



Storage & Renewables Electrifying Cyprus – SREC

On line Workshop

‘Regulatory framework for storage’

Cyprus Energy Regulatory Authority

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Points of discussion

- Introduction
- European Framework related to storage
- Regulatory Framework related to storage in EU MS
- National Regulatory Framework related to storage
- Conclusions

Introduction

- In a perfectly balanced energy system, the electricity demand and supply have to be perfectly aligned. Energy storage can stabilise the fluctuations in demand and supply by allowing the storage of excess electricity.
- With the energy system relying more and more on RES, the energy storage has a key role to play in the transition towards a carbon-neutral economy.
- Therefore, it is essential to provide for a robust regulation of the electricity storage systems in order to achieve a stable and safe supply with no discriminations.

European Regulatory Framework for energy storage (1)

Clean Energy for All Europeans

Electricity Directive 2019/944

RES Directive 2018/2001

Regulation 2019/943

European Regulatory Framework for energy storage (2)

- **Directive 2019/944** 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- centered, flexible, fair and transparent electricity markets in the Union.
- **Directive 2018/2001** establishes a common framework for the promotion of energy from renewable sources. It sets a binding Union target for the overall share of energy from renewable sources in the Union's gross final consumption of energy in 2030.
- **Regulation 2019/944 aims to** 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.

European Regulatory Framework for energy storage (3)

Regulation 2019/943 – Electricity Market Design

The Regulation requires that all relevant actors should ensure electricity markets provide a level-playing field for generation, electricity storage and demand response.

European Regulatory Framework for energy storage (4)

- **Directive 2019/944 – Definition of storage**
 - **‘energy storage’** as 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.
 - **‘energy storage facility’** means, in the electricity system, a facility where energy storage occurs.

European Regulatory Framework for energy storage (5)

Directive 2019/944 – Active customers and Citizen Communities

Member States shall ensure that active customers that own an energy 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 or fees;
- (d) are allowed to provide several services simultaneously, if technically feasible.

European Regulatory Framework for energy storage (6)

Directive 2019/944 – Aggregation

- Final customers should be able to access all electricity markets, including through aggregation, being also entitled to separate electricity supply and electricity service contracts.
- NRAs or system operators should establish the rules for the participation of aggregators in the markets.

European Regulatory Framework for energy storage (7)

Directive 2019/944 – DSO ownership of storage systems

DSOs shall not be allowed to own, develop, manage, or operate energy storage facilities.

However, derogations may be granted to DSOs, where there are fully integrated network components, or where all of the following conditions are fulfilled:

(a) other parties, have not been awarded a right to own, develop, manage or operate such facilities;

(b) such facilities are necessary for the DSOs to fulfil their obligations under the Directive 2019/944 and the facilities are not used to buy or sell electricity; and

(c) the regulatory authority has assessed the necessity of such a derogation.

European Regulatory Framework for energy storage (8)

Directive 2019/944 – TSO ownership of storage systems

TSOs shall not be allowed to own, develop, manage, or operate energy storage facilities.

However, derogations may be granted to TSOs, where there are fully integrated network components, or where all of the following conditions are fulfilled:

(a) other parties, have not been awarded a right to own, develop, manage or operate such facilities;

(b) such facilities or non-frequency ancillary services are necessary for the DSOs to fulfil their obligations under the Directive 2019/944 and the facilities are not used to buy or sell electricity; and

(c) the regulatory authority has assessed the necessity of such a derogation.

European Regulatory Framework for energy storage (9)

Directive 2019/944 & Directive 2018/2001 &
Regulation 2019/943

Connection and access charges

- TSOs shall publish procedures for non-discriminatory connection of new energy storage.
- Network charges shall be cost-reflective, transparent and non-discriminatory, and not discriminate either positively or negatively against energy storage or aggregation

European Regulatory Framework for energy storage (10)

Green Deal – General provisions

- With the adoption of the EU Green Deal, the EU has begun a comprehensive review of relevant EU legislation to determine to what extent amendment or additional legislation will be necessary to make the EU carbon neutral by 2050.
- For storage, much is expected from the revision of the Taxation Directive, the Renewable Energy Directive, the TEN-E Regulation and State Aid Guidelines.

