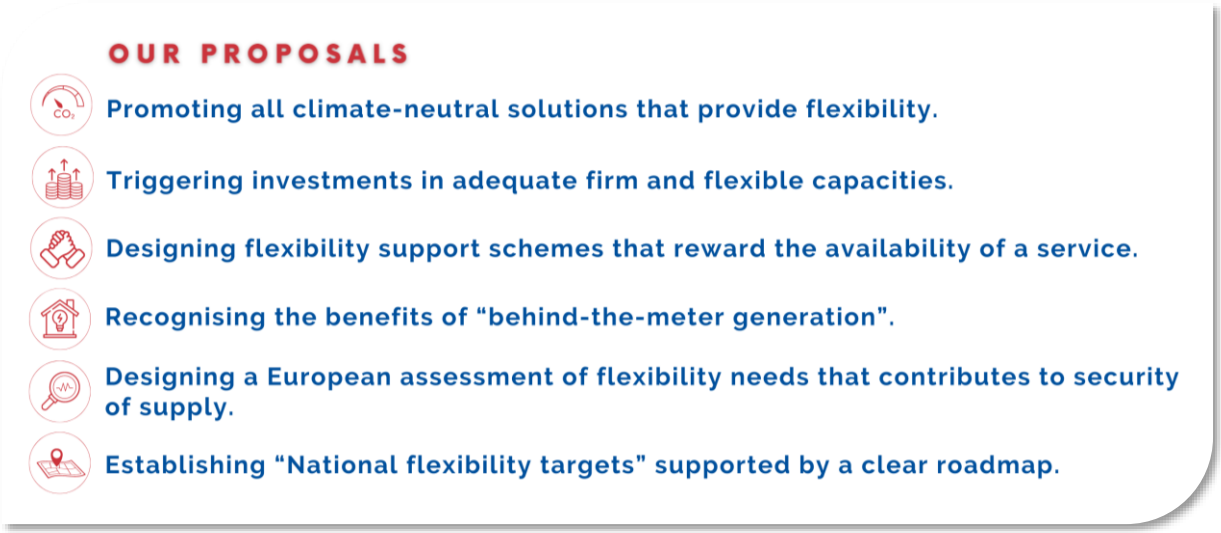
May 2023

An Electricity Market Design that ensures Reliability and Adequacy

Considerations of EUGINE & EUTurbines on the European Commission proposal to revise the European electricity market design

Mid-March, the European Commission presented its proposal to improve the Union's electricity market design. Aimed at making the system more resilient against future price shocks, the proposal puts a new and much-needed focus on the provision of additional flexibility in systems with high shares of fluctuating generation from renewables. This is a very welcome development.

The proposal does, however, miss out on some important aspects, notably flexibility solutions covering longer time periods or extreme weather events, essential for security of supply in a net-zero energy system. In addition, coherence with other policy objectives such as the EU renewable gas targets and the energy system integration strategy could, in our view, be further strengthened.



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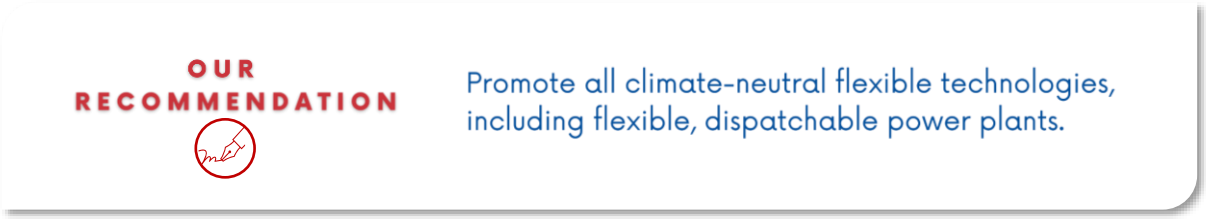
The availability of firm and flexible generation capacity will be essential in times of high electricity demand coupled to low variable renewable supply. Gas networks allow to store larger amounts of energy over longer periods of time to complement the electricity system. In the future, the hydrogen network will allow to store excess renewable electricity production. Therefore, while the electrification of the economy will reduce the total gas consumption, molecules will nonetheless remain essential for security of supply and for the resilience of our energy system.

In this document, EUGINE and EUTurbines lay out their ideas for strengthening the proposal from the European Commission to improve the Union's electricity market design, especially when it comes to long-term flexibility solutions essential to keep the system in balance, reach net-zero goals, and keep electricity affordable at all times.

