European Association for Storage of Energy

The Way Forward for Energy Storage Grid Fees

General Overview and Best Practices Across Member States

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Executive Summary

Energy storage doesn't receive the same treatment across the European Union as far as grid fees go: different technologies, different location (behind-the-meter vs front of the meter), have to face a variety of tariff structures, often not consistent with the EU-level rules as set by the Electricity Market Regulation. As per art. 18 of the Regulation, **tariffs should be cost-reflective and not discriminate against energy storage** – quite often, storage operators face disproportionate network fees that don't take into account the benefit brought by energy storage to grid stability and system flexibility.

To make sure grid fees don't hinder energy storage development, EASE recommends:

- **Full implementation of the Clean Energy Package** market design, and notably art. 18 of Regulation 2019/943;
- **An analysis of network investments and the procurement of flexibility** by system operators, who should transparently share with operators of energy storage facilities the flexibility needs alongside the grid;
- Grid tariff design should follow the main principle of **cost-reflectiveness** and ensure efficient dispatch and supporting flexibility;
- Behind-the-Meter energy storage systems should receive the **same treatment as self-consumed energy which remains within the prosumer's premises** in relation to grid access fees, according to the Renewable Energy Directive (RED II) at Article 21;
- **Tariff methodologies** and procurement of flexibility should **contribute to the deployment of energy storage**.

In the Annex to this paper, a detailed description of the best practices carried out in **Ireland** (temporary abolition of generation related charges for commercial energy storage providers) and **Portugal** (for collective self-consumers and renewable energy communities, the use of the internal grid between a self-consumption unit and the consumption unit is exempted from grid fee payment) can be found.

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1. Introduction

It has been well acknowledged that energy storage can make significant contributions to the European Union's decarbonisation goals by providing system flexibility options, and support security of supply [1], as energy storage withdraws energy in moments of excess of energy in the system, usually related with low prices, and injects it when the system is tight. However, there are several barriers that still need to be addressed for energy storage to more effectively deliver these services. It is responsibility of policymakers to provide an enabling environment in order to create a level playing field for energy storage [2]. The Clean Energy Package (CEP) has provided the basis to tackle many barriers to energy storage in legislation like the Renewable Energy Directive, but work must still be done to implement this at the national level. This includes the development of a national policy strategy for energy storage, as well as organisation at EU and national level to weigh network investments versus the procurement of flexibility from other sources, like energy storage.

The Clean Energy Package's key provisions on grid fees that, if properly implemented, would support the energy storage business case, are mainly article 21 of the Renewable Energy Directive (REDII) and article 18 of the Electricity Market Regulation. article 21 of REDII states that "renewables self-consumers are entitled to store and sell their excess production of renewable electricity (...) without being subject, in relation to the electricity that they consume from or feed into the grid, to discriminatory or disproportionate procedures and charges, and to network charges that are not cost-reflective". It also states that "member states shall ensure that consumers are entitled to become renewable self-consumers, and as such are entitled "to install and operate electricity storage systems (...) without liability for any double charge, including network charges, for stored electricity remaining within their premises." [3] Article 21 continues, clarifying that Member States may apply non-discriminatory and proportionate charges and fees to renewable self-consumers, as long as the economic viability and incentives are not undermined, and depending on the total installed capacity. As the European Commission study [4] indicates, double charging of stored energy (during storage charge and discharge) can be especially detrimental to the deployment of energy storage if it exists in the Member State. Moreover, according to Article 18 of the Electricity Regulation (EU) 2019/943, [5] the charges applied by network operators for access to networks (...), shall be cost-reflective (...) and are applied in a non-discriminatory manner. Those charges shall not include unrelated costs supporting unrelated policy. This article states also that "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".

The aim of this paper is to establish a pathway to creating a level playing field for energy storage, by recognising its specific attributes in national regulations when defining grid fees and charges, and by providing general recommendations on the policy re-design that would make it possible for grid fees to foster the energy storage business case. Part of the challenge of this is the fact that these regulations are different in every EU member state, so a more common approach would benefit energy storage. However, there are examples of good practices regarding the regulatory treatment of energy storage: Portugal and Ireland both provide examples of Member States making changes to regulations to reduce barriers to energy storage, and will be examined more closely for their successes, and what still needs to be improved. The scope of this paper does not include the separate topic of taxation, which is addressed in the EASE reply to the public consultation on the revision of the Energy Taxation Directive.

