ENTSO-E Consultation on Options for the design of European Electricity Markets in 2030

SolarPower Europe contribution

1 Markets for flexibility and RES

10. What do you consider to be the main barriers for the participation of RES into balancing markets?

Solar PV can provide balancing services in different ways, as highlighted in SolarPower Europe's Grid intelligent solar report. While solar power plants equipped with smart power plant controllers can provide flexibility resources, such resources can be maximized when co-located with storage. However, solar power is experiencing barriers when participating into balancing markets:

1. Distributed renewables and renewables co-located with storage behind the meter are often restricted from balancing activities because of **strong metering requirements**. Integrated Measuring Instruments Directive (MID) certified metering should be the strictest standard with a proportionate temporal granularity for the meter. National regulations should not overrule MID requirements for balancing markets with stricter metering requirement if there is no good reason to do so. Yet, the law often goes beyond MID certification, as seen in Germany or in the UK. In addition, in many cases, the Distribution Network Operator request MID compliance meters to provide granular (minute by minute) data which creates disproportionate burdens on consumers. In the UK, the requirement is to have minute by minute metering, while current existing smart meters in the UK only have 30-min resolution. This means that potential flexible providers do need to either install a new meter or get their existing meter solution MID compliance with the consequent cost.
2. **Balancing market design** can also present a barrier to unlocking RES flexibility. The closer to real time balancing product procurements are realised, such as the length of flexibility contracts, the easier to unlock the potential for renewables to provide flexibility.
3. **Preserving renewable energy remuneration under curtailment** is also critical, as stated in the Electricity Market Design Regulation, article 13.

11. Which kind of support scheme has the least distortive effect on the participation of RES in balancing markets?

The barrier to participation of RES to balancing markets is not necessarily support scheme design but balancing market design. RES are able to provide balancing services but these skills are not correctly remunerated by the existing balancing services – which were designed for OPEX-based plants –. Advanced balancing services should be develop considering the RES features and to correctly remunerate for these products.

Where RES support schemes are needed, **it is therefore critical that balancing markets are smartly designed to unlock services from renewable assets and provide the required market signals for flexibility to encourage participation in balancing and other system services markets.**

Some good practices comprise:

- Support schemes promoting the production of renewable electricity during specific periods and/or with different production profiles, reducing the balancing needs when the energy is needed.
- Defining a minimum capacity factor requirement in tenders to promote the optimisation of the grid by maximising the use of connection points (co-location / hybridisation)

- Defining long-term contracts to provide balancing services (as the DS3 Programme in Ireland or the UK design) to provide long-term visibility and reduce the market risk for developers, incentivising the participation in balancing markets.
- The provision of long-term balancing services could also be considered/contracted in RES tenders together with the RES capacity, so the developers could evaluate the cost of providing balancing services when submitting bids to the tender.

In parallel, support schemes that insulate RES from market prices impair the participation of RES in balancing markets as they effectively dampen or entirely remove any signal for controllability or flexibility. Such measures are not fit for purpose for a future-looking flexible energy system. The transition towards Feed-in Premiums where the remuneration is partially based on market prices, for large-scale solar PV plants, is a step in the right direction.

However, it should be reminded that not all installations are on an equal footing when exposed to market signals. In particular, market price exposure may result into increased administrative and financial burden for smaller solar PV installations or for demonstration projects. For instance, small solar PV installations will have to resort to third parties capable of performing this service for them and aggregating their loads. Yet, in many countries, such third parties do not necessarily exist or do not propose services at competitive costs. Exposure to market signals should therefore be limited to those installations that are capable of bearing this obligation. The contrary would result into a missed opportunity for Europe, as smaller installations and demonstration projects have a high market potential (European rooftops could power ¼ of Europe's electricity consumption if equipped with solar PV) and come with high socio-economic benefits (rooftop PV is the most job intensive solar PV market).

12. What do you consider as best practice to the ensure effective provision of voltage control and other non-frequency Ancillary Services by RES?

