

Defining storage in the electricity system

As a relatively new entrant to the electricity system, treatment of electricity storage has been ad-hoc and inconsistent, applying and adapting existing rules to fit the industry. This has been an understandable approach, given the need to see how storage evolves as a technology and create appropriate rules and regulations, rather than making pre-emptive decisions early on in its development.

However, storage is now firmly established in the electricity system; it is providing many essential services to the grid and behind-the-meter, and plays a significant role in future projections for decarbonisation. In order to realise these ambitions and deploy storage at the necessary scale, as well as ensuring that it works in balance with the whole system, a more structured approach to storage is needed.

Government and Ofgem set out their [high level approach to storage in 2017](#), promising to define storage as a subset of generation in the Electricity Act 1989 and in the Electricity Generation Licence. The ESN's proposed definition¹ has been adopted by much of the industry and now by Ofgem, but we have yet to see a concrete resolution to this issue.

This paper will set out the various options available for defining storage and the subsequent implications for the industry. The intention of this paper is to provide stimulus for debate within the ESN and wider industry, for initial discussion at the ESN's Markets and Revenues Working Group on 11 September.

High-level overview of the options available

1. Do nothing

At present, storage is treated, by default, as a subset of generation. In terms of planning, health and safety, grid connection and charging, the rules that apply to generation are also applied to storage. Storage does not have a legal basis – it is not defined in legislation.

There are ad-hoc approaches to developing specific rules for storage and attempts to create favourable markets, for example:

- Some network and engineering codes are using the ESN's definition of storage¹.
- Code modifications are underway to remove residual import charges for storage.
- The Frequency and Capacity Markets allow storage to participate and NG ESO have also set up a Distributed Resource Desk which deals with smaller assets entering the Balancing Mechanism.
- A governance group has been set up by BEIS and British Standards Institution to produce specific guidance on storage.

¹ "Electricity storage is the conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy"

2. Define storage as a subset of generation

This is currently the favoured position by the government and Ofgem which would see storage being defined legally as a subset of generation. As proposed in the [Smart Systems and Flexibility Plan](#) in 2017, this would involve defining storage in the Electricity Act 1989 and in the Electricity Generation Licence and would create legal certainty around the definition and position of storage in the electricity system.

In addition to these key changes, this option would still require ad-hoc changes to the rules which apply to generation in order to ensure storage is treated correctly – see the examples outlined in option 1.

Electricity Generation Licence

This is currently undergoing a [second consultation by Ofgem](#) which proposes to use the ESN's definition of storage with some additional requirements for behind-the-meter storage. Making this change sets a positive precedent to legitimise storage and will also remove Final Consumption Levies (Feed-in Tariff and Renewable Obligation, but not Capacity Market or Contracts for Difference) charges from storage import.

Electricity Act 1989

BEIS proposed to add a definition to the Electricity Act, but this has so far not materialised, due to difficulties in getting any parliamentary time for primary legislation.

3. Define storage as a separate asset class

Storage could be given its own asset class and licence, given the unique type of service it offers to the electricity system. This would require a whole new set of rules to be created specifically tailored to storage.

This would be a significant change in legislation and would require much consultation and detailed drafting of a new licence for storage. The timeframe is likely to be lengthy, but would result in a specific, tailored approach to electricity storage.

What are the outcomes of each option?

1. Do nothing

The industry is familiar with the current rules and regulations and continuing with the current regulatory arrangements would give the industry a level of certainty. Any disruption and uncertainty caused by change would need to be outweighed by the benefits of a different model.

However, there are many disadvantages to the current model, including:

- **Legal limbo.** The absence of a definition in any legal sense creates uncertainty for lawyers and for investors.
- Without an agreed definition, there is the potential for **varying definitions** to be implemented across the industry.
- By default, storage is **treated as generation** and any rules specific to storage need to be created separately. The government and regulator have proposed to amend any rules to tailor them to storage where appropriate, for example;
 - Industry-led code modifications are underway to **remove residual network charges** on import for storage (DUoS, BSUoS and TNUoS);
 - There are proposals from BEIS to amend the **planning regime** to make it more appropriate and amenable for storage;
 - A specific, high-level governance group has been set up to create and/or curate **health and safety standards** for storage;

- The Microgeneration Certification Scheme is creating a **specific standard for small-scale storage**;
- In line with regs for generation, Ofgem has put in place rules that **prohibit DNOs from operating storage** (following EU legislation);
- DNOs are working to promote storage in the **connection queue**.

2. Define storage as a subset of generation

Following this route would go some way to solving some of the issues laid out above in the ‘do nothing’ scenario.

- Defining storage into the Electricity Act and the Generation Licence gives storage **legal status** and would reduce uncertainty.
- It would give a **consistent definition** to be used throughout the industry.
- Changes to the Generation Licence would remove some **Final Consumption Levies**, although not all (RO and FIT only, CM and CfD would need to be addressed separately)².
- It would give storage an official status in the system and the networks could start to **acknowledge the different services** that storage can offer.

However, it would still require most of the issues set out in the ‘do nothing’ scenario to be fixed separately.

