

Clarifying the regulatory framework for electricity storage: licensing

Consultation

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Overview:

Our energy system is changing, and we need to ensure the regulatory environment adapts to the deployment of new smart technologies and the emerging issues that they bring to the system.

Storage can open up many possibilities. It can help to integrate variable renewable generation, reduce the costs of operating the system, and help avoid or defer costly reinforcements to the network. However, it needs a level playing field to compete. In the Smart System and Flexibility plan, we committed to address the barriers we identified, through licencing, planning, connections and charges for storage, and in the way we enable storage to locate on the same site as renewable generation.

This document seeks views on modifying the electricity generation licence for storage. We have also published another consultation on ensuring that storage is sufficiently unbundled from the network business.

Context

In our call for evidence, *Towards a smart, flexible energy system* – published jointly with the Government - we committed to ensuring the energy system works for people and businesses. A smarter and more flexible system offers significant benefits for consumers and the economy. This can help to ensure the UK has a secure, affordable and clean energy system now and in the future, while helping to enable growth in all parts of the country.

Ofgem has a central role in helping this to happen through effective regulation of monopolies and enabling competitive markets. Having listened to stakeholders' views, Ofgem committed in its 2017-18 forward work programme to setting out a plan of action for removing regulatory barriers to storage. We announced the specific actions in the *Smart Systems and Flexibility Plan* in July this year.

In order to ensure that a competitive market for storage and other flexibility services can develop, and to ensure compliance with EU law, we committed in the plan to clarifying the regulatory position on ownership and operation of storage by network operators. We also committed to consulting on modifications to the generation licence to clarify the status of storage in the regulatory regime.

In this consultation, we set out our proposals on modifications to the generation licence. A separate consultation, published alongside this one proposes to ensure the operation of storage is sufficiently unbundled from the network business.

Associated documents

[Ofgem Corporate Strategy](#), December 2014

[Smart, Flexible Energy System – a call for evidence](#), November 2016

[Ofgem Forward Work Programme 2017-18](#), March 2017

[Upgrading our Energy System – smart systems and flexibility plan](#), July 2016

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Executive Summary

In November 2016, Ofgem and the Government published a *Call for Evidence* on a smart, flexible energy system. We received nearly 250 responses containing a wealth of views, evidence and analysis. As a result, we recognised that there was a clear number of issues facing storage¹.

Our *Smart Systems and Flexibility Plan* contained actions to address these issues, including putting into place a licensing regime for storage based on a modified generation licence. In this consultation, we describe how we plan to deliver this action.

Ofgem and the Government have agreed that it is important to ensure consistency between both storage and electricity generation (generation). We consider that the existing electricity generation licence is best placed to clarify the regulatory framework for storage. This is because generation and storage share similar characteristics and perform similar functions in terms of generating and exporting electricity to the grid and because a modified generation licence is the most practical way of providing regulatory clarity.

With this consultation, we are therefore:

- including the definition of electricity storage in the electricity generation licence
- clarifying, based on our review of the electricity generation licence, our expectations for storage with respect to compliance with the standard conditions
- consulting on introducing a new licence condition into the generation licence applicable to electricity storage providers. The condition requires the licensee to ensure that they do not have self-consumption as the primary function when operating its storage facility.

Storage providers that have been granted a licence will therefore:

- be expected to sign up to relevant industry codes only insofar as these are applicable to them and/or depending on the capacity of the storage facility; and
- not be subject to payment of the final consumption levies

The modified licence will provide regulatory certainty to storage facilities, both existing and developing, to encourage deployment of this new technology into the system and will ensure that a level playing field exists, so that storage can compete fairly with other sources of flexibility. It will also address in an appropriate manner the issues storage facilities face surrounding final consumption levies. A draft of the licence is attached in Annex 1.

We are also consulting on changes to the electricity and gas regulations on the licence applications forms to ensure we have the relevant information to assess eligibility for a licence. The proposed changes are set out in Appendix C.