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[1] See the European Parliament report 2019/2189(INI) on a comprehensive European approach to energy storage, and the study by the European Commission (below).

[2] European Commission, (2020) Study on energy storage – Contribution to the security of the electricity supply in Europe.

[3] Directive (EU) 2018/2001 (RED II): Article 21, paragraph 2.

[4] European Commission (2020), Study on Energy Storage.

[5] Regulation (EU) 2019/943 on the internal market for electricity, Article 18: tariff methodologies shall reflect the fixed costs of transmission system operators and distribution system operators and shall provide appropriate incentives to transmission system operators and distribution system operators over both the short and long run, in order to increase efficiencies, including energy efficiency, to foster market integration and security of supply, to support efficient investments, to support related research activities, and to facilitate innovation in interest of consumers in areas such as digitalisation, flexibility services and interconnection.

2. Background and EU Member States Overview

The European Union Agency for the Cooperation of Energy Regulators (ACER) has completed reports on electricity tariff methodologies across Europe, to deepen the understanding of electricity transmission and distribution tariffs. The current situation on charges for energy storage is covered by these reports, providing a solid basis to assess how tariff methodologies around Europe are affecting energy storage. The report on distribution tariffs, published in 2021, found that there is no common understanding of the term "distribution tariffs", and found a great variety in tariff bases and no prevailing practice, making any comparison difficult and potentially misleading. [6] The transmission tariff methodologies report from 2019 had very similar conclusions, noting that great variety of tariff structures makes comparisons difficult. [7] As energy storage does not have its own policy or strategy in most member states, this means the tariffication practice for energy storage across Member States is fragmented, with no common practices setting any standard.

These findings are complemented by a 2017 study [8] on transmission network costs for energy storage facilities in Europe, which found significant differences in transmission network charges, which are mainly explained by the capacity-based component of the transmission tariffs. [9] It should be noted that energy storage markets are generally more developed in western and southern Europe, which can be seen in the examples in the table below. For example, in Romania the focus is mainly on ensuring the functionality of the distributed flexibility solutions, rather than in the stage of incentivisation for mass adoption. While the topic is spread through different pieces of regulation, there is no regulatory framework dedicated to energy storage, and thus several barriers exist which prevent an adequate level of energy storage project development. The table below gives an overview of the variation in the treatment of energy storage in tariff structures across the European Union. There are few prevailing practices, and many Member States have certain exemptions or specific characteristics due to geography or historical regulatory practices. It is important to note that energy storage does not have a dedicated place in the tariff structure of most member states, and the examples provided in the table are some of the cases where it does. In the Member States that have energy storage connected at either the transmission or distribution level and is not otherwise specified below, energy storage is treated the same as any other consumer, and due to the specific attributes and services of energy storage, this may act as a barrier to the deployment of energy storage systems.

As the table shows, different technologies are not always treated similarly: pumped-hydro storage (PHS), for example, is by far the most used energy storage technology in the EU, and is often treated differently than other energy storage technologies: it is often a category of its own in tariff methodologies. There is still a large diversity in transmission charges, and obligations for pumped hydro storage plants, and remuneration conditions vary greatly. [10]

[6] ACER. Report on Distribution Tariff Methodologies in Europe. February 2021.

[7] ACER. ACER Practice Report on Transmission Tariff Methodologies in Europe. December 2019.

[8] "Comparison of Belgian transmission network costs incurred by an idealized storage facility with those in other European countries" (2017) Deloitte. Prepared at the request of the Belgian Commission for Electricity and Gas Regulation https://www.creg.be/sites/default/files/assets/Consult/2018/1718/PRD1718FR.pdf annexe 2

[9] It's worth noting that differences between network charges also depend on the different investment needs for each Member State's grid.

[10] "Assessing the economic conditions of Belgian pumped-hydroelectric storage: comparative review of profitability drivers in Europe and evaluation of the current situation" (2018) Deloitte. Prepared at the request of Electrabel.

