



EASE Analysis of the Clean Energy Package and its Impacts for the Energy Storage Sector

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Introduction to the Clean Energy Package

The '[Clean Energy for all Europeans' Package](#) (CEP), tabled by the European Commission on 30 November 2016, represents the most comprehensive package of EU electricity legislation to date. It includes 8 legislative acts:

- ✓ [Energy Performance of Buildings Directive \(EPBD\)](#): adopted and published in the Official Journal in June 2018
- ✓ [Renewable Energy Directive \(RED\)](#): adopted and published in the Journal in December 2018
- ✓ [Energy Efficiency Directive \(EED\)](#): adopted and published in the Journal in December 2018
- ✓ [Governance Regulation](#): adopted and published in the Journal in December 2018
- ✓ [Electricity Directive \(ED\)](#): adopted and published in the Journal in June 2019
- ✓ [Electricity Regulation \(ER\)](#): adopted and published in the Journal in June 2019
- ✓ [Risk-Preparedness Regulation](#): adopted and published in the Journal in June 2019
- ✓ [Regulation for the Agency for the Cooperation of Energy Regulators \(ACER\)](#): adopted and published in the Journal in June 2019

Of these files, the **Electricity Directive, Electricity Regulation, and Renewable Energy Directive contain the most important provisions related to energy storage.**

The CEP builds on the [Third Energy Package](#), which entered into force in September 2009. Main provisions of this package included:

- ✓ Unbundling energy suppliers from network operators
- ✓ Strengthening the independence of regulators, establishing the [Agency for the Cooperation of Energy Regulators](#) (ACER)
- ✓ Requiring cross-border cooperation between transmission system operators and establishing European Network for Transmission System Operators for electricity (ENTSO-E)
- ✓ Increasing transparency in retail markets to benefit consumers

However, **the Third Energy Package made no mention of energy storage.** Therefore, since 2009 and until the CEP is fully implemented in 2019/2020, there has been a lack of regulatory clarity and harmonisation regarding the treatment of storage across the EU. This led to a number of barriers to energy storage deployment, for instance uncertainty regarding the ownership of storage linked to the unbundling provisions, and a fragmented market for energy storage deployment across Europe.

This document will describe the main CEP provisions related to energy storage, including:

- ✓ An overview of the key provisions related to storage → file by file, what are the key points for storage? (Section I)



- ✓ An analysis of the CEP and its effects for the different storage segments: front-of-meter, commercial & industrial, behind-the-meter → what are the main impacts for each segment? (Section II)
- ✓ An in-depth analysis of each article in the market design files with an impact on the storage sector (Section III)

Please note that this document contains only the EASE Secretariat's analysis of the Clean Energy Package provisions with regards to storage. This does not constitute a formal EASE position that can be shared externally. Over the past several years, during the debates around the CEP, EASE actively shared its positioning on some issues (e.g. [ownership of storage by regulated entities](#), energy storage definition) after approval from the EASE members. However, members did not agree on a common EASE position for some other topics (e.g. capacity remuneration mechanisms). This document touches on all of the key provisions affecting storage, whether or not EASE took a formal position on these topics.



I. Overview of the Clean Energy Package Files and Main Storage Provisions

a. Electricity Market Design Proposals

The Recast Electricity Market Design proposals aim to adapt the current market rules to support the energy transition. They represent an important step forward in terms of clarifying the regulatory framework for energy storage.

On 18 December 2018, the Council of the European Union (Council) and the European Parliament (EP) finalised their discussions on the last files of the CEP. In June 2019 the two pieces of legislation were published:

- A [Directive](#) setting out common rules to ensure that the internal electricity market in the EU is competitive, consumer-centred, flexible, and non-discriminatory (Recast Electricity Directive)
- A [Regulation](#) establishing the framework for an internal electricity market across the EU (Recast Electricity Regulation)

These two pieces of legislation have been formally adopted by the European Parliament and the Council and have been published in the Official Journal:

- The Recast Electricity Regulation is directly applicable in all Member States.
- The Recast Electricity Directive needs to be transposed into national law before the deadline set when the directive is adopted (generally within 2 years).

The **Recast Electricity Directive** includes many provisions related to energy storage. The Directive:

- ✓ Contains a definition of energy storage (Art. 2(59)) that covers all energy storage technologies (incl. power-to-heat, power-to-gas, etc.). This is the first time energy storage is defined in EU legislation.
- ✓ Clarifies unbundling/ownership of storage (Art. 36 and Art.54): In general, storage facilities should be owned and operated by market parties. However, regulated entities could be allowed to own and operate energy storage facilities after obtaining a derogation and under specific circumstances.



- ✓ Includes measures that support active consumers and local energy communities (Art. 15 and Art. 16), allowing them to generate, store, and consume self-produced energy, as well as to participate in retail markets.
- ✓ Ensures non-discriminatory access of new storage facilities to networks (Art. 42), and underlines the need to remove barriers that could prevent access of new market players such as aggregators. TSOs and DSOs must consider energy storage in their network planning (Art. 32 and Art. 51).

The Electricity Regulation (recast):

- ✓ Requires non-discriminatory treatment of generation, demand-side response, and energy storage.
- ✓ Foresees scarcity pricing (recital 23, recital 24) and reliable price signals (recital 30, Art. 18), which would create a stronger business case for storage services such as peak shaving, end user cost management, and arbitrage.
- ✓ States that network tariffs should be cost-reflective and transparent, ensure security of supply, and not discriminate against energy storage (recital 39).
- ✓ Enshrines the right for energy storage to participate in electricity markets on a level playing field with generation and demand-side response (Art. 3).
- ✓ Requires TSOs to procure ancillary and balancing services on a level playing field between generation, demand-side response, and energy storage (Art. 6). Procurement specifications and requirements should be defined to facilitate the participation of all these resources.
- ✓ Removes priority dispatch (Art. 12) and imposes a balancing responsibility (Art. 5) for any new non-demonstration RES-E generator over 400 kW. This is likely to have a positive effect on storage as it would incentivise the introduction of storage assets to the RES-E generator in order to capture any excess production and to avoid imbalance fees.
- ✓ Establishment a European DSO entity (Art.52) to support DSOs' new role as a neutral market facilitator, procuring local flexibility services that should be open for different providers including storage.
- ✓ Ensures access of storage to capacity remuneration mechanisms, where these are introduced (Art. 22 (1) h).

b. Renewable Energy Directive



The Renewable Energy Directive establishes an overall policy for the production and promotion of energy from renewable sources in the EU. The recast directive (known as RED II) was published in December 2018. It contains several provisions of interest for the storage sector. The Directive:

- ✓ Establishes an EU-wide binding target of at least 32% renewable energy in gross final energy consumption by 2030 (recital 8). The need to invest in flexibility, especially storage, is explicitly recognised as a means to reach that goal.
- ✓ Clarifies the rights of ‘renewables self-consumers’ (Art. 21) and ‘renewable energy communities’ (Art. 22) to produce, consume, store and sell renewable energy with access to all energy markets and without being faced with undue charges and fees → This will help the roll-out of behind-the-meter storage by clarifying the legal framework for ‘prosumers’, also referred to as ‘active customers’.
- ✓ Instructs Member States to increase the share of RES in heating & cooling by 1.3% annually (Art. 23) → This is likely to drive demand for thermal storage, as this can support the coupling of the electricity and heating sectors.
- ✓ Sets a target of 14% for the use of RES in the final consumption of energy in the transport sector (Art. 25). Electrification of transport will require more energy storage to link the electricity and transport sectors, for instance to support the roll-out of charging infrastructure.
- ✓ Refers to the need to facilitate the integration of gas from RES by extending access to gas network infrastructure (Art. 20), which could facilitate deployment of power-to-gas technologies.

c. Governance of the Energy Union Regulation

[The Governance of the Energy Union Regulation](#) defines how Member States should cooperate both with each other and with the European Commission to reach the objectives of the Energy Union and the long-term greenhouse gas emissions commitments in accordance with the Paris Agreement. Member States are required to deliver integrated national energy and climate plans to report on their strategy for 2030. First drafts of these plans have been submitted to the Commission, which has reviewed them and provided [feedback](#) that should be integrated into the final plans. EASE has prepared an [open letter](#) addressing the need to support energy storage deployment as part of the National Energy and Climate Plans.