Renewables already provide (non-)frequency requirements that are state-of-the-art. Yet, some additional requirements (such as black-start capabilities, virtual inertia (synthetic inertia), extensive communication and remote control) might require additional investments from the industry and higher O&M costs for the operator. **Where renewable operators are asked for additional requirements, they should therefore receive a fair remuneration or compensation for the incurred costs**.

Using a market-based approach through open tendering processes for new services should be preferred over a mandatory / administrative based approach or bilateral contracting practices. Such tendering procedures should allow a fair and wide participation in all available services for all market participants, stimulate innovation from industry players, and deliver the lowest cost solution for the system.

Multiple application stacking practices, i.e., allowing RES generators that have the flexibility capacity to provide the widest possible suite of services and applications (whether in the same time or adjacent time periods) **should be fully enabled**. Doing so is critical to enabling the development and deployment of RES generation with flexibility capability needed to enable a decarbonised energy system.

13. How could market design mitigate the side effects of the interaction of negative prices and RES supported technologies?

A side effect of the design of legacy RES support schemes is that they reward RES generation for exporting at any time, regardless of whether the system needs it or not. Going forward, **it is important that RES generation that is supported under a support scheme is encouraged to respond to market signals for flexibility**.

To minimise negative prices, as a first step, we should maximise sector coupling and incentivise flexibility, including incentives on end-users to absorb the oversupply of RES and developing a more complex and a wider range of balancing services, such as those developed by Ireland under the DS3 Programme or the UK.

Different options should be explored to achieve this within the design of renewable energy support schemes. Future support measures should preserve the remuneration stability for renewables, do not result in barriers to investments in new renewable projects, and do so in a way that promotes the flexibilization of RES. For example, rather than guaranteed payments based solely on EUR/MWh export, consideration should be given to schemes designed to:

- Give different payments at different times of the day or based on different market conditions.
- Encourage RES generation to be available during times of peak demand through capacity-based availability mechanisms.
- Require a minimum capacity factor to participate in tenders, to promote the optimisation of the connection points by the co-location/hybridisation of different technologies.
- Incorporate new market products that include mandatory flexibility capabilities when relevant, such as requirements that for every MW of export connection capacity, it is matched by 4 MWh of storage (as in the case of the Israel PV + storage auction design described below) and allow full participation in wholesale, balancing, and other grid services markets.
- Compensate curtailment of renewable production during negative prices, i.e., French design compensating curtailments due to negative prices if they exceed 20 hours/year.

This should be complemented by a review of network charges to reduce the proportion of fixed charges that do not recognise the importance of flexibility and instead increase time variable charge elements.

2 Local flexibility markets

53. What recommendations do you have for the development of local flexibility markets based on existing initiatives?

First, develop **a harmonised framework for local flexibility products or services** that will be exchanged or procured on local flexibility markets. This will give clarity to the industry on upcoming needs and develop the necessary solutions. A new Network Code on Distributed Flexibility would be the suitable vehicle for this framework.

Metering requirement can represent a barrier to the participation of end-users in local flexibility meters and should be removed. Based on the experience of the UK´s flexibility program experience, most DNO request MID compliance meters to provide granular (minute by minute) data. However, current existing smart meters in the UK only have 30-min resolution. This means that potential flexible providers do need to either install a new meter or get their existing meter solution (in our case, GW meter) MID compliance with the consequent cost. Develop more flexible metering solutions and alternatives to ensure that smaller users are not faced with disproportionate barriers to participation.

Local flexibility demonstration projects are showing the potential they have to open new market products and unlock local sources of flexibility, such as accounting for local differences and the need for more granular data on distribution grids. Procuring **standardised or harmonised grid-type services through routine auctions** is a well-established approach already used for the procurement of grid services. As such, adapting this approach for local flexibility markets should be encouraged and accelerated. In parallel, it is important to introduce **flexible grid tariffs designs**, such as dynamic time-based grid tariffs, to help establish wider general price signals to motivate demand-side flexibility.

54. Should EU legislation attempt to define some fundamental common principles (e.g. degree of integration with existing wholesale markets, products standardisation, etc.)?

