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The Electricity Market Design Revision and the European Commission's Work on Energy Storage

Introduction

This document briefly analyses how energy-related initiatives presented by the European Commission on the 14th of March, 2023 impact the flexibility and energy storage sector.

On 14th of March 2023, the European Commission published:

I. On electricity market design:
   a. The EU Electricity Market Design revision proposal
   b. The Staff Working Document on the Electricity Market Design

II. On energy storage:
   c. The Staff Working Document on Energy Storage.
   d. The European Commission Recommendation on Energy Storage
   e. The ENTEC Study on energy storage
   f. The Joint Research Center study on Europe's flexibility needs

Importantly, **no energy storage strategy was announced – despite the European Parliament calling on the European Commission to develop "a comprehensive strategy on energy storage" back in 2020** in the context of the European Parliament's Own Initiative Report on energy storage.

1. *Section 1 of this document focuses on the Electricity Market Design revision*
2. *Section 2 of this document focuses on the European Commission Recommendation on energy storage*
3. *Section 3 of this document focuses on the European Commission Staff Working Document on energy Storage*

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Section 1: The Electricity Market Design Revision

With the growing share of renewables in the energy mix and the disruptions to security of supply caused by the Russian invasion of Ukraine, flexibility is a pressing issue for the energy sector and a key political challenge to address within the revision.

Energy storage was first codified in the Clean Energy Package (CEP), which aimed at ensuring a level playing field between flexibility and generation technologies. The CEP fell short to properly address security of supply and its decarbonisation, and Member States lagged in its implementation. The Commission proposal addresses these issues by introducing both specific support schemes and market-based mechanisms to support non-fossil flexibility.

Provision	*Impact on flexibility markets*
Peak shaving product Article 7a	Transmission system operators (TSOs) may procure **market-based peak shaving products to call for electricity demand reduction during peak hours**, defined as an hour with high consumption combined with a low level of electricity generated from renewable or other inframarginal energy sources, and clarified by the TSO. In an early leaked proposal from the Commission, it was made clear that market participants could either reduce electricity consumption, or use stored energy during peak hours. Yet, the published final proposal only states demand reduction may play a role. From the point of view of the TSO, participants using stored energy from behind-the-meter energy storage during peak hours would likely be seen as reducing consumption; however, **the role co-located and front-of-the-meter storage play in shifting energy to reduce and green peaks, would not be captured under this product**.
Right to energy sharing Article 15a	Measures **supporting the active participation of customers** in the electricity market, including energy sharing schemes, **enhance flexibility by fostering behind-the-meter energy storage** (which is a tool to achieve demand side response), including the access to template contracts, the prohibition of discrimination by market participants, and encouraging the use of a third party for energy sharing purposes.
Tariff methodologies Article 18	The **tariff methodologies of TSOs and DSOs shall consider both capital expenditure (CAPEX) and operational expenditure (OPEX)** to better support the use of flexibility services. The tariff methodologies for TSOs and DSOs shall also introduce performance targets to incentivise the procurement of flexibility.
Power Purchase Agreements (PPAs) Article 19a	Member States shall **facilitate the deployment of PPAs**, by reducing the risks associated with off-taker payment default, through guarantee schemes at market prices, and by allowing facilities with a signed PPA to participate in support schemes (and even, if needed,

	give preference to bidders presenting a signed PPA from potential buyers that face entry barriers to the PPA market). RES + storage PPAs are a possible source of long-term revenue streams that would benefit the uptake of new storage facilities; however, **time-matching generation and consumption to ensure the PPA is fully renewable is not taken into consideration** in the published EMD proposal.
Flexibility needs assessment Article 19c	By January 2025, and then **every two years afterwards, the regulatory authority of each Member State must assess the flexibility needs in the electricity system with a 5-year horizon**. The potential of non-fossil flexibility (energy storage and demand response) to fulfil this need at both transmission and distribution level shall be included. **The report shall distinguish between seasonal, daily, and hourly flexibility needs**. ENTSO-E and the EU DSO Entity shall define the type and format of data TSOs and DSOs must provide to regulatory authorities, and a methodology for calculation flexibility needs. ACER can approve or propose amendments.
Flexibility objectives Article 19d	Based on flexibility assessments, **Member States shall set an indicative national objective for demand response and energy storage, to be reflected in their NECPs**. It is not clear whether Member States must set a separate objective for energy storage, and a separate for demand response, or if a combined objective is possible. **The measure of this objective is also not given,** whether in GW, GWh, **or even financial needs to meet defined flexibility needs**.
Capacity Mechanisms (CMs) Article 19e	Member States shall consider the **introduction of additional criteria or features to promote the participation of non-fossil flexibility** when designing CMs. The provision may support energy storage participation in CMs (which is key for non-fossil security of supply and long-term revenues especially for longer duration storage) but does not mandate specific measures and **doesn't set any obligation for Member States to encourage non-fossil facilities participation**. The accompanying Staff Working Document states that **energy storage is currently at "very low levels" in EU CMs** and that CMs are still expected to continue to support fossil-fuelled power plants beyond 2030.
Flexibility support schemes Article 19e – 19f	When a CM is not in place, or a CM alone is not sufficient to meet flexibility needs in accordance with Art. 19d, **Member States may set up specific support schemes for energy storage and demand response**. These need to be (in addition to usual State aid requirements such as proportionality, cost-effectiveness, and others) **limited to new investment**, follow open and transparent competitive auctions, **preserve exposure to price signals**, set out a minimum level

	of participation (in terms of activated energy), and apply penalties for capacity providers not respecting it. This design strikes a good balance between public support (needed to provide a baseline revenue for new capacity, when a market failure arises) and exposure to the spot markets, where the price volatility allows storage facilities to be profitable, but again **doesn't mandate any obligation for Member States to reach the objectives identified through Art. 19d**.

