender schedule is inherently difficult as it is unknown in advance which countries participate in which tender rounds (e.g. because of an apparent gap in target achievement) and thus how much volumes (per technology) are tendered in each case. Moreover, the possibility to implement a long-term tender schedule depends on hosting and contributing Member States' willingness to make longer term commitments for multiple tender rounds rather than for one-off tenders only.

Recommendation

To the extent possible, continuity of competitive tender rounds organised as part of the mechanism should be aimed for in order to increase long-term planning certainty for market actors and tender frequency should be adapted in line with applicable market conditions.

3.2.3 Qualification requirements

Bidders and their bids typically need to comply with certain eligibility or pre-qualification requirements. They aim to ensure the seriousness of bids, i.e. to prevent bidders from participating in a tender with no serious intent to realise the project, and to increase overall realisation rates. In addition, prequalification requirements may be used to pursue secondary objectives, e.g. to increase actor diversity or specify the technological equipment to be used. Setting adequate pre-qualification requirements can be challenging, however, as they highly affect risk levels of participating bidders and hence bid prices and competition levels.

In the following section a high-level recommendation is provided regarding the level of pre-development required from bidders, i.e. whether early or late tenders should be implemented. This is followed by guidance on the three types of pre-qualification criteria, namely material pre-qualification requirements, financial guarantees (bid bonds) as well as additional eligibility requirements or restrictions at the disposal of the European Commission to pursue secondary policy goals (not discussed in detail).

3.2.3.1 Required pre-development from bidders (early-vs. late tenders)

Project development generally starts with a planning stage, followed by the permit approval process, construction, and then operation. Tenders can take place at different stages of this project development process. They can be conducted rather early in the project planning process (so-called early tenders) or projects can be required to wait until e.g. after the permitting procedure to participate in a tender (so-called late tenders), with implications on costs, risk level, realisation probability and actor composition. Figure 14 provides a simplified overview of tender timing within the project development process.

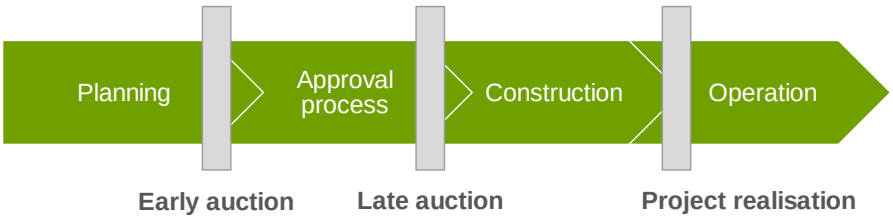

Figure 14 Tender timing within the project development process (simplified)

An *early tender* takes place at an earlier stage of the project development process, where crucial planning permits and a grid connection are yet to be obtained. This implies lower risk for the project developer as they need to invest less in the project before participating in the tender and therefore have lower sunk costs. However, it also implies a higher risk of project failure after the tender award – either because the project developer cannot obtain a certain permit, or because the developer underestimated its costs as it had insufficient site data before bidding.

A *late tender* takes place at a later stage of the project development process, for example once planning permits and a grid connection have been secured. This implies higher pre-development costs for the developer before the tender, but also a higher chance that the awarded project will be realised. Most countries have opted for late tenders in their RES tender design. Note in this context

that late tenders can be implemented explicitly via material pre-qualification requirements or implicitly via (short) realisation periods to be complied with by the successful bidder after the bid award decision has been taken.

International experience has demonstrated that the implementation of late tenders is usually advisable, given the benefits in terms of increasing realisation rates. However, the non-comparability of relevant planning and approval procedures across hosting countries may inhibit participation for developers with projects located in certain countries. For instance, a project developer with a project located in one country and intending to participate in a tender under the mechanism, may be subject to substantially longer national permitting procedures than a competitor developing a project in another country. In order to obtain the (explicitly or implicitly) required permits to participate in the tender, they will therefore need to begin the pre-development of the project significantly earlier than project developers with projects located in countries with faster and less burdensome approval processes. As a result, the affected project promoter will typically incur higher risks and costs and be systematically disadvantaged in the tender compared to other bidders with more favourable national framework conditions. This potential discrepancy should be thoroughly assessed beforehand, especially when setting realisation deadlines and pre-qualification requirements. Nonetheless, remedies for these adverse effects are usually better placed outside the tender procedure, e.g. in terms of improving national approval procedures.

Recommendation

We recommend that competitive tenders for renewables under the mechanism are implemented as late tenders.

3.2.3.2 Material pre-qualifications

Material pre-qualification requirements entail standardised proof of project progress, such as an environmental permit, an approved zoning or development plan or a grid connection agreement. This is to ensure high realisation probability, given that participating projects have already incurred some of the risks pertaining to the initial planning phase (e.g. permits, securing a location). However, material pre-qualifications requirements occur at an increased (sunk) cost for the bidder, i.e. are not reimbursed in case the project is not awarded, which results in additional risks. As a result, high sunk costs can prevent project developers from participating in the tender in the first place, therefore restricting competition.

While adequate material pre-qualifications have generally proven to be an important safeguard for successful project realisation, they have typically been implemented in national tenders, where applicable framework conditions are similar for all projects (e.g. in terms of national planning and permitting procedures). The mechanism's European Union -wide tendering, by contrast, implies that different project developers would face different national framework conditions depending on the hosting country which their project is located in. As such, it is likely not to be feasible to define comparable material pre-qualification requirements that can be applied across all participating countries.

Recommendation

We recommend the sole use of adequate financial guarantees (bid bonds) to select serious bids and ensure project realisation (see next section). We advise against the implementation of European Union-wide material pre-qualification requirements as part of the mechanism, due their lack of comparability across participating countries.

3.2.3.3 Financial guarantees (bid bonds)

Financial pre-qualification requires bidders to present a financial guarantee when entering the tender and/or upon being awarded a bid. This can be done via bank guarantees or a cash deposit in a designated bank account (i.e. a bond). The financial guarantee is usually linked to penalties, as the guarantees can be retained in case the bidder does not live up to its contractual liabilities, e.g. in terms of realising the project within the agreed realisation period (see also section 3.2.4.1and 3.2.4.2).

Financial guarantees come with several advantages. First, (post-award) financial guarantees and the linked penalties in case of non-realisation have demonstrated a good international track record of providing safeguards for project realisation and avoiding delays. Second, they are less prone to be adversely affected by different national framework conditions such as permitting procedures, i.e. are more easily comparable across participating countries. Finally, they reduce administrative burden for the auctioneer compared to material pre-qualifications in case bidders opt for a bank guarantee, given that an external institution assesses the creditworthiness and/or liquidity of the bidder.

On the downside, if financial guarantees are set too high and/or too difficult to obtain, this may discourage participation of especially smaller actors (since high bid bonds require a higher creditworthiness) and thus induce significant barriers for these actors.

Recommendation

We recommend implementing financial guarantees for the bid-stage (pre-award) in each of the mechanism's support windows to ensure that only serious bids participate in competitive tenderrounds under the mechanism. Such pre-award guarantees may be set at up to 1% of estimated project costs.

In addition, we recommend the implementation of post-award financial guarantees to increase realisation rates. Our specific recommendations on these financial guarantees as well as the related realisation periods and penalties are discussed in more detail in section 3.2.4.

3.2.3.4 Additional eligibility criteria

Additional eligibility criteria or restrictions may be implemented in line with secondary policy goals. Such restrictions reduce the potential tender participants to only certain classes of bidders, i.e. only projects complying with certain eligibility criteria may participate in the tender. Restrictions can for example pertain to a specific technology design (e.g. equipment requirements), actor characteristics (e.g. a minimum experience level), maximum project sizes, site or location constraints.

At this point, we are not aware of additional European Commission policy priorities other than the primary objectives outlined above that would justify the incorporation of such restrictions. Additional eligibility criteria may, however, be implemented in line with (upcoming) secondary policy objectives should this be deemed essential. However, such additional restrictions should generally be implemented with care and following proper analysis of applicable market conditions. This is due to this element's likely adverse effect on competition levels and thus higher support levels. At least for the technology-neutral and -specific windows, such restrictions may thus compromise the primary goal of achieving a cost-efficient allocation across and within technologies respectively. For the project-specific window, the implementation of additional eligibility criteria (e.g. in terms of minimum experience level) may be more warranted.

Recommendation

Additional eligibility requirements may be implemented in line with secondary policy goals but should follow an adequate analysis of applicable market conditions.

Note that this recommendation is without prejudice to potential restrictions implemented at Member State level, e.g. in terms of projects sizes or types of sites, but rather concerns additional eligibility criteria to be implemented by the European Commission in line with their own priorities.

3.2.4 Obligations, deadlines and penalties

In the aftermath of the tender, bidders are typically granted a pre-defined time to realise the project, the so-called realisation period. If they fail to comply, they usually face penalties. Another design element to be considered after the tender concerns the possibility to transfer the awarded contract from one project to another. The following section provides more detailed guidance on each of these design elements in turn.

3.2.4.1 Realisation periods

The realisation period specifies the time during which projects need to be commissioned, i.e. the validity of the award. If the realisation period is exceeded, i.e. a project fails to be completed in time, penalties can be imposed.

In general, excessively long realisation deadlines are undesirable because they encourage speculative bids (e.g. developers speculating on equipment costs to fall). Nonetheless, they should allow for project completion times that are realistic for the local market.

To ensure a certain level of pre-development at the start of each tender round under the mechanism (i.e. to implement late auctions as discussed in section 3.2.3.1), delivery periods should usually be rather short, while at the same time reflecting context- and technology specific particularities. Two options are possible in this respect: country-specific and/or technology-specific realisation periods.

In principle, contracted delivery periods should be technology-specific and reflect realistic project delivery periods for each technology, given that the latter differs considerably between technologies. While the realisation of offshore wind projects, for instance, may take up to several years, solar PV projects can often be realised within a few months. In technology-neutral tenders under the mechanism, realisation periods may nonetheless be set uniform across technologies if the aim is to select projects and technologies with the lowest delivery times. However, it should be kept in mind that uniform realisation periods may cause problems in terms of increasing the risk of delays (for technologies with long realisation period if too short grace periods are set) or enable investors to speculate on decreasing costs (for technologies with short realisation periods if too long grace periods are set). As a starting point, for the main RES onshore wind and solar PV, delivery periods (from the time of the award) may be set at three years and two years respectively. However, these deadlines only serve to provide an initial guidance and may be adapted in line with applicable market conditions of participating hosting countries in specific tender rounds, e.g. in case realistic average delivery periods diverge significantly from the above recommendation.

Country-specific realisation periods may be set to account for varying framework conditions leading to diverging realisation periods. However, their implementation may decrease transparency and reduce competition between national frameworks conditions towards best practices. Therefore, setting uniform delivery periods across hosting Member States for all tender rounds under the mechanism may be more straightforward. Nonetheless, a differentiation of realisation periods by countries may be deemed necessary in light of recent outcomes, e.g. in case systematic delays of awarded projects in one country become apparent.

Recommendation

In principle, contracted delivery periods should be technology-specific and reflect realistic project delivery periods for each technology. In the technology-neutral window, delivery periods may be set uniformly across technologies, if the aim is to prioritise projects with short delivery periods. Delivery periods may be differentiated by country, but priority should be given to uniform delivery periods across countries.

3.2.4.2 Penalties (combined with financial guarantees/bid bonds)

Penalties aim to ensure the effectiveness of the tender by reducing the chance of delays, underperformance or non-realisation. For example, penalties are often imposed if project start-up is delayed or if the installed capacity is lower than what was awarded (i.e. underbuilding). Penalties for non-completion can also be a way to discourage strategic underbidding. They alter the economic consideration of developers, increasing the incentive to avoid non-completion. This pushes participants towards cost-reflective bids. On the other hand, harsh penalties can lead to substantial risks for bidders and high bid prices (if participants price the penalties into their bids). If penalties are too large and financial guarantees too difficult to obtain, they may deter developers from participating and hence limit competition.

Besides the full or partial confiscation of financial guarantees/bid bonds, penalties can take several forms such as the termination of contracts, lowering of price levels or the shortening of contract validity periods by the time of the delay.

In line with section 3.2.3.3, we recommend (post-award) financial guarantees and the associated penalties in case of non-delivery or delay beyond the contractually agreed realisation period. Such financial guarantees can be linked to penalties, as they can be retained in case the bidder does not fulfil its contractual requirements.

When determining the extent of penalties, a right balance needs to be struck between accessibility, including by smaller actors (since high bid bonds require a higher creditworthiness) on the one hand, and avoiding the risk of non-realisation on the other hand. If penalties are set too strict and financial guarantees are too difficult to obtain, this may lead to low participation, especially of smaller bidders, and bid prices might therefore increase. If penalties are too low, this might lead to lower realisation rates.

In general, given that we advise against imposing material pre-qualifications for tenders conducted under the mechanism, this needs to be adequately balanced by higher penalties compared to a situation where additional material pre-qualification requirements would have been mandatory. On the other hand, we also recommend implementing late tenders with rather short realisation periods. Hence, most project developers will be implicitly required to have achieved a high level of pre-development at the time that the tender takes place. The combination of a lack of material pre-qualification requirements and the implementation of late tenders via short realisation periods justifies imposing relatively high (post-award) financial guarantees in the range of 5-7% of estimated project costs.[28] In case immature and therefore more risky technologies are tendered as part of the technology-specific or project-specific window, bid bonds may be increased to up to 10%. These are rough indications. Therefore, the mechanism should provide flexibility to adapt bid bond levels (expressed in € per kW) to the context of specific tenders rounds and technology windows. As a general rule, bid bonds are to be set technology-specific to reflect diverging costs for pre-development and thus varying opportunity costs of non-completion or delays.

For penalties applying in case of delays, the possibility to implement a subsequent phase-in of penalties should be considered in order limit penalty risks for bidders. For example, in case the initial realisation period (as outlined above) is exceeded by a project, only 50% of the bid bond (rather than

[28] European RES auctions have typically set post-award financial guarantees at around 3 to 5 percent of estimated project costs. However, financial guarantees have usually been accompanied by material pre-qualifications requirements.

a full confiscation) would be retained. Only if an additionally granted six-month extension of the initial realisation period is exceeded, would the full bid bond be confiscated. No delay penalties apply if the project is completed within the initial realisation deadline.

To discourage strategic bidding. no support should be paid for any capacity installed in excess of the capacity awarded in the tender (i.e. overbuilding penalties). In terms of underbuilding penalties, a 5% downward tolerance seems prudent, in order to provide some flexibility for unintended shortfalls beyond the control of the project developer. As a result, if the installed capacity of the completed project is below 95% of the capacity awarded in the tender (assuming the tender awards capacity), then it will lose the amount of the bid bond per kW of capacity shortfall.

Recommendation

We recommend implementing (post-award) financial guarantees and the associated penalties in case of non-delivery or delay beyond the contractually agreed realisation period. Financial guarantees should be in the range of 5 - 7% of estimated project costs and may be differentiated by technology. They should be partially confiscated in case of delays.

In terms of overbuilding penalties, no support should be paid for any capacity installed in excess of the capacity awarded in the auction. In terms of underbuilding penalties, we recommend a 5% downward tolerance, i.e. if the installed capacity of the completed project is below 95% of the capacity awarded in the auction, the amount of the bid bond per kW of capacity shortfall will be deducted. This recommendation assumes that capacity is awarded.

3.2.4.3 Transferability after award

Post-award transferability usually refers to whether bid awards can be transferred to other sites after being successfully awarded in a tender. In early tenders where awards are not location-specific, post-award transferability may help to ensure high realisation rates but possibly also lead to the creation of a secondary market and unwanted speculative behaviour. In the case of a late tender, however, awards are (explicitly or implicitly) tied to specific project permits, so the role of transferability is very limited.

Since we recommend the implementation of late tenders, transferability should generally not play a large role in the tenders organised as part of the mechanism. However, it may systematically disadvantage countries with longer planning and approval processes. Not allowing transferability after the award therefore seems prudent.

Recommendation

Awards should be location-specific and not transferable to other sites (i.e. the bidder commits to a certain site).

3.2.5 Other relevant design considerations

3.2.5.1 Reflection of grid connection costs in tender design

We do not recommend an explicit reflection of grid connection costs in the tender design. Grid costs may be internalised to projects or be reflected in the statistical compensation to host countries. For a detailed discussion of this aspect please refer to chapter 4.2.

3.2.5.2 Actor diversity

Promoting actor diversity in tenders usually refers to design options that improve the chances for smaller actors or renewable energy communities that would otherwise struggle to participate in the tender. Disadvantages for smaller actors can arise because of systematically higher generation costs compared with larger actors or their inability to spread risks as well as their larger counterparts.

However, actor diversity can also be promoted outside tender design (an example is the guarantee fund for wind energy in Denmark). Furthermore, Member States can exempt smaller projects from tendering (de-minimis rules in the Guidelines on State aid for environmental protection and energy 2014-2020 / EEAG and REDII).

Options to privilege small/community actors within tender design include reduced financial or material prequalification requirements and associated penalties for these actors, differentiated pricing rules as well as quotas or bonusses for small/community actors. However, a fundamental problem of any such measures is that it is difficult to legally define the privileged actors and that privileges might invite other bidders to create equivalent legal constructs.

The experience with renewable energy community privileges in German wind tenders shows that defining what a community actor constitutes is inherently challenging and favourable treatment of a certain group usually creates incentives for all actors to benefit from applicable exemptions, e.g. by adapting legal forms of the project-owning entity in line with the requirements to be considered a community actor. In this case, the group initially targeted by the design element was largely missed.

At this point, we are not aware of European Commission priorities in terms of specifically promoting small/community actors through the mechanism that would justify the incorporation of such design options, given that the mechanism only tenders smaller complements (in terms of the volumes tendered) to larger national markets and national support schemes. However, specific measures to promote actor diversity and community actors may of course be implemented, in case this becomes a policy priority, and/or should it become apparent that adjustment will be necessary in light of past tender result. Further analysis would be needed to identify appropriate measures. Based on our initial analysis, supporting measures outside the tender may be more suitable and less distortive than design options within the tender.

Recommendation

As a default option, we advise against the incorporation of design parameters privileging renewable energy communities and/or small actors as part of the mechanism's auction rounds. However, the auction design should allow all types of actors to participate (e.g. by avoiding excessive financial qualification requirements). Should actor diversity become a policy priority at a later stage and/or should it become apparent that adjustment will be necessary in light of past auction result, specific design adjustments or complementing measures to promote actor diversity may be implemented.

3.2.5.3 Limitation of bidders' concentration

A high bidder concentration can lead to a lack of competition, which can be considered one of the greatest barriers for well-functioning tenders.

Options for seller concentration rules to mitigate the risk of market power include setting a minimum number of bidders under which the tender will not be carried out, limiting the size of bids per bidder or limiting the number of rounds in which bidders can participate. However, such rules are difficult to implement in practice, given that RES bidders are often organised as special purpose vehicles (i.e. project companies) whose ownership structures are not transparent and difficult to track.

Problems related to market concentration are likely to be less pronounced in tenders organised as part of the European Union wide mechanism, given that demand created by the mechanism will be complemented by (potentially larger) national markets. Should market concentration nonetheless become a relevant issue, the incorporation of bidders' concentration rules would need further analysis.

Recommendation

Initially, we advise against the incorporation of concentration rules as part of the mechanism's auction rounds. Should market concentration become a relevant issue, the incorporation of bidders' concentration rules may be considered but would pose practical challenges.

3.2.5.4 Budget minimum thresholds for setting up tenders

The mechanism's tendered volumes depend on its available budget and thus on Member States' financial contributions. In line with the process described in section 5.2, contributing (and hosting) Member States would be first asked to express their interest to participate in auction rounds organised under the mechanism. On this basis, the European Commission would develop draft calls for proposal/invitation for bids. Only after a final binding commitment taking the proposed auction design into account, a final decision would be taken on the implementation of the auction (via a final call for proposals). If at the stage of the Expression of Interest (EOI)-phase, it becomes evident that the sum of contributions from Member States turn out too low to effectively and/or efficiently tender target volumes as part of any of the support windows, it may not be advisable to continue the process of receiving binding commitments by Member States and organise a tender for non-repayable grants, e.g. given the transaction costs involved.

However, other considerations such as providing a testing ground for following tender rounds, creating visibility for the mechanism or giving smaller Member States the opportunity to take part in the tender rounds, even in case smaller volumes are tendered, may be equally important. Against this background, the question arises whether and how budget minimum thresholds for setting up tenders should be introduced as part of the tender design.

While the European Commission should be legally allowed not to organise a tender in a certain year under certain conditions, defining a single minimum threshold for setting up tenders under the mechanism is not feasible, as such a decision is first and foremost a political question that goes beyond purely financial considerations. Nonetheless some general considerations may be warranted.

To effectively serve the gap-filler function, it should be ensured that available budgets are sufficient to at least deploy the required target volume for one contributing Member State. Here, it should be taken into account that technologies differ with regards to their typical project sizes. Hence, estimates of the required minimum budgets to organise tenders need to reflect these specificities, particularly if these minimum thresholds are set for tenders conducted as part of the technology-neutral support window.

Nonetheless, minimum budget thresholds set in this way might still turn out to be relatively low in absolute terms, considering that especially smaller Member States may not require allocating

substantial volumes to reach their European Union targets. Hence, transaction costs to organise (for the auctioneer) and to participate (for project developers) might be comparatively high and overall visibility of the mechanism may be relatively low. In this case, more pragmatic, political considerations become relevant, and the European Commission needs to eventually decide if the overall benefits, e.g. in terms promoting smaller Member States or conducting tenders with a political pilot character, outweigh the costs of organising a tender under the mechanism.

Recommendation

The European Commission should be legally allowed to not organise an auction in a certain year, in case the interest expressed by contributing and or hosting Member States results in volumes which are too low to successfully implement an auction or where the related transaction costs would be excessive.

3.2.5.5 Incorporation of hosting Member States' rights in the tender design

The Governance Regulation prescribes that Member States shall have the right to decide whether and under which conditions they allow installations located on their territory to receive support from the mechanism. This raises the question how tender design can take these rights adequately into account, without making it overly complex and keeping in mind the ensuing administrative burden for all parties involved. Especially for hosting Member States it will thus be important to define how they can set tailored limitations to increase their willingness to participate.

Conditionalities imposed by Member States may include total volumes (i.e. capacities), site restrictions, technologies or project sizes. In principle, these conditionalities may be implemented as eligibility criteria/restrictions (see section 3.2.3.4) and/or via discriminatory elements in the tender's winner selection process, whereby competition is explicitly influenced in favour of some bidders or their bids. Discriminatory elements can be implemented via quota/segments ("volume-based discrimination"), which aims to guarantee that a certain amount of the tendered volume goes to the privileged bids (quota). In case of restrictions, bids or bidders not complying with certain eligibility criteria are excluded from participating in the action in the first place. Note in this context that while discriminatory elements and additional eligibility criteria allow to meet additional policy goals at national level, they also tend to decrease static efficiency of tenders (see for a detailed discussion of these options section 3.5.3).

Member States may decide beforehand on which project sizes and types of sites (e.g. conversion areas or other easily identifiable types of sites) are eligible for support under the mechanism. These preferences can be implemented via eligibility criteria, i.e. bids from projects that are not eligible under these rules would be excluded from the tender. The responsible party for controlling that only eligible projects receive support under the mechanism should be mainly done by Member States, given their better knowledge of applicable national rules (see subtask 4.2).

In case a Member State intends to restrict the deployment of projects located on its territory in terms of total volumes or volumes per technology, two principal routes are feasible. If it decides to only deploy selected technologies, i.e. to not deploy any volumes of certain technologies, the Member should take part in the respective technology-specific tenders rather than a technology neutral tender round, where restrictions and discriminatory elements should be kept minimal. If the country in question intends to apply (additional) volume restrictions, these can either relate to the total volume to be deployed on its territory irrespective of the installed technologies or volume restrictions can pertain to specific technologies rather than outrightly banning them from being deployed. In this case, our recommended tender design depends on the specific window under which support is granted.

In the project-specific support window, tenders are likely to be targeted at large-scale strategic projects, e.g. large cross-border offshore projects. As applicable sites would most likely be suggested by participating Member States under this window, the right to decide whether and under which conditions these installations situated on their territory receive support should therefore be already

fully covered by the coordination process between the European Commission and Member State before tenders in this window are put in place. Hence, additional design elements for volume control are not necessary.

In the remaining windows, on the other hand, tender design can specifically incorporate maximum volumes (potentially differentiated by technology) that Member States' are willing to grant support to under the mechanism. More specifically, such country-specific restrictions on the total volumes installed on their territory and receiving support under the mechanism can be implemented via country-specific quotas set separately for each window or expressed as annual or total limitations across all windows. Member States would notify the European Commission the maximum volumes to be supported on their territory at the time of their opt-in (i.e. tender preparation phase), which then translate into the respective quotas in each of the support windows.

For the technology-neutral support window, quotas may be additionally differentiated by technologies if Member States deem this necessary. However, rather than taking part in a technology-neutral tender in this case, participating in the respective technology-specific tender and applying a country quota as part of this window, seems more advisable if a country intends to control maximum volumes per technology. This is because overburdening technology-neutral tenders with a multitude of applicable country and technology volumes may decrease transparency for tender participants and potentially distort competition towards more expensive bids. As a result, the window's primary objective of achieving a cost-effective deployment would be further compromised.

Recommendation

We recommend that Member States' rights related to limiting projects to be deployed at their territory to certain project sizes or types of sites are implemented via upfront eligibility criteria. Moreover, country-specific quotas in terms of capacities may be implemented as part of the auction design. Such quotas may be set in a technology-specific manner. In the project-specific window, the right to decide whether and under which conditions installations located on their territory are supported by the mechanism will usually be covered by the coordination process between the European Commission and Member States.