Local flexibility markets can unlock new sources of flexibility from the demand side and support the grid integration of decentralised energy resources. **Defining fundamental common principles at EU level would support member states in defining their own frameworks for flexibility markets but most importantly would provide visibility and clarity to the industry**, in line with the principle of the Single Market. For this reason, we welcome the European Commission's proposal to draft a new network code on demand-side response.

The discussion on such new legislation should happen with all concerned parties – transmission system operators, distribution system operators, renewable energy industry, and flexibility providers.

As preliminary input, SolarPower Europe would like to share the following recommendations:

- **EU legislation should avoid mandatory "flexibility readiness" upfront at all costs**. If consumer devices must fulfil hardware and software requirements to be "flex-ready" this adds to the cost of development, manufacturing and ultimately the end-customer price. In addition, if the flexibility potential stays unused thereafter, this would constitute an economic deadweight loss. A flexibility network code should avoid costly pre-qualification technology for flexibility (e.g., for additional surveillance technology/ controllability) for out-of-the-box-technology.
- However, it could be explored the potential of **a standardisation of metering requirements** to make distributed assets capable of providing local flexibility without the need for unnecessary investments.
- **EU legislation should aim at defining harmonised rules for flexibility markets and harmonised principles or standards for "flexibility products" or "flexibility services".** This will bring clarity to the energy industry and give clear incentives to manufacturers to develop technological solutions and to end-customers to adopt the technology.

3 Market model, support schemes and renewables

63. What type of RES supports is more fit for purpose for the 2030 power system?

SolarPower Europe considers two-way contracts for difference as the most fit for purpose support mechanism. This model limits uncertainty in the bidding process by avoiding errors in power price forecasting, compared to for instance fixed premiums which require bidders to forecast the upfront costs of their project's components, power prices (including negative price periods) and curtailment levels.

In general, **remuneration schemes should ensure a predictability for investments.** Solar PV is a CAPEX-intensive activity, which requires visibility and stability on OPEX revenues for the investors. For this reason, retroactive changes on public remuneration schemes are particularly harmful for solar PV projects, as they decrease certainty on the return on investments and result in an increased perceived risk of the investment.

In this perspective, **future support schemes for renewable could therefore transition towards a remuneration of both the MW and the MWh.** Remunerating the capacity (MW) could be more fit to the nature of renewable investments, while remunerating the energy (MWh) would grant an incentive to keep a high quality of electricity generation. However, support schemes with flat remuneration for kWh that ignore the time at which electricity is exported and whether there is a need for more electricity on the grid however should be avoided. While the future power system requires shifting from inflexible renewable generation towards a system with much high levels of flexible and dispatchable renewable energy resources, such approaches discourage renewable generation from becoming flexible.

A differentiated approach should be adopted towards the different types of solar PV systems and players, in order to ensure a socio-economically fair and balanced energy transition. Future support schemes should ensure adequate investment incentives to the development of rooftop solar PV, which represent an important potential for solar PV development despite being more expensive than large-scale solar, or innovative solar PV technologies (such as floating PV or agri-PV – for a definition of agri PV, see SolarPower Europe Agrisolar Best Practice Guideline), which allow an efficient use of land.

64. What other market design elements can facilitate investments in RES to achieve EU climate objectives?

For renewable energy to compete on a level playing field on the electricity market, **it is critical that a fair price is put on carbon as well as unsustainable externalities such as waste**. In this regard, the reform of EU's carbon pricing instruments has a high importance, such as the ETS Directive or the Energy Taxation Directive.

Other elements outside of the market design, such as grid fees, are also critical elements which can lower the cost competitiveness of RES and create barriers to investments, in particular in prosumer or energy community models.