The integrated national energy and climate plans must include provisions that could affect energy storage, such as:

- ✓ Proposing measures to increase the flexibility of the national energy system to guarantee energy security, in particular by deploying energy storage (Article 4(c); Annex I, 2.3).
- ✓ Promoting market-based electricity prices in accordance with relevant sectoral law but also market integration and coupling to provide for more flexibility (Article 4(d); Annex I, 2.4).
- ✓ Supporting the non-discriminatory participation of renewable energy, demand response, and storage in the energy market (Annex I, 2.4).
- ✓ Establishing a clear framework to allow consumers to benefit from self-generation via new technologies (e.g. smart meters) which will facilitate the deployment of behind-the-meter storage (Annex I, 2.4).

d. Energy Performance of Buildings Directive

The [Energy Performance of Buildings Directive](#) establishes rules to accelerate the rate of building renovation, deliver more energy efficiency, and ensure that new buildings have better energy performance. The goal is to speed up the shift towards a low and zero-emission building stock system in the EU by 2050. It contains some provisions that could affect behind-the-meter storage, both in residential and commercial buildings.

This Directive:

- ✓ Introduces a “smart readiness indicator” to measure a building’s capacity to use new technologies to adapt to consumer needs, interact with the grid, and improve energy efficiency. This indicator will enable more flexibility and will take into account features such as smart meters, recharging points for EVs, and energy storage (Article 8; Annex I). The European Commission is tasked with establishing a definition and a clear methodology to assess the smart readiness of buildings by 31 December 2019.
- ✓ Promotes the roll-out of the infrastructure for e-mobility in residential and non-residential buildings (Article 8).
- ✓ States that for heating and cooling systems, buildings should include control functionalities to ensure optimum generation, distribution, storage, and use of thermal energy (Article 14; Article 15).



II. Clean Energy Package Provisions by Storage Segment

a. Provisions with cross-cutting impact across all storage segments

A number of CEP provisions will affect the energy storage sector as a whole:

✓ **Definition and role of energy storage**

- Throughout the CEP, energy storage is recognised as a key flexibility provider and a necessary means to reaching decarbonisation targets. This is a big change from the Third Energy Package, in which energy storage was not mentioned at all.
- Energy storage definition: “‘energy storage’ means, in the electricity system, deferring the final use of electricity to a moment later than when it was generated, or the conversion of electrical energy into a form of energy which can be stored, the storing of such energy, and the subsequent reconversion of such energy into electrical energy or use as another energy carrier.” (ED, Art. 2(59))
 - This definition covers all types of energy storage – both Power-to-Power and Power-to-X, including thermal storage and Power-to-Gas.

✓ **Promoting renewables and energy transition**

- An EU-wide binding target of at least 32% renewable energy in gross final energy consumption by 2030 is established (RED II, Art. 3).
 - The need to invest in flexibility, especially storage, is explicitly recognised as a means to reach that goal.
- The Recast Electricity Regulation removes priority dispatch (Art. 12) and imposes a balancing responsibility (Art. 5) for any new non-demonstration RES-E generator over 400 kW.
 - This is likely to have a positive effect on storage as it would incentivise the introduction of storage assets to the RES-E generator in order to capture any excess production and to avoid imbalance fees.
- RED II establishes the goal to increase the share of RES in heating & cooling by 1.3% annually (RED, Art. 23) and a target of 14% for the use of RES in the final consumption of energy in the transport sector (Art. 25).
 - These targets will drive demand for technologies such as storage that can link the electricity sector to the heating, cooling, and transport sectors.



- Member States are required to develop integrated national energy and climate plans, detailing how they will reach their RES targets; these must include measures to enhance flexibility and storage (Governance Regulation, Art. 4; Annex I).

✓ **Electricity Markets:**

- The Directive establishes “[...] common rules for the generation, transmission, distribution, energy storage and supply of electricity, together with consumer protection provisions, with a view to creating truly integrated competitive, consumer-centred, flexible, fair and transparent electricity markets in the Union.[...]” (ED, Art. 1)
- Non-discriminatory market access is guaranteed for all resource providers, including energy storage (ER, Art. 1, Art. 3).
- Markets should deliver incentives for investments in energy storage and facilitate fair competition among all resources (ER Art. 3 g).
- Electricity prices should reflect actual demand and supply (ED, Art. 3(1)), which will improve the business case for energy storage facilities which provide arbitrage and other services.
- Redispatching of generation and energy storage should be market-based and non-discriminatory (ER, Art. 13).
- TSOs are required to procure balancing services and non-frequency ancillary services in a way that ensures a level playing field among generation, storage, and demand-side response, incl. through aggregation (ED, Art. 40, ER, Art. 6(8)). This means that more revenue streams will be available to energy storage operators. Also, TSOs are encouraged to procure more services in the form of harmonised market products, at national level where possible, which will facilitate access of storage operators.
- Network tariffs and charges should be cost-reflective and transparent, they must ensure security of supply and must not discriminate against energy storage (ER, Recital 22 and Art. 18). This means that some of the [excessive grid fees and taxes](#) placed on storage in some Member States could be removed.
- By 1 January 2021, the imbalance settlement period should be set at 15 minutes (ER, Art. 8). This is a positive development for storage, as it creates a harmonised, finer time resolution. The 15-minute settlement period will more accurately reflect the costs of causing imbalances and will reward resources such as storage that can correct the balance. Flexibility becomes more profitable and inflexibility becomes more expensive. It should be noted that the regulatory authorities can grant an exemption until 31 December 2024.



b. Focus on front-of-meter storage

Overall, the energy market design initiative places an important emphasis on market-based solutions, ensuring a level playing field for all participating technologies and encouraging DSOs and TSOs to tender more services on the market, with standardised national products where possible. This could lead to new, important revenue streams for energy storage providers and a more harmonised market across the EU, which would help storage providers expand into new markets.

The CEP contains several key provisions that will have an important impact on the front-of-meter storage sector (e.g. grid-connected or utility-scale storage):

- ✓ **The Ownership of Storage by TSOs and DSOs** was one of the most debated aspects of the market design initiative, and these provisions represent one of the most important changes in the CEP for storage. The Recast Electricity Directive for the first time clarifies the question of whether regulated entities can own and operate storage devices. The ownership provisions therefore provide much needed clarity, which is important for long-term investment signals, although there is some ambiguity related to the definition of ‘fully integrated network components’.
 - The following rules apply according to Art. 36 (DSOs) and 54 (TSOs):
 - As a general rule, DSOs and TSOs are not allowed to “own, develop, manage or operate” energy storage facilities.
 - By way of derogation, Member States may allow DSOs or TSOs to own and operate storage facilities either:
 - If they are considered ‘fully integrated network components’ and the regulatory authority has granted its approval, or
 - 1) If other parties, following a transparent tendering procedure (to be reviewed by the national regulatory authority) have not been awarded with a right to own / operate storage OR cannot do so at a reasonable cost within the given time frame. 2) These facilities must be necessary for DSOs or TSOs to fulfil their obligations. 3) Facilities cannot be used to buy or sell electricity in electricity markets. 4) The national regulatory authority must assess the necessity of the derogation and has carried out an assessment of the tendering procedure.
 - Where such a derogation is granted, the Regulatory authorities have to perform a public consultation at least every 5 years for existing storage facilities owned and operated by TSOs and DSOs to assess the potential availability and interest



of market parties to invest in such facilities. If market parties are able to own / operate storage facilities in a cost effective manner, the DSO or TSO's activities must be phased-out within 18 months. DSOs and TSOs may receive some compensation according to the decision of the regulatory authority.

