

Energy Storage in the EU: unlocking the next step in the energy transition via the electricity market design

Summary of key recommendations

Energy storage plays a key role in the new decentralised and flexible electricity system. Energy storage allows the shifting of electricity from the moment of generation, over time, to the moment of use. But not only that, it is also an inclusive technology that brings the energy markets to potentially millions of consumers while taking great steps into guaranteeing stability of our new emerging decentralised and renewable energy system.

The Clean Energy for All European package presents the opportunity to shape the future of storage and its place in the energy system. This paper covers, the changes that are needed for energy storage to unlock its full potential and how the Electricity Market Design Directive and Regulation can support this goal.

1. **Foster market-oriented adoption of storage.** Storage has to be allowed for use in market-based scenarios solely, to make the full range of services and benefits available to society.
2. **Prevent double taxation of storage.** Storage must be charged in a fair and transparent way, double taxation has to be overcome, to unleash the cost-saving potential of this technology to the public.
3. **Allow stacking of services.** To provide a better business case storage must be allowed to offer multiple services from a single or multiple unit(s) to multiple markets.
4. **Allow aggregation of storage.** Storage has to be allowed to be aggregated and bring flexibility to all organised markets by a service provider, independent aggregators or suppliers.

Overall, an open and free market is essential for storage. Storage solutions will become competitive not only thanks to cost decrease due to technological evolution, but also due to an unrestricted market, which values fairly all services. Missing the chance now for a new framework might hinder the rapid adoption of this technology into our electricity network. Important principles have been put forward in the proposals for the Electricity Market Regulation and Directive. The inclusion of some important amendments tabled by the European Parliament and Council should bring necessary clarifications and improvements to secure a successful development path for energy storage.

Introduction

The European Union aims to lead the way towards the clean energy transition by adopting some of the most forward-looking climate and energy legislation in the world. This will lay the foundations for energy markets to transform into more competitive, flexible and effective structures where modern energy models can thrive. New scenarios are already shaping up, driven by growing shares of decentralised solutions and variable renewable energy sources. Energy storage, including batteries in electric vehicles, is at the core of this transformation and will play a fundamental role throughout the electricity system of tomorrow. It does so not only by mitigating the variability of renewable energy sources (RES), but also by enabling citizens to play a more active role and become engaged customers – thereby democratising energy markets.

In line with this ambition, the European Commission's proposals on the electricity market design¹ re-write the rules which will govern the electricity markets of tomorrow. In these future markets, new technologies and services such as automation and digitalisation, battery storage, distributed solar and wind power generation and real-time data generation and management will become increasingly common and offer huge benefits in terms of increased system reliability, safety, decreased costs and emissions all the while helping to avoid the need to build new generation capacity². Both the Parliament and Council have recognised the benefits that these technologies bring to the energy sector and have supported, in their respective versions of the text³, the creation of a level playing field for all market participants. In this paper, the particular role of energy storage is discussed as a key technology to achieve the necessary flexibility for an efficient energy system.

Depending on its technical characteristics, storage can provide today a wide range of services characterized by being a flexible and efficient technology:

1. **Response:** Storage is able to fully imitate demand response and can act as generation response
2. **Rapid:** Storage is able to respond in milliseconds to provide or take energy from the grid
3. **Resilient:** Storage is able to store and discharge energy only when needed
4. **Redistribution:** Storage can shift energy from lower to higher demand times to moderate prices and stabilize systems states in our energy system.

However, there are still challenges for storage that need to be addressed before it can realise its full potential as a part of the energy system. Double-charging of taxes and levies on storage are still present and distorting investment decisions. Discussions around regulated ownership and operation of storage assets could stunt the development of the storage industry for years to come⁴. And finally, discussions are still ongoing on what services, and especially at what times, storage should be able to provide to the system.

This paper outlines smartEn's positions on these topics, and its recommendations to the three EU co-legislators on how best to proceed in order to unlock the true potential of storage in the energy transition.

¹ Regulation on the internal market for electricity and Directive on common rules for the internal market in electricity

² Article 8 of the Electricity Directive supported by Amendment 42 of the Parliament text

³ Article 3 of the Electricity Directive on a Competitive, consumer-centred, flexible and non-discriminatory electricity market

⁴ Articles 36 and 54 of the Electricity Directive

1. Foster market-oriented ownership and operation of storage

In line with the liberalisation of the European Energy Market, the ownership and operation of storage should be market based.

The market-based ownership of storage is the only way to ensure that flexibility providers can invest in storage solutions based on their competitive value. Market-based operation of storage makes it possible for these units to offer and deliver ancillary and balancing services to Distribution System Operators, Transmission System Operators and other market participants such as Balancing Responsible Parties, depending on where they are most needed at any moment. On the other hand, a general ownership and operation of storage by regulated actors could distort competition and limit the possible usage cases.