	Transmission	Distribution
Tariff structures	**Germany** and **Austria** are the only countries to have special tariff regimes for energy storage facilities. The majority of other EU member states do not have any specific tariff regime for energy storage, thus must pay fees as any other consumer. Energy storage facilities must pay both injection and withdrawal charges in 5 countries (**BE, FI, IE, NO, UK**).	Energy storage facilities must pay both injection and withdrawal charges in 4 countries (**FR, LU, SE, BE**). Special tariffs for energy communities are rare, but there are some examples: • **France** has an optional structure for collective self-consumption, **Portugal** with structure for RECs.
Tariff exemptions	Certain exemptions exist for energy storage facilities in at least 6 of the Member States that apply injection or withdrawal charges, often depending on voltage level or capacity. The **German** special tariff regime provides a 20-year exemption of the transmission tariff component for energy storage facilities built between 2011 and 2026. In **Italy** storage facilities are exempted from the application of grid tariffs, charges covering transmission and distribution and system costs for the electricity withdrawn and subsequently reinjected into the grid. In **Spain**, PHS plants withdrawals from the network are exempt from paying grid tariffs and system charges. Batteries are exempt from grid tariffs when withdrawing energy when they are directly connected to the grid, but not when they are embedded in customers facilities. In **Portugal**, PHS withdrawals from the network are exempt from paying grid tariffs and system charges, however, for other types of storage, including batteries, the exemption is applied to the injection into the electricity network. Specific tariffs are applied to PHS facilities in **Austria**. In **France** rebates are applied to PHS considered as electro intensive consumers.	**Finland** stands out as the only member state not to charge injection or withdrawal fees for energy storage facilities at the Distribution level. In **Sweden**, time-variable tariffs and some tariff exemptions for generation are available for energy storage. Starting 2022 in **Italy**, network charges are no longer applied also on the energy withdrawn from storage systems in order to be reinjected also for behind-the-meter storage configurations in all voltage levels that share the connection point with other consumption units belonging to the same customer. **Ireland** applies demand related network charges and not generation related charges to commercial energy storage providers. In **Portugal**, behind-the-meter energy storage systems are being exempt from a portion of the tariff for withdrawal from the network (an amount equivalent to the general costs of economic interest). Moreover, the use of the internal grid between the self-consumption unit and the consumption unit (either a household or an energy storage unit) is exempted from grid fee payment.

	Transmission	Distribution
Other important notes	In some member states like the **Nordic countries**, energy storage facilities must fulfil some non-remunerated obligations related to grid services, and they must bear these costs, aside from the tariffs also applied to them. Transmission network costs are lowest in **Finland, France, the Netherlands, and Belgium**, where grid fees are based mostly on the amount of energy transmitted, except Netherlands which is based entirely on power (use of the transmission line at a certain level of capacity).	The dominant tariff design in the EU is volumetric. Only **Norway, Netherlands, Spain, Portugal, Sweden** and **Italy** use a more mixed approach between, volumetric, capacity, and fixed costs.

Each of the studies and reports show that the tariff methodology for energy storage is generally different in each EU member state. What is not different, is that energy storage still faces barriers coming from network charges in Member States where non cost-reflective double grid tariff charging exists. The European Commission study calls on the Commission, ACER, and other EU authorities to prioritise measures to address the identified barriers to energy storage in the majority of member states, and specifies what measures are and are not addressed through the Clean Energy Package provisions at the EU level. The CEP does aim to tackle the issue of double charging of grid tariffs at the national level while recalling that network charges need to be 'cost-reflective', but tariff methodologies must still be updated to address this in some Member States. Along with this change, some of the best practices for energy storage in national regulations can be proposed to address some of the potential barriers in other member states.

3. Best Practices: Ireland and Portugal

As can be seen in the table above, A good example deserving of a closer look is Ireland, an island country with a high level of renewable energy use, which has recently addressed the barrier of double charging of stored energy. The Irish CRU (Commission for Regulation of Utilities) eliminated double charging for energy storage, as a temporary solution to the identified problem that energy storage providers had to pay both demand related and generation related network charges. The CRU decided to apply demand related network charges and cease generation related charges to commercial energy storage providers, as a temporary solution before the full review of grid charges.

Another example worth mentioning of a favourable and advanced regulatory framework is Portugal, which has some of the more developed regulations for these topics, most notably, its approach to renewable energy communities. With the Clean Energy Package, the EU defined the concept of energy communities in legislation, with two variations, citizen energy communities, and renewable energy communities (RECs). The latter aims to empower renewable self-consumers and enable RECs, therefore EU Member States should ensure that they can participate on equal footing with large participants, and have available support schemes. Portugal provides an excellent example of how this is being put into practice, and the difficulties still needing to be worked through. The REC regulations currently in place in Portugal provide several benefits: it is especially noteworthy the full exemption from grid fees that RECs and collective self-consumers are subject to, as well as the partial grid fees' exemption that is applied to individual self-consumers. This solutions encourage domestic and collective self-consumption, simply by adhering to the Clean Energy Package rules (see art. 21 of the Renewable Energy Directive.
A comprehensive report on how these regulatory frameworks are designed can be found in the Annex at pag. 8 of this paper.