3.2.6 Summary

Design element	Technology-neutral window	Technology-specific window	Project-specific window
General tender elements			
Tendered good and volume	In terms of capacity (MW) or budget (€)		
Tender award	see section 3.1.1		
Single- vs. multi-item tenders	Multi-item tenders		Single-item tenders
Tender procedure			
Tender format and pricing rule	Static tender with pay-as-bid or uniform pricing rule		
Ranking criteria	Price-only		Bid price; additional criteria possible

Design element	Technology-neutral window	Technology-specific window	Project-specific window
Price caps and floors	Technology-specific ceiling prices disclosed in advance; calculated on the basis of an LCOE-approach and adjusted for each tender round.		
Tender frequency and schedule	Long-term tender schedule to the extent possible and tender frequency adapted to market conditions		
Qualification requirements			
Required pre-development	Implementation of “late tenders”		
Material pre-qualifications	None		
Financial guarantees (bid bonds)	Pre- and post-award bid bonds		
Additional eligibility criteria	None (initially)		
Obligations, deadlines and penalties			
Realisation periods	Rather short (technology-specific or -neutral) realisation periods (initially uniform across countries)		
Penalties (combined with financial guarantees)	Confiscation of bid bonds in case of delay, non-realisation and underbuilding (with 5% downward tolerance).		
Transferability after award	Awards should be location specific and not transferable to other sites (i.e. the bidder commits to a certain site).		
Other relevant design considerations			
Reflection of grid connection costs	No specific design element. Local/national rules apply but Member States are allowed to change their local rules for projects participating in the mechanism’s tenders.		
Actor diversity	No explicit design elements to promote actor diversity (initially)		
Bidders’ concentration	No design elements to limit bidders’ concentration (initially)		
Budget minimum thresholds	European Commission legally allowed not to organise a tender in a certain year, in case the interest expressed by contributing and or hosting Member States results in volumes which are too low to successfully implement a tender or where the related transaction costs would be excessive.		

Design element	Technology-neutral window	Technology-specific window	Project-specific window
Incorporation of hosting Member States' rights in tender design	Member States to decide which project sizes and types of sites (or other conditions) are eligible. Country-specific (and potentially technology-specific) quotas in terms of capacities may apply.	Member States to decide which project sizes and types of sites (or other restrictions) are eligible. Country-specific quotas in terms of capacities may apply.	Result of coordination process between European Commission and Member States before tenders

3.3 Support for sectors other than electricity

Out of the three applicable sectors, tendering grants for renewables is far more common in RES-E than in RES-T or RES-H&C. Support scheme design for RES-E can therefore be based on a strong empirical base and tender design suggested in this report can be directly applied. Designing support for RES-T and RES-H&C under the mechanism in contrast is more challenging as also on national level experience with tenders for these sectors is very limited. While some design elements established in the electricity sector can be applied to the heating and cooling and transport sectors, there are some distinct challenges. The sections below outline these challenges and give guidance on requirements when integrating RES-T and RES-H&C into the mechanism.

3.3.1 Heating and Cooling

Half of the final energy consumption in the European Union is used for heating and cooling – the sector is therefore crucial to achieve the Union's overall RES targets. At the same time, tendering RES amounts in heating and cooling is more challenging than for electricity. This is mainly because of the decentralised nature of heating & cooling. Almost all electricity is traded through the electricity grid, allowing for national and even international markets. This gives way for RES-E tenders that are open to many players and hence sufficiently competitive. Heat and cold in contrast is usually produced in proximity to consumption and therefore not procured through transparent, liquid markets, which makes it harder to apply large scale tenders.

In principle, operating support as well as investment support could be tendered in the heating and cooling sector. However, since operating support is much less common in the heating and cooling sector, project developers are more used to investment support, which makes this option more suitable for this sector.

The most efficient targets for RES-H&C tenders would be large users of heat or cold. These include mainly district heating systems as well as process heating and cooling by industry, larger tertiary consumers (which may even have identical equipment across their stores) and potentially also cooperatives of smaller consumers bundling their demand to a significant scale. This section outlines challenges and guiding principles should these segments be targeted by tenders under the mechanism.

3.3.1.1 District heating

Many district heating networks are under control of local authorities. The initiative to open a heating network for mechanism tenders therefore likely needs to come from local levels. A municipality could,

for instance, approach its national government to act as host with a project-specific tender conducted for renewable generation in its district heating network.

As heat generators do currently not have open access to networks, technology-specific tenders could suffer from insufficient competition in the near term. Once these networks are opened pursuant to RED II Article 24, a larger project pipeline might allow for such tenders.

A challenge for tendering RES amounts from district heating is the risk of actual generation. Heat generation demand for the network might be reduced e.g. through transmission or energy efficiency measures in buildings, which is generally a desired effect. In the context of the mechanism, however, there could be extreme cases where heat demand is reduced to an extent that it can be covered by heat producers with lower marginal costs than those of the mechanism asset. In that case, there would be no RES amounts generated for transfer to the contributor, i.e. the tender would have failed to fulfil its core function. Bids therefore need to demonstrate robust planning outlining that they will produce enough RES amounts as an eligibility criterion.

Another specific tender design requirement results from RED II Article 23 (2) which allows Member States with a RES share in heating and cooling below 50% to let waste heat and cold contribute only up to 40% of their annual RES increase. Tenders under the mechanism should therefore take into account to which extent contributing Member States would be able to receive statistical RES benefits from waste heat or cold.

The points discussed above also hold for the less common district cooling. When specifying district heating or cooling tender design, the implementing body should take into account the revised Directive 2012/27/EU (“Energy Efficiency Directive”, EED) and country assessments resulting from it.

3.3.1.2 Process heating and cooling

Installations generating heat and cold in industry or services are generally attractive for integration into the mechanism since they present potential in virtually all Member States. Conducting tenders in this segment would therefore allow also Member States with less attractive RES-E or district heating sites to act as a host. Examples for these appliances include heat pumps, solar heating or renewable cooling.

On the other hand, the technology and player landscape in this segment is very heterogeneous by nature. To avoid distortions, tender rounds must hence be well defined. Otherwise some tender rounds might offer overly attractive conditions to specific applicants, leading to windfall profits or – in extreme cases – installations built without physical need. Key specifications to differentiate tender rounds include:

- Type of heating or cooling technology;
- Size of generating unit in MW;
- Temperature levels of heat or cold, and
- Efficiency from generator to final energy recipient.

While some installations, especially in industrial heating, are large enough to participate in tenders on their own, a lot of potential also lies in smaller appliances. But preparing a bid for a mechanism tender is likely too much effort to the asset owners compared to the benefits resulting from installing a smaller RES-H&C asset. For this reason, pooling smaller installations into one bid would be an attractive route to lower their barriers for participation. This could be done by private aggregators such as energy services companies (ESCOs). Furthermore, new monitoring and reporting procedures would be required to capture generated RES amounts, disburse grants and transfer statistical RES benefits for most of these assets.

Pursuant to the “efficiency first” principle, energy efficiency should be a component of RES-H&C support schemes, including potential tenders under the mechanism. For RES-E, energy generation and consumption are mostly physically and economically separate and can hence be addressed by

different policies. In RES-H&C in contrast, generation and consumption is often co-located and owned and operated by one single entity. For this reason, it is desirable to regard RES generation and energy efficiency as one policy package in the heating and cooling sector. As efficiency is strictly not within the mechanism's mandate however, integrating RES-H&C into the mechanism on a pure energy generation basis seems more realistic at first sight. In the long term, including efficiency elements into the design of support would still be desirable to ensure a meaningful and sustainable effect of the mechanism on renewables penetration in heating and cooling.

Recommendation

RES-H&C tenders are an interesting option for the mechanism due to the large potential and because it allows Member States with less RES-E potential to participate as hosts. Grant tenders however must be carefully designed since they are less common in this sector, especially in the case of smaller units. Technology definition, pooling of smaller units and setting up monitoring systems require special attention. Promising sub-sectors to target may be district and process heating.

3.3.2 Transport

The share of RES in transport final energy consumption in the European Union was 7% in 2017 which is significantly lower than in electricity (31%) and also heating and cooling (19%). The accelerated uptake of RES-T should therefore play a central role in European Union energy policy, including the mechanism.

On the other hand, conducting tenders for RES-T and the associated statistical transfers are even more complex than RES-H&C. This is mainly due to the fact that most RES-T technologies are in early stages of market deployment, while tenders rely on sufficiently developed, liquid markets to allow for clear tender specifications competitive bidding. This section describes the key challenges and guiding principles in the case of integrating RES-T into the mechanism.

3.3.2.1 Technologies

Supporting RES-T deployment can be achieved through supporting renewable fuels or through supporting infrastructure required for RES-T consumption.

Fuels are usually less complex to comprehend than infrastructure and therefore seem attractive for tenders. Supporting renewable fuel production however is not fully suitable for the mechanism's concept of tendering support in exchange for transferring statistical final energy consumption, since production and consumption are not directly linked in the use of fuels. Supporting fuel consumption would be more applicable, but as fuels are internationally traded, Member States could simply physically import renewable fuels rather than going through the mechanism. Finally, the two main renewable fuels are each associated with specific challenges:

- Biofuels – quotas for fuel suppliers already exist in almost all Member States, hence direct support measures by the mechanism might not lead to additional RES amounts, and
- Power based fuels (e.g. hydrogen, synthetic hydrocarbons) are at very early stages of market deployment and in many cases very costly. Support for these should therefore be seen as scale-up of innovative technology rather than cost-effective RES expansion and should be pursued by European Union funds with a corresponding mandate.

Infrastructure is seen as a key component of rolling out RES-T options that are in contrast to the fuels mentioned above not drop-in compatible. Including it in support schemes is hence fundamentally desirable, but again challenging when considering the mechanism's functioning through final energy tenders. This is mainly because the infrastructure by itself does not generate RES amounts in the

context of target achievement. Chapter 3.3.2.3 presents a rough outline on how to translate tendered infrastructure to final energy.

Technologies that could be regarded in these tenders include:

- Electric charging stations for passenger cars or light commercial vehicles;
- Hydrogen fuelling stations for various road vehicle classes;
- Electricity lines for rail transport;
- Overhead electricity lines for heavy duty road transport, and
- Synthetic fuel infrastructure for maritime transport.

3.3.2.2 Accounting for renewable electricity under RED II

Most RES-T technologies rely on electricity input – directly (e.g. battery electric vehicles) or indirectly (e.g. fuel cell vehicles). The question of how this electricity input should count as renewable energy in the context of RES target achievement is however not yet finally settled. As tenders under the mechanism are primarily motivated by RES target achievement, this question is crucial to design a cost-effective fulfilment of the mechanism's mandate in the transport sector. Article 27 (3) of RED II foresees two archetypes of renewable electricity use in transport:

- When "electricity obtained from direct connection to an installation generating renewable electricity" is used in transport, it "may be fully counted as renewable electricity". This would apply for instance to a wind or solar farm with a line to a charging station. There are however limited sites with potential for such island solutions. Also, market-oriented operation of generation and consumption through grid connection is usually more economical.
- When grid electricity is used, the "average share of electricity from renewable sources in the country of production" is assumed as renewable content. For mechanism tenders, this would mean that many Member States with lower RES-E shares would not be attractive as RES-T hosts, even if the mechanism's RES-T tender would trigger additional RES-E capacities.

Furthermore, Article 27 (2) establishes that the energy amount of some renewable energy carriers is multiplied by a factor when determining the RES target achievement. These factors are effectively an incentive for RES-T expansion. Applicable end uses include:

- Electricity for road transport: 4x
- Biofuels from specific feedstocks: 2x
- Electricity for rail transport: 1.5x.

3.3.2.3 Support design challenges

As described in chapter 3.3.2.1, RES-T infrastructure is, in principle, an interesting segment for tenders under the mechanism. Besides the general accounting issues outlined above in chapter 3.3.2.2, there are some specific challenges though that need to be addressed before implementing these tenders.

Before the tender, a clear methodology of how to distribute the statistical RES benefits stemming from the tendered infrastructure needs to be agreed on. The simplest case would be to transfer a previously agreed share of all statistical RES benefits generated through the asset's energy distribution to the contributor. The share would have to reflect the share of infrastructure cost in the full RES-T value chain cost. As this share is highly technology and locality dependent, it would need to be defined flexibly between tender rounds or even by the bidders. The arguments and implications of flexible benefit allocation is discussed in detail in chapter 4.1. In light of RES amounts being counted with a factor of up to four in some cases, many transport projects might generate sufficient RES amounts to satisfy both host and contributor.

A bigger challenge is how to determine ex-ante how much energy will be disbursed through the tendered infrastructure. Since mechanism tenders are aimed at achieving low prices per unit of energy and not per unit of infrastructure, this is a crucial question for these tenders. When tendering RES-E, there is also some uncertainty how much energy will be produced from the assets and how much target achievement will consequently be transferred. For most RES-E assets however, sufficiently reliable forecasts can be made nowadays. RES-T infrastructure in contrast is mostly in initial expansion stages and hence the long-term energy consumption through single assets is immensely uncertain. Giving contributors a meaningful indication on the amount of statistical benefits they will receive will likely be possible in the coming decade when more empirical data on RES-T infrastructure is available. Still, technology specific infrastructure tenders under Window 2 will then need to be well defined to ensure that assets will distribute comparable amounts of renewable energy – similar to tendering RES-E upfront investment support. These criteria could include:

- Addressed transportation mode (e.g. heavy-duty road transport, passenger cars, rail, etc.);
- Asset location (highway, urban, commercial zone, etc.);
- Power level (e.g. slow charging, fast charging, ultra-fast charging), and
- Tariff structure (e.g. by minute, by kWh, user flat rate).

After the tender, new monitoring and reporting procedures are required to capture RES amounts distributed through the assets, disburse grants and transfer statistical RES benefits. While RES-E assets have numerous standardised reporting procedures about their generation in place (e.g. for grid regulators), for many RES-T infrastructure technologies like charging stations standards are still being developed. To avoid disproportionate transaction costs for the mechanism, the tenders for the mentioned technologies should only be conducted once there are reliable reporting processes in place that the mechanism can use to disburse grants and transfer RES statistics.

Recommendation

Since key technologies in RES-T are still in early stages of market development and various accounting issues are not yet fully solved, the transport sector currently presents only limited potential for the mechanism's objective of simple and low-cost RES expansion. Towards the mid-2020s however, legal clarity on RES-T accounting should be established, actual consumption from RES-T infrastructure will be more predictable and consumption monitoring should be more advanced. In that case, RES-T tenders could become a more suitable option for the mechanism to fulfil its objectives.

3.4 Summary of support and tender design depending on key objectives

So far, chapter 3 has discussed the pros and cons of a wide range of support scheme design elements. The envisaged design ultimately depends on the objectives of the participating Member States. Therefore, we discuss concisely which likely objectives may result in certain design combinations. We focus here on the applied window, the tendered item and the form of support to keep the overview digestible. In each of the design packages many more details need to be defined.

The key objectives pursued by Member States may include: gap-filling effectiveness, cost-effectiveness, ease of practical implementation, tapping into RES potential so far not addressed and innovation.

Gap-filling effectiveness means that the design ensures that RES capacities are built and that specific RES volumes are delivered.

A possible set of design elements in this context is to combine technology-neutral auctions, however, preferably within sectors to ensure the comparability of bids, with the tendered item defined in terms of energy volumes, i.e. MWh, and providing operating support. The ex-ante definition of energy volumes provides security for participating Member States regarding the attribution of statistical

benefits. In order to keep volume risks manageable for variable RES technologies, the tendering of energy volumes would have to be combined with banking and borrowing options, either over the lifetime of the installation or on a year-on-year basis. The advantage of this design package is that the tender would directly translate the required good into the tendered item and would shift the risk to deliver from the mechanism to project developers. The disadvantages are that the volume risk implies a mark-up on the price, as despite potential banking and borrowing options, the design set-up entails major risks for projects having to commit to the delivery of certain energy amounts. This may result in higher bid prices and thus support costs. In addition, experience with volume-based RES tenders is very limited (if not non-existent) in Europe.

A well-proven option to most effectively ensure delivery is to implement a technology-specific tender, preferably with well-known sectors and technologies. This would allow to estimate full-load hours and resulting energy production. The tendered item may be expressed in MW and either operating support or investment support may be provided as support.

The advantage of this alternative is the well-known and established tender design. In addition, a fairly precise estimate of the expected energy output is possible without transferring the volume risk to project developers. Moreover, this design package is implementable with operating support or upfront capacity support (in case operating support cannot be implemented due to practical reasons). The disadvantage is that there is less certainty on the delivered energy volumes compared to directly tendering energy volumes.

Cost-effectiveness focusses on lowering support costs to the extent possible, thus ensuring the mechanism provides benefits compared to the other options Member States have to deliver their planned contributions. The design package would combine the technology-neutral window to introduce competition between technologies with a tendered item defined as MW. It would need to be combined with operating support to allow for the technology-neutral implementation. More specifically, it would need to be implemented with a fixed premium to make use of the best market values next to RES potential, even though this would increase cost of capital compared to a floating premium.

The advantage of this design package is that it performs very well in terms of cost-effectiveness and project developers are used to operating support as a form of support. The disadvantage are the challenges related to the practical implementation of operating support in the context of the mechanism.

An alternative to maximise cost-effectiveness may be to implement the technology-specific window and focus on a least-cost technology. The tendered item may be expressed as MW and investment support may be implemented.

The advantage of this option would be that bids may be comparable despite the capacity payment. The focus on least-cost technologies would ensure cost-effectiveness. The disadvantage is that there is little experience for RES-E with upfront capacity payments. At the same time, there is experience with investment support in the heating and cooling sector, although not with tenders. The heating and cooling sector would be an obvious sector to address in order to improve the cost-effectiveness of support.

Ease of practical implementation would imply a focus on the practical feasibility of the tender. This may be especially important for pilot tenders in the beginning to get the mechanism operational and to collect experience. Focusing on the practical implementation may be done by implementing the technology-specific window and select RES-E technologies to start with as these are used to tenders across the European Union. The tendered item would be MW, in line with established practice in the European Union. The type of support would be, in contrast to the dominant practice on national level, investment support to avoid the challenges related to implementing operational support via the mechanism.

The advantage is that that this package is the easiest once to implement, serving to create trust in the proper functioning of the mechanism. The disadvantage is, as above, that there is little experience in the RES-E sector with upfront investment support as the sole source of support.

Addressing unused potential means going beyond the established sectors and technologies, such as onshore wind and ground-mounted PV. This package would implement the technology-specific or multi-technology window, selecting for instance heat projects (e.g. district heating). It may also focus on less-used technologies, such as Concentrated Solar Power (CSP). The tendered item would be expressed in MW and upfront investment support would be provided, as this appears to be most suitable for RES-H and RES-T as well as for smaller projects.

The advantage would be the increased cost-effectiveness (e.g. projects in the heat sector). The disadvantage is that there is less experience with tenders in heating and transport. If more expensive technologies are targeted, the design package performs less well in terms of efficiency.

Alternatively, the project-specific window may be implemented, for instance, targeting heating projects. The tendered item may be expressed in MW and either upfront investment support or operating support may be disbursed.

The advantage would be that the tender would be very tailored to the specific interests of participating Member States. The disadvantages are that project-specific tenders are complex to implement as project-specifics have to be defined ex-ante. In addition, in case of single-item, project-specific tenders, the host country needs to be pre-selected.

A focus on **Innovation** would require, for instance, a technology-specific tender. The tendered item may be expressed as MW or MWh, depending on the envisaged innovative technology. Either operating support or upfront investment support may be provided. The advantage of this approach is the ability to address very specific preferences expressed by Member States. The disadvantage is that project realisation risks are higher with innovative technologies than with established one. When targeting innovative technologies, it may be justified to choose forms of support that limit the market revenue risk, i.e. floating premiums or CfDs.

An alternative may be to establish a single-item project-specific tender, with the tendered item being either MW or MWh and the disbursed support either being operating support or upfront investment support. Again, the advantage is that specific preferences by Member States may be addressed. The disadvantages include the complex implementation (as the size has to be pre-selected and project-specifics have to be defined ex-ante).

Numerous combinations of the design options are possible. The only apparently unsuitable combination of design options is upfront investment support and the technology-neutral window (as bids are not directly comparable, unless converted by full-load hours). The final design of the support scheme will in any case depend mostly on the primary objectives aimed for by Member States.

3.5 Applicable market conditions (Subtask 2.2)

Tenders in the mechanism are in principle open to projects located in more than one Member State. This aspect introduces direct competition between project developers from different Member States.

In principle, the form of support and the tender design will be the same for all participants in one tender round. At the same time, participants obviously can make use of very different natural resource potentials (e.g. solar radiation or wind intensity). Gaining access to these potentials is the key motivation of tendering support across various Member States. In addition, project developers also face different local market and regulatory environments. Differences between these country-specific conditions have a major impact on the LCOE of these projects, their competitiveness and thus on the outcome of the tenders and the allocation of projects between hosting Member States.

The rules of the national regulatory framework as well as the national market conditions will remain largely unchanged in the context of tenders under the mechanism. In terms of the regulatory framework, the circumstances of the country where the installation is built apply. These wider regulatory conditions include corporate taxation, planning and permitting rules, conditions for grid connection, eligible areas and sites, and environmental requirements. These aspects cannot easily be converged or aligned, as they stem from a broader regulatory and political context and thus extend

into multiple regulatory areas, including those that are not energy-related. As a result, bidders from different countries inevitably face differing circumstances even though they are competing on the basis of a common support scheme design.

This sub-task discusses relevant framework conditions and the impact of diverging national planning, regulatory, administrative, political and financial frameworks and macroeconomic conditions ("framework conditions") on the results of tenders. Principles that should be reflected in the tender design, which aim at lowering the impact of differing framework conditions or to at least take such differences into account, are presented. Moreover, options to level the playing field are discussed.

Figure 15 - Overview of factors influencing the required level of support

3.5.1 Impact of divergent regulatory conditions on project costs

The effects of differing regulatory conditions have been demonstrated in a recently published study by Ecofys (now Navigant), conducted for Agora Energiewende, comparing the impact of national policies and regulation on the cost of onshore wind across the PENTA countries (Austria, Belgium, France, Germany, Luxembourg, Netherlands, Switzerland)[29], as well as in previous studies that, for example, analyse the cost of financing renewables in Europe[30].

Depending on the specific conditions, costs induced by the regulatory framework may exert a greater influence on the selection of a lowest-cost project than the availability of natural resources or their market value. The results of the cross-border solar PV tenders carried out by Denmark and Germany in the autumn of 2016, resulting in all winning bids being located in Denmark, also underlined the impact of divergent regulatory conditions. Better natural potential – i.e. higher full load hours – was only one of many local advantages for solar PV projects in Denmark that led to a one-sided result. Other reasons were related to differences in wider market conditions, which included lower land lease costs in Denmark (in Denmark solar PV projects can be developed on agricultural lands, whereas German site restrictions forbid such development) and a slightly lower tax burden compared to Germany. In addition, the competition in Denmark was much stronger due to a lack of alternatives for project support, as the support mechanism for large-scale solar PV plants in Denmark was terminated only months before the cross-border tender.

[29] Navigant and eclareon (2018): Cross-border renewables cooperation. Study on behalf of Agora Energiewende, available at: https://www.agora-energiewende.de/fileadmin2/Projekte/2017/RES-Policy/144_cross-border_RES_cooperation_WEB.pdf

[30] See DiaCore (2016): "The impact of risks in renewable energy investments and the role of smart policies": http://diacore.eu/images/files2/WP3-Final%20Report/diacore-2016-impact-of-risk-in-res-investments.pdf

Key aspects impacting the cost of project development apart from resource availability are:

- Planning and permitting procedures
- Site restrictions
- Grid connection regime
- Taxation regime
- Financing conditions (debt interest rate, share and term)
- Project realisation periods
- Risk of non-realisation

Planning and permitting: Planning and permitting includes a wide range of internal and external costs borne by the project developer related to the procedures of planning and permitting (such as preliminary site assessments, securing of land, all types of assessments and permits). This aspect is important as costs, time requirements and risks related to procedures of planning and permitting vary significantly between Member States and are to a large extent driven by regulatory conditions.

In a study for Agora Energiewende, which compared regulatory costs for the development of an onshore wind project between the countries of the Pentalateral region (Austria, Belgium, France, Germany, Luxembourg, Netherlands, Switzerland), the differences in the impact of planning and permitting on LCOE ranged from 0.25 ct/kWh in France to 0.54 ct/kWh in Switzerland. It is important to note that project specific planning and permitting costs can deviate significantly from these average costs, with cost ranges being particularly large in Germany (0.18–0.44 ct/kWh) and in the Netherlands (0.27–0.63 ct/kWh) (Navigant and eclareon, 2018).

Typical issues around planning and permitting include a lack of standardisation in permitting requirements and procedures, a lack of coordination between different levels of administration, the duration of planning and permitting procedures, and court appeals. These challenges already impact projects' competitiveness at the regional and national but even more at cross-national levels as differences between countries are larger.

Site restrictions and requirements: Site restrictions can have significant impacts on the costs of RES deployment. Most countries have various regulations that restrict the availability of land that is suitable for the development of RES projects, including minimum distance requirements from urban zones, radar towers and environmentally protected areas. Depending on the extent of these limitations and the remaining availability of land with favourable conditions, these restrictions can increase the competition for available land and thus lead to higher land leasing costs (as seen in the German-Danish cross-border tenders for solar PV). In addition, in the context of the mechanism Member States may even apply additional restrictions (or remove existing restrictions) for projects participating in the tender.

Grid connection regime: Grid connection costs includes all costs borne by the project developer that are related to the connection of the plant to the grid and, if applicable, grid reinforcement. Costs related to grid connection vary considerably between countries depending on the grid connection regime, which can be "shallow" or "deep" (a detailed discussion of grid connection costs and other costs related to system integration is discussed in section 4.2). In addition to the grid connection costs, generators are charged for grid usage in some countries (thus increasing operational expenditures).