¹ In this consultation we will use 'storage' and 'electricity storage' interchangeably.

Our proposal and rationale

Chapter Summary

We set out our proposal to amend the electricity generation licence to make it fit for electricity storage. We also discuss the practicalities of this proposal.

Question box

Question 1: Do you agree that the form and content of the licence as proposed in this consultation will achieve the purpose and deliver what we committed to in the *Smart Systems and Flexibility Plan*?

Question 2: Do you have any views on whether we should include 'in a controllable manner' in the definition of electricity storage?

Question 3: Do you think there are any risks or unintended consequences that could arise as a result of our proposal? If so, please provide an explanation.

Question 4: Do you have any comments on the list of technologies that should be included or excluded from the definition of storage as set out in Appendix A?

Introduction

We seek to provide regulatory clarity on the treatment of electricity storage in the current regulatory framework, while taking into consideration that electricity storage encompasses many diverse technologies and business models.

We consider that for the time being the existing electricity generation licence is the best vehicle to clarify the regulatory framework for electricity storage. This is because generation and storage share similar characteristics and perform similar functions in terms of generating and exporting electricity onto the grid. We therefore expect parties should procure either one or the other based on their best economic value. To this end, generation and storage should be treated equally in the regulatory framework.

We have reviewed each licence condition in the generation licence to ensure they are relevant and applicable to electricity storage. In doing so, we have added a definition of 'electricity storage' and 'electricity storage facility' to the generation licence and amended the text throughout the document to clarify the treatment of storage within the regulatory framework.

We think the proposed approach is consistent with our policy view on storage and more generally on flexibility, whereby flexibility sources can compete fairly across

the system. The above approach also avoids unnecessary confusion on where storage sits in the regulatory framework and what process potential storage providers should follow to get a licence.

In the sections below we discuss how our proposal addresses the key barriers to storage identified through the *Call for Evidence (CfE)*, while you can find the draft licence in Annex 1.

Modifying the electricity generation licence for storage

Regulatory clarity

In the CfE, we sought views on how to clarify the regulatory framework for electricity storage. The models proposed varied in their levels of intervention, from simply retaining the existing regulatory approach - which would not require any changes to the licensing framework - to options requiring the introduction of primary legislation and the development of a separate regulatory framework (including a separate licence) for storage.

After reviewing and analysing the feedback from the consultation, we considered that the best approach is to modify the generation licence and introduce specific conditions solely applicable for storage facilities. We set out the actions we intended to take to provide greater regulatory clarity for storage in the '*Smart Systems and Flexibility Plan*' published in July².

We believe storage shares many characteristics and functions with generation, therefore including storage as a form of generation in the electricity generation licence would avoid unnecessary duplication of regulations while still allowing specific conditions to be tailored for storage assets. Compared to the other options, this option would also be implemented within a shorter timeframe as we would expect a go-live of the new licence condition in the first half of 2018.

The above approach will also provide certainty for storage developers that already hold a generation licence as they will not need to apply for a different licence. This approach takes into consideration the relatively early stages of electricity storage in providing services to the energy system (compared to conventional generation) and the fact that technologies and business models are nascent and still evolving. We do not want either too much or too little regulation to be a barrier to flexibility, including storage, so our focus is to ensure that regulation allows for innovation while protecting the interest of end consumers.

² See [here](#)

The definition of storage

One of the barriers we identified for storage in the CfE is the lack of a legislative or regulatory definition of electricity storage. This can lead to a lack of clarity when storage interacts with other legislation and regulations.

When Parliamentary time allows, the Government intends to amend the Electricity Act 1989 to include a definition of storage, based on the Electricity Storage Network (ESN) definition proposed in the CfE, as a distinct subset of the generation asset class. In the meantime, we are using this definition in a modified generation licence for storage.