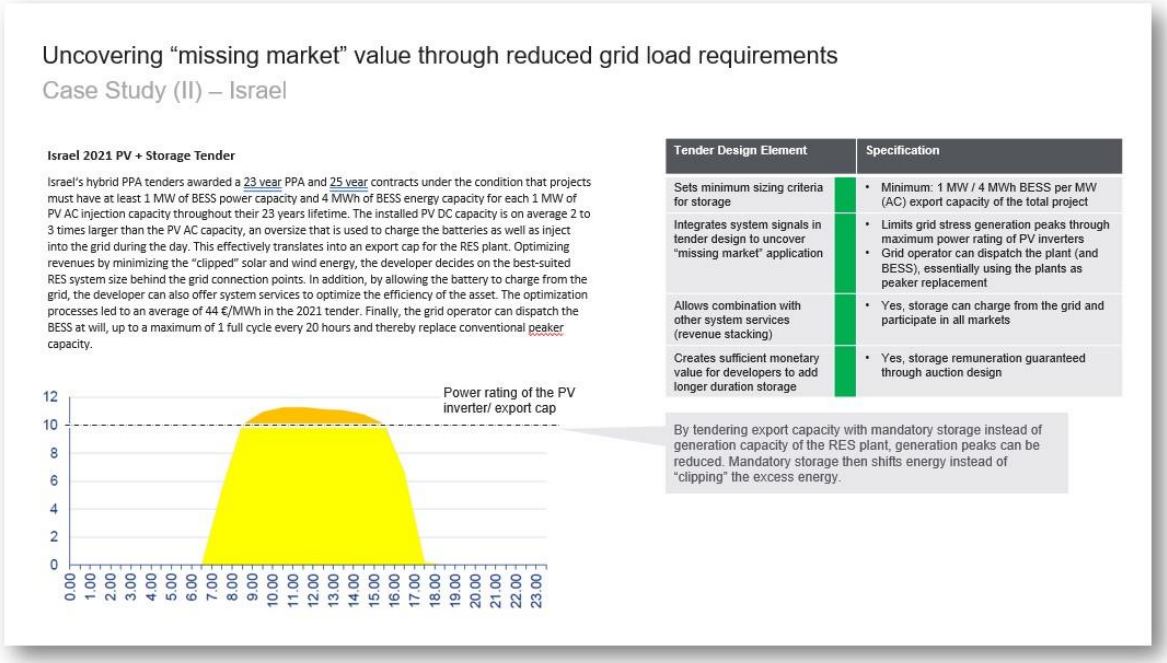
65. What are the best practices for the design of RES tenders?

SolarPower Europe has expressed its recommendation on RES tenders in its position paper on the revision of the Energy and Environmental Protection Aid Guidelines (EEAG) and in its guidelines for tenders for solar projects.

On top of the already expressed views, **it should be noted that current tendering mechanisms do not generally incentivise the deployment of renewable capacities at the point of consumption**. Future tendering schemes could include locational incentives to ensure a grid-friendly deployment of renewables capacities, as expressed in SolarPower Europe position paper on the EEAG.

We have also expressed our support for the development of hybrid tenders, which allow to develop solar and storage. Best practices include certain tender design features used in Israel (see below). While international best practices show that the optimal design of hybrid tenders depends on the context and the individual system requirements, some general recommendations include the following:

- Allow stacking of multiple services, giving access to different revenue streams.
- Set clear dispatchability requirements (e.g., minimum requirements for storage), focusing on energy capacity in MWh rather than power capacity in MW to effectively address the issue of dispatchability of RES at its source and to address congestion issues and energy shifting.
- Include location requirements to maximise benefits and solve network shortcomings.
- Ensure streamlined procedures for new and retrofitted batteries.



66. How should capacity mechanisms consider the participation of RES?

Capacity markets can support the development of storage or hydrogen used with renewables. Yet currently many capacity markets have strict requirements on duration, minimum capacity, load curves which are not adapted to a system with high penetration of renewables.

Some practices which could support the participation of renewables in capacity mechanisms. This is the case of the de-rating factor. Used in the UK, it acknowledges the intermittency of RES or the limited energy capacity/duration of storage. At the same time, it allows these technologies to participate if their bids (including their derating factor) still make economic sense based on the relative contribution they can make to supporting the system at times of system stress.