4. EASE Recommendations

To help create a level playing field for energy storage and target certain barriers, EASE proposes the following recommendations. These include general recommendations, and then recommendations specific for grid scale energy storage and behind the meter storage, respectively.
General Recommendations:

- Energy storage should be guaranteed a level playing field and cost reflectiveness in the EU, by abolishing non-cost reflective grid charges that still exist in national regulations, prioritising the full implementation of the new electricity market design (and notably art. 18 of the Electricity Regulation).

- A clear strategy for both EU-level and national regulations addressing system flexibility and stability needs is required: energy storage is a stand-alone critical pillar in achieving the energy transition and should be subject to specific, tailored regulation – rather than being treated as a subset of generation.

Recommendations for grid scale energy storage:

- An analysis of network investments and the procurement of flexibility is to be expected by system operators, who should transparently share with operators of energy storage facilities the flexibility needs alongside the grid (as lalready foreseen by art. 32 of the Electricity Market Directive).

- Grid tariff design should follow the main principle of cost-reflectiveness and ensure efficient dispatch and supporting flexibility. Careful consideration should be given to the alignment of grid tariffs and the role of storage in reducing renewable energy redispatch costs: t is key to accurately reflect energy storage's ability to address energy scarcity and its unique value in reducing net peak load without the emissions of alternative generation technologies (as it is already done e.g. in France).

Recommendations for Behind-the-meter energy storage:

- Behind the Meter energy storage systems should receive the same treatment as self-consumed energy which remains within the prosumer's premises in relation to grid access fees, according to the Renewable Energy Directive (RED II) at Article 21, which also specifies that renewable self-consumers should not be subject to discriminatory or disproportionate procedures and charges, and to network charges that are not cost-reflective.

- Tariff methodologies and procurement of flexibility should contribute to the deployment of energy storage, taking into consideration tariff framework applied in each Member State that focuses on incentivising efficient dispatch and flexibility, while ensuring cost reflectiveness without creating a disadvantage for energy storage with the charges it faces. While there is not a cost-reflective tariff and/or energy storage is not deployed, some exemptions might apply in the short term to level the field. Exemptions should provide the necessary stability and predictability for the adoption of new business cases, for which energy storage can take an important role.

- The repartition formula and approach for determining the amount of self-produced energy to be shared to each of the REC participants should be defined autonomously by the Community, with stable rules, consistent with an efficient grid management. In case the REC participants have the option to refer to a standard approach, this shouldn't be fixed for a long period of time, to provide more liberty for the RECs to adapt and implement the best approaches for energy sharing, by testing the different solutions currently being applied and the ones expected to be introduced.

5. Annex

Please find below a comprehensive account of the best practices briefly presented in Section III.

5.1 The Irish Case

EirGrid, the operator of the national electricity grid in Ireland, has found that the use of renewable electricity has increased from 36% in 2019, up to 43% in 2020, with wind generation accounting for most of this renewable electricity. [11] This sharp increase came just in time for the country to meet the binding EU targets for renewable energy in 2020. Now that this has been met, EirGrid is now moving on to the next target of delivering 70% of island's electricity from renewable sources by 2030. EirGrid's technical report on the future of the electricity system [12] provides a detailed overview of system technical challenges, and their potential solutions, many of which involve energy storage. The report identifies energy storage potentially contributing to solutions for frequency stability and control, voltage stability, congestion system restoration, and generation adequacy. Energy storage will play an important role in meeting this 70% RES target, and in this regard, EirGrid foresees the country's battery energy storage capacity to increase threefold by 2030.

The decision paper from the Irish Commission for Regulation of Utilities (CRU) explains why and how Ireland eliminated double charging for energy storage. The CRU proposed a temporary solution to the identified problem that energy storage providers had to pay both demand related and generation related network charges. [13] This arrangement was identified as a likely barrier to entry for energy storage providers, as the arrangement was in place before the growth in energy storage projects, and thus was not envisioned in their planning. The CRU gathered responses from a public consultation on its proposed interim solutions, with the majority of respondents supporting the demands related network charging, as the best solution to apply on an interim basis. Based on this, the CRU decided to apply demand related network charges and cease generation related charges to commercial energy storage providers, which had represented 25% of network operator charges. The CRU reiterates that this is only an interim decision as a pragmatic approach, in advance of a full review of grid costs when energy storage providers use the network.