- This condition does not apply to fully integrated network components or for the usual depreciation period of new battery storage facilities with a final investment decision until 4 July 2019 for the DSO's and until 2014 for TSO's mid-2019 (when the Directive enters into force).
- For TSOs only, the decision to grant derogation must be notified to ACER and the Commission.
- 'Fully integrated network components' are defined as "network components that are integrated in the transmission or distribution system, including storage facility, and are used for the only purpose of ensuring a secure and reliable operation of the transmission or distribution system but not for balancing nor congestion management" (ED, Art. 2(51)).
- These provisions do not necessarily apply to TSOs and DSOs in small connected systems and small isolated systems (ED, Art. 66). Specific provisions apply in these cases, which would allow TSOs and DSOs to own and operate storage and other resources in the absence of competitive supply.
- ✓ As the energy system becomes increasingly decentralised and digital, **the role of the DSO** is evolving. The CEP contains several provisions clarifying the DSO's changing role in the energy system:
 - DSOs must act as a "neutral market facilitator", using market-based procurement procedures where possible. Storage must be allowed to participate in these markets on a level playing field with other technologies (ED, Art. 31(5)).
 - The Regulation (ER, Art. 52) establishes an EU DSO entity, which is tasked with, among others, facilitating integration of storage in the distribution network and enhancing collaboration with TSOs. This entity, alongside ENTSO-E, will be a key player for EASE to engage with on topics such as active system management, network codes at DSO level, and procurement of flexibility products.
 - DSOs should be incentivised by the national regulatory framework to procure flexibility services, incl. congestion management, from sources including storage, as an alternative to investing in grid expansion. Standardised market products should be



defined at national level, in collaboration with TSOs and market parties (ED, Art. 32).

This will facilitate access of new market players to these services.

- ✓ The **role of the TSO** is also evolving, with an increased focus on market-based tendering procedures that must be open to all flexibility providers:
 - TSOs must procure balancing services according to market-based procedures, and energy storage must be allowed to participate. The specifications for non-frequency ancillary services must be procured according to standardised market products at least at national level (ED, Art. 40).
 - TSOs must ensure transparent and efficient procedures for connection of new energy storage facilities to the system (ED, Art. 42).
 - When elaborating Ten-Year Network Development Plans, TSOs are required to “fully take into account the potential of the use of demand response, energy storage facilities or other resources as an alternative to system expansion” (ED, Art. 51(3)).
- ✓ Where Capacity Remuneration Mechanisms are introduced, they must be open to all resources including storage (ER, Art. 22 (1) h). This could be an important revenue stream for storage in some Member States.
- ✓ One potential risk to storage is that the duration of balancing service contracts is limited (ER Art. 6(9), (10)): For at least 40% of standard products and 30% of all products, contracting of balancing capacity should be performed no longer than one day before provision of the service, with a maximum contracting period of one day, unless the regulatory authority grants a derogation. The remaining 60% may have a contracting period of up to one month, unless, at the request of the TSO, the regulatory authority extends the contracting period to a maximum period of 12 months. This means that there will be few long-term revenue streams available to energy storage facilities.

c. Commercial & Industrial Storage

As the CEP places a major emphasis on empowering energy consumers, there will be more incentives for commercial and industrial energy consumers to invest in flexibility to reduce their peak demand, to maximise self-consumption of renewables, if these are located within C&I sites, to install EV charging, and to offer flexibility services to the grid. The CEP contains several new provisions affecting the C&I segment:

- ✓ **Enhancing the ‘Smartness’ of Buildings** will drive more investments in energy storage in commercial buildings (e.g. shopping malls, business parks, etc.).



- The Energy Performance of Buildings Directive Introduces a “smart readiness indicator” that can measure a building’s ability to use new technologies to adapt to consumer needs, interact with the grid, and improve energy efficiency.
- This indicator will incentivise the deployment of more flexibility and will take into account features such as smart meters, recharging points for EVs, efficient heating and cooling, and energy storage (Article 8; Annex I). Non-residential buildings will have more stringent requirements than residential buildings.
- The Commission will establish a definition and methodology for the Smart Readiness Indicator by 31 December 2019.
- ✓ **Evolving Market Rules** incentivise active participation in the energy system, open up new revenue stream for C&I players, and reward flexibility. This could lead to more investments in C&I energy storage to achieve cost savings and new revenue streams.
 - All customer groups (incl. industrial, commercial) should have access to the energy markets to trade their flexibility and self-generated electricity (ED, Recital 39).
 - Electricity prices should reflect actual demand and supply (ED, Art. 3(1)).
 - All customers have the right to sell their flexibility to aggregators (ED, Art. 13).

d. Residential storage

One of the central themes of the CEP is empowering consumers to participate in the energy transition. The CEP clarifies the rights and responsibilities of active customers and citizens energy communities, as well as aggregators. This will allow customers to participate in electricity markets, either directly or through aggregators, and to receive remuneration that reflects the market value of the electricity. By ensuring smart meter roll-out, incentivising ‘smartness’ of buildings, deciding fair and non-discriminatory tariffs for residential storage, and allowing consumers to have dynamic price contracts, there will be a much bigger incentive for active customers to invest in storage and offer flexibility to the grid.

The provisions on active consumers, coupled with the targets for renewables in heating & cooling, will incentivise in particular accelerated deployment of thermal storage to decarbonise the heating & cooling sector. The CEP is likely to have positive effect on the residential storage sector, as new markets that were previously less open to residential storage implement the RED II and electricity market design provisions.

The following points are likely to have an important impact:



- ✓ **The Directive provides a definition for ‘active customers’:** Recognising the rights of customers to generate, store, consume, and sell their own (renewable) electricity is a huge step forward for the residential storage business case
 - Art. 2(8) of the ED defines ‘active customer’ as “a final customer or a group of jointly acting final customers who consume or store electricity generated within their premises [...]”.
 - RED also contains a definition for ‘Renewables self-consumers’ who can install and operate energy storage systems (Art. 21); this is roughly the same definition as ‘active customers’.
- ✓ **‘Citizens Energy Communities’** are also defined as a new player in the energy system, opening up new possibilities for groups of consumers (for instance in one neighbourhood) to co-invest in (renewable) generation and storage facilities:
 - According to the ED, a ‘citizens energy community’ (see definition, Art. 2(11)) has a range of options including generating and storing electricity. They generally have the same rights and responsibilities as active customers.
 - RED II similarly refers to ‘renewable energy communities’ that have the right to produce, consume, store and sell renewable energy, including through power purchase agreements (PPAs) (Art. 22).
- ✓ **The rights of Active Customers/Citizens Energy Communities are clearly enumerated:**
 - Active customers and citizens energy communities have the right not to be subjected to “disproportionate or discriminatory technical and administrative requirements, procedures and charges and network charges that are not cost-reflective”. They can operate directly or through aggregators. (ED, Art. 15, 16)
 - Member States are required to ensure that active customers owning a storage facility (ED, Art. 15):
 - (a) have the right to a grid connection within a reasonable time following the request if all necessary conditions such as balancing responsibility and adequate metering are fulfilled;
 - (b) are not subject to any double charge, including network charges, for stored electricity remaining within their premises and when providing flexibility services to system operators;
 - (c) are not subject to disproportionate licensing requirements and fees;



(d) are allowed to provide several services simultaneously, if technically feasible.

- The Directive also explicitly supports enabling demand–response (which could include residential storage) through aggregation. Final customers are entitled to offer demand response through aggregation alongside generators in a non–discriminatory manner in all electricity markets (Art.17).
- ✓ Enhancing ‘Smartness’ of Buildings will also drive residential storage, for instance in apartment buildings and homes:
 - Member States are tasked with ensuring deployment of smart metering systems to enable active participation of customers in the electricity market (ED, Art.19(2)).
 - The Energy Performance of Buildings Directive Introduces a “smart readiness indicator” to measure a building’s capacity to use new technologies to adapt to consumer needs, interact with the grid, and improve energy efficiency. This indicator will incentivise the deployment of more flexibility and will take into account features such as smart meters, recharging points for EVs, and energy storage (Article 8; Annex 1). The Commission will establish a definition and methodology for the Smart Readiness Indicator by 31 December 2019
- ✓ Active customers should be empowered to actively participate in electricity markets:
 - Network tariffs and charges should be applied in a non–discriminatory way that does not disincentivise self–generation, self–consumption, storage, and demand response (ER, Art. 16).
 - Nominated electricity market operators are tasked with providing products for trading in day–ahead and intraday markets that are sufficiently small in size (minimum bid sizes of 500 kW or less) to allow for participation of demand–side response, storage, and small–scale RES (ER, Art. 8).
 - Renewable self–consumers are entitled to receive remuneration for self–generated renewable electricity fed into the grid, which reflects the market value of the electricity (RED, Art. 21(2)(d)).
 - National regulatory frameworks must enable electricity suppliers to offer a dynamic electricity price contract (ED, Art. 11), whereby the tariff per unit of electricity varies during the day depending on supply and demand, which will incentivise active customers modify their consumption from the grid.