ESN defines electricity storage as:

- Electricity Storage in the electricity system 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.*
- Electricity Storage Facility in the electricity system means *a facility where Electricity Storage occurs.*

We propose to add these two definitions to the electricity generation licence and to make relevant changes throughout the licence adding 'electricity storage' or 'electricity storage facility' where appropriate.

We, alongside the Government, agree that the definition of storage provided by the ESN strikes the right balance for primary legislation, and we intend to use it as the basis for defining storage in industry codes, the generation licence and eventually legislation.

Within the licence, '*Electricity Storage Facility*' would be used in the licence – where appropriate and depending on each condition – alongside either '*generating station*' or '*generation set*' to further clarify that conditions apply to electricity storage as well. In other words, for storage we make no distinction in the licence between 'set' and 'station' as both fall under the umbrella of 'storage facility'.

We note that industry is progressing work elsewhere to define electricity storage in the Grid Code (GC096). In that context, industry has suggested adding the phrase '*in a controllable manner*' at the end of the definition of storage set out above. This is to stress the ability of the storage provider to control the conversion and reconversion of electrical energy. The definition therefore would read:

Electricity Storage in the electricity system 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 in a controllable manner.*

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We welcome your views on whether this addition also in the electricity generation licence would provide further clarity.

We and the Government have also compiled a list of technologies that we consider should be included or excluded from the definition of storage. You can find the list in Appendix A. This list is not exhaustive and intended for guidance as we appreciate that as technology evolves new technologies could be added. We welcome your views on the list.

Clarifications on licence obligations

This section clarifies some obligations that electricity storage operators may or may not be subject to. We want to provide as much clarity as possible on our expectations of licensees. We focus on the obligations to sign up and comply with industry codes (SLC 5, 6, 9 and 19) as we felt this is where greater clarity is needed.

The table below sets out the obligations under each of the above conditions and clarifies our expectations on storage providers³.

Condition	Text	What it means for storage
SLC5 Compliance with Grid Codes	<ol style="list-style-type: none">1. The licensee shall comply with the requirements of the Grid Code in so far as applicable to it.2. The Authority may (following consultation with any transmission licensee likely to be affected) issue directions relieving the licensee of its obligation under paragraph 1 in respect of such parts of the Grid Code and to such extent and subject to such conditions as may be specified in those directions.	Obligation applies depending on what services storage provides, e.g. whether or not in order to operate it is either connected to the national energy transmission system or would use it for trading purposes.
SCL6 Compliance with Distribution Codes	<ol style="list-style-type: none">1. The licensee shall comply with the provisions of every Distribution Code in so far as applicable to it.2. The Authority may (following consultation with the licensed distributor responsible for any relevant Distribution Code and any authorised electricity operator directly affected thereby) issue directions relieving the licensee of its obligation under paragraph 1 in respect of such parts of any relevant Distribution Code and to such extent and subject to such conditions as may be specified in those directions.	Obligation applies depending on which services storage provides, e.g. whether or not in order to operate it would use the distribution network.
SCL9 Compliance with BSC	<ol style="list-style-type: none">1. Insofar as the licensee shall construct or operate a generating station, the licensee shall be a party to the BSC Framework Agreement and shall comply with the BSC.	This condition applies to generating stations as defined in SLC14 (ie. station with a capacity of no less than 50MW). The same exception applies to

³ The same expectations apply to generation

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		<p>storage: for storage with capacity below 50MW, there is no obligation to sign up and comply with the BSC.</p> <p>For storage above 50MW, it is likely that a storage facility of such size would carry out activities in the wholesale market. We therefore expect such facilities to sign up and comply with the BSC.</p>
SCL19 Compliance with CUSC	<p>1. Insofar as the licensee shall construct or operate a generating station, the licensee shall be party to the CUSC Framework Agreement and shall comply with the CUSC.</p>	<p>This condition applies to generating stations as defined in SLC14 (ie. station with a capacity of no less than 50MW). The same exception applies to storage: for storage with capacity below 50MW, there is no formal obligation to sign up and comply with the CUSC unless necessary for the provision of services to the grid.</p> <p>For storage above 50MW, it is likely that storage facility of such size would carry out activities in the wholesale market. We therefore expect such facilities to sign up and comply with the CUSC.</p>

The same licence exemption regime⁴ for electricity generation applies to storage. Like generation, storage with capacity below 50MW (or up to 100MW with the approval of the Secretary of State) could be licence exempted. However, where storage obtains an exemption to the requirement to hold a licence, storage would be subject to FCLs as the meter point will need to be registered with a supplier in order to import/export electricity.