The timeframe should be relatively short. The Electricity Generation Licence changes are out for consultation and could be implemented within 56 days of Ofgem finalising their decision². Getting parliamentary time is particularly difficult at the moment, but this would be a small change that would not likely involve controversy. However, changes to both the licence and legislation have been promised since 2017 and neither have yet to be fully resolved, so change to both aspects could still be a year or more away.

3. Define storage as a separate asset class

This option would require a major change to the current approach and would likely involve in-depth drafting and debate which could take years to resolve. However, the long-term benefits to the sector could outweigh the time and effort required to create a new asset class and licence.

The process required to draft and consult on a new licence for storage would prompt a **thorough and valuable debate** about how storage should be treated in the electricity system. Creating new rules that are specific to storage could lead to **new markets** and **increased deployment** of storage into services that benefit the system and aid decarbonisation.

Creating a new set of rules for a storage licence could fix some, but not all of the problems that storage is facing, including those outlined above. Given that some of the key issues to be addressed are already underway, there is the potential for work to be duplicated or overwritten. for example;

- Code modifications to remove **residual network charges** will already have been made in industry codes and would likely need to be changed again if a separate asset class is created.
- It is possible that the rules to prohibit **DNO operation of storage** would also need to be reapplied, although given that these have fairly closely followed EU legislation, it’s likely that they would be transferred to the new licence.

² See Ofgem’s statutory consultation on the regulatory framework for storage <https://www.ofgem.gov.uk/publications-and-updates/clarifying-regulatory-framework-electricity-storage-statutory-consultation-proposed-modifications-electricity-generation-licence>

- Changes to the **planning regime** will need to be addressed through separate guidance and legislation.
- Specific **health and safety guidance** would still need to be created.

Given how much the energy system is changing, it's likely that there will be future changes to the functioning of the network that require a specific approach for storage. At this stage, these changes are known unknowns, but having a separate licence may make it easier to design and implement such changes.

Conclusion

As an industry, we are at a crucial point – growth has been relatively high and the outlook positive, but this is not continuing. Investor confidence is falling and revenues are shrinking. Clearly something needs to change, but there is little agreement on exactly what should change. The high-level, top-down reform outlined in option 3 could lead to important decisions about the role of storage in the energy system and give confidence that the UK see storage as an important asset. However, the sector has also dealt with uncertainty throughout its lifetime and option 3 would lengthen this period of uncertainty. There are also many changes that will still need to be made outside of the scope of these high-level reforms.

This paper is intended to stimulate discussion within the network on this issue and come to a resolution on which to lead the industry.

Comments from ESN members

- The reason why we are not deploying more energy storage at the moment is not because of the import levies, planning or residual charges, it is a direct result of the market opportunities or rather lack of. We need BEIS, Ofgem and National Grid to step up and realise the value of such assets in the market by offering incentives, not in the form of subsidies, but in the form of markets rewarding assets for fast response and having the ability to relieve constraints on the network.
- The current classification of storage as generation will have serious implications for applications such as constraint management, i.e. renewable curtailment avoidance. In the long term a more costly option.
- Legal limbo: In our view, this can lead to advantages to energy storage giving the freedom required to assist the commercial viability.
- We believe the "do nothing" approach in respect of defining energy storage is the correct way.
- The only route to market for the use of storage for constraint management, i.e. avoiding curtailment, is through the BM. For the business case to work the spread between charged and discharged prices should be as large as possible but the BM is not a locational market, so prices are unlikely to reflect locational needs that could result in negative prices. For this reason, it is very likely that storage operators will need to bid negative prices to charge so that the spread is enough. If storage is classified as generation, a unit could not bid negative prices to charge.
 - This is relevant to in front of the meter storage, which has a role to play in reducing

constraints as it can be deployed in areas identified by NG ESO as bottlenecks.

Behind the meter storage would not face this issue, indeed if a wind developer were to install behind the meter storage it would be possible to charge the storage unit while receiving constraint payments without any issues. In my view this bypasses the rule that prohibits generation to charge with negative prices but the end result is similar to bidding negative prices in the BM for those units. So in my view this creates already an uneven playing field for both types of storage.

- National Grid ESO will develop a contractual framework to support the development of the new constraint management product, a key aspect is remuneration, there have been many judicial challenges in recent times so most investors in projects would also like to understand what alternatives there are to monetise the value and the BM will be the preferred option. So I'm interested in making sure that the classification of storage as generation does not impair future key applications and that there is a level playing field between all types of storage.
- We are already able to remove [final consumption] levies through obtaining a generation licence, we do not therefore believe we need to amend the definition of energy storage
- There are significant risks for storage to be defined as a separate asset class rather than as a subset of generation. More specifically, the DNOs will not need to change their licence condition and thus they will have the ability to take over the installation of energy storage directly as part of their regulatory spend under RII02. This has huge monopolistic implications on the market, a hindrance to natural competition and thus this is not the most effective solution for the UK's energy system.
- This is completely missing the point. It is nothing to do with the definition of storage. We need to enable the deployment through new markets that favour fast responding assets. The regulators and policy holders are stifling the market. We will not meet our zero carbon targets if we cannot balance an intermittent renewable network. We must act now to incentivise energy storage and inspire the confidence it so desperately requires.