The CRU instructed EirGrid to cease charging generation related network charges to commercial energy storage units from the 1st of October 2020, and will conduct a wider tariff review in 2021 which will consider new technology types. While it is true that the problem addressed here may not exist in several other member states, it provides an informative example of identifying what storage operators perceive as barriers, and introducing targeted changes in regulation to eliminate them. The Irish case also provides an example of how energy storage can contribute to the system when it has a level playing field, and is not disadvantaged when entering the market.

[11] EirGrid, Electricity consumption from renewables 2020, 12 April 2021.

[12] EirGrid, Full Technical Report on Shaping Our Electricity Future, February 2021. See table 31.

[13] Commission for Regulation of Utilities, Network Charges for Commercial Storage Units Interim Solution. CRU/20/115. 29 September, 2020.

5.2 The Portuguese Case

Portugal has had a legal framework for self-consumption and small production units since 2014, however the introduction of the CEP meant a revision was needed. In 2019 a new legal regime only dedicated to self-consumption (excluding small production units) was introduced already including RECs, collective self-consumption and energy storage. However, the Technical Regulation applicable at the time didn't include energy storage neither did it identify how the generation and grid fees were going to be split into the different participants of the collective self-consumption or of the REC. These points were later included in the 2021 revision of the regulation.

Renewable energy communities share the electricity among the participants, so it is important to note how this is done. This share involves the application of specific coefficients to the different consumption installations belonging to a single REC, which are defined by the Collective Self-Consumption management entity (EGAC). The share of electricity between the different installations can be done either through fixed or proportional coefficients. The fixed coefficients can have a time granularity of 15 min. Through the proportional share, the share is done in proportion of the consumption measured in each installation, with a time granularity of 15 min. The coefficients are fixed for a 12-month period (as stated in DL 162/2019), except in case of new members or exits. These coefficients are also used to determine the grid taxes and fees that need to be incurred by the REC and its singular participants.

Barriers still to be addressed by REC Regulations

Energy storage is considered either as production or consumption unit, depending on the dominant flow measured at the connection point to the electricity grid, and this is also reflected on the grid fees applied, meaning that energy storage systems incorporated in collective self-consumption pay both ways, for injection and consumption from the grid.

The shared coefficients are also applied for energy storage, meaning that the proportion of electricity that is destined to the energy storage system is predetermined by the coefficient, which removes the freedom of self-consumers to manage energy storage systems dynamically and optimally, preventing them from freely participating in the electricity market.

Best Practice examples from REC Regulations

On the other hand, the REC regulations in Portugal provide several benefits. The new regulation introduces the possibility to conduct pilot-projects for a limited time (maximum 1 year), which will be subject to differentiated regulatory treatment under the terms defined and agreed with the National Regulator.

Regarding exemptions, the use of the internal grid between the self-consumption unit and the consumption unit (either a household or an energy storage unit) is exempted from grid fee payment. Self-consumption is exempted from a portion of the grid fees related to the General and Economic Interest Costs, with the level of exemption varying with the size of the self-consumption. For instance, RECs and collective self-consumers are completely exempted from paying these costs, whereas individual self-consumers only pay half of these costs. However, for this exemption to be applied to new participants, it needs to be approved every year by a dispatch from the Government.

[11] EirGrid, Electricity consumption from renewables 2020, 12 April 2021.

[12] EirGrid, Full Technical Report on Shaping Our Electricity Future, February 2021. See table 31.

[13] Commission for Regulation of Utilities, Network Charges for Commercial Storage Units Interim Solution. CRU/20/115. 29 September, 2020.

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About EASE:

The European Association for Storage of Energy (EASE) is the leading member - supported association representing organisations active across the entire energy storage value chain. EASE supports the deployment of energy storage to further the cost-effective transition to a resilient, low-carbon, and secure energy system. Together, EASE members have significant expertise across all major storage technologies and applications. This allows us to generate new ideas and policy recommendations that are essential to build a regulatory framework that is supportive of storage.

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

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Disclaimer:

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

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