Promoting all climate-neutral solutions that provide flexibility

To ensure the stability and reliability of a system dominated by variable renewables, the Commission proposal aims at growing the available flexibility solutions. Given that flexibility needs will increase dramatically in the coming years, this increased focus on climate-neutral flexibility solutions, essential to integrate variable generation, is very welcome.

However, the Commission proposal suggests that promoting “non-fossil flexibility such as demand side flexibility and storage” would be enough to meet the flexibility needs of the European power system. This overlooks one important fact: flexible, dispatchable generation is needed to complement demand response and energy storage.



The need for flexible, dispatchable power

Flexible solutions come in very different shapes and forms. They also have different capabilities and discharge times, and therefore can offer different services. While a reduction of demand from consumers is the no-regret first option, upward balancing (when demand cannot be reduced any further) requires providing additional electricity with quick reaction times and sustainable long-lasting dispatch.

Power plants running on gases are dispatchable, that means, they can generate electricity whenever needed and as long as needed at any moment and for indefinite periods, depending on the market and system needs. They can even contribute to demand side flexibility.

When running on renewable fuels, the plants are climate-neutral and use stored energy in the form of biomethane or green hydrogen. As long as not enough renewable energy is available to cover the need of the energy system at all times, solutions such as climate-neutral power plants with carbon capture technologies need to be used.

Combined heat and power plants (CHP) provide heat for local and district heating through an efficient use of renewable and climate-neutral fuels. Flexible, decentralized CHP solutions run when their electricity is needed and can be combined with heat storage or a heat pump.

Avoid excluding power plants running on renewable fuels

As it currently stands, the reference to "non-fossil flexibility such as demand side flexibility and storage", used in the Commission proposal, is misleading and does not correspond to the existing definitions in the Electricity Directive (Directive 2019/944). It could also disadvantage flexible technologies that switch their fuel supply from unabated fossil to renewable fuels.

The speed of the transition from unabated fossil to renewable fuels depends, to a large degree, on the availability of clean gases. An overly restrictive interpretation of the text proposed by the European Commission could lead to the exclusion of all technology using gaseous fuels, including renewable gases, even running as backup. This would be a serious blow to the transition towards renewable fuels and to the development of renewable gas markets essential to ensure security of supply.

While flexibility needs will increase in all timeframes, the expected roll-out of flexible solutions, as it stands, will not even remotely meet those needs – neither in quantity nor regarding the ability to serve all flexibility timeframes[1]. It is therefore important that the proposal fosters all types of flexibility that do not increase emissions, instead of leading to an exclusion of a particular technology.

[1] See Trinomics and Artelys, 2023: *Power System Flexibility in the Penta region – Current State and Challenges for a Future Decarbonised Energy System*. Available at: https://tinyurl.com/2p8apby8

Triggering investments in adequate firm and flexible capacities

The Commission proposal recognises the importance of supporting investments in new generation. For renewables, this shall be done via direct price support schemes linked to the amount of electricity generated. In contrast to renewable generation, flexibility solutions will only produce electricity when called upon to balance the grid.

OUR RECOMMENDATION

Initiate the design of a "Capability Market" concept as a way to support investments in flexibility solutions and foresee its inclusion in the Electricity Regulation by 2025.

Since flexible technologies will only operate for very limited hours in a year, relying only on wholesale or peak prices to recover investments in these assets is not financially feasible.

The newly suggested "flexibility support schemes" shall only be available for "non-fossil flexibility such as demand side response and storage". For other flexibility solutions, the Commission refers to the option of capacity remuneration mechanisms already existing in today's regulation.

However, the way capacity mechanisms are defined today (Article 21 and 22 of Regulation 2019/943), limits them to supporting temporary solutions for national adequacy problems and imposes a preference for strategic reserves. This approach does not match the needs of flexibility solutions as a steady complement to variable renewables.

An innovative way to support system needs and adequacy would be the creation of comprehensive Resilience or Capability Markets, that, in a targeted way, support the provision of specific flexibility capabilities needed for the stability of the grid. This would be an alternative approach to a pure capacity mechanism.