III. In-Depth Analysis of Key Storage-Related Articles in the Electricity Market Design Provisional Agreement

a. Energy Storage Definition

Electricity Directive, Article 2, para 59/60 – Definitions

59. 'energy storage' means, in the electricity system, deferring the final use of electricity to a moment later than when it was generated, or the conversion of electrical energy into a form of energy which can be stored, the storing of such energy, and the subsequent reconversion of such energy into electrical energy or use as another energy carrier.

60. 'energy storage facility' means, in the electricity system, a facility where energy storage occurs.

EASE's analysis:

The agreed energy storage definition covers all energy storage technologies, not only electricity in/electricity out storage technologies but also electricity in/energy out storage technologies such as heat/cold storage and power-to-gas. EASE strongly advocated for this in 2018, by i.e. proposing the addition of "use as another energy carrier" to cover electricity in/energy out storage technologies.

With this definition, all energy storage technologies will be covered by the Electricity Market Design files, thereby clarifying the overall legislative framework and increasing long-term visibility on the market.

b. Energy Storage in Transmission and Distribution Networks

Network tariffs and Access to Networks

Electricity Regulation, Recital 39

To provide for a level playing field between all market participants, network tariffs should be applied in a way which does not positively or negatively discriminate between production connected at the distribution level and production connected at the transmission level. Network tariffs should not discriminate against energy storage, and should not create disincentives for participation in demand response or represent an obstacle to improving energy efficiency.

Electricity Regulation, Article 18 – Charges for access to networks, use of networks and reinforcement

1. **Charges**¹ applied by network operators for access to networks, including charges for connection to the networks, charges for use of networks, and, where applicable, charges for related network reinforcements,

¹ **Bold text** in this section has been added by the Secretariat to highlight important points for storage within the legislative text.



shall be **cost-reflective, transparent, take into account the need for network security and flexibility and reflect actual costs incurred** insofar as they correspond to those of an efficient and structurally comparable network operator and are applied in a **non-discriminatory** manner. Those charges shall not include unrelated costs supporting unrelated policy objectives.

[...] **The network charges shall not discriminate either positively or negatively against energy storage or aggregation and shall not create disincentives for self-generation, self-consumption or for participation in demand response.**

EASE's analysis:

Recital 39 and article 18 state that network tariffs should be cost-reflective, transparent, ensure security of supply and not discriminate against energy storage.

However, this article does not specify that double charging of energy storage facilities connected to the grid should be avoided (with the exception of "citizens energy communities" which are exempt from double taxation when providing flexibility services). EASE will therefore continue to inform policy-makers about the impact of double-charging on the deployment of energy storage, by e.g. sharing its [position paper on grid fees and charges applied to energy storage](#).

Electricity Directive, Article 58 – General objectives of the regulatory authority

58. In carrying out the regulatory tasks specified in this Directive, the regulatory authority shall take all reasonable measures in pursuit of the following objectives within the framework of their duties and powers as laid down in Article 59, in close consultation with other relevant national authorities including competition authorities and authorities, including regulatory authorities, from neighbouring countries, including third countries as appropriate, and without prejudice to their competencies: [...]

- (e) **facilitating access to the network for new generation capacity and energy storage facilities, in particular removing barriers that could prevent access for new market entrants** and of electricity from renewable energy sources;

EASE's analysis:

National regulatory should take a more active role in facilitating network access for new energy storage facilities and removing any potential barriers to entry.

Ownership of Storage by Regulated Entities

Electricity Directive, Article 2, para 51 – Definitions

51. 'fully integrated network components' means network components that are integrated in the transmission or distribution system, including storage facility, and are **used for the only purpose of ensuring a secure and reliable operation** of the transmission or distribution system but **not for balancing nor congestion management**;



Electricity Directive, Article 36 – Ownership of energy storage facilities by distribution system operators

1. Distribution system operators shall **not be allowed to own, develop, manage or operate** energy storage facilities.
2. By way of **derogation** from paragraph 1, Member States may allow distribution system operators to own, develop, manage or operate energy storage facilities which are **fully integrated network components** and the regulatory authority has granted its approval **or if all of the following conditions are fulfilled**:
 - (a) other parties, following an **open, transparent and non-discriminatory tendering procedure**, subject to review and approval by the regulatory authority have **not been awarded** with a right to own, develop, manage or operate such facilities **or could not deliver those services at a reasonable cost and in a timely manner**. Regulatory authorities may draw up guidelines or procurement clauses to help distribution system operators ensure a fair tendering procedure; and
 - (b) such facilities are **necessary** for the distribution system operators to fulfil their obligations under this Directive for the efficient, reliable and secure operation of the distribution system and they are **not used to buy or sell electricity** in the electricity markets, and
 - (c) the **regulatory authority** has assessed the necessity of such derogation and **has carried out an assessment** of the tendering procedure, including the conditions, **and has granted its approval**.
3. The **regulatory authorities** shall perform, at regular intervals or **at least every five years**, a **public consultation** for the existing energy storage facilities in order to **assess the potential availability and interest of market parties to invest in such facilities**. Where the public consultation, as assessed by the regulatory authority, **indicates** that third parties are able to own, develop, operate or manage such facilities in a **cost-effective manner**, regulatory authorities shall ensure that distribution system operators' activities in this regard are **phased-out within 18 months**. As part of the conditions for this procedure, regulatory authorities may allow the distribution system operators to receive **reasonable compensation**, in particular to recover the residual value of the investment they made into energy storage facilities.
4. **Paragraph 3 shall not apply to fully integrated network components or for the usual depreciation period of new battery storage** facilities with a final investment decision until 4 July 2019, provided that such battery storage facilities are:
 - a. **connected to the grid** at the latest two years thereafter
 - b. **integrated** into the distribution system;
 - c. **used only for the reactive instantaneous restoration of network security** in the case of network contingencies where such restoration measure starts immediately and ends when regular re-dispatch can solve the issue; and
 - d. **not used to buy or sell electricity** in the electricity markets, including balancing

Electricity Directive, Article 54 – Ownership of energy storage facilities by transmission system operators

1. Transmission system operators shall **not own, develop, manage or operate** energy storage facilities.



2. By way of derogation from paragraph 1, Member States may allow transmission system operators to own, develop, manage or operate energy storage facilities, where they are fully integrated network components and the regulatory authority has granted its approval, or where all of the following conditions are fulfilled:
- (a) other parties, following an **open, transparent and non-discriminatory tendering** procedure that is subject to review and approval by the regulatory authority, have **not been awarded** a right to own, develop, manage or operate such facilities, **or could not deliver those services at a reasonable cost and in a timely manner**;
 - (b) such facilities or non-frequency ancillary services are **necessary** for the transmission system operators to fulfil their obligations under this Directive for the efficient, reliable and secure operation of the transmission system and they are **not used to buy or sell electricity** in the electricity markets; and
 - (c) the **regulatory authority** has assessed the necessity of such a derogation, **has carried out an ex ante review** of the applicability of a tendering procedure, including the conditions of the tendering procedure, **and has granted its approval**.
- The regulatory authority may draw up guidelines or procurement clauses to help transmission system operators ensure a fair tendering procedure.
3. The decision to grant a derogation shall be notified to the Commission and ACER together with relevant information about the request and the reasons for granting the derogation.
4. The **regulatory authorities** shall perform, at regular intervals or **at least every five years**, a **public consultation** for the existing energy storage facilities in order to **assess the potential interest of market parties** to invest in such facilities. **Where** the public consultation, as assessed by the regulatory authority, **indicates that third parties are able** to own, develop, operate or manage such facilities **in a cost-effective manner**, regulatory authorities shall ensure that transmission system operators' activities in this regard are **phased-out within 18 months**. As part of the conditions for this procedure, regulatory authorities may allow the transmission system operators to receive **reasonable compensation**, in particular the residual value of the investment they made into energy storage facilities.
5. Paragraph 4 shall **not apply to fully integrated network components or for the usual depreciation period of new battery storage facilities with a final investment decision until 2024**, provided that such battery storage facilities are:
- (a) connected to the grid at the latest two years thereafter;
 - (b) integrated into the transmission system;
 - (c) used only for the reactive instantaneous restoration of network security in the case of network contingencies where such restoration measure starts immediately and ends when regular re-dispatch can solve the issue; and
 - (d) not used to buy or sell electricity in the electricity markets, including balancing.

