

The future of storage in the licence regime

WORKSHOP SUMMARY



Who are we?

The Electricity Storage Network (ESN) was established in 2008 to bring together those working on storage within the electricity sector.

Since then the ESN has been a strong advocate of reducing barriers to the deployment of electricity storage and we are working together to fight for the future of storage.

If you would be interested in joining us and being a part of this important work, please contact Ella:
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The logo for The Electricity Storage Network is displayed on a grey rectangular background. It features the text "THE ELECTRICITY STORAGE" in a small, black, sans-serif font at the top. Below this, the word "NETWORK" is written in a large, bold, white, sans-serif font. The letters "N", "E", "T", and "O" are white, while the letter "W" is blue. A blue outline surrounds the "NETWORK" text, and the blue background of the slide is visible behind the grey box.

THE ELECTRICITY STORAGE
NETWORK

Why are we discussing a storage licence?



As it currently stands, electricity storage sits, by default, within the electricity generation licence. However, due to the distinct differences between the technologies this means regulatory changes must be made to ensure there is fair treatment of electricity storage.

Currently at the stands there are three options; to leave storage without any official recognition in the licence framework; to have storage as a distinct sub-set of generation; or to have a separate licence for storage.

CMP281 - This code modification will remove import Balancing Services Use of System charges for electricity storage facilities.

This was first raised in June 2017 and was approved by Ofgem in May 2020.

The legal stand point

- Storage has been around for at least a 100 years but isn't mentioned in the Electricity Act 1989 as it wasn't performing the same role for the system and the grid as it is now. Therefore the system is built on the idea that an asset is either generation or demand.
- There is now a definition for storage, developed by the ESN, which is being adopted into the legal framework.
- The legislative and regulatory approach to date is to treat storage as a subset of generation. As a result, the problems this creates for storage need to be addressed as they arise.
- Many storage operators, even if they don't need a licence, have obtained a generation licence to try and work within the framework.
- Some believe that defining storage as a subset of generation is simply delaying dealing with the issue and building up problems for the future. It could also encourage the development of the wrong type of storage for our future system.
- Others believe that the subset approach is pragmatic and the most feasible option.



- 2014 ESN and PRASEG launched a proposal for the future framework for storage.
- Many of the people in the group launching the framework at the time were manufacturers rather than developers and investors.
- That framework had 8 recommendations, which were aimed at gaining recognition of electricity storage. On that list was to simplify regulations and licences to encourage deployment of electricity storage.
- The Electricity Act 1989 doesn't mention electricity storage, but the pumped hydro facilities were granted generation licences for expediency originally.



Support for a licence

- This led to confusion in the early development of storage projects. There was confusion not only in the electricity act, but in the definition itself.
- Since storage was treated as generation, people began to apply it to their projects.
- This led to three options: ignore the problem, make storage a subset of generation or give storage a separate licence.
- We've come a long way from 2014 to 2020. Few were aware of storage in 2014 and manufacturers found the commercial framework difficult.

- BEIS published a call for evidence in 2016 where they asked how they can provide regulatory clarity for storage.
- Industry was united on the need for a legal definition and a place in the licence regime for storage, in order to create certainty for how storage was treated in planning, licensing and other legal frameworks.
- However, industry was split on whether to treat it as a subset of generation or whether to give it its own separate licence.
- Government and Ofgem both came to the conclusion that treating storage as a distinct subset of generation was preferable.
- Whilst storage and generation are different they share many similarities, so doing this reduces the amount of regulation and makes it quicker and easier to develop.



Government view

- It also reduces the uncertainty for existing developments that are on the system.
- Most importantly for government, defining storage as a subset allows them to treat storage differently.
- That has happened in a number of ways such as the changes to how storage is treated in the planning regime and storage specific innovation projects.
- Government have yet to receive evidence for how a separate licence would help but don't want to do anything to harm the development of storage.

The breakout rooms

Codes and operations

The electricity licence dictates which codes licensees should adhere to and how they operate in the electricity system. If storage were to have a separate licence, what difference would this make to the codes they adhere to?

How should storage be controlled and allowed to operate in the electricity system? How could the codes and rules which govern its operation best allow all types of storage assets to enable a flexible, decarbonised system?

- Could a tailored approach to storage in codes and operation of the grid ensure that assets can provide multiple services and 'stack' revenues?
- How could the demand aspect of storage be treated in the system operation and in codes to best allow a quick and efficient switch between operation modes?
- How should storage be treated in the connection process? Could a legal framework that acknowledges that storage provides a different service to both demand and generation, allow a more efficient connection process?
- How do curtailment regulations affect storage?

- Demand v generation licence
- Interconnectors act in a similar way but are treated differently
 - Most of the functions of storage are deliverable by systems that pay no system charges.

- Code modification
- If storage sites had a licence, whether as a subset or separate, they would be able to raise changes far more quickly than currently.