The electricity generation licence contains some provisions relevant to generation only (eg. Section D – Supplementary Standard Conditions for Nuclear Generators) which we do not expect to apply to storage providers. Likewise, we would not expect generators to comply with the proposed storage condition SLC E1. The new SLC E1 will apply to both existing and future licensees.

⁴Electricity (Class Exemptions from the Requirement for a Licence) Order 2001, available [here](#)

Final consumption levies

Another barrier storage facilities face is having to pay the cost of final consumption levies (FCLs) – specifically the Renewables Obligation, Feed-in Tariffs, Contracts for Difference and the Capacity Market – on imported energy. These costs could be a significant barrier to new and established storage operators and do not ensure fair pricing.

Storage ‘consumes’ electricity in order to be able to store it. When energy is exported again to the end consumer, this can result in a ‘double counting’ of the supply of electricity to the end consumer and in a payment of levies by both the storage provider and the consumer of the same electricity. It can also add to the operational cost of storage projects (which might be passed on to the end consumer) and makes storage less competitive than other flexibility providers. These costs can make up a significant additional cost for storage, which storage should not be required to pay if they are not the end consumer of the imported electricity.

We want to ensure that the cost of final consumption levies are allocated fairly. We propose to introduce a new licence condition ‘Condition E1’ that requires the primary function of the storage facility to export electricity back to the distribution system or to the national electricity transmission system.

The text of Paragraph 1 of Condition E1 is the following:


Paragraph 1: Requirement to export

The licensee shall not have self-consumption as the primary function when operating its storage facility.

This condition would prevent the facility from being the ‘end consumer’, thus avoiding paying the final consumption levy costs. If the storage facility’s primary function is not to export to the distribution or transmission system, then such facility will not be classified as storage for regulatory purposes and would be subject to final consumption levies.

We note that ‘primary function’ could be defined in many ways, eg. by the electricity exported to the grid vs consumed on-site, by the length of time a storage facility is deployed for injecting electricity back to the grid, by the type and ‘criticality’ of services provided. Therefore, the phrase ‘primary purpose’ aims at capturing the wide spectrum of services that electricity storage could provide and the diverse business models underpinning them.

We also welcome views on alternative ways of ensuring that final consumers of electricity do not avoid paying final consumption levies through deploying onsite licenced storage facilities. We will consider other options if supported by sufficient evidence.



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We also propose to add a second paragraph that requires storage providers to notify of any changes that may affect eligibility of the licence:

Paragraph 2

If at any time the licensee knows or reasonably should know of any event or circumstance that has occurred or is likely to occur that may affect its ability to comply with Condition E1, the licensee shall as soon as reasonably practicable notify the Authority in writing of the event or circumstance.

Paragraph 2 would ensure that the new electricity storage regime is flexible enough to allow for future developments of storage, while ensuring that only those who fulfil the primary purpose of storage as defined in SLC E1 are eligible for a licence.

Other options considered

We have explored an alternative option for clarifying the regulatory framework entailing creating a separate generation-lite licence for electricity storage.

Under this option, storage and its treatment would be defined in a licence similar to but separate from the electricity generation licence.

We considered that this approach would add unnecessary confusion as the majority of licence conditions that apply to generation would apply to storage as well. By having two licences, people may also think electricity generation and storage are subject to different regulation and separate licensable activities, while in fact they are not.