Navigant and eclareon found that in the Pentalateral region, the impact of grid connection costs on the LCOE of an onshore wind project varies significantly, ranging from 0.24 ct/kWh in Belgium to 0.71 ct/kWh in Switzerland (Navigant and eclareon, 2018). Again, there are also large cost ranges within countries (e.g. in France, the Netherlands and Switzerland, project developers face strong subnational variations in grid connection costs). Project-specific costs depend to a large extent on the project's size, its distance to the next network connection point and the voltage level to which it is connected. The length of the cable is usually the most important cost factor. However, for countries

with a “shallow-deep” or “deep” grid connection regime, grid reinforcement requirements can also vary according to the project location.

Also, the coordination of grid planning and spatial planning is an area resulting in cost differences: coordination between local authorities and grid operators is implemented to different extents among Member States.

Taxes: Costs related to corporate taxation reflect a much broader area of regulation and of political priorities compared to the specific field of RES deployment. Accordingly, harmonising corporate taxation in the context of tenders implemented through the mechanism is unrealistic. Nevertheless, differences in taxation are an obvious source of distortion to cross-border competition and have stimulated public debate in the German-Danish cross-border tenders for solar PV held in December 2016 (see section 3). The impact of different corporate taxation rules on LCOE identified in the study for Agora Energiewende ranged from 0.19 ct/kWh in Switzerland to 0.46 ct/kWh in Belgium (Navigant and eclareon, 2018).

Financing conditions: The cost of capital has a major impact on the cost of RES deployment. Financing conditions – specifically, interest rates on debt financing, debt/equity ratios and debt terms – are determined by market factors and are also influenced by regulatory conditions. However, they are an important indication of the perceived regulatory risks in a Member State. They are, for instance, influenced by risks related to the support scheme design (exposure to market price and other revenue risks), planning and permitting (potential of non-realisation or changes in project configuration and operation) and political stability (potential of retro-active changes in support schemes).

Previous studies (e.g. Diacore (2016), Navigant and eclareon (2018)) have surveyed developers for onshore wind projects and found that even in the quite homogeneous Penta-Region there are remarkable differences in financing conditions. Compared to a “theoretic financing case” that provides very favourable conditions (debt interest rate of 2%, debt term of 17 years and a debt/equity of 85/15), the additional financing costs ranged from 0.19 ct/kWh in Germany to 1.28 ct/kWh in Belgium. The large differences between countries are a clear indication of the strong influence financing conditions can have on the outcome of competitive cross-border tenders.

Specifically, the use of financial instruments under the enabling framework function is intended to address this source of cost for RES deployment and it can have a mitigating effect in terms of reducing differences between Member States participating as hosting countries in the mechanism.

Project realisation periods: The project realisation period encompasses all activities from the initiation of project planning to the retrieval of necessary permits, connection to the grid and the start of RES installation operation. The number of years required to realise a RES project provides an indication of the complexity of the processes involved. While regulatory requirements related to planning, permitting and grid connection reflect broader policy goals (related to, for example, environmental protection and ensuring public acceptance/participation), they can complicate the expansion of renewables and may impact the cost of deployment. Long project realisation periods increase the costs of project development as well as the risk of non-realisation. The longer it takes to acquire the necessary final permits for construction, the higher the probability that the initial planned configuration of the project will no longer be feasible, forcing the development to be terminated or reconfigured (e.g. by changing the overall size of the project, exact location, turbine specifications, etc.), which induces additional costs. Average planning periods for an onshore wind project vary largely between countries (e.g. from six years in Austria and Germany to nine years in Switzerland). The key issue here is legal challenges to projects during the development phase (e.g. appeal options).

Risk of non-realisation: There are various reasons for the non-realisation of projects, including, for example, failing to receive the required permits, successful legal appeals, and regulatory requirements, or other factors that would limit the operation of the project or make it uneconomic (e.g. changing financing conditions). The average percentage of projects at the beginning of the planning stage that go unrealised is a result of the uncertainties of project development, influenced by the

transparency and efficiency of administrative procedures and likelihood of legal appeal. The higher the share of planned projects that go unrealised and the later the decision to terminate a project, the higher the sunk costs that developers need to recover through successfully completed projects. In this context, also the specific local context in which a project is planned is important (related to the very specific location of the project, the project developer's strategy in project planning, the technical configuration of the project and support by local stakeholders).

The impacts (sunk costs) of non-realisation depend mostly on the timing of project abandonment. The later the decision to terminate a project, the higher the sunk costs. The study by Navigant and eclareon shows that here are structural differences between countries as to when the termination of an onshore wind project is typically decided on. In Austria and Netherlands, termination is decided early in the project development, in Belgium and Switzerland, very often the decision not to realise a project comes at a late stage in project development.

3.5.2 National market conditions

Besides the regulatory conditions, specific market conditions differ between countries. It is important to understand their effects from a bidder's point of view, i.e. effects on the bidder's behaviour and thus tender outcomes. These market conditions comprise the national market value of the projects' generated electricity, the role of the national support schemes as alternative options to gain support payments, as well as the level of domestic competition (and the state of national project pipelines).

Market value: Renewable power plants, especially wind and solar power plants, are weather-dependent and can be curtailed but cannot freely ramp-up generation depending on demand or electricity prices. As a consequence, the income that renewable energy power plants can generate from the power exchange is determined to a large degree by their variable feed-in profile (i.e. their "market value"). Market values differ between countries or bidding zones depending among others on the generation mix, the existing capacities of both renewable and conventional electricity generation plants and the level of interconnections. The wide range of existing market values influences the competitiveness of RES projects in a tender always when the provided support is a fixed premium or an upfront investment support.

Similar to accessing good RES potential across a range of Member States, tenders implemented by the mechanism will be able to access better market values (and thus lower support costs) compared to only tendering support in a single Member State (i.e. nationally)[31]. The tender design and especially the premium design can favour projects with a higher national market value. This is for example the case when a fixed premium on top of the national electricity price is tendered. Under the assumption of equal LCOE, bidders realizing a higher market value with their generated electricity need lower additional support payments and can consequently submit a lower bid.

National schemes as alternative options: Tenders of the mechanism will usually be implemented in addition to national tenders or other national support schemes, which can be considered as outside options or alternative opportunities to receive support for projects. The relative attractiveness of one opportunity to get support and thus also the bidder's behaviour in that tender depends on the overall availability of alternatives and the overall level of demand and supply for RES installations in the entire market.

The existence of a higher-valued outside option leads to less aggressive bidding behaviour. This might have been one reason for the lower bids from Danish plants in the Danish-German cross-border tenders. In Denmark, a support scheme was neither in place, nor foreseen in the near future. Therefore, Danish bidders had to participate in both cross-border tenders aggressively in order to secure any kind of support. In contrast, the German bidders, who had regular national tenders taking place, had a much lower incentive to bid aggressively in the cross-border tender, i.e. to submit a bid that is below the level that bidders could expect to receive in the national tenders, or even to

[31] This is not the case for floating feed-in premiums and contracts for difference which do not provide investment signals resulting from long-term market values.

participate (for a detailed discussion of interactions of the mechanism with national support schemes, see section 2.3.1).

Domestic competition and project pipelines: Competition in a tender depends on a sufficient number of different bidders (avoiding market concentration) as well as enough bids/projects. A high level of competition in a tender is desirable for the tenderer, since it increases the chances of a cost-effective allocation and decreases awarded prices. On the contrary, bidders prefer a lower competition level, since it increases their chances to be awarded with a comparatively higher bid.

Since tender participants will opt for the more attractive scheme, the level of competition in the national tenders plays an important role for the mechanism. If the level of competition is high in national tenders, there is an increased likeliness of those projects switching to the European Union tender. If competition on the European Union tender is also high, they will likely pursue an aggressive bidding strategy, resulting in low bids. If competition is low in the European Union tender, strike prices will increase.

3.5.3 Options to address differing conditions in tenders implemented by the mechanism

Before identifying options to address these differences in the tenders of the mechanism, it is important to clarify whether levelling them is necessary in the first place. Ultimately, the mechanism will create competition between projects facing a wide range of context factors.

The cost-effectiveness of support allocated through tenders will be better if the participants in the tender are fully exposed to these conditions and their cost impacts. However, in the case of extreme differences between participating host Member States such difference may be perceived as unfair. Member States may express a preference to provide at least a partial level-playing field in the tenders, i.e. by intervening in some of the elements impacting the competitiveness of projects in the tender.

The urge to address this issue may depend on one or a combination of the following elements:

- Extent of existing distortions: The larger the distortions stemming from regulatory conditions, the more impact they have on the outcome of the tender.
- Share of capacities supported by the mechanism compared to total new RES capacities in a given Member State: The share of the tenders from the mechanism in overall new RES capacity tendered will determine the extent to which local project developers are confronted with the varying regulatory conditions of the other hosting Member State.
- Geographic scope (number of involved countries): The impacts that will result from differing regulatory conditions in two countries might be more or less straightforward. If the number of countries participating in the mechanism increases, assessing the impacts of regulatory conditions and potentially aligning them becomes more complex.

There are various basic options to deal with differences in national investment conditions: 1) adjusting bids by the cost impact of the conditions, 2) aligning the conditions, 3) implementing quotas to limit the distributional effects of these distortions and 4) offsetting some of the conditions via financial instruments.

Adjusting bids by the cost impact of the regulatory framework: The bids of tender participants may be adjusted by the amount of cost impacts of the varying conditions. The advantage of this option is that the distortions would be reduced without having to actually align all conditions. The key disadvantage is that exactly estimating the impacts of each factor is very difficult (due to methodological restrictions and lack of data) and that there are also large variations within countries that would need to be accounted for. Another disadvantage is that this approach would undermine efficient outcomes of the tender: depending on the aim of the tender (which in the case of the mechanism includes identifying the lowest LCOE or identifying the lowest support costs) levelling

certain cost factors may result in comparably cost-effective projects to be excluded from the awarded ones.

Aligning the conditions: The most unlikely option is to align the conditions in the Member States participating in the mechanism as hosts. Aligning regulatory frameworks towards good practices would be the preferred option but is unlikely to take place in the short and medium term. In the best of cases, the mechanism would trigger more coordination and alignment of national policies and regulations. However, some of the other conditions such as market values and local competition levels will not and should not be aligned proactively. In an increasingly integrated market such convergence will take place in the mid-to-long-term in any case.

Implementing quotas to limit the distributional effects of these distortions: An option which is more practical to implement would be to establish quotas of bids accepted in each country (e.g. a minimum/maximum of 20% of installations/capacities in country A). This would limit the distributional effect of the discussed market conditions and may address political acceptance issues, if due to regulatory and market conditions all projects are located in one country only. However, the extent to which the quotas become effective, they decrease the efficiency of the tender.

Offsetting some of the conditions via financial instruments: A measure which is explicitly foreseen in the mechanism is the use of financial instruments to lower the cost of capital of RES projects. The availability of a financial instrument in a particular tender round may effectively level the differences in the costs of capital between the participating Member States, by having a stronger impact on the overall costs of project development in those Member States where financing is less available and costlier. Thereby, the impact of differing national conditions on the cost of financing – one of the most important source of cost differences between Member States – can be alleviated. Furthermore, the overall cost of support would be reduced.

Recommendation

Adjusting the competitive tender bids should be avoided. In addition, aligning all market conditions is unrealistic and not desirable. If political acceptance requires proactively influencing the distribution of selected projects among Member States, a combination of quotas and providing access to financial instruments is the most suitable option.

The tender design cannot mitigate diverging market conditions. The tender design can, however, worsen the impact of national regulatory barriers or unfavourable market conditions on the tender outcome, if these are not considered in the design. To avoid such an effect, the applicability of all design elements for all participating host Member States needs to checked and the implementation of EU-wide material pre-qualification requirements should be avoided due to their lack of comparability. In addition, realisation deadlines should not be too short and sufficient bid preparation time should be granted to attract a large number of market actors.

4. ALLOCATION OF COSTS AND BENEFITS (TASK 3)

4.1 Calculation of contributions and allocation of statistical benefits (Subtask 3.1)

This chapter assesses and presents possible modalities for the calculation of Member States' contributions, as well as for the allocation of the statistical benefits of the renewable energy generated by the installations financed under the mechanism. The focus of the chapter is on non-repayable forms of support, i.e. grants, as these are the only forms of support that result in a reallocation of statistical benefits. No statistical benefits will be attributed to repayable forms of support, i.e. financial instruments. This principle was emphasised by the European Commission and follows the European Commission's interpretation of article 33 V of the Governance Regulation which stipulates that "every year, renewable energy generated by installations financed by the mechanism shall be statistically attributed to the participating Member States, reflecting their relative payments".

Article 33 of the Governance Regulation furthermore requires the European Commission to lay down in the act "the minimum requirements for Member States' participation", finding the right balance between "the need to ensure both continuity of the mechanism by means of a sufficient duration of the Member State payment, as well as the maximum amount of flexibility for Member States' participation". To this effect, the modalities presented in this chapter are designed to allow contributing and hosting Member States to flexibly enter and exit the mechanism.

In addition to the provisions made in article 33 of the Governance Regulation, a number of basic principles were derived in the discussions with the European Commission that guide the assessment of viable options. These principles are:

- The European Commission will not pre-finance Member States' contributions.
- Before launching a call for bids, the level of Member States' contributions must be determined, i.e. it must be clear how much funds are available or how much capacities are envisaged.
- The Member States' decision to contribute a certain amount to the mechanism, be it within the gap-filling function or the enabling framework function, must be binding in nature. In case of a tender for operating support, the Member States must commit its contributions for the entire support period.
- There will be no attribution of statistical RES benefits to repayable forms of support, i.e. financial instruments.

The modalities presented build on the basic structure of the mechanism (see Chapter 2.1). For each specific tender round, the mechanism pools both, the voluntary financial contributions to the mechanism and the RES target statistics that are ultimately generated by the RES installations that were awarded in the specific tender round. The RES statistics are then redistributed to the contributing Member States according to their share in the financial contributions. The financial contributions of a particular Member State are not directly linked to specific RES installations. Instead, pooling the RES statistics per tender round – as illustrated in the Figure 16 – allows to attribute the same amount of RES statistics for each unit of financial contribution and thus an equal distribution of RES statistics to the contributing Member States. For instance, if a Member State's financial contributions make up 30% of the support payments distributed under a specific tender round, it receives 30% of the RES benefits that are pooled and allocated by the mechanism.

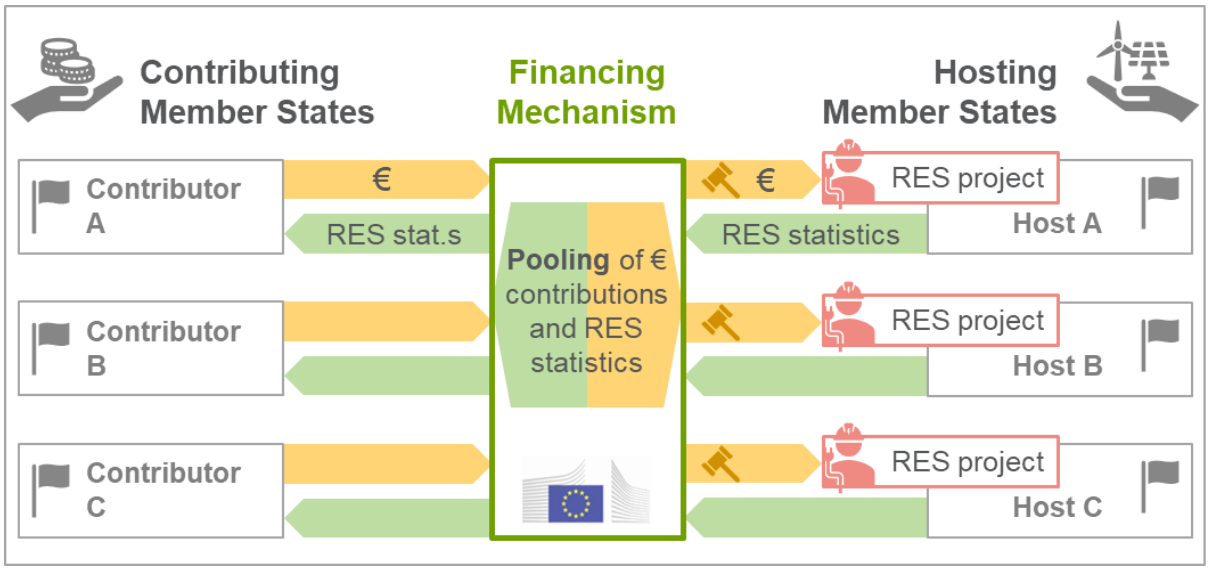

Figure 16 Basic structure of the mechanism (same as Figure 2)

As each tender round shall be open to the voluntary participation of Member States, regardless of whether payments are made under the "gap filler" or the "enabling framework" function, no differentiation should be made between the financial contributions made under the two functions regarding the calculation of contributions and the allocation of statistical benefits.

The modalities are discussed in terms of the following questions:

- How can the size of the contribution of Member States be determined before the tender is implemented?
- How should payments be structured to ensure the sustainability of projects financed by the mechanism? Should this be done through one-off, upfront contributions, or rather through yearly payments?
- Which rules may be applied for the allocation of statistical benefits between all participating countries, including the host countries?
- What happens in case a Member State stops its contributions/breaches the contract?

4.1.1 Determining the size of the contribution of Member States to the mechanism

The process of determining the size of the contributions of the Member States to the mechanism is bound by the following conditions.

- First, the European Commission cannot pre-finance Member States' contributions. That means that Member States must have committed to the transfer of sufficient financial contributions to ensure that support payments are fully covered.
- Second, Member States need to know the budgetary implications of the participation in a specific tender round of the mechanism before making financial commitments.
- Third, the bid level of awarded projects and thus the exact level of support is only known once the tender has taken place.
- Fourth, the tender results and thus the bid level of the awarded projects will significantly depend on the level of participation of Member States as hosting countries as this determines the available RES potential, i.e. the supply side in the tender, as well as on the level of participation of contributing Member States, i.e. the demand side in the tender.

These conditions require to establish ex-ante a "maximum price" for the participation in a specific tender round of the mechanism. For each tender, the European Commission may calculate a

maximum price per MWh (or per MW per technology) and share it with the Member States before they commit to the mechanism. The maximum price is determined in a way that ensures that the actual support payments that will result from the tender are equal or lower to the maximum price (but not higher), thus providing a conservative estimation for the actual support costs that contributing Member States ultimately need to cover. Only in the worst case (low competition, etc.) the strike price in the tender will be equal to the maximum price.[32]

As estimating a maximum price is only possible once both the level of supply and the level of demand are known, we suggest applying the following iterative process per tender round. The presented process has the purpose of making the conditions of participation transparent before contributing Member States enter into binding commitments.

Furthermore, the process of determining a maximum price has the purpose of calculating a minimum budget that is required by a Member State for the specific requirement of taking action under article 32 of the Governance Regulation (making a voluntary financial payment to the mechanism under the gap-filling purpose), irrespective of the actual production.

Process of establishing a maximum price for the use of the Mechanism:

Step 1 – Available potential per Member State: Every two years, the European Commission collects information on the available RES potential. All Member States[33] are invited to commit to participate as hosting countries by defining the eligible technologies, available volumes and potential (maybe even including estimated capacity factors per technology), indicative sharing rules for the statistical RES allocation and any major restrictions, such as non-availability of specific territories. This information will be collected with a view to implement specific tender rounds with specific technology windows and in the form of EOIs. Commitments made by hosting Member States in this step should be binding.[34]

Step 2 – Aggregated potential of all Member States: The European Commission combines the information provided by all hosting Member States and – depending on the envisaged technology window – derives the aggregated potential for that technology window of all Member States.

Step 3 – Deriving an indicative maximum price based on a cost-supply curve: A stacking of the aggregated potential is conducted to derive a range of potential support costs that would result from a tender, given the available aggregated potential and expected revenues. Since the tender result is dependent on the level of demand by contributing Member States – which at this stage is not known – an indicative maximum price for a low, medium and highly tender volume will be derived from the cost-supply curve.

- Detailed steps of building the cost-supply curve under step 3:
- Step 3.1: Calculation of technology-specific LCOE for each hosting country (taking into account all CAPEX and OPEX as well as full load hours).
- Step 3.2: Estimation of technology-specific market value for each hosting country.
- Step 3.3: Determining technology- and country-specific need for support in €/MWh (based on LCOE and market values) and implementing, if feasible, a cross-check of the result with past tenders and any other relevant comparator.
- *Step 3.4:* Combining need for support to derive a cost-supply curve across all technologies and hosting countries.

[32] Note that the definition of a ceiling price in the tender round is derived from the maximum price but may to some degree deviate from it. In case of technology-neutral tendering, differentiated ceiling prices will be set per technology.

[33] Whether or not third countries are also invited to provide information on available RES potential, pursuant to article 33 of the Governance Regulation, needs to be determined by the European Commission. However, inviting third countries may entail additional complexities related to the availability of interconnector capacities.

[34] We propose to make commitments made by hosting Member States in step 1 binding already, as it is required to have certainty on the offered potential in order to derive a reliable cost-supply curve which is used to communicate reference prices to potential contributing Member States.

- *Step 3.5:* Determining an average need for support (€/MWh)[35] for three different tender volumes (small, medium, large tender volume).
- *Step 3.6:* Deriving an indicative maximum price for each of the three different tender volumes. As the indicative maximum price must reliably reflect the upper limit of the support payments that will ultimately be required per RES benefit, a buffer should be added to the determined support costs to account for uncertainties, for example related to market values or the level of competition in the tender round. The buffer may add, for example, +20% to the calculated need for support.

Step 4 – Potential demand per Member State: Indicative information on the available financial contributions is collected. Based on the presented range of maximum prices, all Member States are invited by the European Commission to indicate their willingness to provide financial contributions for individual tender rounds. The Member States may indicate their demand/contributions for each of the three maximum prices presented. This information will be collected in form of EOIs.

Step 5 – Deriving an aggregated demand curve: The European Commission combines the information on quantities per maximum price by all contributing Member States to derive an aggregated "demand curve" of all Member States.

Step 6 – Determining a final maximum price: By matching the supply curve and the demand curve the European Commission determines a final maximum price. This final maximum price is communicated to all Member States that indicated an interest in participating as contributing country.

Step 7 – Binding commitments: Based on the final maximum price, binding commitments are made by the contributing Member States.

These steps should ideally be implemented within a short timeframe to limit the time from the first EOI to the binding commitments. Once the process has been established, the initial transaction costs will decrease.

4.1.2 Allocation of statistical benefits

This sub-chapter aims to provide guidance on a methodology for the allocation of the resulting statistical benefits towards the European Union and the Member States participating in the mechanism. The methodology shall maintain the principle, as laid out in Article 33 V of the Governance Regulation, that "*every year, renewable energy generated by installations financed by the financing mechanism shall be statistically attributed to the participating Member States, reflecting their relative payments*". Furthermore, Article 33 V of the Governance Regulation stipulates that the allocation of statistical benefits needs to follow the principle that "*projects supported by this financing mechanism that are financed by other sources than Member States payments shall not count towards Member States' national contributions but towards the Union binding target"*. Regardless of whether the payments are part of the enabling framework function or the gap-filling function, the attribution of statistical benefits should be done according to the actual contributions made.[36]

The key objectives of the methodology of allocating statistical benefits are to:

- Incentivise Member States to contribute payments to the mechanism (both gap-filler and enabling framework)
- Incentivise Member States to host installations under the mechanism

[35] In case of up-front investment support, the need for support is converted into €/kW.

[36] To the extent that RES-H&C and/or RES-T is supported by the mechanism, they can be included in the accounting of contributions and benefits, based on the principles outlined in this chapter. Since the RES target is measured in final energy, no distinction needs to be made.

- Avoid any incentive for Member States to lower their level of ambition regarding RES deployment as a consequence of contributions made by the European Union under the mechanism

To provide predictability and transparency for all participating Member States, the rules on the allocation of the statistical benefits must be known prior to the binding commitments of the contributing Member States.

Options for the allocation of statistical benefits are presented below, differentiating between contributions to support payments (grants) by Member States and contributions from European Union funds. Contributions from the private sector are discussed in chapter 4.3. As indicated above, no differentiation should be made between the financial contributions made under the two functions regarding the calculation of contributions and the allocation of statistical benefits. The awarding of repayable forms of support, i.e. financial instruments, will not affect the rules of allocating statistical benefits. This means that the statistical benefits will stay entirely with the hosting Member State, if financial instruments are not combined with grants. However, if financial instruments are combined with grants, the allocation of statistical benefits is determined according to the splitting rules discussed in the chapter below.

In order to provide for flexibility to incentivise the participation of hosting and contributing Member States, the European Commission may need to deviate to some extent from a strict interpretation of the principles outlined in Art. 33 V of the Governance Regulation. The statistical benefits related to the generation of a RES installation can either be transferred to the mechanism over the lifetime of support or the lifetime of the technology. Which of these two options is chosen needs to be specified by the European Commission prior to the call for interest of potential hosting and contributing Member States.

The focus in this sub-chapter is on the statistical benefits of RES production. Additional co-benefits that result from RES deployment will remain with the host Member State without any attempt of re-allocation. The suggestion of limiting the reallocation of costs and benefits to the transfer of RES statistics between hosting and contributing Member States was also discussed in the workshop with Member States and industry stakeholders in June 2019 and was generally accepted. For a detailed discussion on the costs of system integration, see chapter 4.2.

4.1.2.1 Options for the allocation of statistical benefits for contributions from Member States

As indicated above the rule on the allocation of statistical benefits must be known prior to the binding commitments of the contributing Member States. Furthermore, it should provide certainty over the entire period of statistical transfer, i.e. changes to the allocation of RES statistics can only be made based on rules that had been agreed prior to the tender.