- The position of storage
- Storage falls across the boundaries of a number of existing licences.
 - Benefits from having its own licence but at certain levels of size.
 - Subset of generation has earmarked it for one area whereas all areas should have access to storage.

Codes and operations - discussion

- Stacking and services
- A separate licence could allow DNOs or the SO to let a contract for storage services.

- Connections
- Separate licence may allow DNOs to make exceptions easier as they have a defined category.
 - Would being a subset of generation mean that the unit is treated as generation in the connection queue? (ENA queue management resolving that)

- Curtailing
- The recognition of storage as a separate asset class could lead to it being treated separately in the event of assets being curtailed on the national grid.



Markets and services

Would a separate licence for storage allow markets to value the services storage provides more explicitly? Would some acknowledgment that storage is different, allow the control room to treat it as such?

- **Stacking:** Storage must be able to provide a number of services in order to gain enough value. Would a separate licence allow the system to acknowledge this holistically, rather than in individual services?
- **Control room:** Would a separate licence for storage allow the control room to acknowledge the difference of storage and therefore how it should be dispatched?
- **Arbitrage model:** With the ability of storage to jump quickly between demand and generation, could it cause balancing issues if not properly regulated? Would a separate licence be needed to regulated how storage behaves in the BM?
- **Charges:** What conflict does the charging system have with the services storage provide? E.g. helping reduce balancing costs, but paying BSUoS ,or paying high TNUoS tariffs in a generation constrained area, even though it's helping to reduce that constraint.
- **Curtailment:** to what extent does storage get caught up in curtailment/turn down actions? Does the Transmission Constraint Licence Condition (TCLC), which is outlined in the generation licence and prohibits 'excessive benefit' in constraint periods, affect the storage business model?
- **Future markets:** What new markets will need to be brought forward to encourage storage? How can we ensure they are constructed in a way that benefits storage?

Balancing

- The grid needs to try and balance the system without relying on fossil fuel generation.
- The merit order for the balancing mechanism needs to change however its uncertain whether a separate storage class would help this or whether it will continue as it is.

Licence

- The rules of the markets and mechanisms need to change to help storage, not a separate licence.

Market design

- Market design favours incumbent fossil fuel generation through payments for both generation and stability services. However this could be delivered through storage and renewable generation.
- This is a point that could be solved through market design alone without the need for a separate licence for electricity storage, however the services and role of storage in the electricity system needs to be recognised in order to achieve this.

Markets and services - discussion

Government response

- There should be more pro-activeness from those acting in the regulatory framework e.g. government and the regulator, to try and find the problems before they start causing barriers for deployment



Approach to different technologies

How can the licence framework acknowledge different types of storage? At present, storage is treated as generation, and there is a generic definition for storage which covers all technologies.

However, not only is storage different to generation, but it encompasses a broad range of technologies that can provide very different services to the system – would a bespoke legal framework help to acknowledge and value those differences?

- Long duration and seasonal storage: much longer duration storage and seasonal storage will require very different remuneration and operation/control to the current storage we have. How can the licence framework ensure that these technologies are supported and valued?
- Applications: storage also has a wide variety of applications which vary across technology types – does this need to be acknowledged in a licence framework?
- Competition: our current market-based system has a principle of allowing technologies to compete from a level playing field – with some types of storage clearly well established in the market, how do we ensure that storage technologies are all working from the same level playing field?

Vehicle to grid

- Unsure of how this would be affected by a storage licence due to the fact it's at a domestic scale.
- Agreement that regulation is required in the near future to enable the development of the technology and to ensure that it is properly managed.



Asset classes

- Classing different storage technologies as further subsets could help with deployment of longer duration assets. In this case, exemptions could be given where a locational need for longer duration assets is identified.

Approaches to different technologies - discussion

Licence and regulation limitations

- The size of sites of larger scale assets are determined by regulation
- This puts limitations on the developments that can be produced and encourages the development of small-scale short-duration projects.

Global examples

- A separate asset class for storage and definition have been introduced in Spain
- South Korea introduced an addition to the Renewable Energy Certificates scheme to encourage co-location with storage however this predominately brought in lithium-ion batteries.

Future opportunities and issues for storage

At the moment, we are fixing problems as they arise; double charges, the planning threshold, market barriers etc. This is often a lengthy process that requires a significant amount of government, regulator and industry effort each time.

Can we identify issues that we think may come up in future, so that we can start to plan for the necessary changes? Would a different licence framework for storage allow us to create solutions to these problems more quickly?