The market-based ownership and operation of storage assets is important also to secure the functioning of European electricity markets. Especially in the early phases of storage development, a market offer for storage may appear more expensive than direct investment by DSOs and TSOs. This can be explained by the favourable access to capital for regulated actors. However, allowing regulated players to own and operate storage assets poses the immediate risk of locking out other players from this activity and directly contradicting the European rules on the unbundling of market activities and system operation, by extending the scope of regulated activities.

The European Parliament reached an agreement on the need to provide a level-playing field, without discrimination or barriers for market entry for new technologies⁵ and emphasized the need for market-based ownership and operation of storage assets⁶. At smartEn we support these principles on ownership and operation but some improvements should be covered in the upcoming trilogues. Conditions and exceptions for TSOs and DSOs to own and operate storage facilities⁷ included in the current version of the Parliament text are too broad and open the door to being exploited. The Council and Commission acknowledged this in their version of article 36, but rules and exceptions need to be further clarified. In line with the proposed changes by the Parliament⁸, the tendering procedure should be organised by Member States or the System Operators, subject to approval of the national regulatory authorities. In particular, smartEn supports the amendments brought forward by the Parliament outlining the guidelines to establish a fair tendering procedure⁹.

POLICY RECOMMENDATIONS IN VIEW OF TRILOGUE NEGOTIATIONS

Support:

Article 36 Directive: §1 and §4 in the Commission proposal, Amendments 129, 130, 132 in the Parliament text, §1 and last sentence of §4 in the Council text.

Article 54 Directive: §1 in the Commission proposal, Amendments 149, 150, 151, 152, 153 in the Parliament text, last sentence of §4 in the Council text.

Oppose:

Article 36 Directive: Amendment 128 of the Parliament text, §4a of the Council text.

Article 54 Directive: Amendment 148 of the Parliament text, §4b of the Council text.

⁵ Amendments 32, 33, 34, 35 of the Parliament on Article 3 of the Electricity Directive

⁶ Articles 36 and 54 of the Electricity Directive

⁷ Amendment 128 in the Parliament text

⁸ Compromise Amendment 18 of the Parliament on Article 54 of the Electricity Directive

⁹ Amendments 129, 130, 132, 149, 150, 151 and 152 in the Parliament text

smartEn position paper on energy storage in the European energy market design

2. Prevent double taxation of storage

The proper taxation of each kWh will make the case for the expansion of storage

With several different revenue streams for storage, the double-charging of taxes and levies adds an unnecessary burden on the viability of a storage installation. Different levies (incl. renewable obligations and feed-in tariffs or contracts for difference) are passed on by suppliers to the consumer. Storage solutions are especially vulnerable to this, since storage operators pay once when charging their storage asset and again when they feed it back to the grid to provide services or to the end consumer. Regulation should make sure that every kWh can be traced and is only taxed one time. At the same time, energy losses should not be burdened with taxes or fees, or owners should at least be able to deduct part of it. Energy losses should be considered a cost to run the asset, similar to the untaxed energy spent to run a generation plant. Some storage assets will be acting as virtual power plants, competing with other sources, and so should be able to do it evenly.

The transitional role of storage in the energy system needs to be addressed and clarified also with a view to network charges. Thanks to their technical specifications, storage technologies can offer different services with the energy stored. Part of that energy will be used to balance out the system, helping the electricity grid to remain stable. It is therefore important that network tariffs do not penalise the use of storage and users should be charged and rewarded for the costs and benefits they generate for the network.

Following these principles smartEn supports the Parliaments position in article 15 of the Electricity Directive making sure that storage owners are not subject to additional taxes, levies and fees for the electricity stored¹⁰. Even though smartEn supports Article 15 of the Directive in the Commission's and Council's version there is no specific coverage on the prevention of double taxation for storage, which we aim to improve in the upcoming negotiations.

POLICY RECOMMENDATIONS IN VIEW OF TRILOGUE NEGOTIATIONS

Support:

Article 15 Directive: Amendment 68 of the Parliament text.

Oppose:

Article 15 Directive: Both Commission and Council version need to be improved, including the prevention of double taxation.

3. Allow stacking of services

Storage can offer several services making the case for a diversified investment

A storage solution that only provides delayed consumption of energy is a suboptimal use of an asset. Whenever stored energy is not being used for direct consumption, the storage asset can provide different services to the grid, increasing the return on investment of the installation. Measures should be in place to enable the stacking of services from storage, i.e. allowing a single asset to perform and switch between different tasks also for

¹⁰ Amendment 68 of the Parliament on Article 15 of the Electricity Directive
smartEn position paper on energy storage in the European energy market design

different users. The Parliament recognizes this need for storage to offer several services simultaneously and included it as a requirement for Member States in their text¹¹. We strongly encourage the Council and Commission to follow the same path as the Parliament on this topic, since the viability of storage as a profitable business case will depend on the services it can provide.

