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RfG 2.0
Solar Industry **Priorities & Recommendations**

33rd GC ESC meeting

Thorsten Buelo and Catarina Augusto

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Solar industry Priorities on RfG Network Code

1. **Implementation timeline:**
   - Postpone the compliance start date for solar products to ensure an adaptation period after the definition of national rules and provide a realistic path for European harmonised implementation
   - **Implementation Guidance Document:** Better recognition of stakeholders' input for the IGD

1. **Grid–forming (GFM):** A market-based procurement of grid-forming services
   1. As a principle, market-based procurement of GFM services, especially for batteries
   2. For PV-only systems, focus on robust and grid-supporting operation
   3. Develop a roadmap on GF needs and industry capabilities, in transparency with stakeholders

2. **Harmonisation of requirements for Solar manufacturers:**
   - Harmonise Type A / B thresholds at 1 MW and further harmonise Type A requirements
   - Do not allow remote control of BTM batteries

3. **Flexibility at the connection point:** Recognition of different technologies at the same connection point has a high grid stability and flexibility potential.

4. **Significant Modernisation:** There should be a balance between the cost and the benefit of a need to fulfil the new requirements

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Solar industry commenting on Grid forming (1/4):

Concerns with ACER Proposed Framework (19 December 2023)

- **Unclarity how grid-forming capabilities will be derived from various technologies** (beyond the definition of PPM/Types) → Technologies can offer vastly different capabilities, particularly concerning availability and independence from operating points, which may result in an overall behaviour that is hard to predict for the RSO.
  - Dismissed PV Technology assessment under the ACCPM report regarding grid-forming services
    → PV Technology has limitations regarding grid-forming services, unlike other technologies; TRL is very low
  - There is no agreed and objective baseline for being "grid forming within capabilities"
  - Regarding the IGD it is unclear, how stakeholder consultation is done, and this is not binding for the implementation (Member States may contradict IGD) – both in contrast to European Standards

- **Requirement of storage to new PV systems** (type C and D) **to provide grid-forming services**, without first clearly defining the system's needs and determining whether this is the most cost-effective way for the system to procure such needs → Emerging technologies like BESS entail complex monetization strategies involving participation in multiple markets, which are virtually non-existent in most Member States

- The **compulsory imposition of GFM in the RfG 2.0** – especially within the given timeline – is not sufficiently justified and **conflicts with the obligation to procure such capabilities through market-based grid services as outlined in the Market Design Directive (EU) 2019/944**.
  → Article 31 Paragraphs 6 and 7 (DSO) (1)
  → Article 40 Paragraphs 4 and 5 (TSO) (1)

(1) Articles attached on the next slide

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Solar industry commenting on Grid forming (2/4):

Concerns with ACER Proposed Framework (19 December 2023)

Article 31 Paragraphs 6 and 7 (**DSO**) + Article 40 Paragraphs 4 and 5 (**TSO**)

Article 31

Tasks of distribution system operators

1. The distribution system operator shall be responsible for ensuring the long-term ability of the system to meet reasonable demands for the distribution of electricity, for operating, maintaining and developing under economic conditions a secure, reliable and efficient electricity distribution system in its area with due regard for the environment and energy efficiency.

2. In any event, the distribution system operator shall not discriminate between system users or classes of system users, particularly in favour of its related undertakings.

3. The distribution system operator shall provide system users with the information they need for efficient access to, including use of, the system.

4. A Member State may require the distribution system operator, when dispatching generating installations, to give priority to generating installations using renewable sources or using high-efficiency cogeneration, in accordance with Article 12 of Regulation (EU) 2019/943.

5. Each distribution system operator shall act as a neutral market facilitator in procuring the energy it uses to cover energy losses in its system in accordance with transparent, non-discriminatory and market-based procedures, where it has such a function.

6. Where a distribution system operator is responsible for the procurement of products and services necessary for the efficient, reliable and secure operation of the distribution system, rules adopted by the distribution system operator for that purpose shall be objective, transparent and non-discriminatory, and shall be developed in coordination with transmission system operators and other relevant market participants. The terms and conditions, including rules and tariffs, where applicable, for the provision of such products and services to distribution system operators shall be established in accordance with Article 59(7) in a non-discriminatory and cost-reflective way and shall be published.

7. In performing the tasks referred to in paragraph 6, the distribution system operator shall procure the non-frequency ancillary services needed for its system in accordance with transparent, non-discriminatory and market-based procedures, unless the regulatory authority has assessed that the market-based provision of non-frequency ancillary services is economically not efficient and has granted a derogation. The obligation to procure non-frequency ancillary services does not apply to fully integrated network components.

Article 40

Tasks of transmission system operators

1. Each transmission system operator shall be responsible for:

(a) ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity, operating,

4. In performing the task referred to in point (i) of paragraph 1, transmission system operators shall procure balancing services subject to the following:

(a) transparent, non-discriminatory and market-based procedures;

(b) the participation of all qualified electricity undertakings and market participants, including market participants offering energy from renewable sources, market participants engaged in demand response, operators of energy storage facilities and market participants engaged in aggregation.

For the purpose of point (b) of the first subparagraph, regulatory authorities and transmission system operators shall, in close cooperation with all market participants, establish technical requirements for participation in those markets, on the basis of the technical characteristics of those markets.