Regulatory Framework related to storage in EU MS

Country	Participation of storage in the market	Involvement of TSO/DSO
Austria	Storage facilities can participate in the electricity markets (including intraday and balancing).	System operators are currently testing/running (battery) storages in the framework of scientific research projects for frequency and non-frequency ancillary services * System operators run (battery) storages as integrated grid assets for congestion management of meshed (medium voltage) nodes and to balance the power fluctuation of energy communities (in the framework of scientific research projects)
Belgium	Storage facilities in Belgium can participate in the electricity spot and balancing markets, either directly (with a minimum bid volume increment of only 0.1 MW), or via aggregators.	In Wallonia (= <70kV), the DSOs are allowed to own and operate storage systems but only if it is for strict support of the grid and only after the market fails to provide * At federal level (>70kV), the regulator does not allow the TSO to own and operate storage
Czech Republic	Storage facilities can participate in the electricity markets (including intraday and balancing) only together with the spinning reserves. Stand-alone batteries are completely forbidden for any kind of use in the energy markets in the Czech Republic, use with RES officially allowed, but technically infeasible.	DSOs and TSOs are not allowed to own storage plants, but can operate them for the time being (the 4 MW project between CEZ and CEPS (Czech TSO) in Tusimice is partially operated by CEPS, but only in the testing regime).
Denmark	Storage devices (including batteries) can participate in the electricity markets.	While in 2014 stationary Li-ion batteries were installed by TSOs and DSOs on a test basis, it is assumed the grid operators are allowed to own and operate storage plants
France	Pumped hydro and batteries can participate in the electricity markets. The threshold for direct participation in wholesale markets was lowered to enable other flexibility resources. A storage unit can individually participate in the CRM if its capacity is above 1MW, or through aggregation for a total of minimum 1MW, for lower capacities.	The EU Electricity Directive 2019/944 states that TSOs and DSOs cannot own, develop, manage or operate energy storage facilities because it's a market-based and competitive activity; except if a derogation is given by the NRA in very specific conditions.
Germany	Electricity storage (pumped hydro and batteries) can individually or via aggregation participate in the electricity markets (threshold for direct participation of 1 MW) as long as storage is part of a nomination for which a balancing responsible party exists.	Due to the unbundling between network operation and the other actors according to the Energy Industry Act the operation of a storage facility for the distribution network operator is only possible for a few services.
Ireland	Energy storage is allowed to participate in the electricity markets (including intra-day and balancing). The effective participation varies per technology.	Currently the TSO/DSO do not own any energy storage plants
Italy	* The Italian energy markets do not specify the system actors which are able to participate, thus not blocking storage. However, the Italian wholesale energy markets do not have specific linked or loop block orders to allow tailored bids by storage. * Storage is allowed to participate in the Italian CRM (with a derating factor), whose auction took place at the end of 2019.	TSOs and DSOs may develop and operate battery storage facilities (Legislative Decree no. 93 of 01 June 2011). Regulation foresees that DSOs must submit a proposal providing a cost-benefit analysis to the regulator that justifies such investments if it is to be recovered through tariffs.
Slovenia	Behind-the-meter storage is already allowed. Besides larger projects, there have been some smaller projects including the vanadium-flow batteries installed at a restaurant in the Slovenian Alps.	The role of the Slovenian TSO excludes storage systems.
Spain	Spain's regulatory framework does not address energy storage systems, with the exception of pumped hydro, which is considered a conventional generation system, and thermal storage associated with thermal solar power plants. * There is no regulation for the electricity storage participation in the market in the resolution 15049/2019, which updated the rules for the day-ahead and intra-day markets, but mentions only producers, suppliers and consumers.	There are no unbundling requirements for TSOs/DSOs owning storage since regulation does not address the topic (except for pumped hydro in islands). * System operators are the owner of pumping capacity in the Canary islands to secure the supply of energy, to ensure the system's safety or to integrate non-manageable renewable energy sources (act 17/2013).
UK	Pumped hydro storage is active in wholesale markets. The UK has a capacity market suitable for storage	The current regulation does not address ownership and/or operation of storage by network operators.