Electricity Directive, Article 38



1. Member States may provide for national regulatory authorities or other competent authorities to classify a **system which distributes electricity within a geographically confined industrial, commercial or shared services site and does not**, without prejudice to paragraph 4, **supply household customers, as a closed distribution system if**:
 - (a) **for specific technical or safety reasons**, the operations or the production process of the users of that system are integrated; or
 - (b) **that system distributes electricity primarily to the owner or operator** of the system or their related undertakings.
2. Closed distribution systems shall be considered as distribution systems for the purpose of the Directive. Member States may provide for national regulatory authorities to **exempt the operator** of a closed distribution system **from**: [...]
 - (e) **the requirement under Article 36(1) not to own, develop, manage or operate energy storage facilities.**

EASE's analysis:

Since the Third Energy Package, there has been uncertainty about how the unbundling provisions should apply to energy storage facilities. This regulatory uncertainty led to a fragmented EU market for storage and has hampered investment in storage. The ownership provisions of the CEP are a highly important change for the energy storage sector, as they lay out a clear path towards market players owning and operating storage to provide services to the TSO and DSO.

In principle, regulated entities (TSOs/DSOs) will not be allowed to own, develop, manage or operate energy storage facilities. However, the above provisions introduce two types of derogations enabling regulated entities (TSOs/DSOs) to own/operate storage facilities under specific circumstances:

1. When these storage facilities are 'fully integrated network components' (see article 2, 51: storage facilities used for the only purpose of ensuring a secure and reliable operation of the transmission or distribution system) and the regulatory authority has granted its approval.
2. When three conditions are met:
 - a. Following a tendering procedure, market players were not awarded the right to own/operate storage or did not provide a solution at reasonable costs and in a timely manner.
 - b. The energy storage facility is needed to ensure the efficient and reliable operation of the energy system by the TSO or DSO.
 - c. The regulatory authority has granted its approval.

The derogation process for TSOs also entails information-sharing with the European Commission and the Agency for the Cooperation of Energy Regulators (ACER). This means that there will be some oversight at EU level for any derogations granted according to Article 54.



Energy Storage facilities owned and operated by TSOs and DSOs will be submitted to regular reviews, at least every five years, by the regulatory authority. If relevant market solutions come forward, regulated entities will be required to phase-out their storage activities within eighteen months. In this case, regulated entities could receive a reasonable compensation to capture the residual value of their investment in the storage facility, at the discretion of regulatory authorities. The above review/phase-out request is neither applicable to ‘fully integrated network components’ nor to battery facilities used for ‘reactive instantaneous restoration of network security in case of network contingencies’ under specific conditions and timelines (see paragraphs 4 and 4a of each article).

Additionally, operators of closed distribution systems (article 38) and TSOs and DSOs operating small connected systems and small isolated systems experiencing substantial problems (article 66) could be exempted from the requirement to not own, develop, manage or operate energy storage facilities.

During the discussions leading to this agreement, EASE positioned itself in favour of maximising the social welfare provided by energy storage facilities owned, developed, and used by regulated entities by inserting the possibility of multi-service business cases: business cases which would see a regulated entity share operation and/or ownership of one energy storage device with a non-regulated entity. In these cases, the regulated entity would use the storage facility for the only purpose of ensuring a secure and reliable operation of the system while the market party could use the same storage facility to provide other services such as balancing or congestion management.

The current agreement seems to prevent this possibility since it specifies that “storage facilities [...] are not used to buy or sell electricity in the electricity markets”. Considering that the spirit of this Directive is to prevent regulated entities and not storage facilities to interact with the market, it could be possible that Member States allow multi-service business cases when transposing the current directive in their national law, e.g. by amending as follows:

- Article 36(2)(b): such facilities are necessary for the distribution system operators to fulfil their obligations under this Directive for the efficient, reliable and secure operation of the distribution system and the facilities are not used to buy or sell electricity in the electricity markets;
- Article 54(2)(b): such facilities or non-frequency ancillary services are necessary for the transmission system operators to fulfil their obligations under this Directive for the efficient, reliable and secure operation of the transmission system and they are not used **by transmission system operators** to buy or sell electricity in the electricity markets; and
- Article 2(51): ‘fully integrated network components’ means network components that are integrated in the transmission or distribution system, including storage facility, and are used for the only purpose of ensuring a secure and reliable operation of the transmission or distribution system but are not used **by transmission and distribution system operators** for balancing nor congestion management.



Exemption of Ownership for Small Connected Systems and Isolated Systems

Electricity Directive, Article 66

1. Member States which can demonstrate that there are substantial problems for the operation of their small connected systems and small isolated systems, may apply to the Commission for derogations from the relevant provisions of Articles 7 and 8 and of Chapters IV, V and VI. Small isolated systems and France, for the purpose of Corsica, may also apply for a derogation from Articles 4, 5 and 6. The Commission shall inform the Member States of such applications before taking a decision, taking into account respect for confidentiality.
2. **Derogations** granted by the Commission as referred to in paragraph 1 shall be **limited in time and subject to conditions that aim to increase competition** in and the integration of the internal market and to ensure that the derogations do not hamper the transition towards renewable energy, increased flexibility, energy storage, electromobility and demand response. For outermost regions within the meaning of Article 349 TFEU, that cannot be interconnected with the Union electricity markets, the derogation shall not be limited in time and shall be subject to conditions aimed to ensure that the derogation does not hamper the transition towards renewable energy. Decisions to grant derogations shall be published in the Official Journal of the European Union.

EASE's analysis:

TSOs and DSOs operating small connected systems and small isolated systems (e.g. regulated islands) experiencing substantial problems could be exempted from the requirement to not own, develop, manage or operate energy storage facilities. This clarifies that regulated entities owning and operating storage devices on islands may continue to do so.

c. Roles and Responsibilities of TSOs and DSOs

Electricity Directive, Article 51, para 3

3. When elaborating the **ten-year network development plan**, the transmission system operator shall **fully take into account the potential of the use of demand response, energy storage facilities** or other resources as an alternative to system expansion in addition to expected consumption and trade with other countries and investment plans for regional and Union wide networks.

EASE's analysis:

TSOs are required to consider energy storage in network planning as an alternative to grid expansion. EASE has been working with ENTSO-E to improve the [cost-benefit analysis \(CBA\) methodology](#) for storage projects in the Ten-Year Network Development Plan, to ensure that the benefits of storage projects are fully taken into account.

Electricity Directive, Article 31, para 5



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 according to transparent, non-discriminatory and market based procedures, whenever it has such a function.
8. The procurement of the products and services referred to in paragraph 6 shall **ensure the effective participation of all qualified 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, in particular by **requiring regulatory authorities and distribution system operators in close cooperation with all market participants**, as well as transmission system operators, to establish the technical requirements for participation in those markets on the basis of the technical characteristics of those markets and the capabilities of all market participants.

Electricity Regulation, Article 55 – Tasks of the EU DSO entity

1. The tasks of the **EU DSO** entity shall be the following:
 - (b) **facilitating the integration of** renewable energy resources, distributed generation and other resources embedded in the distribution network such as **energy storage**;
 - (c) facilitating demand side flexibility and response and distribution grid users' access to markets;
 - (d) contributing to the digitalisation of distribution systems including deployment of smart grids and intelligent metering systems;
 - (f) participating in the elaboration of network codes which are relevant to the operation and planning of distribution grids and the coordinated operation of the transmission and distribution networks pursuant to Article 59.

Electricity Regulation, Article 57 – Cooperation between TSOs and DSOs

2. Distribution system operators and transmission system operators shall cooperate with each other in order to achieve coordinated access to resources such as distributed generation, energy storage or demand response that may support particular needs of both the distribution system operators and the transmission system operators.

EASE's analysis:

The CEP emphasises the changing role of TSOs and DSOs in the system. Both but especially the DSO, whose role is changing from a passive transporter of energy to final consumers to an operator which needs to actively manage their grid due to the increase in RES generation connected directly to the distribution network, should act more and more as neutral market facilitators. This would entail tendering more and more flexibility services on the market while ensuring a level playing field for all generation, storage, and demand response resources.