5. Paragraph 4 shall apply to the provision of non-frequency ancillary services by transmission system operators, unless the regulatory authority has assessed that the market-based provision of non-frequency ancillary services is economically not efficient and has granted a derogation. In particular, the regulatory framework shall ensure that transmission system operators are able to procure such services from providers of demand response or energy storage and shall promote the uptake of energy efficiency measures, where such services cost-effectively alleviate the need to upgrade or replace electricity capacity and support the efficient and secure operation of the transmission system.

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Solar industry commenting on Grid forming (3/4):

Our vision and steps to support GFM developments

The solar industry is committed to supporting grid stability in facing the challenge of integrating vast amounts of solar PV into the grid → In Great Britain, grid-forming battery assets with several 100MW will be interconnected this year to the bulk power system and provide stability services, through market-base, such as inertia and short circuit power on top of energy shifting and traditional ancillary services.

PV systems can already and do already provide 'grid supporting' services that should be sufficient to deal with today's system stability challenges → Today the grid-supporting capabilities regarding PV technologies can be enhanced and may comprise the following: (i) Voltage control, (ii) Fast LFSM, (iii) defined robustness against sudden voltage angle changes. These functionalities are critical to support the grid, within the solar industry's reach, and two of them are already included in the RfG (Articles 13(3) - for ii and 13(10) for i)

Specific system needs must be clearly defined, and a thorough cost-benefit analysis should be conducted to determine the most cost-effective way of procuring the services, such as through a market-based approach.

- The demand for GFM can be covered efficiently and to a sufficient extent by market-based principles and support the lack of a storage framework. This allows procuring capabilities according to the appropriate amount at appropriate locations with appropriate technologies.

Solar industry commenting on Grid forming (4/4):

Our vision and steps to support GFM developments

→ Where grid operators identify a need for a grid-forming requirement **that the market-based procurement cannot meet**, the 3 steps shall be followed before introducing any requirement:

Needed Assessments

Step 1: Grid stability assessment to determine grid-forming and inertia requirements

(publication of areas and quantities of grid-forming/inertia necessary)

Step 2: Cost-benefit analysis of the available technologies and their capabilities

(selection of the most suitable options that can effectively address the requirements of the identified areas, considering the economic impact and the barriers remaining to further revenue streams of each technology)

Step 3: For approval with NRA in close consultation with industry manufacturers

If found that further requirements are necessary, these should come with **right compensation** → **Proposal:** the requirements shall be attached to the CfDs for PV+Storage systems

Long-term step: a grid-forming roadmap must be mandated to ensure the systematic development of mature and resilient grid-forming technology for all types

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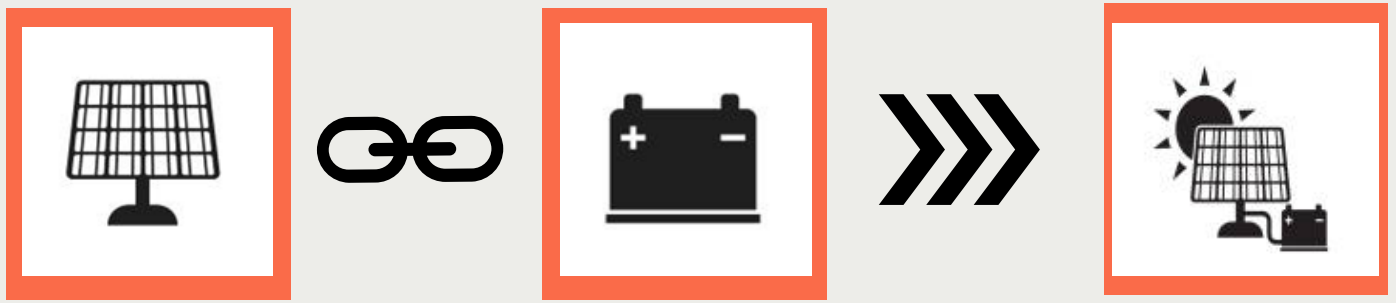
Solar industry commenting on
Solar + Storage or Solar+Wind at utility-scale projects (1/2):

Problem: the **RfG 2.0 network code is not clear on the rules for the determination of the significance** of connecting non-synchronous power-generating modules of different underlying technologies and whether the ACER proposal supports this approach.

Use Case: generating facility **consisting of 40 MW solar + 10 MW storage connected at the same point with a grid connection capacity of 40 MW according to the grid connection agreement.** The generating plant is constructed in a way, that the solar and storage will never generate more than 40 MW, which is equal to the grid connection capacity. The **capacity for determining significance should be 40 MW instead of 50 MW**, which is the fully aggregated value, if the power-generating module is constructed in such a way, and this is agreed upon between the relevant system operator and the power-generating facility owner.



40MW **10MW** **40MW**

Better grid use + Lower costs → **win-win situation for Solar and SOs**

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Solar industry commenting on
Solar + Storage or Solar+Wind at utility-scale projects (2/2):

What is needed? Further clarification on how to treat such cases → a **new approach to determine the significance of a power park module**. The determination of significance should be based on the **maximum capacity of a PPM, understood as the maximum injection capacity of the power park module which is agreed between the developer and the grid operator**. This is a solution that is already implemented by several TSOs such as REE in Spain, and Fingrid in Finland.

How can we do it? Ideally, this should be clarified under **articles 2 and 5**. Alternatively, **this should be addressed in an implementation guidance document**, particularly in calculating the injection capacity for collocated systems and how the significance of the PPM should be determined.

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Thank you for your attention!