The first basic option for the allocation of statistical benefits is to allocate the entire statistical benefits to the contributing Member States only, according to their relative payments. The advantages of this option are a simple and transparent methodology of allocating statistical benefits that applies equally to all participants of the mechanism. It provides clarity for all involved Member States and strong incentives for making contributions to mechanism. Such a methodology would also be in line with the principle of article 33 V of the Governance Regulation ("*every year, renewable energy generated by installations financed by the financing mechanism shall be statistically attributed to the participating Member States, reflecting their relative payments*"). However, if no statistical benefits of the RES production remain with the host country, the incentive for Member States to host such installations is reduced.

We suggest a deviation from the basic option described above and instead provide for a splitting of statistical benefits between contributing and hosting Member States, i.e. allocating parts of the statistical benefits to the hosting Member States, for the following reasons. First, hosting Member States also bear costs despite not contributing to the support payments. Costs for hosting Member States relate to the system integration of additional RES capacities and potentially also to the grid connection of individual projects (depending on the grid connection regime). Second, hosting Member

States give up part of their domestic RES potential, which in the long term may lead to higher domestic costs of RES development. Third, distributing parts of the statistical benefits to the hosts increases the incentive to participate as hosting Member States. The more Member States are willing to host installations under the mechanism, the better the functioning of the mechanism, the cheaper the auction outcomes and the more attractive it will be for contributing Member States. However, the main share should go to the contributing Member States to maintain an incentive to contribute to the mechanism.

While statistical benefits can compensate for some of the costs borne by hosting Member States, the split should not be determined through a calculation of costs. As shown in Annex 1, determining the exact magnitude of system integration costs incurred by a specific installation is close to impossible. Furthermore, their share in support costs varies with the support level, which is a result of the EU tender. Instead, the allocation of statistical benefits should be seen as a politically determined split that must balance the willingness to offer (by hosting Member States) and the willingness to pay (by contributing Member States).

The current state of discussion with Member States clearly favours the option of splitting the statistical RES shares between hosting and contributing Member States. However, determining the split of statistical RES shares can be challenging. Flat-rate approaches that apply to all cases (e.g. 20% of statistical benefits attributed to hosting Member States) can be a simple solution. Defining a default case, which implements a flat-rate approach, would simplify the operation of the mechanism. However, such a default case may cause acceptance problems for individual cases of application, which underlines the need to provide for more flexibility.

How should the statistical benefits be split between contributing and hosting Member States?

As a standard case of target attribution, a flat-rate approach was presented in the workshop with Member States and other stakeholders, with the example of a splitting rule of 90/10 or 80/20 (80% of statistical benefits are transferred to the contributing Member States, while 20% remain with the host country). The flat-rate approach foresees that prior to each tender round, all participating Member States (hosts and contributors) agree on a splitting rule that is applicable to all participants. For example, for a specific tender round, the splitting rule may be 80/20, and in another tender round, it may be 70/30.

The splitting rule that is established for a particular tender round also has an impact on the indicative maximum price that is communicated to the potential contributing Member States, as well as on the final price upon which a binding commitment is made. The higher the share of statistical benefits retained by the hosting Member States, the more support needs to be paid per RES benefit transferred to the mechanism. Consequently, if hosting Member States retain a higher share, the higher the price for the contributing Member States.

In the workshop, Member States representatives provided the feedback that a 80/20 split could be a good starting point for defining a distribution among contributors and hosts. However, some Member State representatives also emphasised the need to provide for flexibility in the definition of a standard case for the target attribution. According to the Member State representatives, flexibility should be provided to the splitting of RES statistics to account for:

- Differences between technologies and sectors
- Different preference of hosting Member States
- A dynamic perspective on system integration costs

To this effect, we suggest reflecting on the following criteria in the consultation of the default splitting rule for each tender round:

- Maturity of technology: For less mature technologies, the share of support payments in total revenues will be higher. Therefore, contributing Member States bear a relatively higher share of the costs. Retaining a smaller share of the statistical benefits for the hosts may be considered.

- Likelihood of having a very low auction result: If auctions result in very low (e.g. close to zero support) bids, for example because technologies are very mature and/or competition is high, contributing Member States bear very low support costs. Retaining a higher share of the statistical benefits for the hosts may be considered, as the host provides low-cost potentials/sites to the mechanism and the project could have been built domestically at very low support costs as well. Auction results cannot be predicted, but past auction results in the participating host Member States can be used as an indicator for the likelihood of having a very low auction result.
- Impact of technology on system integration costs: The higher the impact of a tendered technology on the system integration costs, the higher a fair share of statistical benefits for hosting Member States. However, the extent to which a technology incurs system integration varies between Member States, depending on a variety of factors of the energy system as well as on regulatory conditions, such as the grid connection regime.
- Preferences of participating Member States: The default split should take into account the known preferences of hosting Member States as well as the acceptability for contributing Member States in order to find a right balance. Ultimately, the default split suggested by the European Commission needs to be a compromise, based on the Member States' feedback.

While we suggest to define a splitting rule that applies equally to all participating countries in one specific auction round for reasons of operability, transparency and fairness, Member State representatives argued that it may be necessary to allow hosting countries to determine individual target attribution splitting per hosting country. For example, in a particular tender round, host country A may request 20% of the RES statistics (80/20-split), whereas host country B may request that 30% of the RES statistics (70/30-split).

Should individual splitting rules per host Member State be allowed?

Allowing for hosting Member States to determine their own individual target attribution split has some advantages. First, by determining their individual split, hosting countries have flexibility in defining a central aspect of the terms and conditions of their participation. This could increase the attractiveness to participate as a hosting country and thereby increase the availability of low-cost potential offered to the mechanism. As a result, the mechanism may also be more attractive to potential contributing Member States. Second, it avoids that all participating Member States have to agree on one splitting rule or that the European Commission has to define a flat-rate splitting rule applicable to all participants, which may not be acceptable to some potential participants[37].

Allowing individual splitting rules for hosting Member States, however, has important disadvantages. First, different splitting rules can be seen as a discrimination between Member States and may be perceived as unfair, especially by those hosting Member States that retain a lower share. Second, it adds complexity to the tender, as all bids would need to be adjusted to the same denominator when making a bid decision. And third, individual splits can lead to a situation in which the projects awarded may not be those with the lower support costs.

Contributing Member States may want to make sure that the mechanism is designed in a way that ensures selecting the bids with lowest support costs per RES benefit transferred to the mechanism. To ensure that bids are compared on equal terms from the perspective of the contributors, bids should be awarded based on the ratio of support payments per RES statistics transferred to the mechanism. This means that all bids must be compared on the basis of "€ per MWh transferred to the financing mechanism", i.e. all bids must have the same denominator. In case of investment aid, the same ratios would apply and bids would be compared on the basis of "€ per MW-share of which production is transferred to the mechanism". This requires adjusting the bids in the tender according

[37] Alternatively, the mechanism could accommodate for differing preferences by running separate auction rounds with differing splitting rules, e.g. one auction for Wind Onshore for hosting Member States that accept 80/20 and one auction for Wind Onshore for hosting Member States that accept 70/30. We advise against such separation, as the potential of the mechanism to optimise on support costs across Member States would be reduced in such a scenario, as the number of Member States per auction is reduced. Also, this could lead to a fragmentation of auctions which complicates the operation and reduces the transparency of the mechanism.

to the splitting rule of the country in which the projects will be located. For example, a bid from country A with a splitting rule of 80/20 would be divided by 0.8 and a bid from country B with a splitting rule of 70/30 would be divided by 0.7.

As a result of the adjustment of bids to the same denominator, the tender will award the projects with the best ratio of "€ per MWh transferred to the financing mechanism", ensuring cost-effectiveness from the contributors' perspective. However, the projects awarded may not be those with the lowest support costs. Projects with a lower need for support but located in a host country with a less "favourable" splitting rule (e.g. 70/30) may lose to projects that require more support but are located in a host country with a splitting rule that grants more RES statistics to the contributors (e.g. 80/20). Thus, from a system's perspective, allowing for individual splits per host country can result in sub-optimal result in terms of cost-efficiency. Individual splits per host country add an administratively determined element that has an impact on the competitiveness of projects in the tenders under the mechanism. This can be considered as another disadvantage. Furthermore, the incentive for potential contributing Member States to participate in the mechanism may be reduced, depending on the share retained by the hosting countries.

Considering these advantages and disadvantages, a uniform splitting rule per auction round for all participating Member States appears to be the preferred option. If no agreement can be reached, however, individual splitting rules per Member State may be considered as fallback option.

Allocation of statistical benefits in case RES installations do not require support payments

Installations that successfully participated in auctions for grants under the mechanism, may not require grants in two cases:

Case 1 – Zero support payments despite higher bids (only possible if support is paid in form of a floating premium/CfD): If the market value is above the bid level for a floating market premium, no premium is paid. This may be a temporary or a frequent situation, depending on the development of the market value. The support scheme still fulfils the function of providing revenue stability to RES projects.

Case 2 - Zero bids (very unlikely outcome unless grid access is restricted by the tender, e.g. in the case of offshore wind): Bidders project that the installation can refinance with market revenues alone and bid "zero". No support payments are required over the entire period of operation.

The general principle of "who pays the support, receives the benefits" may not apply in these cases. Therefore, the question arises how the statistical benefits are allocated. To account for both cases, the European Commission and the participating Member States have the option to agree *ex-ante* on a deviation from the general splitting rule and define a higher share of the statistical benefits to be retained by hosting Member States. It should be noted, however, that these cases are not likely to occur frequently, as host Member States may keep such projects for their domestic target achievement, especially if they expect case 2.

Recommendation

The splitting rules needs to be clear to all participants before they enter a binding commitment for a specific tender. The mechanism should allow for the splitting rule to be adapted for each tender. We suggest proposing a flat-rate split applicable across all Member States at the beginning of the consultation, which may be adjusted for all participating Member States based on objective criteria (technology costs, likelihood of low auction results, system integration costs) as well as Member States' feedback. Allowing for individual splits per host Member States should only be considered if deviating views by the Member States cannot be accommodated otherwise. Bids need to be adjusted to ensure that the award decision is based on "€ per MWh transferred to the mechanism".

4.1.2.2 Options for the allocation of statistical benefits for funds from the European Union

To provide for the case of using European Union funds to allocate non-repayable support, i.e. grants, through the mechanism, two aspects require clarification. First, the methodology of attributing statistical RES benefits to the payments. In line with article 33 of the Governance Regulation, the attribution of statistical benefits to the contributions from the European Union should be treated equally to Member State contributions. This means that the rule(s) of distribution of statistical benefits that is chosen for a particular tender applies likewise to contributions from the Member States and from the EU funds, see previous chapter.

The second aspect relates to the target accounting of the statistical RES benefits acquired by the contributions from the European Union. In terms of RES target accounting, European Union contributions should be clearly separated from Member State contributions. European Union contributions should not allow Member States to reduce their own efforts for achieving the European Union RES target (i.e. their national contribution to the target). Therefore, it needs to be clarified how statistical benefits for European Union contributions may be accounted towards the European Union as a whole with potential implications for all Member States.

Option 1 - Accounting towards European Union and "beyond" 32%": All statistical benefits are solely attributed to the EU. Whether or not European Union contributions are counted "on top of" the 32% target, thus enabling to increase the European Union RES share in 2030 beyond 32%, is a central point of discussion. It could be argued that accounting European Union contributions beyond 32% is still in line with the European Union RES target, which states "at least 32%". This option has the advantage of avoiding any incentive for Member States to lower their level of ambition as a consequence of contributions made by the EU. However, Member States may oppose this option as an attempt to increase the level of ambition through the back door. The accounting beyond 32% may also reduce the incentive of Member States to provide additional funds to the enabling framework function, as these have no reducing effect on the Member States' obligations. Especially Member States that are net-contributors to the MFF may oppose that money, channelled through the mechanism, is only accounted towards the European Union.

Option 2 - Accounting towards the European Union, but not beyond 32%: As in option 1, all statistical benefits are solely attributed to the European Union, but not "on top of" the 32% target. This somewhat increases the incentive for Member States to provide funds to the enabling framework function. However, the EU contributions would indirectly lower the RES deployment required by the Member States to jointly achieve the European Union -level target, thereby potentially lowering the Member States' ambitions. The impact on Member States' obligation to jointly achieve 32% depends on volume of European Union contributions and should be monitored parallel to the Member States' progress reports.

Option 3 - Accounting of European Union contributions towards all Member States, based their MFF-share: The statistical benefits are attributed to the EU in a first step. In a second step, they are redistributed to all Member States based on their respective contribution-share to the overall MFF. Advantages of this option are that (i) once the allocation key is determined, the attribution of statistical benefits is transparent for all Member States, (ii) it avoids the distinction between European Union statistical benefits and Member States' collective target achievement and (iii) the accountability of individual Member States is not diluted. A disadvantage of this option is that (i) if European Union funds count towards Member States, this may create a disincentive for Member States to provide sufficient own funds for their national deployment, i.e. lower the national levels of ambition. Furthermore, this option creates the administrative burden of redistributing statistical benefits at the end of each year, as well as a disincentive for Member States to provide funds to the enabling framework function, especially if their MFF-share is small (hence they have a small share in the attribution of RES statistics).

Recommendation

The discussion has shown that there is a clear preference for the accounting of statistical benefits for funds from the EU towards EU and "beyond" 32%. This is the only option that avoids a dilution of the level of contributions that is required from the Member States.

4.2 Methodology for the sharing of additional system costs in host countries (Sub-task 3.2)

System costs may incur for the integration of RES projects financed by the mechanism into the energy system of the host country. Member States have repeatedly highlighted that such costs may prevent potential host countries from participating in the mechanism, unless the mechanism provides for some form of compensation or internalises these costs in the mechanism.

Developing a methodology for sharing additional system costs resulting from RES projects in host countries is complicated by several factors:

- From an economic perspective, the system costs need to be compared against the benefits of the additional RES projects. However, the public debate on RES support typically focuses more on costs than benefits.
- Political arguments are often more important to Member States than purely economic arguments. Being a host country may be economically beneficial but not find political acceptability. As discussions with Member States show, the price requested for becoming a host country may differ from actual system costs.
- Quantifying the additional system costs of RES projects financed by the mechanism is relatively burdensome. Several cost elements cannot be quantified on project level.

Against this background, we suggest a flexible approach to reflect system costs that occur in host countries:

Flat-rate statistical compensation of host countries ("splitting rule")

As described in section 4.1.2, host countries will receive a share of the RES statistics generated by the RES installations financed through the mechanism. This share does not depend on the actual system cost but on the splitting rule negotiated between the European Commission and host countries upfront, e.g. 80% of RES statistics go to the contributing Member States, 20% to the host country (could also be 90/10 or 70/30 etc). The share reflects the economic and political price of giving up domestic RES potential for the target achievement of other Member States and integrating the additional RES installations in the domestic energy system. Since it is a price rather than a cost compensation, it is not calculated based on actual system costs. It should be fixed per tender round and possibly per technology. If the price is too high, it will not be accepted by contributing Member States, i.e. supply and demand will not be matched. Ideally, in each tender round the same splitting rule should apply to all host countries. If no agreement can be found on that basis, the default share can also be differentiated between host countries, even though this reduces the transparency and efficiency of the mechanism. Section 4.1.2.1 elaborates the pros and cons of both approaches in further detail.

Internalisation of system costs through the regulatory regime of the host country, e.g. through deep connection charges

Host countries may internalise system costs through their regulatory framework, specifically through applying a deep grid connection charging regime to RES-E projects supported by the mechanism (or to all RES-e projects on their territory). In case of deep connection charges, RES projects bidding in the tender would price the cost of grid extension and reinforcement into their bids. This would reduce

the competitiveness of those projects compared to projects in countries with a shallow charging regime but minimise additional costs occurring for the host country. The choice of whether to internalise such costs to RES projects should be left to the host countries. The pros and cons of internalising grid costs are further elaborated in section 8.1.3 of Annex 1.

Furthermore, host countries can also avoid high additional system costs through the choice of technologies and sites that are eligible for the mechanism (see section 3.2.5.5).

We do not recommend a cost-based monetary compensation of system costs through the mechanism. Such a cost-based approach is elaborated in detail in Annex 1 but discarded for several reasons:

- A cost-based approach would not reflect the political considerations of host countries, i.e. their willingness to sell. The latter is better captured in a price-based approach as suggested for the statistical compensation above. For the successful application of the mechanism the core question is at what price host countries are willing to provide RES sites to the mechanism. This price may differ from actual system costs.
- As shown in Annex 1, calculating system cost and benefits would be burdensome and could provoke substantial debate regarding its accuracy. The effort appears disproportionate in the context of the mechanism, also considering that system costs typically make up a low share of RES costs.
- Looking at RES electricity, the most relevant system costs of installing additional RES projects are grid extension and reinforcement costs and - in countries with high RES penetration - redispatch and curtailment costs (see section 8.1.2). Grid extension and reinforcement costs could theoretically be compensated financially through the mechanism, but it appears more practical to internalise them through deep grid connection charges (see above and Annex 1). Curtailment and redispatch costs cannot be calculated on project level but only on system level per control area. Theoretically, they could be derived and compensated ex-post on an aggregated level, but this would undermine the functioning of the mechanism, as ex-post financial compensation would decrease the predictability and acceptability of the mechanisms.
- The additional compensation payment streams to host countries would lead to additional administrative burden for the mechanism. This administrative burden can be avoided in case of statistical compensation, as proposed above.

Recommendation

System costs should not be calculated and compensated on an individual cost-basis. Instead, a compensation in form of a flat rate statistical share (e.g. 80/20) should be negotiated between the Commission and the host countries (“splitting rule”). This splitting rule reflects the host countries’ selling price rather than their actual system costs. If the requested share is too high, it will not be acceptable to contributing Member States, i.e. supply and demand cannot be matched.

Independent of the statistical compensation, host countries may internalise system costs to RES projects through their regulatory framework. This particularly applies to grid extension and reinforcement costs that can be internalised through deep connection charges, even though such charges reduce the attractiveness for RES project developers and the competitiveness of the respective projects in the EU auction.

4.3 Private sector contributions (Sub-task 3.3)

The mechanism mentions “private sector contributions” that may contribute to the enabling framework function. The objective of sub-task 3.3 is to assess and present possible modalities for the participation of private entities as contributors to the platform. Such contributions are defined as

- Option 1: Direct contributions to the mechanism by the private sector, or
- Option 2: PPAs for the offtake of energy

In addition, this section explores possible incentives for attracting private sector contributions to the mechanism, such as a specific green label or other marketing advantages. In this context it is important to clearly differentiate between target achievement statistics on the one hand (which are reserved for Member States and the European Union as these bodies are subject to the European Union RES target) and private sector benefits, such as GOs or other means to proof a company’s engagement in sustainability.

4.3.1 Contributions

Option 1: Direct contributions to the mechanism by the private sector

The most straight forward contribution of the private sector would be direct payments into the mechanism to subsequently tender grants. This would be an option for philanthropic organisations.[38]

In case of direct contributions by the private sector, the question is where RES target achievement based on these payments are located. One option is to attribute them to the European Union, which would be in line with the Governance regulation, stating in article 33 (5) that “Projects supported by this mechanism that are financed by other sources than Member States payments shall not count towards Member States’ national contributions.” In this case, the sub-options are to count the target achievement as exceeding the 32% share since all Member State contributions need to add up to the 32% share. This would implicitly increase the ambition level of the European Union target. In contrast, statistical target achievement resulting from private sector contributions may be counted towards the hosting Member States. This would clearly incentivise Member States to become hosts for such projects, but it quite clearly contradicts the provision in Article 33.

Based on how the energy market is currently operating in terms of investments and energy sourcing, the willingness of private sector actors to substantially support RES (beyond the values of grey energy) is apparently very limited.

Option 2: PPAs for the offtake of energy produced by projects

The private sector entity may source renewable energy through power purchase agreements (PPAs). Such agreements can take various shapes and forms, depending on the market conditions, the involved parties and their preferences and capabilities. A PPA is typically a long-term contract securing the offtake of energy from one or more power plants. It may be signed between a power producer and a utility or between a power producer and the final consumer (a “corporate PPA” in the latter case). A PPA may include a “pay-as-produce” clause and a fixed price. This combination is usually the PPA leading to revenue stabilization for the RES producer.

PPAs do not have a direct impact on or contribution to the mechanism. However, projects bidding for support under the tenders of the mechanism, may also sign a PPA to hedge against market price fluctuations. If combined with investment support or operating aid paid in the form of a fixed market premium under the mechanism, PPAs may lead to lower bids and thus reduced need for support. This can be seen as an indirect contribution of the private sector to the mechanism. The signing of PPAs

[38] For instance, the “Breakthrough energy coalition” is “committed to investing in new technologies to find better, more efficient and cheaper energy sources” to contribute to climate change mitigation. It includes companies and institutions like ENGIE, GE, Microsoft, Amazon, Total, SAP, etc.

should obviously be allowed for projects under the mechanism. At the same time, the mechanism should not provide specific incentives for projects to sign a PPA.

It is important to have in mind that the contractual arrangements actually applied in the market are very diverse, including shorter time-frames (e.g. 5 years), “pay-as-consume” clauses or the trade of “blocks” or specific “shapes” (i.e. delivery patterns) of energy. It may include price review clauses, prices indexed with the power exchange, and it may include price floors and ceilings. It may include third parties to address balancing needs and PPAs may be signed between a single plant and various consumers (a club PPA) or between various plants and one consumer (multi-technology PPA). Moreover, PPAs may include the “physical” delivery of energy (meaning the inclusion of obligations as balancing responsible parties, supplier obligations, contracts for grid usage etc.) or it may be set up as a financial hedging instruments in the form of a “virtual PPA” whereby both the producer and consumer market and source their energy in traditional ways but enter into a contract to hedge prices on both sides.

The wide range of contractual arrangements in the PPA market is important to have in mind, as only a part of the PPAs provides the full and long-term revenue stabilization that is often referred to when discussing the role of PPAs in the European energy transition.

In principle, there are three ways in which PPAs can (and sometimes already do) make a genuine contribution to the energy transition:

Unsubsidised PPAs: Such PPAs can be related to new RES installations that do not receive public subsidies, thereby effectively addressing the revenue gap (if it exists at all) and providing additionality – at least in terms of not relying on support scheme payments. This type of PPA provides the most evident contribution to additional RES deployment but is also the one that is only very recently emerging. With RES costs decreasing and electricity market prices potentially increasing, the number of PPAs outside of subsidy schemes may well increase towards 2030.

PPAs with previously subsidised installations: Such PPAs can ensure that RES installations running out of support after 15 or 20 years continue operation, if operation and maintenance costs exceed wholesale market revenues or if the market revenue risk would make the continued operation unfeasible. In this case RES installations received subsidies in the past and they are not new (a quality criterion that some labels and corporates mention), but PPAs would serve as a price-stabilizing mechanism to keep capacities online and operational (thus effectively increasing online capacities).

Subsidised PPAs: PPAs can support new RES installations, even if they receive public subsidies, by improving the revenue stability for projects in case support schemes come with strong revenue risks. This in turn improves the bankability of RES projects and decreases their cost of capital. Thereby the amount of support required can be reduced. Revenue risks (and the reduction thereof) is relevant in the case of fixed premium systems and upfront investment support. But revenue risks for producers will also increase in floating premium schemes always when the strike price for tenders is below the actual LCOE and the tender participants bet on increasing electricity prices (as seems to be happening in some of the tenders in Germany).

Thus, while PPAs make the most obvious and strongest contribution if separated from support scheme payments, they might be valuable to mitigate revenue risks in various support scheme contexts. This might be particularly relevant in the context of the mechanism: if upfront investment support is provided, RES producers will be fully exposed to market risks and PPAs can play a crucial role to make a larger number of projects commercially viable in this context.

The distribution of target achievement should follow the principles laid out in task 4. i.e. the contributing Member State should receive the target achievement statistics (or the European Union in case of European Union contributions).

4.3.2 Incentives

As stated above, we assume that direct private sector contributions to the mechanism are quite unlikely. The more likely contribution, but also the more difficult one to assess, is through PPAs. In the first place, market participants will implement PPAs if they have an intrinsic motivation to do so, i.e. to fix energy prices long-term, to reduce their carbon footprint in a broader sense (e.g. scope 2 emissions) or to show their direct involvement in the energy transition. To statistically prove their green energy consumption, they rely on guarantees of origin (GOs).

GOs

In many Member States GOs are issued and transferred to energy producers regardless of whether the respective plant received subsidies or not. Other Member States, like Germany, argue that the green value of the energy was enabled by the support payment, which in term was financing by energy consumers based on a levy. Thus, it does not issue GOs for subsidised plants. The new RED practically still leaves the decision to Member States whether to issue GOs or not.

For the mechanism the decision needs to be taken whether and under which circumstances GOs are issued for subsidised plants. Issuing GOs for subsidised plants would clearly incentivise corporates to source energy from plants supported by the mechanism. Alternatively, GOs may be issued for plants that receive “only” financial instruments, as in this case the PPA may be a decisive factor for the investment decision.

In any case, the GOs would have to be issued on national level by the respective Issuing Body. It may be either a condition of the mechanism to adhere to its rule related to the issuing of GOs. Alternatively, the decision may be left to Member States. In this case, the issuing of GOs for subsidised or unsubsidised electricity becomes part of the general framework conditions for RES deployment in that Member State.

A label

The second option is to provide a “mechanism label”, confirming the sustainable and European engagement of the company providing either direct contributions or sourcing energy from a plant. In this case, the label would have to clearly state what the contribution was of the company using it and which share of the RES production is really based on this contribution.

The option of a label will likely be developed in detail and separately from this project, as the REDII states in Article 19: “The Commission shall adopt a report assessing options to establish a Union-wide green label with a view to promoting the use of renewable energy coming from new installations. Suppliers shall use the information contained in guarantees of origin to demonstrate compliance with the requirements of such a label”.