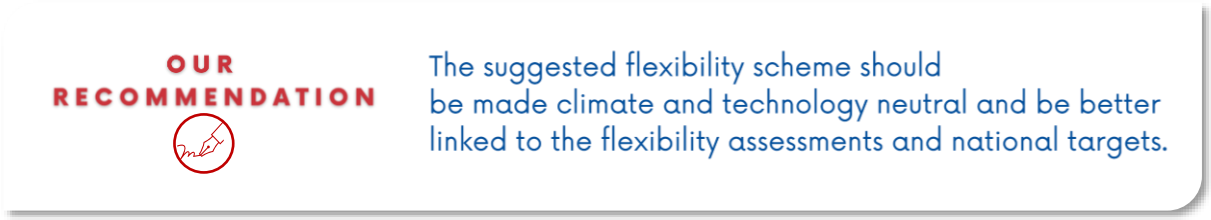
In a Capability Market, different tenders could be organised depending on the capacity timeframes, on the identified pinch points of the system (e.g., grid limitations) and on the specific system services that should be provided. Thus, this scheme would also incentivise investments in power plants that can be dispatched instantly or over longer periods of time, whether the plant is producing electricity or not. Given that capacity markets value adequacy over dispatchability, such services cannot be procured with the current capacity market design.

The development of new support mechanisms requires time. However, while the target of this revision is to quickly amend certain parts of the market design to achieve quick outcomes, it should also open the door to the deeper reforms needed to make the market future-proof.

Designing flexibility support schemes that reward the availability of a service

The new Article 19e proposed to be included in Regulation 2019/943 introduces "flexibility support schemes". Those schemes should promote the participation of "non-fossil flexibility" in case existing capacity mechanisms are insufficient to achieve the flexibility objective for demand response and storage, or when a country does not yet have a capacity mechanism in place. The new proposed Article 19f defines the design principles for such capacity support schemes for flexibility.

Capacity payments will be needed to incentivise solutions that will not run as much as possible, but only when needed. However, several questions arise in relation to these new articles 19e and 19f.



Avoiding duplications with state aid rules

The general provisions and design principles for capacity mechanisms are set in the Electricity Regulation, and additional requirements are also detailed in the Guidelines on state aid for climate, environmental protection, and energy 2022 (CEEAG). These rules allow and encourage the participation of demand response and storage. Member States can, already today, establish specific tenders for a specific set of solutions and technologies, as is being done in Belgium[2]. The added value of the current proposal is therefore not clear and might only unnecessarily complexify the existing rules.

[2] See Elia, 2023: Public consultation on the Low Carbon Tender design note. Available at: https://tinyurl.com/3txj48rp

Unclear relation between flexibility support schemes and capacity mechanisms

The rules and procedures to be followed by Member States that want to establish a capacity mechanism are complex and can take years to be approved. Member States need to set up implementation plans to address the market failures that create resource adequacy concerns and have the support programmes checked against state aid rules.

As it stands, it is unclear how far the flexibility support schemes would need to comply with the existing state aid rules or whether they constitute a capacity mechanism that can be fast-tracked, bypassing the rules that other Member States had to abide by.

Paving the way for a more coordinated and future-proof design of capacity mechanisms

There is no doubt that climate-neutral flexibility solutions should be prioritised. The changes proposed in short-term markets (i.e., gate closure times closer to real time and lower bidding sizes) will benefit flexibility solutions by opening more markets to them. The proposal does, however, miss out on some important aspects, notably flexibility solutions covering longer time periods, essential for security of supply in a net-zero system.

As stated before, current rules already allow and encourage the participation of demand response and storage in capacity mechanisms. Therefore, if the intention of the Commission was to facilitate the establishment of new capacity mechanisms, the easiest solution would have been to simplify the existing rules, instead of creating two different approval tracks for capacity payments.

As an interim step towards a more coordinated and future-proof design of capacity mechanisms, we propose to better link the flexibility support schemes to the flexibility needs assessment and national target. In addition, a technology neutral approach – which does not just fund specific solutions but pays for the services provided by demand-side response, storage, and other dispatchable flexible technologies – would be a better way forward.

Recognising the benefits of “behind-the-meter generation”

Behind-the-meter generation is mentioned twice in the text. The new Article 7a to be included in Regulation 2019/943, establishing a peak shaving product, requires that “the peak shaving product shall not imply starting generation located behind the metering point”. The new Article 19f on “Design principles for flexibility support schemes” excludes “starting fossil fuel-based generation located behind the metering point”.

“Behind-the-meter generation” is currently not defined in EU legislation, but we understand it refers to “captive power”. This generation allows to self-consume renewable energy. In addition, “behind-the-meter generation” such as batteries or micro and industrial CHP can take part in demand management schemes. As increasing shares of biomethane are fed into the grid, “behind-the-meter generation” using gas from the grid will also become sustainable. In the case of larger industrial installations, the decarbonisation is already driven by the ETS.

OUR RECOMMENDATION

Avoid any misunderstanding as regards the benefits of behind-the-meter generation, from biogas and biomethane plants to batteries.