DSOs are empowered in many provisions, notably through the creation of an EU DSO entity similar to ENTSO-E. This new entity will be a.o. tasked with facilitating the integration of energy storage and demand-side flexibility (which could include residential/C&I storage) in the distribution network.

TSOs and DSOs are also required to enhance their cooperation in order to facilitate the access of storage and distributed generation to the network and both must include storage in their network development plans.



EASE could work more closely with DSO associations in the future to help them in facilitating the integration of storage within the distribution network and define proper tendering procedures and specifications. This would complement EASE's long-term partnership with ENTSO-E.

d. Energy Storage in the Network Codes

Electricity Regulation, Article 59, para 1

1. The Commission is empowered to adopt implementing acts in order to ensure uniform conditions for the implementation of this Regulation by establishing **network codes** in the following areas:
[...]
- (e) rules implementing Article 57 of this Regulation and Articles 17, 31, 32, 36, 40 and 54 of Directive (EU) 2019/944 in relation to **demand response**, including rules on **aggregation, energy storage, and demand curtailment rules**.

EASE's analysis:

The Electricity Regulation specifies that energy storage will be covered by the electricity network codes. The European Commission will be in charge of drafting/reviewing the network codes and this process will be overseen by a committee in which every EU country will be represented.

Even though the European Commission does not differentiate formally demand-response from energy storage in this article, it is highly positive to see that the EU institutions recognise the need for energy storage to be covered in the network codes. A lot of activities have already been initiated at EU level to understand how energy storage technologies could be best covered in the codes. ENTSO-E set up for instance three expert groups on this topic, in which EASE is involved, under the [Grid Connection European Stakeholder Committee](#). Members are invited to contact the Secretariat if they wish to receive more information on these Expert Groups' activities.

Electricity Directive, Article 42

1. The transmission system operator shall establish and publish **transparent and efficient procedures for non-discriminatory connection** of new generating installations and **energy storage facilities** to the transmission system. Those procedures shall be subject to **approval by the regulatory authorities**.
2. **The transmission system operator shall not be entitled to refuse the connection** of a new generating installation or energy storage facility **on the grounds of possible future limitations to available network capacities**, such as congestion in distant parts of the transmission system. The transmission system operator shall supply necessary information. The first subparagraph shall be without prejudice to the possibility for transmission system operators to limit the guaranteed connection capacity or to offer connections subject to operational limitations, in order to ensure economic efficiency regarding new generating installations or energy storage facilities, provided that such limitations have been approved by the regulatory authority. The regulatory authority shall ensure that any limitations in guaranteed connection capacity or operational limitations are introduced on the basis of transparent and non-discriminatory procedures and do not create undue barriers to market entry. **Where the generating**



installation or energy storage facility bears the costs related to ensuring unlimited connection, no limitation shall apply.

EASE's analysis:

Transparent, efficient and non-discriminatory procedures should be put in place for the connection of storage facilities to the transmission system. This can facilitate the deployment of storage projects and lead to more harmonised procedures at national level.

ENTSO-E, together with relevant stakeholders like EASE, is currently defining whether EU-level requirements for grid connection of storage should be included in the grid connection network codes.

e. Level-playing field for storage

Electricity Directive, Article 1 – Subject matter

This Directive establishes common rules for the generation, transmission, distribution, storage and supply of electricity, together with consumer protection provisions, with a view to creating truly integrated competitive, consumer-centred, flexible, fair and transparent electricity markets in the Union. [...]

Electricity Regulation, Article 2 para 25 – Definitions

25. **market participant'** means a **natural or legal person** who buys, sells or generates electricity, who is engaged in aggregation or who is an operator of demand response or **energy storage services**, including through the placing of orders to trade, in one or more electricity markets, including in balancing energy markets

Electricity Directive, Article 2, para 57

57. '**electricity undertaking**' means a natural or **legal person who carries out** at least one of the following functions: generation, transmission, distribution, aggregation, demand response, **energy storage**, supply or purchase of electricity, and who is responsible for the commercial, technical or maintenance tasks related to those functions, but does not include final customers.

Electricity Directive, Article 3, para 1

Member States shall ensure that their national law **does not unduly hamper cross-border** trade in electricity, consumer participation, including through demand response, investments into, in particular, variable and flexible energy generation, **energy storage**, or the deployment of electromobility or new interconnectors between Member States, and shall ensure that electricity prices reflect actual demand and supply.

EASE's analysis:

Energy storage is clearly recognised as one indispensable element of the energy system and is differentiated from generation, transmission/distribution and supply of electricity (ED article 1, article 2(57)). Energy storage services are considered as market services that can be provided by any market player – natural or legal persons, final customers (ER article 2, (25) and ED article 2(57)). The Directive marks a turning point for the



energy storage sector since it introduces for the first time specific provisions on storage, thereby increasing visibility on long-term deployment.

f. Active Customers and Citizens Energy Communities

Active customers

Electricity Directive, Article 2 para 8 – Definitions

8. ‘active customer’ means a **final customer, or a group of jointly acting final customers, who consumes or stores electricity generated within its premises** located within confined boundaries or, where permitted by a Member State, 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’s analysis:

The introduction of the concept of ‘active customer’ empowers final customers (e.g. households) to play an active role in the energy system, whether by generating and consuming their own electricity, or by being active on electricity markets. ‘Active customers’ are explicitly allowed to store self-generated electricity, which provides an incentive for final customers to invest in storage devices. The EU residential storage sector could therefore experience a stronger growth in the next years, driven by a clearer regulatory framework and economic incentives (e.g. subsidise for behind-the-meter storage in Germany and some regions of Italy).

Electricity Directive, Article 15

2. Member States shall ensure that **active consumers** are:
- (a) entitled to **operate either directly or through aggregation**;
 - (b) entitled to **sell** self-generated electricity including through power purchase agreements;
 - (c) entitled to **participate in flexibility and energy efficiency schemes**;
 - (d) entitled to delegate to a third party the management of the installations required for their activities, including installation, operation, data handling and maintenance, without that third party being considered to be an active customer;
 - (e) subject to **cost-reflective, transparent and non-discriminatory network charges that account separately** for the electricity fed into the grid and the electricity consumed from the grid, in accordance with Article 59(9) of this Directive and Article 18 of Regulation (EU) 2019/943, ensuring that they contribute in an adequate and balanced way to the overall cost sharing of the system;
 - (f) **financially responsible for the imbalances** they cause in the electricity system; to that extent they shall be balance responsible parties or shall delegate their balancing responsibility in accordance with Article 5 of Regulation (EU) 2019/943.
5. Member States shall ensure that **active customers owning a storage facility**:
- (a) **have the right to a grid connection within a reasonable time** after the request, provided that all necessary conditions, such as balancing responsibility and adequate metering, are fulfilled;



- (b) are **not subject to any double charges**, including network charges, for stored electricity remaining within their premises or when providing flexibility services to system operators;
- (c) are **not subject to disproportionate licensing requirements and fees**;
- (d) are **allowed to provide several services simultaneously**, if technically feasible.

EASE's analysis:

This new paragraph clarifies the legislative framework for active customers owning storage facilities:

- Right to a quick grid connection when various conditions are fulfilled
- Prohibition of double charging, including network charges, but only for electricity remaining within their own premises or when providing flexibility.
- Prohibition of disproportionate requirements and fees
- Possibility for revenue stacking

This provision seems to tackle most of the barriers faced by active customers owning storage facilities: double taxation, unfair fees & taxes, inability to stack multiple revenues. These barriers significantly increased the costs of storage facilities while limiting possible revenues.

Active customers can still be faced with charges when they feed electricity into the grid and then draw electricity from the grid, except when they are providing flexibility services. Therefore, they will have a bigger incentive to co-locate storage with any residential solar systems and to use that storage to provide system services.

Energy communities

Electricity Directive, Article 2, para 11 – Definitions

‘citizen energy community’ means a legal entity that:

- (a) is based on **voluntary and open participation** and is effectively controlled by members or shareholders that are **natural persons, local authorities, including municipalities, or small enterprises**;
- (b) has for its primary purpose to **provide environmental, economic or social community benefits** to its members or shareholders or to the local areas where it operates rather than to generate financial profits; and
- (c) may engage in **generation**, including from renewable sources, **distribution, supply, consumption, aggregation, energy storage, energy efficiency services or charging services** for electric vehicles or provide other energy services to its members or shareholders.