Source: Study on energy storage –contribution to the security of the electricity supply in Europe March 2020

National Regulatory Framework for energy storage (1)

Law Regulating the Electricity Market N.130(I)2021- General provisions

- In October 2021, the Law was voted, in order to harmonize with European Directives and Regulations.
- Energy storage is defined according to the Directive (EU) 2019/944.
- Defines the obligations and responsibilities of CERA, the TSOC and the DSO, regarding the energy storage.
- Obligation to obtain a licence for energy storage facility from CERA.
- Provisions of ownership of energy storage facilities by the DSO and TSOC.
- Decision-making powers regarding the connection of energy storage facilities to the transmission system

National Regulatory Framework for energy storage (2)

Law Regulating the Electricity Market N.130(I)2021-Ownership of storage facilities

- The DSO/TSOC shall not own, develop, manage or operate energy storage facilities, unless the Minister of Energy, after consultation with CERA, with notification published in the Official Gazette of the Republic, may allow the DSO/TSOC to own, develop, manage or operate energy storage facilities, where they are fully integrated network components and CERA has granted its approval, or all of the following conditions are fulfilled:
 - i. where other parties, following an open, transparent and non-discriminatory tendering procedure 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,
 - ii. such facilities are necessary for the DSO/TSOC to fulfil its obligations under the Law for the efficient, reliable and secure operation of the system and the facilities are not used to buy or sell electricity in the markets; and
 - iii. CERA has assessed the necessity of such a derogation and has carried out an assessment of tendering procedure , including the conditions of the tendering procedure , and has granted its approval.

National Regulatory Framework for energy storage (3)

Law Regulating the Electricity Market N.130(I)2021 – Licencing

- CERA ensures that active customers do not incur any double charge for stored electricity remaining within their facilities and when providing flexibility services to system operators.
- CERA ensures that self-consuming energy consumers from RES, are entitled to install and operate energy storage facilities, without being liable for any double charge.
- The installation and/or operation of an electricity storage facility without obtaining a licence from CERA is prohibited, except for electricity storage facilities that operate exclusively for own use. A person who installs and/or operates an energy storage facility, without a license, is guilty of a criminal offense.

National Regulatory Framework for energy storage (4)

Regulatory Decision 03/2019 (KDP 224/2019)

- Participation of licenced storage facilities located in-front-of-the-meter in the wholesale electricity market, which are not combined with on-site electricity consumption, except the consumption necessary for the operation of the storage facility.
- Storage facilities should meet the requirements of the Transmission and Distribution Rules (TDR) and the Trading and Settlement Rules (TSR).
- TSOC was instructed to proceed with all necessary modifications of the TSR and / or the TDR, and to submit to CERA for approval a final proposal of modifications of the TDR and the TSR.
- At present, the TSOC has submitted to CERA his proposal on the relevant amendments on TSR and the TDR, and currently the issue is under consultation between CERA and TSOC.

National Regulatory Framework for energy storage (5)

Trading and Settlement Rules (proposal under consideration)

- Electricity Storage Facility is defined as the facility where energy is stored and it is connected to the Transmission or Distribution System located in-front-of-the-meter, which can receive operation orders derived from the TSO in case it is registered.
- Two new concepts are included:
 - Operator of Electricity Storage Facility
 - Representative of Electricity Storage Facility
- The amendments of TSR aim to allow the participation of electric storage facilities into the electricity market by purchasing and selling electricity according to its price, while providing also auxiliary services (i.e. system balancing, energy shift) to the system.

National Regulatory Framework for energy storage (6)

Transmission and Distribution Rules (proposal under consideration)

- TDR illustrate all technical requirements which must apply for interconnecting energy storage systems to the grid.
- In addition, the following concepts are also defined:
 - Electricity Storage
 - Minimum Energy Availability of Electricity Storage Facility
 - Maximum Energy Availability of Electricity Storage Facility
 - Maximum Discharge Capability of Electricity Storage Facility

Conclusions

- CERA has instructed the TSO to revise the TDR and TSR in order to include the storage provisions that were proposed by the recast electricity directive that was under consultation at that time. The TSOC submitted his proposal which is under consideration.
- Cyprus has fully transposed the provisions of the Directive 2019/944 into national law L.130(I)/2021
- CERA will re-examine the provisions of the Directive 2019/944 as well as the relevant provisions of the national law related to storage facilities in order to ensure that the proposed TSR and TDR are aligned.



Thank you!

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