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ANALYSIS: THE ELECTRICITY MARKET DESIGN REVISION

Impact on security of supply, flexibility, and energy storage

Introduction

The Russian invasion of Ukraine has highlighted the potential risks associated with the European Union's transition to renewable energy sources to meet its 2030 targets. While decarbonising the energy sector is a key priority, it's become clear that relying on renewables without addressing flexibility impacts energy security and affordability for consumers. Price spikes and gas shortages have forced European Union policymakers to act swiftly.

On 14 March 2023 the European Commission unveiled its proposed reform of the Electricity Market Design. Although – overall – quite limited in scope, the proposal has the potential to significantly impact the energy storage sector.

The proposal strikes a good balance between public involvement and market-based mechanisms, and it ultimately aims at maintaining the current price signals and overall framework focused on day-ahead and intraday markets – while introducing some tweaks.

The main objectives of the proposal are the following:

- Boosting investments in renewables and flexibility;
- Reducing energy prices volatility;
- Protecting consumers from price spikes.

The Market Design Revision proposal is accompanied by a [Staff Working Document for the Electricity Market Design Reform](#), a new [Staff Working Document on Energy Storage](#), a series of [recommendations on energy storage](#), a Joint Research Centre [study on flexibility needs and storage](#), and an [ENTEC study on energy storage](#).

- **Boosting investments in renewables and flexibility**

The proposal is especially focused on fostering public and private investment in renewables and non-fossil flexibility (energy storage and demand response). By utilising support schemes in the form of Contracts for Difference (CfDs) and by signing renewable Power Purchase Agreements (PPAs) with private off-takers, renewable energy suppliers and energy storage operators can receive reliable revenues while consumers can benefit from stable prices.



According to the Commission, this can lower financial risks and reduce capital costs, ultimately contributing to the goal of reaching renewable targets as set in the Renewable Energy Directive.

The Commission highlights that to promote investment in renewables, it is important to support in parallel the deployment of (non-fossil) flexibility, i.e. storage and demand response. The proposal aims to achieve this by:

- 1) Allowing Member States to create or adjust capacity mechanisms that promote low-carbon flexibility;
- 2) Enabling Member States to implement new support schemes for non-fossil flexibility like demand side response and storage;
- 3) Mandating Member States to evaluate their power system flexibility needs and establish objectives to meet them;
- 4) Authorising transmission system operators to design a peak shaving product that facilitates demand response to reduce consumption peaks during specific hours of the day.

Additionally, system operators will be responsible for improving transparency in connection with capacity availability, allowing renewable energy developers to deploy RES and energy storage in areas with less congestion. Finally, the proposal aims to bring trading deadlines closer to real-time in an energy mix characterised by increasing amounts of RES, improving system efficiency, and more accurately reflecting balancing needs based on actual generation from RES.

➤ **Reducing energy prices volatility**

Reduction of price volatility is at the core of the market design revision. The European Commission addresses these issues by focusing on:

1. Optimising short-term markets by improving liquidity;
2. Enhancing market access to stable long-term contracts (PPAs and CfDs).

To achieve this, the minimum bid size for short-term markets will be reduced to 100kW, and PPAs will be made more widely available by tackling financial risks and incentivizing access to the market. CfDs will be introduced as a preferential support scheme for certain types of energy, with two-sided contracts that guarantee a minimum price and a maximum price to channel revenue back to the public. To improve liquidity in forward markets, the proposal includes regional reference prices, longer transmission rights, and the expansion of ACER competences.

➤ **Protecting consumers from price spikes**

The proposal introduces several provisions to shield consumers from high prices. It gives consumers the right to fixed or dynamic price contracts, access to regulated retail prices during



a crisis, clearer contract information, and the right to share renewable energy. In addition, the proposal involves establishing a supplier of last resort regime to support households and small and medium enterprises during a crisis. Finally, the proposal sets a provision to stabilise energy supply for industry by encouraging suppliers to use forward contracts to lock future prices.

In the next section, key measures impacting energy storage will be discussed:

- Describing the European Commission proposal
- Underlining similarities and differences between EASE recommendation (December 2022) and the Commission's proposal
- Highlighting possible recommendations to improve the Commission's proposal

In the final section, the previously mentioned European Commission [recommendations on energy storage](#) will be mentioned.



Analysis of the Electricity Market Design reform proposal

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1. Peak shaving product

Electricity Market Design Proposal

Under the European Commission proposal, 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 renewables or other inframarginal energy sources, and clarified by the TSO. The specific reason to tackle peak hours is that during these periods gas supplies a significant proportion of the electricity need, which raises the overall electricity price and leads to higher CO2 emissions.