Section 2: European Commission Recommendation on Energy Storage

The European Commission Recommendation on Energy Storage builds upon the European Commission Staff Working Document on Energy Storage, which recognises that "energy storage can play a crucial role in the current and future energy system". The Recommendation complements the Electricity Market Design revision.

The document lists ten recommendations that Member States should look into to achieve a decarbonised and secure EU energy system. The ten recommendations:

- Are positive, but oftentimes general
- In the case of Capacity Market and support schemes-related provisions, they *might* hinder the objective of creating a single, interconnected electricity market:
    - Different Capacity Markets or support schemes will exist, changing from country to country
    - This diversity and complexity *may* turn away investors
    - Therefore, it may be argued some recommendations should be present in the Electricity Market Design revision proposal to ensure:
        - (a.) Member States actually implement them
        - (b.) The integration of European electricity markets.

In the blue text, EASE highlights some points that would have been worth including in the Commission Recommendation.

Recommendation N. and content	*Impact on the energy storage sector*
1. Member States take into account the double role (generator-consumer) of energy storage when defining the applicable regulatory framework and procedures, e.g. for: a. Double taxation b. Network charges and tariff schemes c. Permitting procedures	- **Positive**: It aims to avoid unreasonable barriers and regulatory uncertainty. In most national legal systems energy storage falls under either "generation" or "consumption" - **Missing**: The recommendation could be more specific for network changes, introducing e.g. a mechanism that reflects the congestion in the grid and signals the scarcity of grid resources - This topic was to a great extent already addressed in the Clean Energy Package, but years later, Member States still lag in its implementation - **Missing**: Establishing a definition for system flexibility and energy shifting may further help in avoiding legal uncertainty
2. Member States: a. Identify the flexibility needs of their energy systems in the short, medium and long term.	- **Positive**: NECPs often overlook storage, both in terms of deployment and manufacturing. As the NECPs revision will be this year, it's an opportunity for

b. Update their national energy and climate plans (NECPs) to strengthen energy storage's role c. Assess manufacturing capacity needs	energy storage - Positive: Flexibility is associated within different timeframes (here it is categorised as "short, medium, long term")
3. Member States/regulatory authorities: a. Ensure system operators assess the flexibility needs when planning transmission and distribution networks	- Positive: Energy storage can defer costly grid upgrades - **Missing**: Non-binding seasonal energy shifting targets and strategy - **Missing**: Renewable energy curtailment reduction is not considered, nor new curtailment caps - **Missing**: Member State fossil gas peaking replacement strategies would be an effective tool to decarbonise flexibility, as is already done in the United States
4. Member States: a. Identify potential financing for all types of storage	– Positive, but general
5. Member States: a. Explore whether energy storage services (especially in distribution networks/non-frequency ancillary services) are sufficiently remunerated b. Whether operators can add up the remuneration of several services	- **Positive**: It promotes strengthening remuneration and revenue stacking, but general - **Missing**: The procurement of ancillary services should follow the general principle of pursuing the least carbon-intensive option - **Missing**: Congestion management platforms are an effective way to procure flexibility in a competitive manner - **Missing**: Priority dispatch is not discussed – energy storage deployed in co-located facilities with renewables follows the same priority dispatch rules of renewables-only facilities
6. Member States consider a redesign of capacity mechanisms, e.g. by: a. Ensure appropriate derating factors b. Reduce minimum eligible capacity and minimum bid c. Facilitate aggregation d. Lower CO2 emission limits e. Prioritise greener technologies	- **Positive**: At the moment, the vast majority of capacity auctions are won by gas turbines, with renewables and storage representing a minority - **Positive**: Smaller minimum bids and easier aggregation may empower energy storage - **Missing**: Seasonal capacity auctions that ensure revenues streams for technologies able to store electricity

	from season to season - **Missing**: Storage-only auctions, as per the Italian case
7. Member States: a. Promote, through regulatory and non-regulatory actions, the uptake of demand response and behind-the-meter	- **Positive**: Can contribute to the electrification of end-use sectors and promote EV mobility
8. Member States favour storage and flexibility in (energy) islands/remote regions by: a. Introducing support schemes b. Revise network connection criteria to promote renewables with storage	- Positive, but general. There are no details on what the support schemes should look like. Yet, the topic is already discussed in the Electricity Market Design revision
9. Member States and national regulatory authorities publish data on: a. Network congestion b. Energy curtailment c. Market prices d. RE and GHG e. Installed energy storage facilities	- Positive, but general - **Missing**: Transparency obligations for system operators
10. Member States a. continue to support research and innovation in energy storage b. consider de-risking instruments, such as technology accelerator programmes/support schemes	- Positive

Section 3: The European Commission Staff Working Document on Energy Storage

As highlighted in the introduction, the Staff Working Document on Energy Storage release was accompanied by the ENTEC Study on energy storage, The Joint Research Center study on Europe's flexibility needs, and the just discussed Recommendation on Energy Storage

The European Commission Staff Working Document on energy storage provides an overview of the EU's energy storage landscape, challenges, and opportunities.