By incentivising different activities, multiple revenue streams will be created that will lower the payback time of storage assets. For example, during a period of 24 hours a battery can provide frequency response to the grid, avoid the triad periods for end consumption and finally charge up when the prices of electricity are the lowest. Besides this, storage assets can provide a wide range of services: Peak shaving when electricity is at its highest price, energy shifting, demand response, ancillary services, support to microgrids and solar self-consumption, guaranteeing power quality and acting as an emergency backup. Finally, it also provides support to the transmission and distribution system.

In addition to the sequential stacking of services, storage can provide certain services simultaneously. Battery storage control systems allow for the 'segmenting' of a battery storage's capacity with incredible precision, enabling, for example, battery storage to bid in 50% of its capacity to deliver frequency control, while increasing self-consumption with the remaining 50%.

Not only is it important that storage can provide these services, but also that it is able to deliver these to all market parties, be it suppliers and Balance Responsible Parties (BRPs) or Distribution and Transmission System Operators (DSOs and TSOs). To achieve this, a streamlining of markets and product definitions needs to be performed (by TSOs, DSOs and wholesale) to enable stacking and switching between markets.

These principles are covered in the Electricity Directive and Regulation and especially highlighted by the Compromise Amendments brought forward by the European Parliament. The original version by the Commission and the General Approach by the Council are not creating hurdles on this topic but can still be improved, especially Article 15 of the Electricity Directive. We strongly stand by storage being included as one of the possible service providers in most relevant articles, especially when covering the balancing markets and other services to the grid¹².

POLICY RECOMMENDATIONS IN VIEW OF TRILOGUE NEGOTIATIONS

Support:

Article 15 Directive: Amendment 68 of the Parliament text.

Oppose:

Article 15 Directive: Both Commission and Council version need to be improved to include the stacking of services.

4. Allow aggregation of storage

The aggregation of storage empowers consumers to control their energy cost

For all decentralised assets, including storage, the possibility of aggregation plays a major role in their development. Storage owners who do not have the capacity or desire to offer their flexibility to the market themselves should have the option to work with an aggregator (which can be their supplier or an independent

¹¹ Amendment 68 of the Parliament on Article 15 of the Electricity Directive

¹² Amendment 32 of the Parliament on Article 5 of the Electricity Regulation
smartEn position paper on energy storage in the European energy market design

aggregator). Aggregators provide a key service to the market, offering a path to the market for big and small storage owners, and streamlining the process for them. In a decentralised energy system, with an increase of participants whose main occupation may not be related to the energy sector, aggregators will provide an easy way to optimise the wholesale of energy, scheduling and dispatch of services and in general connecting the individual storage assets into the different grid services.

As the complexity of operating storage assets increases and with more decentralised generation, guaranteeing the security of supply will be one of the key issues of the energy transition. There will be a greater need for aggregators that can take over the role of system safeguarding and allowing the owners to access new revenue streams for their storage systems. There is also a need for simply streamlining the process for smaller distributed systems, whose owners can't or don't want to be involved in the micromanagement of their installations. This need has been understood and reflected by the Parliament and the Commission, asking for a streamlined process for aggregators and storage to participate in selling non-frequency ancillary services to the DSOs¹³. We encourage the European Institutions to acknowledge the importance of providing a harmonized market in the EU to facilitate the creation of new business models and avoid a fragmentation of the market.

To enable a dynamic market for aggregation services that storage solutions can provide, it is important that consumers have the choice to work with aggregators, be it independent aggregators or their suppliers, to increase the offer available. Consumers that decide to work with independent aggregators should not depend on a prior agreement by their supplier as covered by the Parliament Amendments¹⁴. The General Approach reached at the Council¹⁵ leaves this decision to each Member State. We see some room for improvement here, since this will create different scenarios and goes against the harmonization process. In this regard we strongly support the Parliaments position on the freedom for the consumer to choose who sells their flexibility in their best interest¹⁶.

POLICY RECOMMENDATIONS IN VIEW OF TRILOGUE NEGOTIATIONS

Support:

Article 13 Directive: Amendment 60 of the Parliament text.

Article 15 Directive: Amendment 68 of the Parliament text.

Article 31 Directive: §5 of the Commission text, Amendment 118 of the Parliament text, §5d of the Council text.

Article 5 Regulation: §6 of the Commission text, Amendments 32, 33, 34, 35, 37, 38, 39, 40 of the Parliament.

Oppose:

Article 12 Directive: Council text version.

Article 13 Directive: Amendment 61 of the Parliament text, §1 second and third sentence of the Council text.

Article 31 Directive: §5a of the Council text.

¹³ Article 31 and 32 of the Electricity Directive and Amendment 118 of the Parliament text
Article 5 of the Electricity Regulation and Amendment 32 of the Parliament text

¹⁴ Amendment 60 of the Parliament on Article 13 of the Electricity Directive

¹⁵ Article 13 paragraph 1 of the Electricity Directive in the Council General Approach

¹⁶ Articles 12 and 13 of the Electricity Directive