5. PRACTICAL IMPLEMENTATION (TASK 4)

There are numerous issues to be solved around the practical implementation of the mechanism. These include the management, implementation and governance of the mechanism as well as related processes and timelines. With a view to the management and implementation of the mechanism, the report focuses on the high-level distribution of responsibilities and related contractual structures that need to be established between the European Commission or implementing agency and the Member States. With a view to the processes, the report focuses on the broader multiannual tender procedure and on the specific process for each tender round. In addition, it discusses options for the selection procedure for financial instruments. Finally, it describes in practical terms how funds from the mechanism may be combined with other European Union funds.

5.1 Management, implementation and governance of the mechanism (Sub-task 4.1)

This chapter describes the (contractually determined) practical procedures and distribution of responsibilities between the European Commission/implementing agency and participating Member States for the implementation of tenders as well as the minimum contractual requirements for the binding commitments to be established between the European Commission and participating Member States (i.e. contributing and hosting countries).

Contractual arrangements need to be established to ensure that responsibilities and liabilities are properly defined between all parties involved. A whole range of topics will need to be contractually defined at an early stage of the implementation of the mechanism and/or the actual practical implementation of the tenders. For this purpose, blueprint agreements may be developed that determine the contractual arrangements, including rights and obligations, between

- the European Commission/implementing agency and hosting countries (section 5.1.1)
- the European Commission/implementing agency and contributing Member States (section 5.1.2)
- the support counterparty and off-taker for counterparty risk, i.e. the European Commission or (theoretically) contributing Member States, and RES projects receiving support from the mechanism (section 5.1.3 elaborating on how to reduce counterparty risk under the mechanism)

Moreover, this section briefly elaborates on the contractual liabilities and implications for contributing Member States, the mechanism and project developers under specific scenarios (section 5.1.4). A final section briefly outlines a possible allocation of tasks between the European Commission and a responsible implementing/executive agency (section 5.1.5).

5.1.1 Contractual arrangements with hosting countries

The smooth functioning of the mechanism requires contractually defining clear procedures and responsibilities for the evaluation of bid requirements and awarding of the bids, the monitoring of project implementation as well as for the disbursement of support and the transmission of data. Moreover, before tenders are announced, hosting Member States (and Third Countries) need to contractually commit to the European Commission to allow projects located on their territory to receive support under the mechanism, including applicable restrictions, e.g. in terms of maximum capacities (see section 5.2 for a detailed overview of the envisaged process).

This chapter provides our recommendations on the further detailing of required contractual arrangements between the European Commission and hosting Member States, in particular on:

- The contractual determination of procedures and the distribution of responsibilities related to the evaluation of bid requirements, the awarding of bids and the monitoring of project

implementation, the disbursement of support payments and the collection and transfer of production data and market values (section 5.1.1.1), and

- Elements to be contractually defined as part of the binding commitments with hosting countries to allow projects located on their territory to receive support under the mechanism (section 5.1.1.2)

Note in this context binding commitments by hosting countries to allow projects located on their territory to participate in the mechanism would usually have to be done for a specific tender round (but could also include more than one round). By contrast, the contractual determination of procedures and responsibilities should generally be implemented as part of a separate contractual framework covering various tender rounds in which the respective hosting country participates. This is to make full use of a streamlined centralised approach at European Union level and thus reduce transaction costs related to lengthy negotiations of specific arrangements between Member States/third countries and the European Union before each tender round.

5.1.1.1 Contractual determination of procedures and distribution of responsibilities

Contractual arrangements must ultimately determine the procedures and responsibilities in a legally robust manner. The distribution of roles and responsibilities between the European Commission or implementing agency and the national authorities (as well as the contractual arrangements that determine this distribution) should be determined with a view to ensure efficiency, robustness and legal certainty of the processes.

Centralised versus decentralised approach

In general, one can differentiate between more centralised approaches for the distribution of roles and responsibilities and decentralised approaches. The following discusses the basic functioning of each approach as well as its advantages and disadvantages.

A *centralised approach* in this context means that the European Commission or implementing agency define and implement their own processes of, for example, disbursement of support payments to awarded installations and the necessary transfer of production data of each installation and related information such as market values. In this case, the European Commission or implementing agency itself assumes (large parts of) the responsibilities of, for example, retrieving the correct production data from the installations, calculating the corresponding technology-specific market values of the price zone and matching this information with the disbursement of the support payments for each single installation. The European Commission or implementing agency would also disburse the payments directly to the project without any intermediary body. In a centralised approach, the processes under the mechanism run largely parallel to processes established in the national schemes.

Advantages of a centralised approach include that rather than a multitude of national processes per task, only one procedure at European Union level that is applicable to all Member States would be required for each task. In addition, a centralised approach provides a clear distribution of responsibilities and liabilities (mostly with COM). However, disadvantages of this approach are significant and include the difficulty to design a process that is applicable to all Member States (no “one size fits all” in most cases). It also implies a large administrative burden for the European Commission or the respective implementing agency. Deviations from processes established at national level for the mechanism can create uncertainty for project developers/operators. In addition, several liability issues for the European Commission or implementing agency would emerge as the question would be who would be legally accountable for errors (for instance in the reporting of production data).

A *decentralised approach* in this context means that the European Commission or implementing agency relies to a large extent on the processes already established within each Member State. Rather than creating its own parallel processes of disbursement and data collection, the European Commission or implementing agency establish a lean process that is complementary to, i.e. feeding into (or being fed by) the processes established in the Member States. This means that large parts of

the procedures are assumed by the national authorities that are also assigned with these specific tasks in the national schemes. Consequently, more responsibilities and liabilities are transferred to national authorities.

The clear advantage of this approach is that it builds on functioning processes at national level. It creates less administrative burden for the European Commission or implementing agency related to disbursement of payments, data transfer, etc., once the contractual arrangements are determined. It also limits uncertainties for project developers/operators as they are already familiar with the national processes. In addition, it is potentially quicker and easier to implement compared to "centralised approaches". A challenge in the decentralised approach is that different procedures apply in the Member States, i.e. contractual arrangements between the European Commission or implementing agency and Member State may differ in each case. This also means that potentially more complex contractual arrangements are required, i.e. with more parties involved.

Recommendation

Considering the number of aspects that need to be contractually arranged, our general recommendation is to reduce the complexity of the administrative procedures of competitive tenders under the mechanism and make use of (or align with) procedures that are already established at national level to the extent possible. For instance, it is difficult to assess the pre-qualification documentation and monitoring the project implementation of multiple small and geographically dispersed installations for the European Commission or implementing agency. Instead, we recommend involving the authorities assigned with these tasks in the national schemes and agree on mechanisms to ensure the close cooperation between national authorities and the implementing agency.

The process may vary depending on the institutional setup of the countries involved, i.e. no "one process fits all". As a result, the roles and thus contractual arrangements need to be tailored to the national context of the involved Member States. We therefore recommend deriving the concrete contractual structures from a set of principles on how to adapt these structures to different national contexts and institutions.

Evaluation of bid requirements, awarding of bids and monitoring of project implementation

The responsibility of evaluating and awarding of bids should lie with the implementing agency and thus will be done centrally which ensures an objective comparison between bids from different countries. However, the involvement of the national bodies is recommended to facilitate a number of processes that are related to the effective evaluation and awarding of bids. Processes that should be conducted by national bodies are:

- Assessing of material prequalification (if applicable[39]) and compliance with national legal framework**:** The European Commission or implementing agency is neither familiar with the details of licensing and permitting of the hosting Member States nor with all the technical standards and other legal requirements, such as site restrictions, stemming from the national framework. Familiarising with the context of the Member States would induce extensive additional transaction costs. Therefore, we recommend that the national authorities assess the correctness of the material prequalification and confirm the basic eligibility of the planned project according to a limited set of basic criteria (e.g. confirming that the planned project is in accordance with national rules on site restriction, maximum project sizes, etc.). The national authorities will provide a statement to the European Commission or implementing agency that the bid does or does not comply with the basic set of requirements. Alternatively, bidders can be asked to simply provide a statement that they comply with the prequalification (e.g. have

[39] As explained in section 3.2, we do not recommend applying material prequalification requirements initially.

the permit in question) and the national legal framework without any checks at the time of the tender. This would provide for a leaner process.

- Monitoring project implementation and on-site checks: The implementation of awarded bids needs to be monitored to ensure, for example, the correct start of support payments or application of penalties. If investment support is competitively tendered, the disbursement of support will be attributed to certain milestones in the project development. In case of multi-item tenders, with multiple small and geographically dispersed installations, a decentralised approach is recommended, i.e. the monitoring of progress can be done more easily by national authorities. However, in case of tenders resulting in few or single large-scale installations (e.g. project specific tenders), a more centralised approach may be applied, i.e. the implementing agency may assume parts of the monitoring.

The national bodies should be assigned by each Member State. The procedures for the transfer of the required information from the Member States to the implementing agency need to be established and contractually agreed upon.

Table 7 provides a detailed overview of our recommendation on the aspects and responsibilities to be contractually determined regarding the evaluation of bid requirements, the awarding of bids and the monitoring of project implementation. This table (as well as the following tables of this chapter) contain a recommendation on whether the responsibility for a certain task/aspect should principally lie with the European Commission or with the national bodies that are assigned with these specific tasks in the national scheme. Note in this context that national body refers to a whole range of different authorities and stakeholders at national level, including national regulator, issuing body, DSO/TSO, environmental agencies, project operators, etc.

Table 7 Awarding of bids and monitoring of project implementation: Aspects and responsibilities to be determined

Function to be defined	Corresponding aspects	Responsible authority	Comments
Evaluation of bid requirements & Awarding of bids	Assessing technical and material prequalification (if applicable)	National	Alternatively, bidders can be asked to simply provide a statement that they are compliant
	Assessing compliance with national regulation, e.g. site restriction, technical requirements	National	
	Exclusion of bids	European Commission	European Commission based on information provided by national authorities. Potential legal implications require further legal assessment.
	Awarding of bids	European Commission	

	Checking and administrating financial guarantees (bid bonds)	European Commission	
Monitoring/ ensuring national regulatory framework are complied with	Assessing if local rules are complied with	National (divided among the various involved national bodies)	
	Penalties: Full (or partial) confiscation of bid bonds in case of delay, non-realisation and underbuilding	European Commission	European Commission based on information provided by national authorities
	Process and responsibilities of monitoring project implementation	National	Possibly European Commission in case of single large projects (single project tenders)

Recommendation

The responsibility for the awarding of bids should lie with the implementing agency (i.e. centralised approach) to ensure an objective comparison between bids from different countries.

However, the involvement of the national bodies is recommended to facilitate a number of processes that are related to the effective evaluation and awarding of bids. Processes that should be conducted by national bodies are:

- Assessing of material prequalification (if applicable) and compliance with national legal framework
- Monitoring project implementation and on-site checks

Disbursement of payments

The contractual arrangements between the European Commission and hosting countries also need to define rules and responsibilities for the disbursement of funding, which must be closely linked to the exchange and monitoring of information on the production of the installation to ensure correct support payments. A dedicated agency has to be assigned with the disbursement of funding. One option is to disburse the funding through the respective bodies responsible in the national support scheme (decentral approach). Alternatively, the European Commission assigns the implementing agency (or another central institution) with this task, which would increase its control and oversight function (central approach).

Table 8 outlines the aspects to be contractually determined in the context of the disbursement of support payments.

Table 8 Disbursement of support payments: Aspects to be determined

Function to be defined	Corresponding aspects
Disbursement of support payments	• Defining the beneficiaries of support • Defining the counterparty contractually responsible for paying the support (e.g. the mechanism directly vs providing guarantees to another entity)

Recommendation

We recommend a centralised approach to the disbursement of funding, i.e. the European Commission assigns the implementing agency (or another central institution) with this task. This would increase its control and oversight function.

Collection and transfer of production data and related information

Furthermore, processes need to be established for the frequent data exchange of the production volume of each installation as well as the (technology specific) market values that are the basis for calculating the support payments. The European Commission and the hosting Member States will have to set up procedures for the exchange of the required information, specifying the format, frequency and timing of the data transfer.

In any case, the disbursement needs to be aligned with the volume of production of each installation funded by the mechanism, which requires specific data collection and transmission processes. This process requires close cooperation between the national bodies designated with the data collection and the agency responsible for the disbursement of the funding. Furthermore, depending on the design of the support payments, technology-specific market values need to be taken into account.

Table 9 provides a detailed overview of our recommendation on the aspects and responsibilities to be determined regarding data collection and transmission.

Table 9 Data collection and transmission: Aspects and responsibilities to be determined

Function to be defined	Corresponding aspects	Responsible authority	Comments
Data collection and transmission	Defining type, periodicity and format of production data required	European Commission	
	Defining type, periodicity and format of data on (technology specific) market prices in the respective price zone (in case of a floating premium/CfD)	European Commission	
	Defining methodology to calculate “technology specific” market prices	National	In accordance with national procedures, but needs to be checked by European Commission
	Retrieving production data	National	

Retrieving data on market values (in case of floating premiums/CfD)	National
Responsibility of matching production data and support levels for each installation	National
Transferring of data to entity disbursing support payments	National

Recommendation

Our recommendation is to take a decentralised approach to the collection and transfer of production data and other local information, i.e. mainly national bodies that are assigned with these specific tasks in the national scheme should also be responsible for those tasks under the mechanism.

5.1.1.2 Elements to be defined in the binding commitment to participate as hosting country

For the binding commitment, hosting countries contractually commit to the European Commission to allow projects located on its territory to receive support under the mechanism. Minimum contractual requirements and conditions need to be defined in this context. These include the details on the availability of projects to the mechanism, including applicable restrictions e.g. in terms of eligible technologies and available sites. Moreover, the contractual arrangements with host countries need to detail the share of statistical benefits to be allocated to host countries for energy produced in installations located on their territory and the applicable grid connection charging regime for installations receiving support from the mechanism needs to be defined.

Table 10 Elements to be defined in the binding contractual commitment by hosting countries

Element to be defined	Corresponding aspects
Projects available to the mechanism	• Restrictions in terms of capacities, technologies, sites etc.
Allocation of costs and benefits	• Allocation of RES statistics during and after support period • National grid connection charging regime applicable to participating projects

Recommendation

As part of binding commitment by hosting countries to allow projects on its territory to receive support under the mechanism at least the following information and conditions need to be contractually determined:

- Eligible technologies and type of energy (i.e. electricity, heat, transport)
- Maximum capacities on their territory which are made available to the mechanism (per technology, if applicable, and per year)
- If applicable, maximum project sizes and site restrictions
- Statistical benefit to be allocated to host countries during and after the support period

5.1.2 Contractual arrangements with contributing Member States

Contributing Member States will have to enter a binding contractual agreement with the European Commission regarding their financial contribution and the allocation of RES statistics for a specific tender round under the mechanism. This includes the committed volume (in terms of budget, capacities or generation), duration, use of financial contributions and the timing of the commitment and transfer. Regarding the allocation of statistical benefits to contributing Member States, the specific rule for the attribution of RES statistics to contributing Member States needs to be determined.

Table 11 provides an overview of the aspects to be defined in the contractual agreements between contributing Member States and the European Commission.

Table 11 Elements to be defined in the binding contractual commitment by contributing Member States

Element to be defined	Corresponding aspects
Financial commitment	• Financial commitment: volume, duration, timing and transfer of committed funds, including a suspensive clause which announces that the tender is executed under the condition of financing being provided by the contributing Member State
Allocation of statistical benefits	• Allocation of RES statistics during and after support period

Recommendation

The binding contractual commitment with the European Commission regarding contributing Member States' financial contribution, at least the following elements need to be contractually determined:

- Financial commitment in terms of budget, capacities or generation: volume, duration, timing and transfer of committed funds (based on confirmed maximum price communicated by the European Commission) including a suspensive clause which announces that the tender is executed under the condition of financing being provided by the contributing Member State.
- Maximum financial contributions per tender round, if applicable.
- The recognition as additional measure in accordance with Article 32(3) of the Governance Regulation to close (part of) the Member States' gap (if not already fully covered by Implementing Act)
- Allocation of RES statistics during and after the support period

5.1.3 Contractual arrangements between RES projects and the off-taker for counterparty risk

In principle, either the European Commission or a contributing Member State may enter into binding contractual arrangements with RES projects and act as the off-taker for the counterparty risk. To fully reap the benefits of a streamlined central approach at Union level, we recommend that the European Commission or an implementing agency should act as the responsible support counterparty directly disbursing support payments and acting as the off-taker for the counterparty risk.

In case operating support is disbursed, this set-up may pose substantial counterparty risk for project developers**,** however, because the disbursement of support by the European Commission depends on the availability of funds in the mechanism throughout the whole support period and thus actual payments into the mechanism by contributing Member States. At the same time, the European Commission cannot provide guarantees itself to RES projects regarding the future disbursement of support payments in its role as support counterparty**.**

Recommendation

In line with section 5.1.1, we recommend that the European Commission or an implementing agency acts as the support counterparty responsible for support payment disbursement to RES projects and thus the off-taker for counterparty risk. To mitigate the counterparty risk for RES projects, the disbursement of investment support is generally more advisable than operating support, given that the full support payment would be provided upfront rather than spread over a longer support period.

To fully mitigate the off-taker risk in case of operating support, the European Commission would need to collect the respective Member State funds upfront. As this would be suboptimal from a financial/budgetary perspective, it may decide for yearly upfront payments and define stringent contractual liabilities for contributing MS over the support period.

5.1.4 Contractual liabilities

This section briefly elaborates on the contractual liabilities and implications

- for contributing Member States in case projects supported under the mechanism fail to realise or severely underperform (section 5.1.4.1)
- for the mechanism and RES projects in case contributing Member States stop their financial contributions / breach their contract (section 5.1.4.2)

5.1.4.1 Implications of non-realised or underperforming projects on Member State commitment

This section briefly analyses the implications of failed realisation, delays or underperformance of projects awarded under the mechanism on a contributing Member States' contractual commitment to participate in the mechanism in order to cover a gap compared to the national reference points in 2020, 2025 or 2027. More specifically, such a situation raises the question whether Member States would bear the full risk in terms of falling short of their target achievement for the amount contributed in case projects awarded under the mechanism fail to be realised or severely underperform in terms of the energy they produce. In order to provide minimum securities for contributing Member States committing resources to the mechanism in terms of the target achievement they intend to achieve with their participation, while at the same time complying with the Governance Regulation's requirement that statistical benefits can only be attributed on the basis of actual energy produced, we suggest the following provisions:

- A contributing Member State participating in the mechanism to cover its gap towards a national reference point should be deemed to have taken "additional measures" in accordance with Article 32(3) of Regulation (EU) 2018/1999 for the amount of energy (based on the calculated maximum price) it has committed to finance on the sole basis of the financial contribution paid by that Member State to the mechanism, i.e. irrespective of the actual energy produced by installations awarded under the mechanism.
- By contrast, statistical benefits to Member States will be solely attributed on the basis of the actual energy produced (and the amount of energy for which they have financially contributed to the mechanism). That is, in case awarded projects are not realised or underperform severely, contributing Member States would continue to receive statistical benefits only on the

basis of the actual energy production, which in sum might be less than initially anticipated as a result of these irregularities. Consequently, this may have an impact on the absolute amount of statistical benefits the Member State will eventually receive. In this case, the European Commission may try to compensate for non-realised projects by retendering these volumes (to the extent possible and in the limit of European Union budget rules).

Recommendation

In line with the Governance Regulation, contributing Member States only receive statistical benefits proportional to the actual energy produced by projects supported under the mechanism and for the amounts they financially contributed to the mechanism. As such, they generally bear the risks of potential production shortfalls of projects supported under the mechanism (related to the amount of their contribution). However, by having contributed to the mechanism, they will be deemed to have taken "additional measures" in accordance with Article 32(2) of the Governance Regulation. Moreover, the European Commission may try to compensate for non-realised projects by retendering these volumes (to the extent possible and in the limit of European Union budget rules).

5.1.4.2 Implications of Member States stopping their contributions to the mechanism

As stated above, the Member State commitments must be legally binding, which is to be formalised in an agreement between the Member State and the European Commission. Nevertheless, the mechanism must provide for the event that a Member State stops its contributions and thereby breaches its legal obligations. In such a case, the mechanism should guarantee continued payments to the installation, which means that liquidity shortfalls with potentially adverse impacts on investor confidence in the mechanism should be prevented.

In this respect, two opposing objectives need to be balanced: On the one hand, the European Commission cannot back-up Member State contributions, in case they bail out, as this could suggest flexibility for Member States to step back from their commitments. On the other hand, if there is no guarantee by the European Commission for continued payment of support, RES projects are faced with similar (or even worse) risks as under the domestic support schemes. As a consequence, the potential to improve financing conditions under a European Union mechanism may not be realised, which reduces the attractiveness of the mechanism.

Recommendation

In addition to the juridical possibilities of the EU to hold a Member State accountable for breaching its legal obligations, options may be implemented to prevent an uncontrolled "bail out" of a Member State in the first place, such as

- Selling statistical benefits through the platform established under Article 8 of the RED II, or
- Selling/transferring the entire commitment to another Member State, which then assumes the obligations to make payment contributions in return for the statistical benefits.

5.1.5 Allocation of responsibilities between the European Commission and a responsible implementing agency

In accordance with Article 69 of Regulation (EU, Euratom) 2018/1046, the Commission should be able to delegate, as appropriate, specific implementation tasks to an executive agency, such as the preparation of the calls for proposals, the evaluation procedure, the contractual management of grants, and the monitoring of project implementation.

Table 12 provides an overview of a potential allocation of responsibilities between the European Commission and the responsible implementing agency (e.g. INEA). In this context, some tasks would most likely have to be carried out by the European Commission itself, for instance due to the political nature of the task in questions, but it may still be assisted by an implementing agency in these cases (e.g. the organization of the expression of interest phase or the stakeholder consultation). At the same time, most tasks likely to be executed by the implementing agency will nonetheless involve guidance and require approval by the European Commission as the parent institution of the executive agency in question (e.g. as part of the evaluation and ranking of projects). Below, we therefore only refer to the main responsible party in each case.

Table 12 Suggested allocation of tasks between the European Commission and a responsible implementing agency

Task	(Main) Responsible party (EC/implementing agency)
Drafting and adoption of multiannual work programmes	European Commission
Organising and managing expression of interests by Member States, incl. determination of maximum price and preparing of draft tender documentation	European Commission
(optional) Stakeholder consultation on draft tender documentation	European Commission
Setting up of binding contractual arrangements with participating Member States	European Commission
Preparing, organizing and publishing calls for proposals	Implementing agency
Managing receipt of applications	Implementing agency
Checking admissibility and eligibility of submitted applications, in particular (financial) pre-qualification requirements	Implementing agency
Ranking of applications	Implementing agency
Awarding of bids until volume (MW), generation (MWh) or budget cap (€)	Implementing agency
Information to bid winners and unsuccessful bidders and publication of tender outcomes	Implementing agency
Contract preparation and signature of grant agreement with bid winners	Implementing agency
Monitor realisation of projects & execution of penalties (if applicable)	Implementing agency (in cooperation with national authorities)
Disbursement of support payments to projects	Implementing agency
Reporting to European Commission and Member States on project realisation & financial reporting	Implementing agency

5.2 Process and timeline (Sub-task 4.2)

This chapter describes our recommendation regarding a high-level tendering process for grants (section 5.2.1), provides a more detailed overview of practical implementation steps to organise a tender (section 5.2.2) and discusses different approaches to allocate support in the form of financial instruments under the mechanism (section 5.2.3). Moreover, the chapter discusses options on how selection procedures of the mechanism and other funds such as InvestEU can be combined (section 5.2.4).

5.2.1 Tender process for non-repayable grants

The recommended **process to tender non-repayable grants under the mechanism** (i.e. upfront investment support or a premium on top of market price) to projects follows a competitive bidding process and allocates support to projects bidding at lowest price[40]. Table 13 gives an overview of how the high-level process to implement tenders as part of the mechanism may be designed, including the elaboration of multiannual work programmes (stage I), tender preparation (stage II) and its implementation (stages III to IV) as well as monitoring, accounting and support payment disbursement (stage V). We briefly outline each of these five stages in turn:

Stage I (Work programme): In a first step, the European Commission develops a multiannual work programme detailing the actions and operations envisaged by the mechanism for a defined time period, which could be whole or part of the period of the mechanism until 2030. To assess contributing and hosting Member States' medium-term willingness to participate in tenders for grants, the Commission may, for this purpose, conduct first non-binding bilateral inquiries. Hosting Member States would be asked to provide their medium-term preferences with regard to the total volumes they intend to deploy on their territory and receiving support from the mechanism as well applicable restrictions in terms technologies, sites and project sizes. Contributing Member States provide information on their intended financial contributions to be supported under the mechanism, preferred technologies as well as the timing of their contribution. The organisation of a dedicated process to gauge interest from Member States as part of the drafting of the work programme (i.e. in addition to the dedicated calls for interest for specific tender rounds) needs to be weighed against potential time constraints and the necessity to commit significant administrative resources for this purpose. A leaner process may thus initially suffice (e.g. via already available information in the NECPs) which would result in a more high-level document at the start of the process to be updated and detailed in the course of ongoing tender procedures as part of the mechanism.

The final adoption and publication of the work programme by the Commission follows an interservice consultation as well as a consultation of the Energy Union Committee. For the period of the work programme, the adopted version lays down broad priorities in terms of technologies and sectors as well as planned tender volumes including an indicative tender schedule, to the extent possible. The Commission may update the work programme in accordance with the interest expressed or commitments by Member States as well as relevant renewable energy market developments.

Stage II (Tender preparation): The preparation phase for individual tender rounds is organised roughly every two years and ideally starts between 1 to 2 years before the planned tender is executed. Nonetheless, the tender preparation could in principle be launched on a rolling basis whenever windows of opportunities in participating Member States emerge.

[40] Lowest price in this case meaning the lowest statistical transfer price to Member States, which may be different from the bid price, see section 4.1.