Key Takeaways – The Commission believes that:	*Explanation*
N. 1: Energy storage added value must be recognised	• "Energy storage can play a crucial role in the current and future energy system. It can help decarbonise the economy and increase the efficiency and security of energy supply by providing flexibility, stability and reliability" • "Energy storage can play a crucial role in the current and future energy system. It can help decarbonise the economy and increase the efficiency and security of energy supply by providing flexibility, stability and reliability"
N. 2: Different energy storage technologies, for different applications and durations, are needed	• "Long-duration energy storage" is needed to "shift" energy over timescales • Certain energy storage technologies, e.g. Thermal, are needed to decarbonise several sectors
N. 3: Energy storage role's will increase as renewables are further integrated. The future power system will be more sophisticated	• *This takeaway is addressed in the Commission Recommendation, Electricity Market Design revision*
N. 4: Current EU legislation is already solid, nonetheless there is "potential to be unlocked"	• The EU's Fit-for-55 package will strengthen energy storage (in particular through: Energy Taxation Directive, Renewable Energy Directive, Energy Efficiency Directive, Energy Performance of Building, EU Taxonomy, and the Revised CO2 standards for cars and vans/Alternative Fuel Infrastructure Regulation/FuelEU). Similarly, Power-to-Gas-related legislation is expected to also have a positive impact. • On the EU-wide ten-year network development plan (TYNDP), a new methodology specific to

	energy storage is being addressed • *This takeaway is addressed in the Electricity Market Design revision*
N. 5: Energy storage should be developed as a market-based activity	• System operators should only own, develop, manage, and operate energy-storage facilities in exceptional cases
N. 6: At the national level, legislation is still not tailored to energy storage	• The Clean Energy Package implementation is still incomplete in many Member States – oftentimes even an energy storage definition is missing • Regulatory conditions for energy storage change significantly from country to country • *This takeaway is addressed in the Commission Recommendation*
N. 7: On financing, there is a need to ensure increased revenues and reduce investment risks to mobilise private investments	• Both wider revenue stacking and long-term visibility and predictability of revenues are needed to attract investments • Different storage technologies may require different business models based on their characteristics and applications. • *This takeaway is addressed in the Commission Recommendation, Electricity Market Design revision*
N. 8: On system planning, energy storage could be further exploited by network operators. Grids must be fit for energy storage	• Incentives for system operators to opt for innovative solutions and less costly network investments are important • Network charges and tariffs tailored to storage are needed. • Permit-granting procedures are too lengthy and complex • *This takeaway is addressed in the Commission Recommendation, Electricity Market Design revision*
N. 9: The EU needs a strong, sustainable, and resilient industrial value chain for energy-storage technologies	• Specific monitoring is needed to ensure a resilient supply chain • Better standards, legislation, and existing EU

	strategies can strengthen the Industry
N. 10: Raw materials used by several energy-storage technologies have been identified as critical"	• *This takeaway is addressed in the Critical Raw Materials Act*
N. 11: Flexibility/ancillary services drive energy storage deployment	• *This takeaway is addressed in the Commission Recommendation, Electricity Market Design revision*
N. 12: Strategies or national targets (e.g. in the National Energy and Climate Plans) drive energy storage deployment	• *This takeaway is addressed in the Commission Recommendation*
N. 13: Maturity of energy storage is growing but still insufficient	• Both R&I and regulatory sandboxes are needed to address that • Public financing may need to be tailored to storage • *This takeaway is addressed in the Commission Recommendation*
N. 14: A level playing field is important	• Regulatory frameworks should be updated to provide a level playing field for all energy storage technologies
N. 15: New flexibility services and revised capacity Markets could support energy storage	• The Electricity Market Design and the Network Codes on demand-side flexibility are key to address this • *This takeaway is addressed in the Commission Recommendation, Electricity Market Design revision*
N. 16: Behind-the-Meter, and Electric Vehicles in particular, has huge potential	• *This takeaway is addressed in the Commission Recommendation, Electricity Market Design revision*
N. 17: Transparency, data availability, and sophisticated analytical tools are needed	• *This takeaway is addressed in the Commission Recommendation, Electricity Market Design revision*
A notable absence: Throughout the Staff Working Document, the positive role of energy storage strategy and objectives in accelerating the deployment of energy storage is discussed. *Yet, an energy storage strategy or objectives at the European Union level is not discussed.*	