EASE's analysis:

‘Citizens energy communities’ would be a new player in the energy system, similar to ‘active customers’ and with many of the same rights and responsibilities. Citizens energy communities could be a new business case for energy storage, enabling consumers who are unwilling or unable to invest in storage alone to participate in joint self-consumption and storage.

Smart metering



Electricity Directive, Article 2, para 23 – Definitions

'smart metering system' means an electronic system that is capable of measuring electricity fed into the grid or electricity consumed from the grid, providing more information than a conventional meter, and that is capable of transmitting and receiving data for information, monitoring and control purposes, using a form of electronic communication;

Electricity Directive, Article 19, para 2– Smart metering

2. Member States shall ensure the deployment in their territories of smart metering systems that assist the active participation of customers in the electricity market. Such deployment may be subject to a cost-benefit assessment which shall be undertaken in accordance with the principles laid down in Annex II.

EASE's analysis:

Smart metering systems will be mandatory in all EU Member States. These systems will provide accurate data on energy consumption and electricity supply to consumers, thereby increasing consumer engagement/empowerment. This will also facilitate the deployment of energy storage at residential level since arbitrage will be facilitated by the availability of data on energy supply and demand.

g. System adequacy

Resource adequacy

Electricity Regulation, Article 20, para 3 – Resource adequacy

3. Member States with **identified resource adequacy concerns** shall develop and publish an **implementation plan** with a timeline for adopting measures to eliminate any identified regulatory distortions or market failures as a part of the State aid process. When addressing resource adequacy concerns, the Member States shall in particular take into account the principles set out in Article 3 and shall consider: [...]
- (e) **enabling** self-generation, **energy storage**, demand side measures and energy efficiency **by adopting measures to eliminate any identified regulatory distortions**;

EASE's analysis:

Member States with adequacy concerns are tasked with creating a plan to address regulatory distortions or market failures, including efforts to reduce barriers to energy storage deployment front-of-meter and behind-the meter.

Electricity Regulation, Article 23 – European resource adequacy assessment

5. The European resource adequacy assessment shall be based on a transparent **methodology** which shall make possible that the assessment: [...]
- (d) **appropriately takes account of the contribution of all resources including** existing and future generation, **energy storage**, sectoral integration, demand response, and import and export possibilities and their contribution to flexible system operation; [...]



(m) **ensures that national characteristics of generation, demand flexibility and energy storage**, the availability of primary resources and the level of interconnection **are properly taken into consideration**

EASE's analysis:

The European resource adequacy assessment aims at determining resource adequacy concerns by assessing the overall adequacy of the electricity system to supply current and projected demands for electricity. This assessment will be conducted by ENTSO-E on a yearly basis and will a.o. take into account the contribution of energy storage to meet adequacy concerns.

Electricity Directive, Article 59 – Duties and powers of the regulatory authority

1. The **regulatory authority** shall have the following duties: [...]

(v) **monitoring investment in generation and storage capacities** in relation to security of supply

EASE's analysis:

Regulatory authorities will have to monitor investment in storage capacities in order to assess security of supply levels.

h. Capacity mechanisms

Electricity Regulation, Article 22 – Design principles for capacity mechanisms

1. **Any capacity mechanism shall:**

(h) **be open to participation of** all resources that are capable of providing the required technical performance, including **energy storage** and demand side management;;

EASE's analysis:

Capacity remuneration mechanisms (CRMs) should be used as a last resort only, following an adequacy assessment, with preference for strategic reserves. Where they are introduced, CRMs should be market-based and non-discriminatory, open to all types of resources including energy storage. This could be a source of longer-term revenues for energy storage facilities in some Member States, although derating of storage and demand response can hamper profitability.

Electricity Directive, Article 8, para 2

2. Member States shall lay down the criteria for the grant of authorisations for the construction of generating capacity in their territory. In determining appropriate criteria, Member States shall **consider:** [...]

(l) the **alternatives to the construction of new generating capacity, such as demand response solutions and energy storage.**

EASE's analysis:

Energy storage and demand-response are recognised as valid alternatives to the construction of new generating facilities in certain circumstances.



i. Market Access

General provisions

Electricity Regulation, Article 1 – Subject matter and scope

This Regulation aims to: [...]

- (b) **set fundamental** principles for well-functioning, **integrated electricity markets**, which allow all resource providers and electricity customers **non-discriminatory** market access, **empower consumers**, **ensure competitiveness** on the global market as well as **demand response**, **energy storage** and **energy efficiency**, and facilitate aggregation of distributed demand and supply, and enable market and sectoral integration and market-based remuneration of electricity generated from renewable sources;;

Electricity Regulation, Article 2, para 25 – Definitions

- (y) 'market participant' means a natural or legal person who buys, sells or generates electricity, who is engaged in aggregation or who is an operator of demand response or energy storage services, including through the placing of orders to trade, in one or more electricity markets, including in balancing energy markets;;

Electricity Regulation, Article 3 – Principles regarding the operation of electricity markets

Member States, regulatory authorities, transmission system operators, distribution system operators, market operators and delegated operators shall ensure that electricity markets are operated in accordance with the following principles: [...]

- (g) market rules shall **deliver appropriate investment incentives for generation**, in particular **long-term investments** for a decarbonised and sustainable electricity system, **energy storage**, energy efficiency, demand response to meet market needs and facilitate fair competition and thus ensure security of supply;
- (j) safe and sustainable generation, **storage** and demand shall **participate on equal footing** in the market, under the requirements provided for in the EU law;
- (m) market rules shall **enable the efficient dispatch of** generation assets, **energy storage** and demand response;
- (n) market rules shall **allow for entry and exit of** electricity generation, **energy storage** and electricity supply undertakings based on their assessment of the economic and financial viability of their operations;

EASE's analysis:

The Electricity Regulation enshrines the right for energy storage to participate in electricity markets, on a level playing field with generation and demand-side response. Market rules should deliver proper investment incentives, including long-term investments, and enable the efficient dispatch of energy storage.

Dispatching, redispatching and curtailment

Electricity Regulation, Article 13 – Redispatching



1. The **redispatching** of generation and redispatching of demand response shall be based on **objective, transparent and non-discriminatory criteria**. It shall be **open** to all generation technologies, **all energy storage** and all demand response, including those located in other Member States unless technically not feasible.
2. The resources redispatched shall be selected amongst generation, energy storage or demand facilities using **market-based mechanisms and shall be financially compensated**. Balancing energy bids used for redispatching shall not set the balancing energy price.
3. **Non-market-based redispatching** of generation, energy storage and demand response may only be used where:
 - (a) **no market-based alternative is available;**
 - (b) **all available** market-based resources **have been used;**
 - (c) **the number** of available power generating, **energy storage** or demand response facilities is too low to ensure **effective competition** in the area where suitable facilities for the provision of the service are located;
 - (d) the **current grid situation** leads to **congestion** in such a **regular and predictable** way that market-based redispatching would lead to regular strategic bidding which would increase the level of internal congestion and the Member State concerned either has adopted an action plan to address this congestion or ensures that minimum available capacity for cross-zonal trade is in accordance with Article 16(8).
4. The transmission system operators and distribution system operators shall report at least annually to the competent regulatory authority, on:
 - (a) The level of development and effectiveness of market-based redispatching mechanisms for power generating, energy storage and demand response facilities;
 - (b) the reasons, volumes in MWh and type of generation source subject to redispatching;
 - (c) the measures taken to reduce the need for the downward redispatching of generating installations using renewable energy sources or high-efficiency cogeneration in the future including investments in digitalisation of the grid infrastructure and in services that increase flexibility. [...]
7. **Where non-market based** redispatching is used, it shall be subject to financial compensation by the system operator requesting the redispatching to the operator of the redispatched generation, energy storage or demand response facility except in the case of producers that have accepted a connection agreement under which there is no guarantee of firm delivery of energy. Such financial compensation shall be at least equal to the higher of the following elements or a combination of both if applying only the higher would lead to an unjustifiably low or an unjustifiably high compensation:
 - (a) additional operating cost caused by the redispatching, such as additional fuel costs in the case of upward redispatching, or backup heat provision in the case of downward redispatching of power-generating facilities using high-efficiency cogeneration;
 - (b) Net revenues from the sale of electricity on the day-ahead market that the power-generating, energy storage or demand response facility would have generated without the redispatching request; where financial support is granted to power-generating, energy storage or demand response facilities based on the electricity volume generated or consumed, financial support that would have been received without the redispatching request shall be deemed to be part of the net revenues.