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, however the published 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, and therefore be able to participate under the product; however, **the role co-located and front-of-the-meter storage play in shifting energy to reduce and decarbonise peaks, would not be captured under this product.**

EASE Position

Initial EASE position called for the procurement of ancillary services to pursue the least carbon-intensive option, taking into consideration the ETS CO2 price. Energy storage operators should



be able to sign multi-year contracts with system operators, with the ability to stack different revenues based on ancillary services.

To tackle congestion, EASE called for a further rollout of local flexibility markets, standardised flexibility service markets based on capacity payments, and ensure minimum contract lengths of at least one year. Additionally, faster Frequency Response products, such as those found in the UK, Ireland, and Italy, should be encouraged across the EU.

What can be improved?

Firstly, **all forms of energy storage (behind-the-meter, front-of-the-meter, and co-located) should be able to participate under the product** alongside demand side flexibility, covering all technologies and time durations. Energy storage assets, regardless of how they are placed on the grid, are able to reduce overall system demand. For example, during periods of high demand, industry may choose to rely on stored energy from grid-based storage located nearby, which will not changing demand when measured at the connection point, however demand on that part of the grid put onto the larger energy system would be reduced, therefore lowering overall demand, and replacing gas.

Secondly, when designing peak shaving products, **TSOs should consider whether peaks can be better decarbonised** as well as reduced, to best remove gas from producing electricity.

2. Right to energy sharing

Electricity Market Design Proposal

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 enact 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.

The proposal introduces the definition of **active customer**, meaning “a final customer (or group of jointly acting customers) who consumes or stores electricity generated within its premises located within confined boundaries or self-generated or shared electricity within other premises [...], or who sells self-generated electricity or participates in flexibility or energy efficiency schemes, provided that those activities do not constitute its primary commercial or professional activity”.

EASE Position

EASE didn't advocate for any specific reform of the framework concerning active customers in the EMD revision. However, any opportunity to enhance customers participation in the electricity market is a positive improvement to guarantee their empowerment and ensure that the system is resilient and not exclusively reliant on grid-level flexibility.



What can be improved

There are not specific points for improvement to highlight – but it's key to ensure policy coordination with the Renewable Energy Directive, and that more active participation by consumers goes in parallel with enhanced transparency and data sharing by DSOs.

3. Tariff methodologies

Electricity Market Design Proposal

The proposal introduces measures to encourage the use of flexibility services by system operators, both TSOs and DSOs, and to better consider the potential of using flexibility as an alternative to grid expansion/modernisation. The Commission highlights in its Staff Working Document on the Electricity Market Design that most Member State' regulatory frameworks have a bias towards capital expenditure, which could disincentivise choosing a flexibility solution.

For the reasons stated above, new **tariff methodologies of TSOs and DSOs shall consider balancing between both capital expenditure (CAPEX) and operational expenditure (OPEX)** to better support the use of flexibility services. Previous leaks of the proposal had a direct reference to "TOTEX", where the total capital and operational expenditure over the long-term operating life of an investment, how wording in the published proposal settled on "balancing".

Additionally, **tariff methodologies for TSOs and DSOs shall now also introduce performance targets to incentivise the procurement of flexibility.** In the previous market design, setting performance targets in general was optional and up to the national regulatory authority (NRA). The text leaves open how the NRA would design these targets and whether there would be incentives for hitting targets, or penalties for not meeting them.

EASE Position

EASE has called for both capital and operational expenditure to be taken into consideration when investigating possible grid expansion, which has been taken onboard by the Commission's proposal.

What can be improved?

More clarification on how significantly NRAs would alter tariff methodologies is needed to better understand the impacts these changes would make.



4. Power Purchase Agreements (PPAs)

Electricity Market Design Proposal

Member States shall **facilitate the deployment of PPAs with a view to reaching the objectives set out in the NECPs. They are encouraged to do so** by reducing the risks associated to 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).

EASE Position

RES + storage PPAs are a possible source of long-term revenue streams that would benefit the uptake of new storage facilities, by ensuring bankability especially for bigger projects. EASE advocated to introduce a definition of 24/7 renewable energy in regulation or as industry practice (conceptualised as guaranteeing that each kWh is consumed in the same calendar hour as it is produced/injected into the grid, through validation by metering or grid data and energy attribute certificates with a time stamp of one hour or less). Moreover, EASE proposed to develop an incentive system (through longer contracts, temporary credit guarantees by Member States, and large use of standardised forms) to procure as close as 24/7 renewable energy as possible. Finally, EASE called to ensuring access to long-term 24/7 contracts to residential consumers.