Changes to the licence application form

Question 1: Do you have any comments on the proposed changes to the Application Regulations for electricity and gas licences?

Application Procedure

We propose to introduce a new question into the electricity licence application form, set out below. It can be found in Section 19 of the application form:

19. *Provide a brief description of the activities the applicant intends to carry out, specifying whether they entail the storage of electricity.*

We also do not propose to change the application fee for a generation licence as a result of our changes.

Alongside the changes to include electricity storage, we propose to make further changes to the application form (for both gas and electricity). All changes are detailed in Appendix C. We do not consider these changes to be material.

Appendices and Annexes

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Appendix	Name of Appendix	Page Number
A	List of technologies	
B	Feedback on this consultation	
C	Proposed changes to Application Regulations	

Annex	Name of Annex	Page Number
1	Draft of the electricity generation licence	

Appendix A – Electricity storage definition: technologies list

ESN definition

- “Electricity Storage” in the electricity system 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.
- “Electricity Storage Facility” in the electricity system means a facility where Electricity Storage occurs.

Key principles

- The definition is not intended to capture network equipment whose primary function is not energy storage on the power system.
- Lists A and B below are not exhaustive, but intended to serve as indicative of the storage technologies that should and should not be considered to be captured by the definition.

(A) Technologies that should be considered as electricity storage

- Electro-chemical batteries, such as:
 - Flow batteries
 - Solid state batteries
- Gravity energy storage systems such as:
 - Pumped hydro
 - Weights being moved up inclines
- Air based storage systems, such as:
 - Compressed air energy storage
 - Liquid air energy storage
- Kinetic energy storage systems, such as:
 - Flywheels
 - Advanced rail energy storage
- Thermal storage where the heat stored is re-converted to electricity, such as:
 - Molten Salt
 - Phase-change energy storage systems
 - Pumped heat
- Chemical storage where the stored chemical energy is then converted back into electricity, such as:
 - Synthetic gases
 - Synthetic liquid or solid state fuels
- Electromagnetic storage such as:
 - Superconducting magnetic energy storage
 - Supercapacitors when used to store electrical charge

(B) Technologies that should not be considered as electricity storage

- Capacitors and supercapacitors when used as circuit impedance components
- Transformers
- Inductors
- Thermal energy storage when the stored energy is used directly as heat and not re-converted to electricity before being used

NOTE: Treatment of power-gas-power systems

Power-gas-power systems, such as those based on electrolysis to create hydrogen, would not be captured by the definition as, in practice, they would entail the export of hydrogen to a wider gas network and import of gas at certain times to generate electricity.

Thus, it would not be the 'same' energy being stored and converted back into electricity, which is specified by the definition.

If there were a system which involved the creation of gas from electricity, and the subsequent storing and reconversion of that energy to electricity on-site, this would fall within the definition.

Appendix B - Feedback on this consultation

We want to hear from anyone interested in this document. Send your response to the person or team named at the top of the front page.

We've asked for your feedback in each of the questions throughout it. Please respond to each one as fully as you can.

Unless you mark your response confidential, we'll publish it on our website, www.ofgem.gov.uk, and put it in our library. You can ask us to keep your response confidential, and we'll respect this, subject to obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004. If you want us to keep your response confidential, you should clearly mark your response to that effect and include reasons.

If the information you give in your response contains personal data under the Data Protection Act 1998, the Gas and Electricity Markets Authority will be the data controller. Ofgem uses the information in responses in performing its statutory functions and in accordance with section 105 of the Utilities Act 2000. If you are including any confidential material in your response, please put it in the appendices.

General feedback

We believe that consultation is at the heart of good policy development. We are keen to hear your comments about how we've conducted this consultation. We'd also like to get your answers to these questions:

1. Do you have any comments about the overall process of this consultation?
2. Do you have any comments about its tone and content?
3. Was it easy to read and understand? Or could it have been better written?
4. Were its conclusions balanced?
5. Did it make reasoned recommendations for improvement?
6. Any further comments?