EASE's analysis:



This article specifies that redispatching shall be non-discriminatory and market-based, open to all technologies including energy storage. The resources that are redispatched should be remunerated and balancing energy bids used for redispatching shall not set the balancing energy price. In specific cases, non-market-based redispatching could be implemented and resources subject to non-market-based redispatch should receive a compensation calculated according to one of the options listed in paragraph 7.

This article clarifies once again the legislative framework for storage and emphasises the need for market-based solutions wherever possible.

Balancing market

Electricity Directive, Article 40

1. Each transmission system operator shall be responsible for: [...]
 - (d) managing electricity flows on the system, taking into account exchanges with other interconnected systems. To that end, the transmission system operator shall be responsible for **ensuring a secure, reliable and efficient electricity system** and, in that context, for ensuring the **availability of all necessary ancillary services, including those provided by demand response and energy storage facilities**, insofar as such availability is independent from any other transmission systems with which its system is interconnected;
4. In performing the task referred to in point (i) of paragraph 1, transmission system operators shall procure balancing services subject to the following: [...]
 - (b) **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.
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.
6. Transmission system operators, subject to approval by the regulatory authority, or the regulatory authority itself, shall, in a transparent and participatory process that includes all relevant system users and the distribution system operators, **establish the specifications** for the non-frequency ancillary services procured and, where appropriate, **standardised market products** for such services at least at national level. The specifications shall ensure the **effective and non-discriminatory participation of** all 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. Transmission system operators shall exchange all necessary information and shall coordinate with distribution system operators in order to ensure the optimal utilisation of resources, to ensure the secure and efficient operation of the system and to facilitate market development. Transmission system operators shall be adequately remunerated for the procurement of such services to



allow them to recover at least the reasonable corresponding costs, including the necessary information and communication technology expenses and infrastructure costs.

EASE's analysis:

TSOs have to ensure a level-playing field between generation, demand-side response and energy storage when procuring ancillary and balancing services. Procurement specifications and requirements should be defined to create harmonised products, which will facilitate the participation of new market entrants. Energy storage is also recognised as an effective alternative to network reinforcement in various places.

All of these provisions will improve harmonisation of balancing markets across the EU, facilitate market access for energy storage, and allow storage to access new revenue streams.

Electricity Regulation, article 6, para 1

1. **Balancing markets**, including prequalification processes, shall be organised in such a way as to:
 - (a) **ensure effective non-discrimination between market participants taking account of the different technical needs of the power system and the different technical capabilities** of generation sources, energy storage and demand response; [...]
 - (c) **ensure non-discriminatory access to all market participants**, including electricity generated from variable renewable sources, demand response and energy storage, be it individual or through aggregation; [...]
9. The procurement of upward balancing capacity and downward balancing capacity shall be carried out separately, unless the regulatory authority approves a derogation from this principle on the basis that this would result in higher economic efficiency as demonstrated by an evaluation performed by the transmission system operator. Contracts for balancing capacity shall not be concluded more than one day before the provision of the balancing capacity and the contracting period shall be no longer than one day, unless and to the extent that the regulatory authority has approved the earlier contracting or longer contracting periods to ensure the security of supply or to improve economic efficiency.
Where a derogation is granted, for at least 40 % of the standard balancing products and a minimum of 30 % of all products used for balancing capacity, contracts for the balancing capacity shall be concluded for no more than one day before the provision of the balancing capacity and the contracting period shall be no longer than one day. The contracting of the remaining part of the balancing capacity shall be performed for a maximum of one month in advance of the provision of balancing capacity and shall have a maximum contractual period of one month.
10. At the request of the transmission system operator, the regulatory authority may decide to extend the contractual period of the remaining part of balancing capacity referred to in paragraph 9 to a maximum period of twelve months provided that such a decision is limited in time, and the positive effects in terms of lowering of costs for final customers exceed the negative impacts on the market. The request shall include:
 - (a) the specific period during which the exemption would apply;
 - (b) the specific volume of balancing capacity to which the exemption would apply;
 - (c) an analysis of the impact of such an exemption on the participation of balancing resources; and



(d) justification for the exemption demonstrating that such an exemption would lead to lower costs for consumers.

12. By 1 January 2028, national regulatory authorities shall report to the Agency and the Commission on the share of contract durations and procurement periods longer than one day.

EASE's analysis:

Article 6(1) specifically allows energy storage to participate in the balancing market and urges prequalification processes to take into account the technical capabilities of energy storage.

Article 6(9) of the Electricity Regulation states that the contracting period of at least 30 % of balancing products should not exceed one day. For the remaining part of the balancing capacity (60%), contracts up to one month can be foreseen. Contracts up to twelve months until end-2025 and six months after this date could also be foreseen, under specific conditions laid out in paragraph 9a.

This agreement allows for longer-term contracts than what was initially proposed by the European Commission; however, the absence of contracts longer than twelve months could be a risk for the storage business case as it may hamper investment in storage facilities.

Wholesale market

Electricity Regulation, Article 8, para 3 – Trade on day-ahead and intraday market

3. NEMOs shall provide products for trading in day-ahead and intraday markets which are sufficiently small in size, with minimum bid sizes of 500 kW or less, to allow for the effective participation of demand-side response, energy storage and small-scale renewables including direct participation by customers.

EASE's analysis:

Article 8(3) requires nominated electricity market operators (NEMOs) to provide day-ahead and intraday market products which are sufficiently small in size to allow for participation of energy storage. Minimum bid sizes of 500 Kilowatt or less should be implemented.

The implementation of minimum bid sizes could have a strong impact on the development of the energy storage sector: if minimum bid sizes are too high, this will prevent energy storage facilities with limited energy reservoirs to participate in the day-ahead and intraday market. EASE members will therefore be invited to discuss this topic and identify a minimum bid size that would best allow for the development of the storage sector. EASE could then advocate for a minimum bid size at Member State level.

Electricity Directive, Article 32

1. Member States shall provide the necessary regulatory framework to **allow and provide incentives to distribution system operators to procure flexibility services**, including congestion management in their areas, in order to improve efficiencies in the operation and development of the distribution system. In particular, the regulatory framework shall ensure that distribution system operators are able to procure such services from providers of distributed generation, 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 distribution system. Distribution system operators shall procure such services in accordance with transparent, non-**discriminatory and market-based procedures** unless the regulatory authorities have established that the procurement of such services is not economically efficient or that such procurement would lead to severe market distortions or to higher congestion.

2. Distribution system operators, subject to approval by the regulatory authority, or the regulatory authority itself, shall, in a transparent and participatory process that includes all relevant system users and transmission system operators, establish the specifications for the flexibility services procured and, where appropriate, standardised market products for such services at least at national level. The specifications shall ensure the effective and non-discriminatory participation of all 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. Distribution system operators shall exchange all necessary information and shall coordinate with transmission system operators in order to ensure the optimal utilisation of resources, to ensure the secure and efficient operation of the system and to facilitate market development. Distribution system operators shall be adequately remunerated for the procurement of such services to allow them to recover at least their reasonable corresponding costs, including the necessary information and communication technology expenses and infrastructure costs. [...]
3. The **development of a distribution system shall be based on a transparent network development plan** that the distribution system operator shall publish at least every two years and shall submit to the regulatory authority. The network development plan shall provide transparency on the medium and long-term flexibility services needed, and shall set out the planned investments for the next five-to-ten years, with particular emphasis on the main distribution infrastructure which is required in order to connect new generation capacity and new loads, including recharging points for electric vehicles. **The network development plan shall also include** the use of demand response, energy efficiency, **energy storage facilities** or other resources that the distribution system operator is to use as an **alternative to system expansion**.

EASE's analysis:

DSOs will have to procure flexibility or energy it uses to cover energy losses from various resources on a level playing field between generation, demand-side response and energy storage. Procurement specifications & requirements should be defined to facilitate the participation of all these resources. Energy storage will also be specifically covered by the distribution network development plans.

This will therefore facilitate the participation of energy storage and specific products could be created to reward energy storage specificities, e.g. fast-response time.