What can be improved?

Time-matching generation and consumption to ensure the PPA is fully renewable is not taken into consideration in the EMD proposal. A definition may be introduced, and the European Commission could list some suggested measures to nudge the uptake of 24/7 contracts (through for example public procurement, fiscal incentives, lifting administrative barriers).

5. Flexibility needs assessment

Electricity Market Design Proposal

The proposal introduces requirements for Member States to assess the flexibility needs of the electricity system to support the deployment of renewable energy sources and security of supply.

By January 2025, and then **every two years, 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 which TSOs and DSOs must provide to regulatory authorities, and a methodology for



calculation flexibility needs. ACER can approve or proposal amendments to the proposed methodology.

The proposal does little to clarify what ENTSO-E and the EU DSO Entity will take into consideration when proposing a methodology for be used by Member States to calculate flexibility needs, however it is assumed that the latest [report on flexibility requirements by the Joint Research Centre](#) will provide a foundation. Whether stakeholders will be able to input on this methodology is unclear.

EASE Position

EASE has previously called for the need of an energy storage strategy and has called for a comprehensive methodology to asset flexibility needs an EU-level. The proposal to have Member States asset flexibility needs and the potential of energy storage to fulfil this need is welcomed.

What can be improved?

There exist a range of methods to calculate flexibility, with some considering different needs for ramping-up and ramping-down generation/consumption, whereas the Joint Research Centre looked at an overall flexibility magnitude, regardless of direction. Other assumptions need to be discussed, such as how ancillary services are considered, renewable curtailment levels, “copper plate” topologies, and natural gas prices.

For this reason, **stakeholders involved with non-fossil flexibility should be consulted during methodology development.**

6. Flexibility objectives

Electricity Market Design Proposal

To build upon the flexibility assessments, **Member States shall set an indicative national objective for demand response and energy storage, to be reflected in their National Energy and Climate plans.**

These targets are mandatory to set, but would be indicative, meaning there is nothing binding the Member State legally to fulfilling these objectives. What is not clear from the current proposal is whether Member States must set a separate objective for energy storage, and another for demand response, or if a combined objective is possible. The use of the singular “objective” implies the latter.



The measure of this objective is also not given, whether in GW and/or GWh, or if financial needs to meet defined flexibility needs should be included. This lack of clarity risks creating a patchwork of differently based objectives across the EU, making it difficult to extrapolate up to the EU-level and give investors confidence to invest in non-fossil flexibility in Europe.

EASE Position

EASE has previously published its analysis on [Energy Storage Targets for 2030 and 2050](#), investigating energy storage needs, improving upon out-dated Commission analysis on EU flexibility needs for a 32% renewable energy target, to see what is required to meet 40–45%.

What can be improved?

Firstly, **Member States should be required to separate objectives for energy storage and demand-side response**, in order to give long-term market signals to channel investment into a range of non-fossil flexible technologies. The role that some energy storage assets may play in participating in demand-response needs to be fairly factored in.

The metric to be used to set objectives should be clarified to have harmonisation across the EU, and to better compare the progress between Member States.

7. Flexibility support schemes

Electricity Market Design Proposal:

When a Capacity Mechanism is not in place, or a Capacity Mechanism 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 principles set out strike 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 and also provide benefits to the grid, but again **doesn't mandate any obligation for Member States to reach the objectives identified through Art. 19d**.

EASE position

EASE has called for the deployment of specially tailored Contracts for Difference and Cap and Floor mechanisms for energy storage to provide partial fixed revenues, while also allowing for market exposure to provide system benefits. Additionally, co-located facilities covered under



any renewable support scheme should be able to participate in other markets. Any support schemes should be open to all forms of energy storage, including longer duration energy storage.

What can be improved?

There is no requirement for Member States to launch flexibility support schemes, even in the case where it is determined that the current market and capacity mechanisms are not sufficient alone to meet the set flexibility objectives. For this reason, **stronger encouragement is needed to ensure Member States launch flexibility support schemes where needed.**

The limitation to new investments must be preserved as well as limiting the scheme to non-fossil flexibilities such as energy storage and demand-response. A backdoor to allow fossil gas to provide flexibility under the scheme must not be introduced.

8. Capacity Mechanisms (CMs)

Electricity Market Design Proposal

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 to support non-fossil security of supply and providing long-term revenues especially to 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 Document¹ 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. At the same time, the document states that **what is being proposed in the market design reform is actually already possible under existing rules.** This admission seems to suggest that little change will come to capacity mechanisms.