The logic underlying the two requirements proposed by the European Commission is therefore not clear to us. While it is understandable that the Commission wants to avoid supporting the installation of additional generation capacities that use unabated fossil fuels, behind-the-meter generation using natural gas today will be able to switch to renewable gases once they become available.

Given that these decentralised installations help relieve the grid in times of high demand (peak demand) and low supply (and, therefore, counteract high market prices) their use should not be disincentivised.

As it stands, the proposed wording will disincentivise all behind-the-meter generation without distinction and thus reduce the available flexibility in the system instead of increasing it. A relatively easy solution be to still encourage behind-the-meter generation while making it clear that the intention is to avoid increasing greenhouse gas emissions.

Designing a European assessment of flexibility needs that contributes to security of supply

The Commission proposal foresees a national bi-annual assessment of flexibility needs (new Article 19c Regulation 2019/943) . It shall be carried out by national regulatory authorities with data from grid operators, be drawn up “for a period of at least 5 years” and consider the potential of “non-fossil flexibility such as demand side response and storage”. It shall also consider the “integration of different sectors” and “distinguish between seasonal, daily and hourly flexibility needs”.

OUR RECOMMENDATION

Flexibility needs assessments should be as granular as possible and contribute to the design of capacity mechanisms.

Flexibility plays a key role in ensuring both system reliability and generation adequacy. Security of (electricity) supply is generally understood as the sum of both system reliability and generation adequacy. It would therefore make sense to align the different assessments linked to security of supply, instead of creating two or more separate assessment cycles and governance structures.

Ideally, flexibility needs should be identified in adequacy assessments and included in the European resource adequacy (ERAA) methodology. Similar as to what is done with resource adequacy assessments, a Europe-wide flexibility assessment would give a more comprehensive view than just an evaluation of national assessments.

In addition, considering the links between flexibility, system needs and system adequacy, flexibility assessments should also include plans on how to overcome identified shortfalls, including through capacity support schemes.

Lastly, a series of improvements would be needed to increase the scope and granularity of the assessment and thus provide better investment signals:

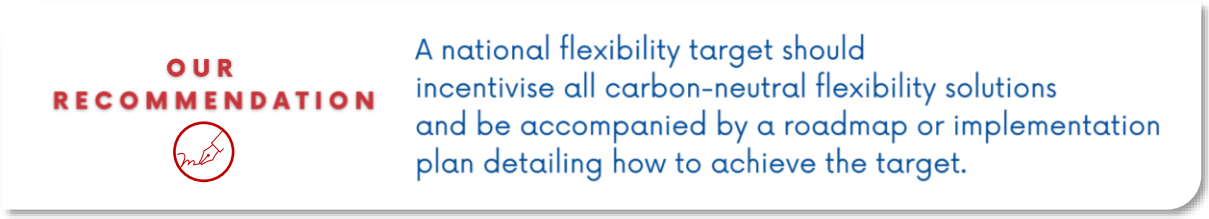
- The flexibility assessments should distinguish between seasonal, **weekly**, daily, and hourly flexibility needs, in line with established research and literature. The technologies needed to support weekly needs might be different from very short-term and long-term ones.

- The flexibility assessments should **detail the specific capabilities (ancillary services) or system attributes** that the flexibility sources are expected to meet. The assessments should offer details on the type of flexibility that is needed in the system instead of merely announcing the total flexible capacity requirements of the system.

- Heating needs make up the bulk of seasonal demand variations. It could therefore be beneficial to include a specific section related to the **flexibility needs that will arise with the electrification of the heating sector**.

Establishing "National flexibility targets" supported by a clear roadmap

The proposal tabled by the Commission introduces a new "Indicative national objective for demand side response and storage" (new Article 19d in Regulation 2019/943) which shall be based on the flexibility assessments report. This indicative national objective shall also be reflected in Member States' integrated national energy and climate plans.



While this is a very welcome proposal, we regret its lack of ambition. Instead of a mere "objective", a target would give a stronger signal to investors and allow its alignment with other national targets.

In addition, it is illogical to single out specific technologies to cover a system need (flexibility) that will change with time and will need to be reassessed at least every 5 years. Setting up an objective or target for specific technologies or solutions will not achieve the most efficient outcome. Instead, all carbon-neutral flexibility solutions should be equally incentivized.

Lastly, it would be good to accompany the flexibility target with national flexibility roadmaps or implementation plans, laying down specific measures and milestones to incentivise flexibility in different timeframes (seasonal, weekly, daily, hourly) and to bring existing flexible assets to net-zero.

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