The European Commission would start this process by launching an informal, non-public expression of interest (EOI) phase, whereby Member States (and potentially Third Countries) express their interest to participate in the mechanism as contributing or hosting states. Interested hosting Member States are first asked to provide information on preferences or flexibilities related to their participation in the planned tender round(s), including inter alia the available maximum capacities (per technology and year) which are made available on their territory, maximum project sizes, site or geographical constraints and minimum requirements regarding the share of statistical benefits they request to participate. Based on the emerging aggregated RES potential on hosting Member States' territories available to the mechanism and a resulting support cost range, indicative maximum prices are determined by the Commission for a small, medium and high tender volume, in line with the methodology outlined in section 4.1.1. The three indicative maximum prices are then communicated to Member States. Taking the indicative maximum prices into account, interested contributing Member States are asked to provide information on their intended financial contribution to the mechanism in terms of budget, capacities or generation as well as maximum intended financial contributions per tender round (if applicable). Based on the information provided by the contributing Member States, a final maximum price is determined.

Rather than asking for specific information from Member States, the EOI-phase may also be organised in a more open manner, i.e. the Commission would not ask Member States to provide specific information but rather leave it open to Member States to contribute the information that they deem necessary. An advantage of this approach is that it may reduce the risks of inducing preferences in terms of applying one of the suggested restrictions (e.g. in terms of sites or technologies). On the other hand, a disadvantage of such an open process would be that the Commission might end up lacking all necessary information to efficiently determine the supply curve and thus indicative maximum prices or draft a call for proposals that reflects and matches all relevant preferences and restrictions, as this may require additional negotiation rounds and thus eventually prolong the process at later stages before actual binding contracts are signed.

On the basis of the interest expressed by participating Member States and third countries, the Commission prepares draft call(s) for proposals[41]. They contain inter alia the maximum price, the objectives pursued by the tender (e.g. support window), the good and volume to be tendered, eligible technologies, the type of support (e.g. upfront investment support or operating support) and other applicable tender design parameters as outlined in section 3.2 (e.g. penalties, pre-qualification requirements, realisation periods). Moreover, the documentation should include practical arrangements such as the final date of bid submission and the dates on which bidders are informed about the outcome of the bid evaluation. Following this, Member States who have previously expressed an interest are consulted on the draft call for proposals. In addition, private stakeholders such as project developers may be consulted to be able to voice their opinion on the proposed tender design in line with international best practice. In any case, such a stakeholder event should be informal and organised at the discretion of the European Commission.

In a next step, the Commission sets up binding contractual arrangements with contributing and hosting countries (as well as private contributors if applicable). A binding contractual arrangement is first set-up with hosting Member States, who contractually commit to the European Commission to allow projects located on its territory to receive support under the mechanism. These arrangements should at least entail the minimum content requirements outlined in section 5.1.1.2. Once the contractual arrangements with the hosting Member States are made, contributing Member States contractually commit to the European Commission to provide payments to the mechanism in the form of external assigned revenues before grant agreements with successful bidders are signed. The contract determines at least the elements outlined in section 5.1.2 and includes a suspensive clause which announces that the tender is executed by the Commission up until the award decision under the condition of financing being provided by the contributing Member State.

Once all binding arrangements with participating countries are finalised, draft call for proposals are consolidated and the upcoming tender round(s) are pre-announced by the European Commission or

[41] Note that we use the terms call for proposals and invitation for bids for tenders organised under the mechanism interchangeably. The term call for proposals is in line with the terminology used in the Financial Regulation, while the term invitation for bids is more often used in the academic discussion surrounding the design of competitive tenders.

an implementing agency, including at least information on participating hosting and contributing Member States, available volumes per technology and sector, timing of the tender, the type of support as well as other key tender design elements. The pre-announcement ideally takes place roughly one year before the actual start of the tender, so as to provide sufficient room for project promoters to prepare their bids and ensure investment security for project pipelines. This ideal timing obviously poses a challenge for the mechanism – at least in the gap-filling function – since quick action is required to effectively fill gaps in a timely fashion.

Stage III (Invitation for bids and tender execution): In this step, the European Commission invites bidders to submit their bids. The invitation for bids ideally takes place between 6 weeks and 3 months before the tender. The applicable call for proposals/invitation for bids should include all relevant information for bidders, such as the specific tender design and relevant technical details regarding the submission process (see content requirements on draft call for proposals above). The European Commission or an implementing agency receives submitted bids and opens received bids once the tender deadline is reached.

Stage IV (Bid evaluation and selection): Submitted bids are first vetted in terms of their compliance with financial prequalification requirements and national requirements such as applicable site restrictions. Bids not complying with these requirements are not evaluated further. A European Union implementing agency conducts eligibility checks of financial pre-qualifications and Member States or a relevant national regulatory authority (NRA) conducts eligibility checks in terms of national or regional rules, given their deeper knowledge of the respective national regulatory framework, e.g. in terms of size restrictions. Remaining bids are then evaluated and ranked by the European Commission or an implementing agency on the basis of their bid price (or the price to contributing Member States, in case this differs, and/or any other award criteria determined in the call for proposals). Successful bids are awarded until the set volume is reached. Potential technology- and/or country-specific volume caps are considered.

Before grant agreements are signed with successful project developers, contributing Member States (and potentially private contributors) will have to have paid into the mechanism in line with their financial commitment set out in the previous contract with the European Commission. Payments by contributing Member States will be done on the basis of external assigned revenues in line with Article 33 of the Governance Regulation and Article 21 (5) of the Financial Regulation. Funds available to the mechanism have to be committed (via a budgetary commitment which is the signed grant agreement with successful RES projects) within two financial years. Otherwise, appropriations available to the mechanism will be cancelled and paid back to contributors. Once the funds are committed as part of a grant agreement with successful RES projects, there will be no time limitation for spending the available funds, i.e. for the purpose of avoiding cancellations, the date of the legal commitment (the grant signing) is the relevant deadline.

Finally, the European Commission or an implementing agency informs participating bidders on the tender outcome and publishes tender results and contracts with successful bidders are prepared and signed.

Stage V (Monitoring, accounting and support payment disbursement): After contracts with project developers have been signed, a European Union implementing agency and relevant NRAs would be responsible for monitoring project realisation of RES projects that receive grants from the mechanism. They submit status reports on project implementation as well as financial reports to the European Commission and Member States. Accounting of RES production shares, i.e. allocation of RES production shares in line with Member State contributions made to the mechanism and hosting Member States requested share of statistical benefits (if applicable), is conducted by the European Commission or an implementing agency on a rolling basis with the support of national institutions in charge of this task at national level. The Commission would also be responsible for the disbursement of support payments, which could either be upfront investment support or monthly production-based feed-in premiums.

Figure 17 provides an overview of the timeline of the basic implementation steps outlined above with reference to the tender deadline in year T. Note that this illustration starts with the call for interest to Member States and Third countries and therefore excludes the process of drafting and updating work programmes.

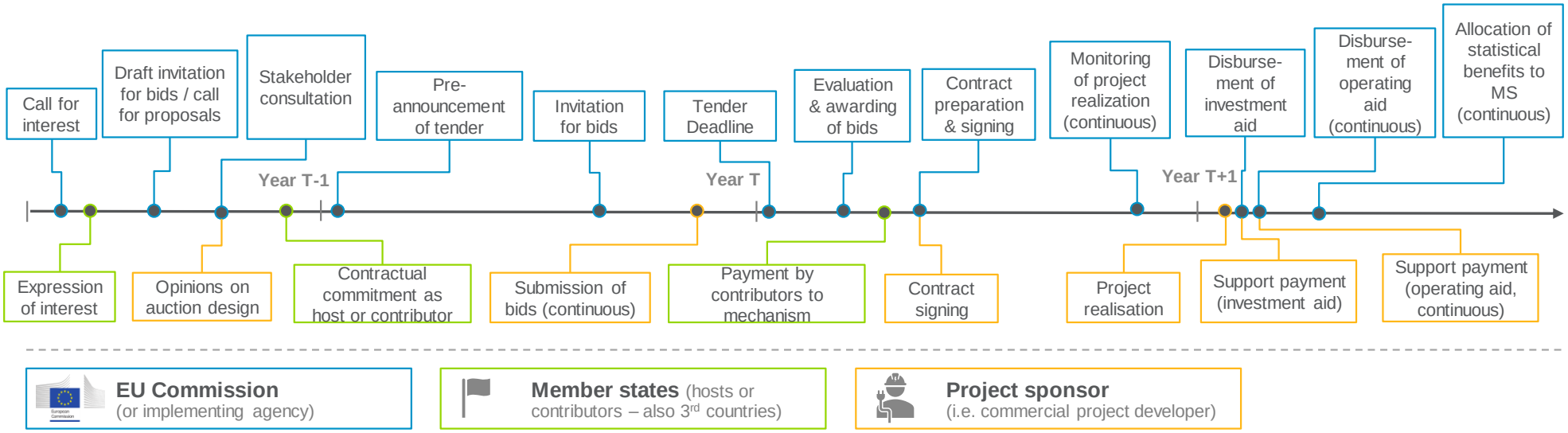

Figure 17 Timeline of tendering grants under the mechanism

Table 13 High-level overview of process to implement tenders in the mechanism

Step	Description / discussion of step	Responsible parties
I. Work programme (optional)		
(1) Bilateral inquiries: Assessment of contributing and hosting Member States' medium-term willingness to participate in tenders for non-repayable grants	For the period of the work programme, contributing Member States provide (preliminary, non-binding) information on funds or capacities they aim to contribute (per technology); preferences in terms of specific technology windows, timing of their contribution. For the period of the work programme, hosting Member States provide (preliminary, non-binding) information on total capacities they intend to deploy on their territory receiving support from the mechanism, potential volume restrictions (per technology) including ineligible technologies, preferences in terms of specific technology windows, timing of their participation.	European Commission & Member States
(2) Draft of multiannual work programme	To include general priorities envisaged by the mechanism (in line with the information available at this point)	European Commission (DG ENER)
(3) Interservice consultation		European Commission
(4) Consultation of Energy Union committee	Review of draft work programme and opinion	European Commission & Member States
(5) Adoption and publication of work programme in Official Journal		European Commission

Step	Description / discussion of step	Responsible parties
II. Tender preparation for dedicated tender rounds under the mechanism to allocate grants[42]		
(1) Start of Expression of Interest (EOI) process / Call for expression of interest	Every two years (or on a rolling basis), the European Commission conducts an informal, non-public process with Member States whereby they can express their interest to participate as contributing or hosting Member State. This should be accompanied by a consultative conference with all Member States (and interested Third countries) to effectively coordinate the process, e.g. by introducing the overall framework and next steps, receiving first feedback and manage expectations.	European Commission
(2) Hosting countries express their interest	For the tender round in question, hosting countries provide information on preferences or flexibilities regarding the following items: • available maximum capacities per technology, if applicable, and per year, which are made available on their territory for projects supported by the mechanism; • maximum sizes of projects, per technology, if applicable; • any site or geographical restrictions, if applicable; • minimum requirements regarding the share of statistical benefits between hosting and contributing Member States they request to participate • any other relevant preferences or restrictions	Hosting countries (MS and third countries)
(3) Indicative maximum prices are announced to Member States	Based on the aggregated RES potential on hosting Member States' territories available to the mechanism and a resulting support cost range, indicative maximum prices are determined for three different tender volumes, in line with the methodology outlined in section 4.1.1.	European Commission
(4) Contributing Member States express their interest	For the tender round in question and based on the indicative maximum prices, contributing Member States provide information on: • Intended financial contribution to the mechanism in terms of budget, capacities or generation (based on maximum price announced by European Commission before) • If applicable, maximum intended financial contributions per tender round	Contributing Member States

[42] This section is an integrated description of the processes of tender preparation/design and the process of establishing a maximum reference price for the participation of Member States. For a more detailed description for the process of establishing a maximum price for the use of the mechanism, please see chapter 4.1.1.

Step	Description / discussion of step	Responsible parties
(5) Deriving overall demand and final maximum price	The European Commission combines the information on quantities all contributing Member States to derive the overall demand and determine a final maximum price by matching supply and demand.	European Commission
(6) Draft call(s) for proposals/invitation for bids for upcoming tender round(s)	On the basis of the expression of interest, the European Commission prepares draft call(s) for proposals. They contain inter alia the maximum price, the objectives pursued by the tender (e.g. support window), the good and volume to be tendered, eligible technologies, the type of support (e.g. upfront investment support or operating support) and other applicable tender design as outlined in section 3.2 (e.g. penalties, realization periods). Moreover, documentation will include practical arrangements such as the final date of bid submission and the dates on which bidders are informed about the outcome of the bid evaluation.	European Commission
(7) Consultation of draft call(s) for proposals with participating Member States	Member States that have expressed their interest are consulted on the draft documentation.	European Commission & participating countries
(8) Informal Stakeholder consultation on draft call(s) for proposals (optional)	Based on draft invitation for bids, stakeholders (e.g. project developers) voice opinions regarding the proposed tender design.	European Commission or Member States
(9) Setting up of binding contractual arrangements with hosting countries	Based on draft invitation for bids, the European Commission enters into binding contractual commitments with hosting countries. These shall at least include the minimum content requirements outlined in section 5.1.1.2.	European Commission & hosting countries
(10) Setting up of binding contractual arrangements with contributing Member States	Based on draft invitation for bids and the final maximum price, the European Commission enters binding contractual commitments with contributing Member States mainly regarding their financial contribution to the mechanism. These shall at least include the elements outlined in section 5.1.2., including a suspensive clause announcing that the tender is executed under the condition of financing being provided by the contributing Member State.	European Commission & contributing Member States
(11) Consolidation of draft call for proposal and pre-announcement of the upcoming tender round(s)	Pre-announcement to take place ideally 1 year before start of the tender and including at least information on participating hosting and contributing MS, available volumes per technology and sector, timing of tender and key tender design details.	European Commission or implementing agency

Step	Description / discussion of step	Responsible parties
III. Calls for proposals/Invitation for bids and tender execution		
(1) Calls for proposals/Invitation for bids for upcoming tender round(s) are published	To take place ideally 3 months before start of tender and based on contractual commitments by hosting and contributing countries. They contain inter alia the maximum price, the objectives pursued by the tender (e.g. support window), the good and volume to be tendered, eligible technologies, the type of support (e.g. upfront investment support or operating support) and other applicable tender design as outlined in section 3.2 (e.g. penalties, realization periods). Moreover, documentation will include practical arrangements such as the final date of bid submission and the dates on which bidders are informed about the outcome of the bid evaluation.	European Commission or implementing agency
(2) Bid preparation	Compiling all relevant information and requirements (e.g. bid bonds) for bid submission	Project developers
(3) Submission and receipt of bids		Project developers & European Commission or implementing agency
(4) Tender deadline	Bids are opened	EC or implementing agency
IV. Bid evaluation and selection		
(1) Eligibility and admissibility checks	Member States to conduct eligibility checks in terms of national/regional rules (e.g. site restrictions) and European Union implementing agency to conduct eligibility checks of financial pre- qualifications.	Implementing agency and Member States (e.g. NRAs)
(2) Ranking of eligible bids according to bid price and/or according to additional criteria, if applicable		Implementing agency

Step	Description / discussion of step	Responsible parties
(3) Awarding of bids until volume (MW), generation (MWh) or budget cap (€)		European Commission or implementing agency
(4) Payment to Mechanism	In line with the financial commitment as set out in contract with the European Commission to be paid as external assigned revenues to the European Union budget in line with Article 33 of the Governance Regulation and Article 21 (5) of the Financial Regulation.	Contributing Member States
(5) Information to bid winners and unsuccessful bidders and publication of tender outcomes		European Commission or implementing agency
(6) Contract preparation and signature of grant agreement with bid winners		Implementing agency & project developers
V. Monitoring, accounting and support payment disbursement		
(1) Monitor realisation of projects		Implementing agency and/or NRAs
(2) Disbursement of support payments (upfront investment support)	Upon entry into operation	Implementing agency
(continuous) Reporting to European Commission and Member States on project realisation & financial reporting		Implementing agency & NRAs

Step	Description / discussion of step	Responsible parties
(continuous) Accounting of RES production (statistical benefits) to Member States	The yearly RES production of the supported plant is registered as (yearly) statistical benefit and allocated towards the participating Member States and/or the European Union.	European Commission (supported by national institutions)
(continuous) Disbursement of support payments (operating support)	Monthly support payments based on energy production	Implementing agency

5.2.2 Detailed tender procedure

Table 14 describes the tender procedure (i.e. steps III and IV) in more detail and provides guidance regarding the applicable timing of each implementation step. The basic steps are outlined below:

In line with international best practice, key tender details should ideally be pre-announced one year before the tender deadline. Note in this context that such a time line might pose a challenge regarding the requirement for Member States to take measures to close a gap in achieving the RES target within a year, as outlined in the Governance Regulation. This would most likely require a much faster tender procedure and the time between announcement and tender deadline would have to be shortened significantly. However, the remedy to address a potential delivery gap on Member State level as defined in the Governance regulation is the payment to the mechanism and not the actual deployment of RES capacities.

After the pre-announcement, the responsible tendering authority prepares the tender documentation including the invitation for bids / call for proposals. Before the invitation for bids / call for proposals is published and the bid submission window starts (i.e. three months before the tender deadline), Member States, supported by their national regulatory authorities, need to have the opportunity to check and amend, where necessary, the tender documentation, particularly in terms of national restrictions pertaining to sites, project sizes and technologies. The invitation for bids for any tender round contains all relevant information for bidders intending to participate in the respective tender round. They need to be in line with the contractual arrangements between the European Commission and Member States as well as private contributors, if applicable.

Project developers prepare their bids and are able to submit them to the tendering authority until the tender bid submission deadline in T is reached. At this point, the tendering authority opens the bids for the first time. The tendering authority first checks if bids are admissible, i.e. if all required information is included in the bid and if they have been submitted in time. All admissible bids are then vetted in terms of their eligibility by the tendering authority at European Union level as well as by Member States for rules applicable at national or regional level. Eligible bids are ranked according to bid price and awarded until the tender volume (defined in MW, MWh or €) is reached and considering applicable country quotas. Finally, tender outcomes are published within one month after the tender deadline.

Table 14 Detailed tender procedure for tendering non-repayable grants (may be shortened)

Timeline (T=start of tender)	Step	Description	Responsible parties
T-12 months	Pre-announcement of key tender details for upcoming tender round(s)	Ideally including available volumes, technologies and sectors, participating countries, timing of upcoming tender round(s), applicable restrictions in Member States, core applicable design elements	Tendering authority (i.e. European Commission or implementing agency)
T-12 months until T-3 months	Preparation of tender documentation	See contents of invitation for bid below	Tendering authority (i.e. European Commission or implementing agency)
T-7 months until T-4 months	Check and amendment (where necessary) of tender documentation	Particularly in terms of national rules pertaining to site restrictions, project sizes or technical requirements.	Member States and Third Countries, if applicable (e.g. NRAs)

Timeline (T=start of tender)	Step	Description	Responsible parties
T-3 months	Publication of invitation for bids on homepage of tendering authority & start of bid submission window	In line with contractual arrangements with contributing and hosting countries, the following information needs to be included • Tender date • Participating hosting Member States and their responsible national regulatory authorities • Tendered volume (per technology/sector) • Support tendered, tender format and pricing rule • Maximum awarded volume per hosting country, if applicable (i.e. quotas) • Other applicable restrictions in hosting countries e.g. in terms of sites and project sizes • Amount of required financial guarantee and applicable penalties in case of delays or non-realisation • Technical details regarding submission process, including forms to be submitted by tender participants	Tendering authority (i.e. European Commission or implementing agency)
T-3 months until T	Preparation of bids	Bids to be in line with bid requirements as outlined in invitation for bids	Bidders
T-3 months until T	Submission of bids to tendering authority		Bidders
T-3 months until T	Receipt and registration of bids		Tendering authority (i.e. European Commission or implementing agency)

Timeline (T=start of tender)	Step	Description	Responsible parties
T	Bid submission deadline	No further bids are accepted.	Tendering authority (i.e. European Commission or implementing agency)
T until T+1 week	Check of admissibility	All submitted bids are opened. Bids are excluded if provided information is incomplete and if submitted after tender deadline. Bids need to be complemented by the following information to be admissible: • Name, address, telephone number, e-mail address of bidder; • In case bidder is legal entity or legal partnership, additionally the seat, name of the representative • Energy source for which bid is submitted • Date of tender round for which bid is submitted • Bid amount in kW or kWh (no decimals) • Bid price in ct/kWh or ct/kW (two decimals) • Sites of installations for which bid is submitted • Transmission system operator	Tendering authority (i.e. European Commission or implementing agency)
T until T+2 week	First evaluation of eligibility of admissible projects	To be eligible for participation in the tender, the following criteria need to be checked: • Bidder is eligible (eligible legal entity) • Technology is eligible for tender round • Bid is below or equal ceiling price • Applicable financial guarantee submitted	Tendering authority (i.e. European Commission or implementing agency)
T+2 week	Send project list resulting from first eligibility check to respective NRAs		Tendering authority (i.e. EC or implementing agency)

Timeline (T=start of tender)	Step	Description	Responsible parties
T+2 week until T+4 weeks	Second evaluation of eligibility in terms of compliance with additional rules and restrictions on national/regional level	Check compliance with additional national rules, such as project sizes or site restrictions.	Member States (e.g. NRAs)
T+4 weeks	Send project list resulting from second eligibility check to tendering authority		Member States (e.g. NRAs)
T+4 weeks until T+6 weeks	Ranking of eligible bids according to bid price	Ranking done in ascending order starting from lowest bid price. In case of equal bid price ranking done in ascending order starting with lowest bid amount. In case bid price and bid amount are equal ranking to be done by lots.	Tendering authority (i.e. EC or implementing agency)
T+2 weeks until T+6 weeks	Awarding of bids until capacity, generation or budget cap and considering quotas (where applicable)	Tendering authority awards bids in the amount of their bid until the tender volume has been reached or exceeded for the first time. Bids exceeding this threshold are not awarded. If country quotas apply, the tendering authority awards bids for projects located in the concerned country in the amount of their bid until the maximum tender volume for this country has been reached or exceeded for the first time. Bids for projects located in the country concerned exceeding this threshold are not awarded. The next cheapest bid for a project not located in the concerned country is awarded instead.	Tendering authority (i.e. EC or implementing agency)

Timeline (T=start of tender)	Step	Description	Responsible parties
T+6 weeks	Information on tender outcomes on homepage of tendering authority	Information to be published include: • Tender date, energy sources for which bids have been awarded and awarded amounts • Names of successful bidders, including the site mentioned in the bid, number of the bid (in case of multiple bids) and a unique award number • the hosting Member States on which the successful bidder aims to build the project • Lowest and highest bid prices that have been awarded	Tendering authority (i.e. European Commission or implementing agency)
T+6 weeks	Bid award to successful bidders and information to unsuccessful bidders	Including award price and award amount (for successful bidders) and reasons for non-award (for unsuccessful bidders)	Tendering authority (i.e. European Commission or implementing agency)
T+ 6 weeks until T+8 weeks	Appeal window	Bidders have the possibility to appeal the award decision (Tbd)	Bidders

5.2.3 Selection process for financial instruments

The selection of projects for (repayable) financial instruments (i.e. low-interest loans, guarantees, junior loans) will have to be organised differently from the project selection for non-repayable grants (i.e. investment or operational support) via tenders. Two main options to allocate financial instruments to projects are:

- Option 1: Allocation to projects (section 5.2.3.1)
- Option 2: Allocation to Member States (section 5.2.3.2)

We discuss each alternative in turn. Note in this context that this question is different from the issue of how exactly financial instruments are disbursed and which exact contractual arrangements are defined.

5.2.3.1 Option 1: Allocation to projects

This approach would target projects directly, taking less of a country-specific focus. When financial instruments are directly allocated from the mechanism to projects, several sub-options are available. Support can either be allocated across tender rounds in the mechanism (i.e. on a rolling basis) or it can be allocated per tender round for non-repayable grants. We discuss either option in turn:

In the case support to projects in the form of financial instruments are allocated to projects across tender rounds, it would be allocated irrespective of the tender rounds for investment or operating support. As such, the specific project selection for financial instruments may be implemented in a "technical selection process" or a "competitive selection process".

A technical selection process conducted by e.g. EIB might be implemented without project ranking. Projects are selected on a rolling basis and in principle all projects (or within each tender round) can benefit from financial instruments.

On a positive note, this approach would ensure lean selection processes and hence a large number of smaller applicants would principally be manageable. Moreover, potentially high synergies with national or European Union -wide tenders for non-repayable grants could be created, as the time of application for financial instruments could be chosen flexibly by project promoters. Finally, a technical selection process would potentially induce a higher uptake of financial instruments in terms of volume and this would increase their leverage function in terms of overall cost-effectiveness.

On the other hand, budget control is more difficult under this approach, given that steering of support in terms of a balanced allocation over time is not provided for and no safeguards exist against an early depletion of available funds.

To address the limited availability of funds for the disbursement of financial instruments, it could be limited to certain projects, such as

- on the basis of the "first-come-first-serve" principle, which would be easy to implement but would not ensure to select "the best" projects for public support;
- only projects in participating (hosting) countries are eligible;
- only projects in certain countries are eligible or country-specific volume caps apply;
- only projects below benchmark financing conditions or ratings are eligible (e.g. higher than average WACC).

A competitive selection process according to clearly defined award criteria with project ranking is another option for allocating financial instruments to projects across tender rounds. Here, projects are selected on pre-defined points in time (i.e. calls for proposals) and only the best projects can benefit

from support in the form of financial instruments. This process could be closely aligned with the selection process for cross-border RES projects, in order to avoid duplications and ensure coherent processes.

The obvious advantage of this approach is that it allows for a better budget control, particularly in terms of the timing of outflows, due to the pre-defined allocated volumes.