Please send your comments to stakeholders@ofgem.gov.uk

Appendix C – Proposed changes to the Application Regulations

Proposed change	Gas/Electricity/both	Reason
Paragraph 8(1) include text to make it clear that the prescribed period begins after we notify the applicant that their application is duly made.	Both	Provide clarity on the process followed.
Question 1: Applicant details		
Q1.6: remove question on whether the registered address of the applicant is outside of Great Britain	Both	Align requirement for all applicants.
Q1.7: remove requirement for a service address.	Both	Align requirement for all applicants.
Renumber questions 1.8, 1.9,1.10	Both	
Renumbered Q1.9: a new question on ‘Person to contact following licence grant’	Both	Following licence grant we contact licensees, for example consulting on proposed licence modifications. The contact person for the application process may not be the correct person for us to contact post licence grant.
Question 2: Licence details		
Q.2: statement on timing of licence grant	Both	Provide clarity that date requested for licence to come into effect may not be met.
Question 3: Details of applicant’s directors		
Q3.1 include at ‘Note’ details should include date of birth and appointment details.	Both	Aligns the requirement of Q3.1 for all directors of the applicant.
Question 4: Details of ultimate holding company		
Q4.1: new question on jurisdiction of incorporation	Both	Will assist in carrying out our existing checks on the UHC.
Q4.1: add requirement for director’s date of birth	Both	Will assist in carrying out our existing checks on directors of the UHC.
Q4.1: add at ‘Note’ that ultimate holding company director’s date of birth to be included in attachment	Both	Aligns the requirements of amended Q4.1 for all directors of the applicant.
Question 5: Details of parent undertaking		
Q5.1: new question on jurisdiction of incorporation	Both	Will assist in carrying out our existing checks on the parent undertaking.
Q5.1: add requirement for date of birth	Both	Will assist in carrying out our existing checks on directors of the parent undertaking.
Q5.1: add at ‘Note’ that Parent Undertaking director’s date of birth to be included in attachment	Both	Aligns the requirements of amended Q5.1 for all directors of the applicant.

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Q5.1: Remove requirement for home addresses of additional directors.	Both	Aligns the requirements of Q5.1 for all directors of the parent undertaking.
Question 8: Details of previous applications made and licences held		
Q8: include option to provide further details of applications made and/or licences granted on a separate sheet	Both	Allows applicant to provide full details.
Question 10: Criminal convictions and disqualification		
Q10.1: clarify that we require a statement that none of the persons named in the application have any criminal convictions in any jurisdiction	Both	Provide clarity on the information we require from the applicant.
Q10.2: statements to apply to previous disqualification	Both	Provide clarity on the information we require from the applicant.
Question 11: Proposed arrangements for commencing licensable activities		
Q11: provides examples of information to include when completing this question on proposed arrangements for commencing licensable activities.	Both	Provide clarity on the information we expect the applicant to provide, for example that they have read and understood the relevant standard licence conditions they are applying for and a description of their arrangements to accede to or comply with relevant industry codes.
Question 14: Gas shipper licence applications		
Q14: renumber as Q14.1 and Q14.2	Gas	
Q14.2: separate each question and delete "or"	Gas	Provides clarity on the information we require from the applicant.
Question 15: Gas transporter licence applications		
Add questions on arrangements similar to those for electricity distribution licences	Gas	Align the questions for gas transporter licence applications with electricity distribution licence applications by including that the applicant is to provide details of its proposed arrangements for compliance with standard condition 45 (Undertaking from Ultimate Controller) and standard condition 46 (Credit rating of Licensee).
Question 15: Restriction of an existing distribution licence		
Q15.2: Add that the applicant can include as attachment details of arrangements to ensure that the connection of all relevant consumers will be maintained	Electricity	Allows applicant to provide full details.
Question 16 electricity and Question 17 gas: Interconnector licence applications		

Annex 1 – Draft electricity generation licence

See subsidiary document