- **Price cannibalisation:** we are all aware of this as an issue for renewables – how will storage be a part of mitigating this effect, and how much will storage be able to take advantage of such price shifts?
- **Future markets:** will we see markets being saturated and revenues being cannibalised as more storage enters the few markets available (see FFR as an example)? What could be done to prevent this? Could a separate licence help?
- **Arbitrage model:** this is becoming a more viable business case – BM trading and NIV chasing in particular. Storage is taking advantage of peaks and troughs in prices, but this may not last forever if those peaks are flattened. Flattening those peaks is in the interest of the system and the ESO – and they may want to regulate storage so that it's not benefitting from or even causing high price spikes. Could a bespoke storage licence approach help?
- **Technologies:** How can the system allow multiple storage technologies to flourish and acknowledge the different benefits they bring? Would a storage licence help identify those different services? Could it prevent them competing against each other (to the point that the variety of technologies we need cannot develop)?

Future opportunities and issues for storage - discussion

Government stand-point

- Subset definition has been drafted but is just waiting on an energy bill to be introduced.
- BEIS want to question whether the subset definition has influenced any decisions.
- BEIS would need to balance the economic benefits against the regulatory burden of a separate licence.

German example

- Germany still has double charging on existing builds but not on new builds.
- New batteries are free of double charging but only for the first year.
- Uncertainty for investors in Germany



Licence or no licence

- A separate storage licence has the potential to create certainty in the long term but could damage the confidence the investment community has now.
- It would be good to spend time on the licence to make sure things are correct, however having a separate storage licence doesn't mean that changes won't be required in the future.
- There are wider issues such as connections, planning and investment that may be supported by a separate licence but its uncertain if that would be the case.



Use post it notes to leave comments on debate in general in the box below or on specific topics in the grid below that.

General comments on a separate licence

Licence or not DNOs and TOs should not be allowed to own storage

Reverse existing is model for storage if natural monopolies take away 2 or 3 markets - other providers and owners won't survive

Agree - same principle No monopolies should be allowed to own different asset class (transmission-distribution-supply-generation)

Please use the notes in the top left to leave comments

See my document Regulatory Definition of Storage - Mark Howitt, Storelectric

The many technologies, usages and applications for storage, the new services it can provide to the networks and different usages, all of this won't fit into one definition and a subset of another completely different asset class

Discussion areas

<p>The future problems</p> <p>The biggest gains from large-scale long-duration storage will be for grids. But they're banned from investing in, controlling or incentivising it. Without it, the total system costs of the energy transition will be unaffordably higher, jeopardising the entire transition. Mark Howitt</p> <p>Increasing the max proportion of renewable generation on a stable grid at a given time - the only way to continue to reduce fossil generation - will require preference/incentive for renewable-driven [i.e. storage] stability</p>	<p>Markets and services</p>
<p>The different technologies</p> <p>Tech could be more strongly differentiated on its e.g. carbon intensity for providing balancing services - if lower-carbon grid operation were valued</p>	<p>Codes and operations</p> <p>See my document Regulatory Definition of Storage - Mark Howitt, Storelectric</p>

Anything missing? any other comments

How can we level up the level playing field when competing with traditional reinforcement if the TO asset don't pay BSUoS, TNUoS, connection charges etc.. generation does..

Markets looking for flexibility are open to diesel generators DSR and storage indifferently. Whilst the response could be the same, the wider impacts on fairness, environment, roll out of storage and its system benefits are not the same - TCR and trials are a great example of it.

Additional comments

- The many technology types, usages and applications of storage won't all fit within one definition and a subset of another completely different asset class.

How will storage compete with traditional network reinforcements when TO assets don't face the BSUoS, TNUoS etc charges storage do.

- The storage technologies could be differentiated in a different way e.g. through the carbon intensity of balancing services - if lower-carbon grid operations were valued.
- Markets for flexibility are open to diesel generators, DSR and storage indifferently. Whilst their response is the same the wider impacts aren't.

Conclusions

There continues to be some disagreement within the industry about whether a separate licence would be a significant for the sector going forward.

Whilst there are strong advocates on both sides, until there can be a strong agreement and evidence of its impact, BEIS will continue on its current course of action: defining electricity storage as a distinct subset of electricity generation and making regulatory changes specific to the storage when necessary.

Despite disagreements, this debate has allowed for an open and honest discussion about the ramifications of a separate storage licence and has allowed the industry to debate the fundamental framework for the future of storage - whether that is shaped by a separate licence or not.

Some examples include how market design doesn't value all of the services storage can offer, that storage isn't being valued by networks in connection queues and how vital certainty in the market is for the investment future of storage.

Next Steps

A summary of the workshop will be discussed with BEIS, and we will highlight the issues raised as well as continuing to raise new ones as they come up.

At present, we hold the view that there is not sufficient evidence to push for a separate licence for storage, however it's likely this debate will be raised again in future and we will continue to consider the issue as part of our ongoing work.

We will continue to push for BEIS and Ofgem to make progress with the trajectory they set in 2017, to define storage in the electricity generation licence and in the Electricity Act.