However, this approach also entails several disadvantages. First, it creates high administrative burden on all sides as a result of the detailed selection processes involved, thus potentially making it a show-stopper for a number of (especially smaller) projects. Second, an adequate timing in terms of an alignment of the calls for proposal for support in the form of financial instruments with the multitude of national and European Union -wide tenders for investment or operational support would be very challenging. In case of extensive misalignment, this would lead to a suboptimal exploitation of potentially achievable synergies between these two forms of support. Third, defining sensible award criteria in the context of financial instruments, e.g. in terms of the effectiveness of support, is rather difficult, and hence there is a high risk to select the wrong applicants if administrative pre-selection is too high. On a more pragmatic note, it can be argued that the expected lower volumes of support in the form of financial instrument compared to investment or operational support justify a rather lean selection process involving fewer administrative pre-selection and thus lower transaction costs.

In case support to projects in the form of financial instruments is allocated per tender round for non-repayable grants, it may be available for all projects participating in specific tender rounds under the mechanism. Hence, projects from all participating hosting Member States would principally be eligible. Effectively, however, only projects from Member States with higher WACCs and lack of access to project finance would apply for support, since projects from Member States with low WACCs would have no need to apply for low-interest loans or guarantees. The final awarding of the support in the form of financial instruments would follow the technical process established by EIB (or any relevant institution).

This approach entails several advantages. Since the allocation of financial instruments is tied to specific tender rounds, the possibility to exercise budget control is very high. Moreover, this approach implicitly leads to the allocation of support to those projects in Member States with lower WACCs where support in the form of financial instruments arguably has the highest impact. Finally, given that no complex selection process to allocate financial instruments is required, transaction costs for project developers and the managing authority are rather limited.

However, the main weakness of this approach is its limited scope, given that the supported capacities would be limited to the volumes in the respective tender rounds.

5.2.3.2 Option 2: Allocation to Member States

Support in the form of financial instruments may also be allocated to projects via Member States. This approach would rather target Member States as such rather than specific projects or tender rounds. Therefore, it would potentially include agreements between Member States and the European Union mechanism to provide support in the form of financial instruments for national RES deployment. This agreement might include a plan for each Member State on how to specifically improve the investment conditions in exchange for receiving access to low-interest loans, guarantees and junior loans. This could include aspects like permitting procedures or the stability of the support scheme.

If allocated to Member States, support in the form of financial instruments may be available

- for the entire national support scheme;
- for a limited number of years;
- for specific national tender rounds.

The allocation to specific projects on national level would be implemented by the Member State.

One key question is how to allocate financial instruments to entire Member States, given that their availability will be limited. Several options are conceivable in this respect:

- First-come-first-served basis for Member States;
- Political agreement in MFF negotiations and resulting quota per Member State;
- Structured application process of Member State (aligned with application process in cb-RES projects);
- All Member States with below average WACC and/or participating in the mechanism can benefit from financial instruments.

5.2.4 Process of combination with other European Union funds

5.2.4.1 Option 1: Structural mixing of various EF funds in the mechanism

This section follows the design option outlined in chapter 0 which is based on the mechanism having direct access to capital from other European Union funds and awarding and disbursing these resources unilaterally.

An indicative process to manage the hypothetical structural mixing of a tender for grant support with guarantee support through InvestEU is shown in Figure 18. Each step is discussed in more detail below (and in chapter 5.2.4.2 for option 2).

Work Programme

Before the mechanism receives direct access to InvestEU resources, both funds need to align on the mechanism's work programme. The goal is to ensure that the mechanism can later seamlessly access InvestEU capital. To this end, both funds need to enter a dialogue to align details in the following dimensions:

- Temporal: The mechanism's tender schedules and corresponding guarantee volumes need to be in line with the availability of funds at InvestEU at the specific points in time;
- Financial: The overall investment volumes, including those for national tenders supported by the enabling framework, need to be compliant with the budget made available by InvestEU;
- Legal: Eligibility criteria for awarding projects as well as monitoring, reporting and support disbursement requirements after project commencement need to be compliant with InvestEU

Once alignment in these dimensions is reached, both funds can agree contractually on the amount and conditions of guarantees that the mechanism will be able to access directly. The mechanism then adopts and publishes the work programme, taking into account the previously discussed points regarding schedule, funding volumes and eligibility criteria.

Tender preparation

For the preparation of an individual tender for grant support, it must again be ensured that timing, financing volumes and eligibility criteria are in line with InvestEU policies. If this is not already warranted through the previous alignment of the work programme, both funds need to enter talks again to resolve remaining details.

The mechanism can then, in collaboration with hosting and contributing Member States but without further consultations with InvestEU, publish the draft terms of reference of the request to tender, the pre-announcement of tender and finally the terms of reference of the tender. Potential applicants need to apply for the InvestEU guarantee and close a corresponding pre-agreement before bid submission. This is because on one hand, they need certainty that they will receive a guarantee when calculating their bid level but on the other hand, InvestEU guarantees can only be granted to entities fulfilling certain financial criteria.

The project promoters can in this scenario conduct the tender process with only one organization. Compared to the parallel submission of bids in option 2 (chapter 5.2.4.2), this could reduce transaction costs through synergies of the grant tender and the guarantee award formalities. It should be noted though that this requires the mechanism's implementing body to possess the capacities required in the process of awarding financial instruments.

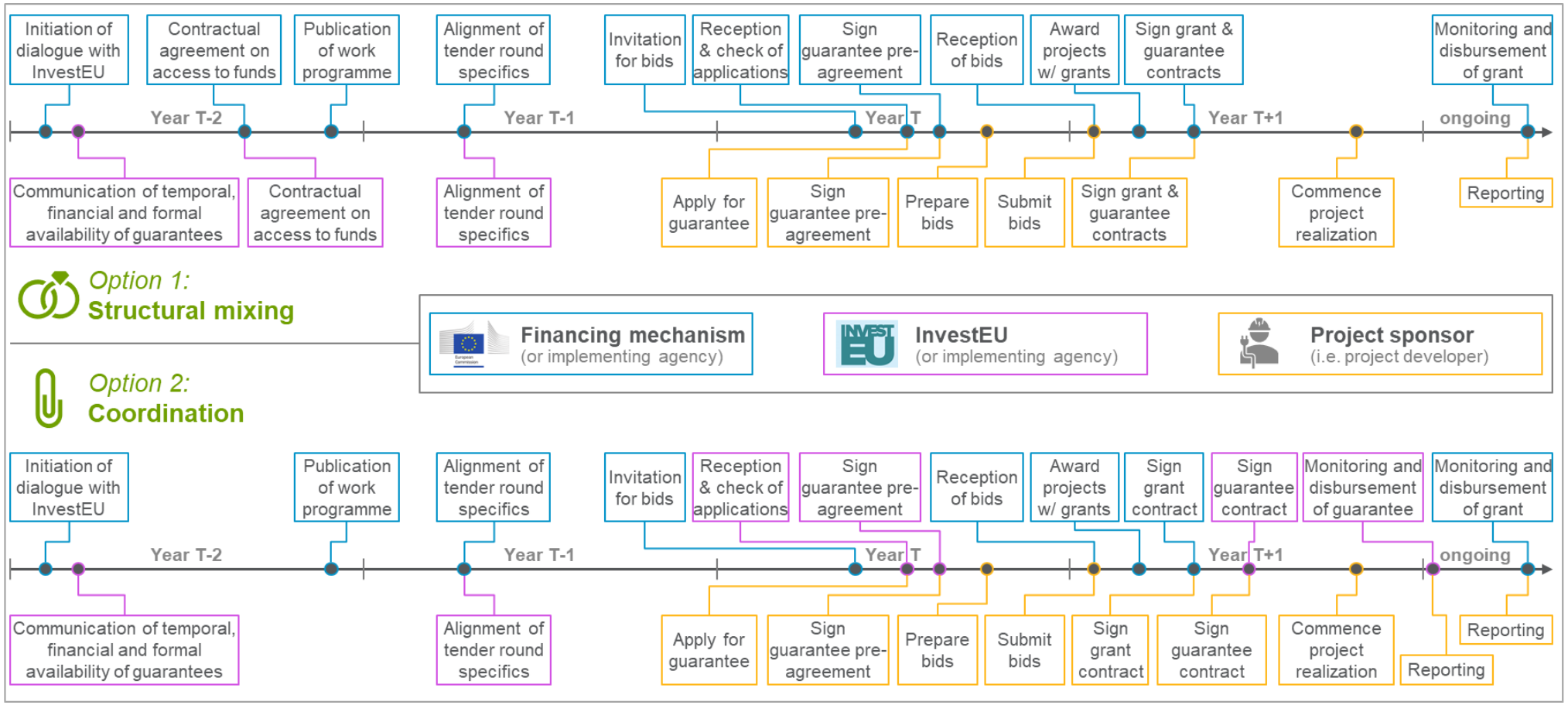

Figure 18: Indicative timeline of the process of the hypothetical combination of InvestEU guarantees and grants under option 1 (structural mixing, chapter 5.2.4.1) and option 2 (coordination, chapter 5.2.4.2), respectively

Tender execution

Since eligibility criteria and support volumes have already been agreed on in the work programme and/or tender preparation, the mechanism does not need to interact with InvestEU when conducting the tender process. The implementing body of the mechanism can therefore unilaterally perform eligibility checks, rank eligible bids, award projects, communicate the decisions and prepare support contracts. This allows for a smoother and more efficient process as opposed to a scenario where similar assessments of the same bidders are performed in different European Union institutions.

From the project promoter's perspective, it is also an advantage that contracts with only the mechanism's implementing body need to be signed to receive both mechanism and InvestEU support. If, however, the mechanism and the respective other Union fund happen to be managed by the same body, some of these synergies may be harnessed also without structural mixing (as in option 2 described below).

Project implementation

Once the contracts for support between the mechanism and the projects are signed and the projects are being physically implemented, the mechanism will be responsible for monitoring project progress, reporting and disbursing support payments. The specifications for monitoring and reporting required by InvestEU therefore have to be aligned beforehand, e.g. during work programme or tender preparation. Also, the formalities of the mechanism's implementing agency (e.g. INEA) granting an InvestEU guarantee rather than EIB need to be in place.

Again, this could reduce transaction costs for project developers substantially because there is only one monitoring process and one payment stream.

Recommendation

Structural mixing is initially more complex to implement for the EC, but much more advantageous for the project developer and hence likely to enable the financial instruments to develop more impact compared to a coordination scenario. Wherever legally possible, process elements should therefore be consolidated as described above.

5.2.4.2 Option 2: Coordination of work programmes and calls for proposals between funds

This section follows the design option outlined in section 2.3.2 which is aimed at aligning the mechanism with other European Union funds as much as possible but keeping them as separately governed support schemes.

Figure 18 shows a hypothetical timeline of a tender for grant support coordinated with support through financial instruments from InvestEU. Additionally, it is assumed that INEA will be the implementing body of the mechanism while EIB will implement InvestEU.

Work programme

To allow for the strong coordination of tenders for grant support and InvestEU, the mechanism's work programme needs to be aligned with InvestEU regarding tender schedules, guarantee volume, and eligibility criteria as discussed above for option 1.

The goal of these talks between mechanism/INEA and InvestEU/EIB is that the mechanism's work programme matches the InvestEU policies to an extent that a virtually complete supply of InvestEU guarantees to the bidders in the tenders for grant support can be achieved.

Tender preparation

When preparing the tenders further alignment is needed between the funds to achieve two things:

- Ensure that awarded projects will receive an InvestEU guarantee so that project promoters factor this into their bids. To this end, INEA must consult EIB to warrant that timing, financing volumes and eligibility criteria of the tenders for grant support are in line with InvestEU policies;
- Consolidate application steps between INEA and EIB, wherever possible, to reduce transaction costs for project developers.

Once these agreements and the respective Member State interactions are finalized, INEA can publish invitations for bids with explicit referral to the awarded projects' option of receiving an InvestEU guarantee. Before the project promoter submits their bid, they therefore approach EIB to apply for an InvestEU guarantee. After having passed the EIB application process, the project promoter signs a pre-agreement with EIB which affirms that the project will be granted a guarantee in the case that it is awarded a grant in the upcoming tender.

Finally, project promoters finalize their bids taking into account lower financing costs through the guarantee and submit them to INEA. The alignment between the funds was ideally thorough enough so that the projects can use at least parts of their application documents for submission to both EIB and INEA. In reality however, the twofold submission of applications to INEA and EIB could potentially result in significant incremental transaction costs which might lead to a reduced uptake of support.

Tender execution

The tender for grant support, including eligibility checks, bid ranking, project awards and grant contract signing is conducted by INEA unilaterally since at this point only mechanism grants are being decided on. Awarded projects that signed a pre-agreement with EIB then receive an InvestEU guarantee.

Project implementation

InvestEU and the mechanism are formally two separate contributors to the awarded projects in this scenario. This means that the projects need to conduct monitoring and reporting both with EIB and INEA. Part of these double structures might be reduced by consolidating elements that InvestEU and the mechanism have in common, but higher transaction costs due to the non-unified communication streams will likely persist.

Similarly, EIB and INEA need to be responsible for the disbursement of their respective support. This would also lead to higher transaction costs compared to option 1, where support payments are handled bilaterally between INEA and the projects.

Recommendation

The coordination scenario is at first sight more realistic to be implemented. If this route is taken, as many details as possible should be aligned to allow for a smooth process for the project promoter. Also, in this option, potential over-the-counter pre-agreements between EIB and the project promoter should be considered to ensure that financial instruments can effectively reduce the bid levels.

6. EXPERT MEETING (TASK 5)

The expert meeting , held on the 13th June 2019, helped to prepare the European Commission's work on the implementing act foreseen by Art 33 (4) of the Governance Regulation. This implementing act will set out the provisions necessary for the establishment and functioning of the mechanism to be established by 1 January 2021.

The objective of this task was to hold a focused and open exchange with industry representatives and Member States to:

- present and describe the structure of the mechanism in detail and the rationale for Member States' participation;
- establish a common understanding by participants on how the mechanism will work in practice, and
- answer questions on aspects of the mechanism, such as the basic functions of the mechanism (gap filling / enabling function); types of support (grants/financial instruments); allocation costs and benefits, and the rationale for Member State participation.

The expert meeting was divided into two parts: the first part was focused on briefing industry representatives with Member States participating in more of an observing role. The second part of the day was a closed meeting for Member States only, which was interactive, where participants were divided into smaller groups to gather Member States' feedback on the tender design, types of support, allocation of costs and benefits and technology and sector focus.

At least 49 participants attended in person in the morning session and at least 22 Member States were represented. The agenda is outlined below:

Time	Session
Morning session: Industry briefing with Member States present	
9.30-10.00	**Registration & coffee**
10.00-10.20	**Welcome and Introduction**
10.20-11:00	**How it will work: Structure of the mechanism** Basic functions (gap filling / enabling function) Types of support (grants/financial instruments), Allocation costs and benefits, Rationale for MS participation (Contributing / hosting / mixed role)
11.00- 12.15	**Questions of clarification on How it will work** **Stakeholder input & feedback on key themes**
12.15-12.30	**Wrap up & close of morning session**
Afternoon session: Member States only, in-depth consultation session	
12.30 14.00	**Lunch Break**
14.00- 14.30	**Member States: questions for clarification**

Time	Session
14.30 – 16.00	**Interactive sessions** *to cover:* 1. **Tender design** 2. **Types of support:** upfront grant vs. operational support, use of financial instruments 3. **Allocation of costs & benefits:** Contributing / hosting / mixed role 4. ***Technology / sector focus –*** small scale projects, Heating and Cooling, Transport
16.00-16.15	**Coffee Break**
16.15 – 16.45	**Feedback from interactive session**
16.45 – 17.00	**Wrap-up**

6.1 Welcome and Introduction by European Commission

The participants were welcomed by Paula Pinho, Head of unit A1, and Pala Abreu Marques, Head of unit C1.
Key points of the introduction by the European Commission included:

- The mechanism is a part of the available tools to Member States to deliver on their RES targets and a mechanism for support to RES across the European Union. More specifically, the mechanism should fulfil two main objectives, to deliver on national contributions and to contribute to the enabling framework by supporting RES in a cost-effective way.
- Funding will primarily come from Member States' contributions. At this point, there are no dedicated European Union funds in place to be used by the mechanism.
- It needs to be ensured that the mechanism provides for a lean, easy-to-use and attractive option for both contributing and hosting Member States and that it creates European Union added value.
- For the drafting of the implementing act, key design features need to be determined such as the type of support, tendering rules, rules for participation of Member States, allocation of statistical benefits (particularly in light of incentivizing the use of the mechanism by hosting Member States).
- In the workshop, the terminology generally used e.g. to describe support types will be used. However, this terminology may have to be translated by the European Commission into terminology used by the Financing Regulation to describe the same concepts.
- Objective of the workshop is to receive input from stakeholders on the mechanism's design in light of the implementing act that has to be drafted for the mechanism to enter into force by 2020.

6.2 Structure of the mechanism

Navigant presented on the structure of the mechanism, in a presentation which conveys the preliminary results of Tasks 1 to 4. The presentation includes a set of guiding questions to trigger a

focused and informative discussion for each session (see separate PowerPoint presentation which was presented, annexed to this report.).

Following the presentation, participants had the opportunity to raise questions for clarification and to comment to the proposed design of the mechanism. The discussion was very constructive, industry stakeholders and Member States commented on a range of issues, including the questions on impacts of project failure on the reported RES statistics, the distribution rules for the RES statistics (who decides and what to do with system costs), the issue of respecting different market and regulatory conditions in the various markets, the use of European Union funds for the mechanism and various other elements.

The second part of the day was a closed meeting for Member States only, covering in detail the issues of tender design, types of support, the allocation of costs and benefits and the sector and technology focus of the mechanism. Member States expressed their technical preferences and views during the interactive sessions. Feedback form the meeting was carried through into all tasks.

7. CONCLUSION

There are several conclusions to be drawn from the report (for an overview of the outcomes, see the summary in chapter 0).

The mechanism is composed of various design elements and implementation considerations, including the form of support to be disbursed, the use of financial instruments from other European Union funds, the tender design, the allocation of costs and benefits and the management, implementation and governance of the mechanism. Some of the design options interact with each other and may result in adverse effects (for instance, on efficiency or effectiveness). At the same time, many choices on how to ultimately implement the mechanism in specific tender rounds depend on the preferences of the participating Member States. When tailoring the tender design to the preferences of Member States to make the mechanism as attractive to them as possible, it is crucial to ensure a coherent design which avoids unintended interactions.

The mechanism is potentially applied across a wide range of Member States, requiring a design which does not structurally exclude certain Member States from participating. One example is avoiding material pre-qualification requirements in the tender design and instead implementing financial pre-qualification requirements, which are applicable across Member States. The implementation of a new support scheme spanning across (potentially all) Member States will necessarily induce initial transaction costs, e.g. to set up the required legal frameworks between the mechanism (i.e. the European Union and the European Commission) and the participating Member States. In the subsequent and repeated implementation of the mechanism, additional transaction costs will occur. Once the mechanism is implemented and operational, we expect transaction costs for all involved parties to decrease dramatically, leading to the envisaged efficiency gains in support schemes.

In this context, it appears relevant to keep the first tender rounds as simple as possible and to include more innovative design elements and sectors less experienced with tenders in subsequent tender rounds.

Once the initial burden of implementing the mechanism is overcome, contributing Member States will be able to tap into the manifold benefits potentially provided by the mechanism, including reducing the costs for RES deployment, more effective and efficient use of other Member States' RES potential, staying above the 2020 RES target, and compliance with the requirement to open national support schemes for RES installations abroad. Member States acting as hosts will be able to benefit from the structural transition of the national energy system towards a decarbonised one, greenhouse gas reductions and reduced import dependency (free from support costs), among others.

The next steps towards the design and implementation of the mechanism include the proposal for and adoption of the Implementing Act, a brief assessment of the specific interest to participate in the mechanism and finally, setting up the legal frameworks with participating Member States.

In this way, the mechanism can then be a corner stone of delivering the binding EU RES target of at least 32% in gross final energy consumption by 2030.

8. ANNEX

8.1 Annex 1: Analysis of potential additional system costs in host countries and options for sharing them under the mechanism

This Annex provides background information for section 4.2 and documents the work performed under task 3.2 of the ToR.

First, we provide an overview on the wider costs and benefits of RES projects for host countries, in order to avoid an isolated discussion of system costs. Second, we map the different types of system costs that me caused by additional RES electricity projects, assess their relevance and discuss whether they can be allocated explicitly or implicitly to RES projects (implicitly through internalisation to RES projects, explicitly through quantification and compensation through the mechanism). Third, we discuss options to internalise the most relevant system costs. Fourth, we provide a methodology how these costs could be quantified and compensated explicitly.

Based on the analysis performed in this Annex, we recommend not to follow a cost-based methodology for compensating system costs in host countries but to use a flexible approach, consisting of a flat-rate statistical compensation combined with the option to internalise grid extension and reinforcement costs through deep connection charging (see section 4.2 for details).

8.1.1 Wider costs and benefits of RES projects for host countries

Adding RES projects in hosting countries has several economic and environmental impacts on the surrounding local area in addition to the impacts of hosting countries' energy system. Benefits from European Union -supported RES installations in hosting countries include e.g. local added value, the creation of jobs alongside the value chains, innovation effects, increased security of supply, improved air quality, transition of national energy system and related economic structures towards decarbonisation as well as fostering political cooperation between Member States. Costs occurring in the host country include system integration costs (which will be further discussed below) but also the reduction of national RES potential available for national target achievement, negative effects on landscape and environment as well as possibly reduced acceptance of RES deployment (NIMBY etc.). An overview of the potential costs and benefits of RES projects financed through the mechanism is presented in Table 15. In the debate on cross-border cooperation, the political awareness for RES costs is often higher than for RES benefits. However, local benefits, even though difficult to quantify, may outweigh system costs in the host countries. This should be addressed with potential host countries to increase the awareness for the positive aspects of additional RES projects and provide a balanced view on being a host country.

Table 15: Potential costs and benefits of RES projects financed through the mechanism

Potential costs for host country	Potential benefits for host country
Economic impacts	
• Reduced cost-effectiveness of national RES support due to reduction of national RES potential available for national target achievement	• Local added value • Creation of jobs alongside the value chains • Innovation effects • Transition of economic structures towards decarbonisation
Environmental impacts	
• Negative effects on landscape and environment, e.g. Visual impact, land use, disturbance of endemic species, etc.	• Improved air quality
Energy system impact	
• Additional energy system costs for RES integration	• Increased security of supply • Transition of national energy system towards decarbonisation • Decreasing energy prices due to wholesale price impact
Other impacts (political / societal / regulatory)	
• Potentially reduced acceptance of RES deployment • Changes to national regulation might be required	• Fostering political cooperation between Member States

8.1.2 Mapping of additional system costs of RES projects in host countries

In this section, we identify system costs related to RES electricity (RES-E) installations, analyse their relevance in the context of the mechanism and the possibility of allocating and internalising them to RES projects. We also discuss whether they could be reflected in cost sharing methodology, assuming that a cost-based sharing approach is chosen (as explained in section 4.2, we decided against such approach in the end). System costs that are not substantial will be disregarded for the further analysis, same as system costs that cannot be clearly related to additional RES deployment.

We focus on additional system costs of RES-E, including electric mobility counted under RES transport (RES-T). We do not analyse system costs of RES heat and gas in detail, as they are much less in the focus of Member States and appear less significant in the context of the mechanism[43].

[43] RES-H projects can be differentiated in grid-connected and decentralised projects. Grid-connected RES-H projects are particular, because the plant is usually owned and operated by the owner of the district heating system, e.g. the local utility. Grid-connected projects will only be implemented if district heating or gas networks are already established in the hosting countries, i.e. RES-H would replace other sources of energy. Central RES-H plants are typically mounted in close connection to an existing heating plant and will not entail substantial grid connection costs in that case. One can therefore argue that additional heating or gas network costs of projects added under the financing mechanisms will not be significant. Decentralised RES-H installations are installed at suitable locations at any place and connected directly to the existing district heating network. The impact on system costs is very limited since the existing infrastructure is barely used due to the spatial proximity of heat production and consumption. For conventional heat generation the costs for grid connection and reinforcement are typically socialised. In case of power-to-heat (PtH) technologies, the challenges would be the same as described for RES-E. RES fuel and gas projects are unlikely to add significant system costs. For gas from renewables, the existing infrastructure can be used and the use of fuels from renewables does not require central infrastructure. In summary, the additional system costs resulting from the support of projects for RES-H (other than PtH), fuels and gases in hosting countries are not significant and will thus be disregarded in the following discussion.

System costs of adding RES-E projects in the host country can occur for:

- Grid connection, extension and reinforcement
- Curtailment
- Redispatch
- Balancing
- Grid losses
- Wholesale price impact

Grid connection, extension and reinforcement costs represent the needed investments in the grid to connect the RES installation. These costs include the local circuit from the RES installation to the appropriate point of connection in the network but also for any uprating of transformers or switchgear at any point. Thereby, grid connection includes the development or extension of the substation for the installation. Grid extension means the possible need for additional feeder(s) developed by the system operator purely to connect the generation plant. Grid reinforcement covers all further grid investments needed in the existing grid to cope with new infeed.

In European Union countries, grid connection costs are always taken over by plant operators, whereas upstream grid reinforcement costs are often paid by system operators and distributed to grid users through network tariffs (shallow connection cost allocation). Some countries apply deep cost allocation whereby RES projects also pay a share of upstream grid reinforcement costs. Associated costs can in principle be allocated to particular RES projects, even though this gets more complicated for upstream reinforcement costs.

Curtailment occurs if the electricity output cannot be accommodated to the electricity system and particular plants need to suspend their generation. This might be the case if renewable resources are available but need to be curtailed because the energy demand is lower than current generation. Inflexible generation technologies such as nuclear, lignite and coal power plants contribute to curtailment due to time-consuming start-up and ramping operations.

