

Energy storage commercial regulation: overview and recommendations

Key obstacles to storage:

1. Lack of clarity on the rules under which storage can access markets in particular the inability of transmission system operators (TSOs) and distribution system operators (DSOs) to own and operate storage, or purchase T&D deferral as a service in some countries, or lack of rules concerning the access of storage to the ancillary services market.
2. Application of final consumption fees to storage, even though storage does not constitute final use of the energy.
3. Payments for curtailment to renewable energy sources (RES) producers, removing an incentive for productive use of the curtailed electricity.

LESSONS LEARNED FROM THE ANALYSIS OF BUSINESS CASES FROM THE REGULATORY PERSPECTIVE

Introduce a capacity remuneration scheme: capacity payments to conventional generators and other dispatchable backup capacity (including storage).
Differentiate payments for frequency reserves based on speed and ramping capacity: provide higher payments for sources that are better suited to follow frequency regulation signal (pay for "mileage").
Enable access to the market for storage with limited energy capacity: reduce the duration of periods for which frequency reserve services have to be reliably provided and increase the number of tendering periods accordingly.
Allow storage access to the market: clarify rules under which TSOs/DSOs can operate storage or purchase T&D deferral as a service from third parties.
Remove price signal distortions caused by compensating curtailment: find alternative ways of compensating renewables producers so that curtailment payment is not an obstacle to storing the energy that would be curtailed.
Ensure Wind feed-in tariff/feed-in premium (FIT/FIP) is conserved for renewable electricity discharged from storage: conserve FIT for all renewable energy stored. If storage is charged both from renewables and non-renewables, conserve FIT/FIP for the renewable part.
Include producers of renewables electricity in the balancing market: increase responsibility of renewables producers for deviation between forecast and supplied energy.
Introduce time-of-use pricing at consumer level: set time-of-use pricing for households to encourage reduction of load at times of high residual demand (e.g., via use of storage).
Exempt electrolyser from final consumption fees when hydrogen is used outside power sector: enable integration of power and gas sectors as well as use of renewable electricity where it has the highest value/can contribute most to CO2 reduction.

Policy/Regulatory changes

There are three types of regulatory changes that can support the deployment and further commercialization of storage:

- I. **Removing obstacles to storage and hydrogen storage applications stemming from current regulation**
- II. **Introducing new regulation changing the overall energy system regulation**
- III. **Providing support during the initial phase.**

I. REMOVING OBSTACLES TO STORAGE APPLICATIONS

The minimum improvements the current regulation requires are changes that set a level playing field and remove obstacles preventing storage from participation in power markets. The main pitfall of the current regulation observed is thus a lack of storage-specific regulation causing obstacles to storage deployment. To that end, the new regulation should:

- Explicitly acknowledge storage as a separate asset class to encourage its differentiated treatment in applicable uses
- Recognize that storage is not final consumption and should not be regulated as such: – Storage should be exempt from final consumption fees and levies – Storage should not be subject to double grid or discriminatory fees
- Define conditions under which storage can participate in ancillary services markets, including minimum capacity, minimum availability time, maximum duration of service provision and minimum intervals between repeated provision of reserve

- Clarify conditions and limitations under which network operators (TSOs, DSOs) are allowed to own and operate a storage asset or purchase the T&D deferral service from external providers.

II. INTRODUCING A NEW REGULATION CHANGING THE OVERALL ENERGY SYSTEM REGULATION

Besides removing obstacles stemming from the current regulation, business cases for storage can be improved by considering new regulatory provisions described in the business case analysis section above. Importantly, new regulatory proposals as well as the existing regulation need to be consistent with EU energy policy objectives as set in the Treaty of Lisbon. The objective of the regulation is there by to:

- Ensure the functioning of the energy market
- Ensure the security of energy supply in the EU
- Promote energy efficiency and energy saving as well as the development of new and renewable forms of energy
- Promote interconnection of energy networks

III. PROVIDING SUPPORT DURING THE INITIAL PHASE

On top of removing obstacles and introducing new regulatory arrangements, deployment of storage technologies can be further supported by other measures with the aim to decrease costs of technologies and accelerate their commercialization, similarly to solar and wind technologies in the past. Potential support measures should be considered only in the initial deployment phase and were not further analyzed by the study.

Examples of potential impact on key stakeholders resulting from new regulatory options

Selected regulatory options	Potential impact on key stakeholders (non-exhaustive examples)
Introduce capacity remuneration scheme	Final power consumers: depending on how capacity remuneration is implemented, it may lead to an increase in electricity costs for final consumers
Exempt electrolyser from final consumption fees when hydrogen is used outside the power sector	Consumers in power, gas and mobility sectors: incidence of the costs for decarbonisation would depend on allocation of final consumption levies to individual sectors
Differentiate payments for frequency reserves based on speed and ramping capacity	Conventional generators: decrease in frequency reserve remuneration from slower/less accurate thermal sources if total frequency reserve remuneration amount is kept unchanged
Remove price signal distortions caused by compensating curtailment	Renewable generators: removing payments for curtailment could adversely impact renewables profitability and their further build-up
Include renewables producers in the balancing market	Renewables generators: increases costs of producing RES power and could adversely impact renewables profitability and their further build-up
Introduce time-of-use pricing at consumer level	Grid-level storage: time-of-use pricing at consumer level would lower residual load fluctuations at grid level, reducing the opportunity for grid-level storage TSOs and DSOs: – Introducing time-of-use pricing may require upgrades to infrastructure (e.g., smart metering); the costs may have to be borne by final consumers – Smoothing local demand profile may reduce required T&D upgrade investments

Source: European Commission, (2015)/ *Commercialization of energy storage in Europe: A fact-based analysis of the implications of projected development of the European electric power system towards 2030 and beyond for the role and commercial viability of energy storage*. Final report.