Not every Member State has a capacity mechanism, and the process to setting one up can be burdensome, therefore the Commission has stated it will work with ENTSO-E and ACER to simplify the approval process of the European resource adequacy assessment (ERAA) and in the national resource adequacy assessment (NRAA) needed to set up a capacity mechanisms

EASE Position

EASE has called for progressively reducing the carbon cap of capacity mechanisms to 250 g of CO₂ per kWh, in line with the European Investment Bank's energy lending policy, to phase out the use of fossil fuels. Milestones should be set every 5 years until 2040 to phase out fossil fuel capacity providers.

Long contracts that have historically been handed out to fossil gas generation should be given to energy storage, with contracts of around 15–20 years, with the longest contracts awarded to



newly built facilities with carbon-neutral operations. Higher remuneration should be awarded depending on carbon content, with the option to factor in energy investment savings due to reduce renewable energy curtailment. Assets under the capacity mechanism should still have access to other revenue streams such as ancillary services to provide full system benefits.

What can be improved?

A new cap of 250 g of CO₂ per kWh needs to be brought in at an EU level, without derogations (such as the one Poland is currently operating to keep coal in its CM). Milestones must be set to ensure a gradual lowering of the cap and the phase in of non-fossil security of supply. The current proposal leaves everything up to Member States, leaving open the door to inaction and further fossil lock-in. Longer contracts or carbon-neutral facilities should also be supported.



Analysis of the 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.

<i>Recommendation N. and content</i>	<i>Impact on the energy storage sector</i>
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: <ol style="list-style-type: none"> a. Double taxation b. Network charges and tariff schemes c. Permitting procedures 	<ul style="list-style-type: none"> - 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



	<p>may further help in avoiding legal uncertainty</p>
<p>2. Member States:</p> <ul style="list-style-type: none"> a. Identify the flexibility needs of their energy systems in the short, medium and long term. b. Update their national energy and climate plans (NECPs) to strengthen energy storage's role c. Assess manufacturing capacity needs 	<ul style="list-style-type: none"> - 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 energy storage - Positive: Flexibility is associated within different timeframes (here it is categorised as "short, medium, long term")
<p>3. Member States/regulatory authorities:</p> <ul style="list-style-type: none"> a. Ensure system operators assess the flexibility needs when planning transmission and distribution networks 	<ul style="list-style-type: none"> - 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
<p>4. Member States:</p> <ul style="list-style-type: none"> a. Identify potential financing for all types of storage 	<ul style="list-style-type: none"> - Positive, but general
<p>5. Member States:</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> - 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



	<p>follows the same priority dispatch rules of renewables-only facilities</p>
<p>6. Member States consider a redesign of capacity mechanisms, e.g. by:</p> <ol style="list-style-type: none"> 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 	<ul style="list-style-type: none"> - 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
<p>7. Member States:</p> <ol style="list-style-type: none"> a. Promote, through regulatory and non-regulatory actions, the uptake of demand response and behind-the-meter 	<ul style="list-style-type: none"> - Positive: Can contribute to the electrification of end-use sectors and promote EV mobility
<p>8. Member States favour storage and flexibility in (energy) islands/remote regions by:</p> <ol style="list-style-type: none"> a. Introducing support schemes b. Revise network connection criteria to promote renewables with storage 	<ul style="list-style-type: none"> - 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
<p>9. Member States and national regulatory authorities publish data on:</p> <ol style="list-style-type: none"> a. Network congestion b. Energy curtailment c. Market prices d. RE and GHG e. Installed energy storage facilities 	<ul style="list-style-type: none"> - Positive, but general - Missing: Transparency obligations for system operators
<p>10. Member States</p> <ol style="list-style-type: none"> a. continue to support research and innovation in energy storage 	<ul style="list-style-type: none"> - Positive



b. consider de-risking instruments, such as technology accelerator programmes/support schemes	
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About EASE

The European Association for Storage of Energy (EASE) is the voice of the energy storage community, actively promoting the use of energy storage in Europe and worldwide. It supports the deployment of energy storage as an indispensable instrument within the framework of the European energy and climate policy to deliver services to, and improve the flexibility of, the European energy system. EASE seeks to build a European platform for sharing and disseminating energy storage-related information and supports the transition towards a sustainable, flexible and stable energy system in Europe.

For more information please visit www.ease-storage.eu

Disclaimer

This response was elaborated by EASE and reflects a consolidated view of its members from an energy storage point of view. Individual EASE members may adopt different positions on certain topics from their corporate standpoint.

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