System costs due to curtailment in hosting countries may be directly related to an increased RES-E deployment but also to inflexibilities in the domestic power system. Curtailment costs can be allocated to specific RES projects on an ex-post basis. An ex-ante allocation is not possible. The level of curtailment costs varies considerably between Member States depending on the flexibility of the energy system and the level of RES penetration. In most European Union countries, curtailment costs are currently not significant but might increase until 2030. Scientific evidence suggests that curtailment levels are usually very low until more than 50% of electricity is supplied from RES.[44] Curtailment costs are substantial in countries with high RES penetration and structural congestion, as for example Germany.

Network congestions or other non-secure grid situations may lead to DSOs or TSOs actions that cause additional system cost for the dispatch of alternative capacity. Redispatch costs are highly dependent on grid conditions and the availability of flexibility options. In most European Union countries, redispatch costs are very low. In countries with high RES penetration and delayed grid expansion, redispatch costs become more relevant. Additional system costs for the redispatch of alternative capacity are socialised through grid tariffs. An allocation of the redispatch costs of other facilities to specific RES installations is not possible and consequently not suitable for internalisation. The quantification of redispatch costs is possible ex-post but only for specific control areas, not on project level. Additional redispatch costs should therefore not be considered explicitly in the cost sharing methodology of the mechanism.

European Union -supported RES projects might increase balancing costs because of the higher variability in the generation pattern and the resulting need for reserve contracting and activations. In

[44] CREG (2017). The costs and impacts of intermittency – 2016 update. Retrieved from: http://www.ukerc.ac.uk/publications/the-costs-and-impacts-of-intermittency-2016-update.html

many countries, imbalance penalties are charged to balance responsible parties based on marginal costs of activated reserve capacity. The costs of increased reserve requirements due to the integration of RES is found to be modest (below €6/MWh) even at RES penetration shares up to 30%.[45] A public consultation for the harmonisation of imbalance settlement rules for establishing a guideline on electricity balancing in accordance with Article 52(2) of the Commission Regulation (EU) 2017/2195 closed in September 2018.[46] Since RES installations are already charged with penalties for their own imbalances in most Member States and changes to the current regulatory framework are to be expected, we suggest not to reflect balancing costs explicitly in the cost sharing methodology.

Grid-related energy losses differ based on infeed profiles of generators. RES installations can lower or higher grid losses, depending strongly on local energy system conditions. The costs of grid losses are distributed over final consumers through the network tariffs. The impact of particular RES installations on avoided or additional grid losses is negligible and very complex to determine. Other generation assets such as conventional generators are not required to account for grid losses that relate to their infeed. The quantification of grid loss system costs requires detailed case-specific modelling. Alternatively, benchmark figures could be developed but with wide uncertainty ranges. We suggest disregarding this cost category for the sharing of additional system costs.

The deployment of additional RES installations is expected to lower wholesale energy prices on average (merit-order-effect) because their marginal costs of energy generation are close to zero. The wholesale price impact will most likely lead to a welfare increase in the hosting country due lower energy prices for final consumers. On the supply side, lower wholesale energy prices affect the viability of other energy and flexibility providers, which might lead to stranded assets, but this effect cannot be attributed to individual RES installations.

The quantification of welfare impacts requires different assumptions and typically invites to discussion. In addition, the contribution of particular RES installations to wholesale price changes cannot be determined. The approximation of the wholesale price impact caused in particular by a large offshore wind hub might be possible with extensive modelling exercises but especially for smaller projects, the robustness of the results would be far from justifying the necessary efforts. However, the wholesale price impact can be quantified for larger RES volumes. Since this impact tends to be a benefit to the hosting countries, we suggest not to consider it in the sharing of system costs but in the wider discussion of costs and benefits (see above).

8.1.3 Internalising the different system costs

Host countries could avoid additional system costs by internalising them to the projects supported by the mechanism. In this section, we analyse to what extent relevant system cost categories can be assigned to the RES projects and discuss the pros and cons of internalising these costs from a project finance perspective. Particularly relevant for the sharing mechanism are the system costs for grid connection, extension and reinforcement as well as curtailment costs. Balancing costs are already internalised to RES projects through full balancing responsibility. System costs related to grid losses and wholesale price impact have been discussed in the previous step and will be disregarded for the above-mentioned reasons.

Internationalisation of grid connection, extension and reinforcement costs

In European Union Member States, the costs incurred from the generation connection to the grid are recovered by negotiated connection costs from generators and network tariffs charged to final consumers. Network tariffs are levied to final consumers by system operators and are regulated in the context of the EU Electricity Directive (2009/72/EC) and its recast (Internal Electricity Market Regulation[47]). Member States are free to develop their own grid tariff methodology, reflecting the particularities of national electricity systems. The Directive places responsibility on the regulator to

[45] CREG (2017). The costs and impacts of intermittency – 2016 update. Retrieved from: http://www.ukerc.ac.uk/publications/the-costs-and-impacts-of-intermittency-2016-update.html

[46] https://consultations.entsoe.eu/markets/imbalance_settlement_harmonisation_proposal/

[47] European Parliament is expected to vote in the March II 2019 plenary session, followed by formal adoption by the Council.

approve these. European countries differ in both the share of costs that are recovered from generation and load, and the basis on which tariffs are determined. One notable aspect which shows significant variation across Europe is the ratio of the grid tariff that is related to installed capacity over the injected energy. Note that grid tariffs do not only recover infrastructure costs by the TSO or DSO, but also various system services.

Shallow charging involves that only the costs for the grid connection to the nearest point of the network are born by the RES project. Further costs for extending and reinforcing the distribution system are typically recovered by use-of-system charges. These charges are applied by the system operator and socialised over all users of the network and should reflect their use of the network assets. With shallow charging, only parts of the additional system costs that result from the connection of a new installation to the grid are recovered.

The entire costs for grid connection, extension and reinforcement can be internalised to RES projects by applying a deep connection charging regime. Leaving those costs to hosting countries may pose a barrier for their participation in the mechanism. Deep charging implies that the bidder takes over the costs for grid connection, extension and reinforcement for the deployment of the RES installation.

Deep charging is conceptually simple, however, there is some problems that need to be addressed appropriately. The most important issue of deep charging is that it operates on a first-come-first-served logic. If two installations are to be connected to a network with limited remaining capacity, the first one will not pay for grid reinforcement if there is sufficient available capacity left in the existing circuit. The second one, however, will incur the entire costs for grid reinforcement only because of the prior application to connect of the first operator. The situation is further complicated by the fact that distribution networks can only be expanded in discrete steps. The second plant operator might be charged for excess capacity for the benefit of the subsequent application. A similar problem arises if an installation is to be connected to a circuit where transformers or switchgear equipment operates close to its technical limits. Ad-hoc agreements are often entered between project developers and system operators to resolve such difficulties. In these agreements charges for the developer can be limited to the costs incurred one voltage level above the one used for the connection. Deep charging is applied in seven Member States of the European Union, namely Croatia, Estonia, Latvia, Lithuania, Romania, Sweden and case-specific in Hungary. Further details on the characteristics of grid connection charges in European Union Member States are explained in Table 16.

Table 16: Characteristics of grid connection charges in European Union Member States[48]

Member State	Connection cost regime	Details
Austria	**Shallow**	In the form of a building-cost contribution
Belgium	**Mainly Shallow**	- Onshore: Everything is socialized, except all installations between the grid user and the substation and the connection bay at the substation. - Offshore: idem. However, a support mechanism foresees in an additional subsidy for the cable connection up to 25 M€.
Bulgaria	**Shallow**	The price for connection is paid by the user, for installations up to the point of connection. The price for reinforcement of the grid is paid by the operator.
Croatia	**Deep**	Generator pays for the infrastructure connecting its installation to the transmission grid and extensions in existing network
Cyprus	**Mainly Shallow**	The connection cost includes all new infrastructure that will need to be built, up to the point of connection, e.g. a new substation and transmission line. No other costs are charged, e.g. for upgrading existing equipment further into the transmission network.

[48] https://docstore.entsoe.eu/Documents/MC%20documents/TTO_Synthesis_2018.pdf

Member State	Connection cost regime	Details
Czech Republic	**Shallow**	Connection fees per MW
Denmark	**Super Shallow to partially Shallow**	In some cases, charges are calculated to a fictitious point that can be closer than the physical connection point. Charges are not differentiated for L, G or DSO's and there is no locational differentiation. In most cases the costs are socialized in the tariffs – if not the charges to the grid user are based on actual costs.
Estonia	**Deep**	Necessary reinforcements in the grid are included in the connection fee
Finland	**Shallow**	Standard fee based on average costs of connection infrastructure. No differentiation of charges for L, G, DSO. No locational differentiation.
France	**Shallow**	* G, L, DSOs: the connection is made to the nearest substation where the appropriate voltage level is available and where this connection is technically possible. No locational differentiation, charges based on actual costs. Generators pay 100 % of the cost, consumers pay 70 % of the cost of their main connection. * RES: network development costs due to RES integration are mutualized on a regional basis. No locational differentiation, charges based on actual costs.
Germany	**Shallow to Super shallow**	Charging is generally based on actual costs. Grid users pay for their own connection line and substation. General reinforcements of the grid are socialized via tariffs. No differentiation of charges for L, G or DSO.
Greece	**Shallow**	Grid users pay for the infrastructure connecting its installation to the transmission grid. The charge includes studies, materials check, construction, supervision and delivery costs. The costs depend on distance or voltage level and they differentiate according to the installation location characteristics (e.g. ground morphology) or any other special project requirements.
Hungary	**Shallow/Deep**	Charging is based on actual costs. Establishing a new connection for a generator incurs a maximum 100% of investment costs charged. If the generator used at least annual average 70 % of renewable energy sources for its production per 5 years, it pays only 70 % of the investment costs, and if this value is at least 90 %, it pays only 50 % of the investment costs. Multiple generators and/or customers on the new connection are charged proportionally.
Ireland	**Shallow**	All connecting parties pay for the connection to the system (using a Least Cost Chargeable methodology). Demand customers only pay 50% while generators pay 100% of connection charges.

Member State	Connection cost regime	Details
Italy	**Shallow**	Connection of production plants - G: When first requesting the connection, applicants pay upfront Terna a fixed amount of 2 500 € to get a general appraisal of the possible connection solution. Once obtained the authorization, applicants pay upfront Terna an amount of 2 500 €+ 0.5 €/kW (max 50 000 €) for a more detailed project plan. Grid user bears costs for building the grid connection plant. Enhancements of the NTG are socialized in tariff. Reduced fees apply in case of connection of production plants powered by renewable sources and for high-performance co-generation plants. Connection of consumption units – L: Applicants pay Terna a connection fee equal to 50% of the expenditure for building grid connection plant including cost of the materials and labour costs as well as overheads, assumed equal to 20% of these amounts. Connection of DSO: The DSO/TSO that implements the connection
Latvia	**Deep**	Grid users builds own connection line. All connection equipment and reinforcement are included in the connection fee. Producer (G) always has to compensate 100% from new connection charge. DSO must compensate 100% from new connection charge. For load increasing of existing connection DSO must compensate connection fee pro-rata with load increasing. Consumer (L) must compensate 100% of new connection charge and must compensate existing connection load increasing by pro-rata with load increasing, except consumers, who have special connection status issued by National Authority (Regulations on the Special Connection to the Electricity Transmission System). The Special Connection to the Electricity transmission system is allocated by Cabinet of Ministers. If the Consumer has the special connection case, then compensation costs from consumer side are: • 66% with load ≥50MW and consumption ≥100000MWh in the nearest two years; • 33% with load ≥75MW and consumption ≥150000MWh in the nearest two years; • 0% with load ≥100MW and consumption ≥200000MWh in the nearest two years. Other charges are compensated from TSO side. No locational differentiation. Charging is based only on actual costs.
Lithuania	**Deep**	100% of all actual connection costs, exception for the renewable generators - 40% of all actual connection costs.
Luxembourg	**Shallow**	Grid users (L, G and DSO) pay the actual costs for their own connection line and substation. General reinforcements of the grid are socialized in the tariffs.
Malta	**N/A**	N/A
Netherlands	**Shallow**	The connection charge consists of the costs to connect the client's installation to the client's circuit end connecting to the TenneT station.

Member State	Connection cost regime	Details
Poland	**Shallow**	The enterprise which is going to be connected pay for all the expenditures to build the connection site which contains the direct line and extension or rebuilding costs for the substation (if necessary) where connection takes place. The reinforcement and development of existing network is performed by TSO. Connection charges are: • Final customers (load) pay 25% of total investment expenditures. • RES units of installed capacity <=5MW pay 50% of total investment expenditures. • Co-generation units of installed capacity <=1MW pay 50% of investment expenditures. Other generators and distribution companies pay 100% of total investment expenditures. RES units of installed capacity <=40 kW do not pay connection charges.
Portugal	**Super Shallow to partially Shallow**	The grid user, either generator (G) or consumer unit (L), has to pay for the cost of the infrastructure needed to connect its installation to the transmission grid but the internal reinforcement/expansion of the grid is endorsed to TSO's responsibility, in the case of G. The connection is made to the nearest substation where it is technically possible and where available capacity exists. For G, the available network capacities are defined in the NDP (National Development Plan) and in the annual document "Network Characterization", according to Decree Law nº 215A and 215B/2012 from October 8th. For L, there is the obligation to connect, according to the Commercial Relationship Code and if internal grid development is needed, it is paid by L. After built, the connection facilities (lines, cables, equipment at substations, etc.) will be integrated in TSO asset; thus, TSO is in charge of their O&M costs. Concerning the DSO reinforcement needs (there is just one in Portugal) all the costs are socialized via the tariff. The charges are based on the actual costs and no locational differentiation is applied.
Romania	**Deep**	Connection equipment: the generator fully covers the cost of the equipment that connects their installation to the transmission grid. Upstream grid reinforcement: costs associated to upstream grid reinforcements required to safely connect new generators are shared between the TSO and generators connecting to the grid. Connection charge is calculated based on actual costs (on a case by case basis).
Slovakia	**Shallow to Super shallow**	Distribution companies pay 40% of actual costs for the infrastructure connecting its installation to the transmission grid and 60% of actual costs for the infrastructure connecting its installation to the transmission grid are socialized via the tariff of TSO (40% shallow and 60% super shallow). Direct customers and generators connected on the TSO pay 100% of actual costs for the infrastructure connecting its installation to the transmission grid (100% shallow).
Slovenia	**Shallow**	L: pays the costs of the first connection for power specified in permission of connection. G: pays the costs of the first connection in accordance of consumed power. DSO: does not pay any costs for the first connection. There is no locational differentiation. Charging is based on tariff charges

Member State	Connection cost regime	Details
Spain	**Shallow**	Promoter (generator or consumer) pays for the infrastructure necessary to be connected to the transmission grid. All reinforcements that are needed as a consequence of this new connection are included in the National Planning and thus socialized via tariffs.
Sweden	**Deep**	Generators or consumers connecting to the grid will pay costs related to this (lines, sub stations,)
United Kingdom	**Shallow**	This applies to both generation and load and means that connection charges relate only to the costs of assets installed solely for, and only capable of use by, an individual user. All other assets are assumed to be shared and their costs are included in the wider locational transmission tariff

In the following, different options for internalising grid costs are discussed.

Option 1: Deep connection charges apply for all projects under the mechanism

In the context of the European Union mechanism, deep connection charges would lead to the reflection of grid connection, extension and reinforcement costs in bids. Deep charging creates a strong incentive for developers to select project locations that lead to no or limited grid reinforcements. The internalisation of deep grid connection costs will remove an important disincentive for hosting countries' participation in the mechanism. A compensation to host countries for grid connection, extension and reinforcement costs would not be necessary. On the other hand, applying a deep charging regime to all projects under the mechanism would require changes in most Member States' national regulations, which would be difficult to accomplish. We therefore discuss two alternative options.

Option 2: Deep and shallow connection charges according to Member State regulation

In a flexible solution, deep and shallow connection charges are applied according to Member State preference and regulation. Deep connection costs would only be borne by project developers if hosting countries decide to apply deep charges. In this option, changes to the existing legal framework in Member States are not necessary, unless Member States with shallow connection charges decide to introduce deep charges to projects under the mechanism. For Member States with deep connection regime, additional grid costs are anyway internalised to RES projects. Member States with shallow connection regime are free to decide if they allow RES projects to participate in the mechanism or whether they apply deep charging for internalising those costs to the RES projects. In Member States opting to maintain a shallow cost regime, RES projects would have a competitive advantage against those in Member States with deep connection regime. The advantage of this option is that it leaves flexibility to Member States. A disadvantage is that it does not provide a level playing field for RES projects in all Member States (however, there are also other framework conditions that prevent a level playing field, see section 0).

A third option could be considered to establish a level playing field.

Option 3: Deep and shallow connection charges according to Member State regulation and financial compensation to RES projects under deep charging regime

Under this option, deep and shallow connection charges are applied according to Member State preference and regulation. In case deep connection charges are applicable in a Member State, the project developer receives an ex-ante defined compensation to allow for a competitive bid in the European Union tender. In this option, changes to the existing legal framework in Member States are not necessary. For Member States with deep connection regime, additional grid costs are internalised to RES projects. For project developers, there will be no competitive disadvantage in the European Union tender against projects developed under shallow connection regime, i.e. theoretically, there will

be a level playing field across the European Union. However, there are some major disadvantages of this option. First, it increases administrative burden to determine and pay out the compensation to project developers. Second, as grid costs can only be determined in an ex-ante approximation (see section 8.1.4 for possible quantification approaches), the compensation of bidders bears a high risk of wrong parametrisation and distortion of competition. Experience shows that tenders can be very sensitive to such distortions. For an accurate reflection of the grid extension and reinforcement costs, the compensation would have to be determined case-specific per project, which however is not realistic. Third, the option increases costs for contributing Member States who would have to pay for the compensation to RES projects.

Comparing the pros and cons of the different options, we would recommend option 2.

Internalisation of curtailment costs

Most of the curtailment and redispatch costs must be compensated to generators by system operators and are consequently borne by hosting countries. With the transposition of the Internal Market Regulation, a market-based allocation approach will be introduced. In consequence, the costs for curtailment and redispatch will be depending on the provisions of market participants and their contracting. Only where no market-based alternative is available, non-market-based curtailment or redispatch shall be used. In such case, the financial compensation shall be at least 90% of the net revenues from the sale of electricity on the day-ahead market that the installation would have generated without the curtailment or redispatching request.[49]

The costs for the market-based curtailment cannot be allocated to the RES projects financed by the mechanism. In addition, other generators are also not requested to contribute to those costs. Additional system costs for non-market-based curtailment must be compensated to an extent of at least 90% of net revenues. A compensation to host countries for the particular case that a European Union -supported RES project is curtailed is not justified if there is a market-based mechanism beforehand. An internalisation of at most 10% of the non-market-based curtailment can be decided by the Member States. To assure compliance with the Internal Electricity Market Regulation, an internalisation to RES projects beyond the 10% of non-market-based curtailment costs is not possible.

Against this background, we recommend not to internalise curtailment costs to RES projects.

8.1.4 Quantification of system costs

In the previous sections, it has been found that the costs for grid connection, extension and reinforcement are particularly relevant. Curtailment costs are currently relevant in few Member States but might increase until 2030. The question arises whether those additional costs could be compensated to host countries if not internalised to RES projects to avoid that these become a barrier to the adoption of the mechanism. Below we present a methodology for quantifying grid extension and reinforcement costs. While the presented approach is robust, we do not recommend applying it for the mechanism, as it would create substantial additional burden for the European Commission. Internalising grid extension and reinforcement costs through deep connection charges appears to be the more practical solution. We also discuss options for quantifying curtailment costs (which cannot be internalised) but show that their quantification and compensation would be even less practical.

Grid extension and reinforcement

The presented approach applies system-wide reference costs to compensate host countries for grid extension and reinforcement costs in a pragmatic manner. It is appropriate to assess full grid extension and reinforcement costs for large-scale projects in a case-specific assessment. This implies that relevant design criteria (technology, size, location, operation mode, operational constraints) are known. When there is limited information on the possible generation sources and/or when a large

[49] Art. 12 § 6 Internal Electricity Market Regulation, *https://eur-lex.europa.eu/resource.html?uri=cellar:d7108c4c-b7b8-11e6-9e3c-01aa75ed71a1.0001.02/DOC_1&format=PDF*

share of distributed sources is considered (e.g. residential PV or onshore wind) an exhaustive set of case-specific studies is not pragmatic.

Various studies already assessed the general grid investment impact of higher shares of RES in the system. Such analyses could be used to allocate grid extension and reinforcement costs to new RES installations. Two variants exist: either a dedicated benchmark study is done, or a meta-review of existing studies is taken.

Performing a dedicated benchmark study would need to include the following steps:

1) A scenario pathway is constructed at regional level. This pathway takes the supply/demand mix of either today or of a reasonable target year (e.g. 2025) and the related grid configuration.
2) Increments of RES penetration are quantified. Preferably the exercise is done for a specific RES technology (this would be easier for the technology-specific than for the technology-neutral window of the mechanism). The additional RES levels are spatially assigned based on a priority list or if no information is available proportionally to substations based on load distribution. Such priority list could be:
    - Zones already assigned for renewable energy development in national plans
    - Available grid hosting capacities
    - Information on regional LCOE variations.
3) Load patterns are kept fixed in the hosting country. A reasonable assumption needs to be made on supply corrections, i.e. reduction of renewable and conventional thermal supply in either the hosting country or other countries.
4) For every increment step the necessary grid extensions and reinforcements are assessed. This allows to estimate the total costs for increasing RES shares.
5) This information is recalculated to a levelised grid cost of RES energy supplied at various penetration levels of RES.

This approach can be taken either for the complete transmission system or for a set of representative distribution grids. It depends on the RES technology considered whether the analysis considers transmission, distribution or both levels. When considering residential PV more attention to distribution analyses (non-urban) is appropriate. For onshore wind impact both levels may be relevant. For offshore wind, case-specific analysis is appropriate as this is difficult to generalise. As a result, the unit costs for grid extension and reinforcement will be provided for each RES technology in EUR/MWh per RES penetration level.

Ideally this gives insights such as that of Table 17.

Table 17 Unit costs for grid reinforcements due to additional RES levels

RES increments	5%	10%	15%	…
PV	… €/MWh			
Wind				
Biomass				
(other)				

The exercise is conceptually quite similar to how grid tariffs are set by the TSO or DSO. Main differences are that such tariffs should normally not differentiate between RES technologies, and that other energy developments such as load growth are also included.

It may be relevant to perform the assessment for a mix of RES technologies, e.g. when a technology-neutral tender is considered. Also considering the various options to spatially allocate RES

connections, it may be relevant to repeat the exercise for several spatial scenarios to get a range of the unit costs.

A general trend in various studies is that with low additional shares of RES the cost remains fairly limited but ramps up at higher shares. This often brings back the usual dilemma of whether grids should be developed as copper plate (accommodate all infeed at all times at all locations), or whether a socio-economic optimum can be struck between costs of curtailment and costs of grid reinforcement.

The objective of this assessment is to isolate the grid impact cost that can be purely attributed to RES. This type of assessment has been explored in various earlier publications. Most relevant ones are:

- CREG (2017). The costs and impacts of intermittency – 2016 update.
- CREG (2016). Determining the impact of renewable energy on balancing costs, back up costs, grid costs and subsidies.
- Agora Energiewende – AEW (2015). The Integration Costs of Wind and Solar Power.
- IEA (2015). Projected Cost of Generating Electricity.
- ECN (2014). Cost and revenue related impacts of integrating electricity from variable renewable energy into the power system - A review of recent literature.
- Imperial College (2013). Grid integration cost of photovoltaic power generation direct costs analysis related to grid impacts of photovoltaics (PV Parity).

These reports give methodological insight in how to asses unit costs for grid development with increasing shares of RES, as well as applications for various European systems. A summary of their findings is given in Table 18.

These example studies already highlight substantial ranges for the unit costs of RES deployment related to grid reinforcements. When performing a dedicated study for the hosting country, clear attention is needed for main sensitivities and underlying assumptions to understand the robustness of the results and take an informed decision on specific values.

Table 18 Selection of studies on RES integration costs directly related to transmission and distribution reinforcements

Geographical coverage	Type of RES	Scenario	Grid cost estimate	Source
Belgium	Variable RES	General 2020-2030 timeframe	1.6 – 2.2 €/MWh (transmission excluding interconnection and internal reinforcement)	CREG (2016)
Belgium	Variable RES	General 2020-2030 timeframe	2.4 – 3.1 €/MWh (transmission including interconnection and internal reinforcement)	CREG (2016)
Belgium	Variable RES	General 2020-2030 timeframe	2.5 – 9 €/MWh (distribution)	CREG (2016)
Germany	PV/ wind onshore	NEP2024	4 – 8 €/MWh (transmission)	AEW (2015)
Germany	Wind offshore	O-NEP2024	25 – 40 €/MWh (transmission)	AEW (2015)
Germany	PV/ wind onshore	Consentec 2033	3 - 11 €/MWh (distribution)	AEW (2015)
Germany	PV/ wind onshore	IAEW/E-Bridge/OFFIS 2032	11 - 18 €/MWh (distribution)	AEW (2015)
Europe	PV	PV Parity 2030	3 €/MWh (transmission)	Imperial College (2013)
Ireland	Wind onshore	Wind power from 16 to 59%	1.5 – 8 €/MWh (transmission)	IEA (2015)

Curtailment

The quantification of curtailment costs requires a clear process for monitoring. Curtailment costs could be quantified ex-post but not upfront for the cost sharing approach. A methodology does not need to be developed for this exercise since the costs are determined by the system operator in any case. An ex-post compensation of curtailment costs would complicate the administration of the mechanism. The distribution of support payments and statistical benefits between hosting and contributing countries would be possible only after curtailment costs for the RES projects are determined. To assure that curtailment costs can be financially compensated to host countries, funds would have to be reserved, implying that less RES projects could be supported by the mechanism. We therefore suggest not to introduce ex-post compensation of curtailment costs.

8.2 Annex 2: Workshop presentation

See separate power point presentation.