

# STORY

added value of STORage in distribution sYstems

## Deliverable 8.4 Webinar on Recommendations



Revision ..... 1  
 Preparation date ..2019-05-16  
 Due date ..... 2020-04-30  
 Dissemination level PU

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 Leonardo Meeus, Vlerick Business School





# STORY

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## **1 Publishable executive summary**

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On May 16th 2019 Vlerick organized a webinar on regulation for storage. The webinar lasted one hour and had 33 participants.

The aim of the webinar was to provide an overview of the main regulatory issues that affect the roll-out of storage.

The main topics treated in the webinar were:

- Legal definition of storage and its status within the electricity system and planning regimes.
- How network charges can, in some scenarios, put storage at a disadvantage.
- Storage behind the meter and its effect on renewable energy incentives.
- Network connection rules that have not been designed with storage in mind and cause misunderstandings for storage connections.

A recording of the webinar and a copy of the slides is publicly available for download at:

<http://horizon2020-story.eu/webinar-on-regulation-for-storage/>

This document is presented as follows. Chapter 2 presents the introduction explaining the work process of the webinar and it's place within the STORY project. Chapter 3 presents the programme that was announced on the Vlerick website to promote the webinar. Finally, chapter 4 presents the slides that were used at the live webinar.

## **2 Introduction**

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The objective of the webinar was to showcase the work done in WP8 regarding regulation and policy for storage as part of the STORY H2020 Project. This webinar builds on the work done in tasks 8.1 and 8.2 of the project.

The work builds on the seminar on regulation and business models for storage that was carried out in November 2018 at Vlerick Business School, in collaboration with EASE, for the STORY project. Similarly, before the webinar took place a round table of feedback from the STORY project participants was carried out during the April 2019 General Meeting in Brussels. The feedback collected served to zoom in on topics that are relevant for the STORY demos and the future business of STORY in general.

### 3 Programme

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## REGULATION FOR STORAGE IN DISTRIBUTION NETWORKS

Online Webinar

May 16<sup>th</sup> , 2019  
12:00h – 13:00h

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The H2020 STORY project demonstrates how energy storage can be used and integrated into distributed power systems. In a framework where different actors can use storage assets it is essential to identify the business models and regulation that make storage sustainable. STORY is a European project researching new energy storage technologies and their benefits in distribution systems and involves 18 Partner Institutions in 7 different European countries. Integrating large amounts of renewable energy into the grid poses a big challenge for the energy industry. This project answers a fundamental question to face the renewable energy challenge: what if a large amount of storage is integrated in the distribution grid?

The aim of the webinar is to provide an overview of the main regulatory issues that affect the roll-out of storage. Some of the topics to be treated in the webinar are:

- Legal definition of storage and its status within the electricity system and planning regimes.
- How network charges can, in some scenarios, put storage at a disadvantage.
- Storage behind the meter and its effect on renewable energy incentives.
- Network connection rules that have not been designed with storage in mind and cause misunderstandings for storage connections.

This webinar is co-organized by Vlerick Business School, Innoenergy and STORY, under the scientific supervision of:

**Leonardo Meeus**, Vlerick Business School and Florence School of Regulation at RSCAS (EUI)


**Ariana Ramos**, Vlerick Business School





# STORY


## 4 Presentation Slides



# STORY

## Energy Storage Regulation

Ariana Ramos  
Leonardo Meeus







**Demonstration of multi energy grid in an industrial area**  
Olen, Belgium Duration of demonstration October 2015 – April 2020  
[READ MORE >](#)



**Demonstration of medium scale battery**  
Suha, Slovenia Kranj, Slovenia Start: 2018  
[READ MORE >](#)



**Demonstration of storage in residential district**  
Lecale, Northern Ireland Start 2017  
[READ MORE >](#)



**Demonstration of storage in the factory Li-ion battery installed in industrial zone**  
Navarra, Spain Duration of demonstration: April 2016 – May 2020  
[READ MORE >](#)



**Demonstration at residential neighbourhood scale**  
Oud-Heverlee, Belgium Duration of demonstration: May 2017 – October 2019  
[READ MORE >](#)



**Demonstration at residential building scale**  
Oud-Heverlee, Belgium Duration of demonstration July 2015 – November 2016  
[READ MORE >](#)

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**Project STORY - H2020-LCE-2014-3**



## Vlerick in STORY WP8 Business Preconditions

- Business models
- Regulation for storage



### Energy Storage Our take on business models and regulation

Story Highlight  
May 2019

Authors:  
Saskia Steiner  
Andrea Franceschi  
Luca Fernandez  
Lorenz Hesse

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## Who has developed plans for energy storage?

Courtesy Translation in English Provided by the Translation Services of the European Commission

Germany's

Draft Integrated National Energy and Climate Plan

Pursuant to COUNCIL Directive 94/65/EC of 2009/119/EC Council Directive

Draft Integrated National Energy and Climate Plan 2021-2030

The Netherlands

28.05.20

Rialtas na hÉireann Government of Ireland

Draft National Energy & Climate Plan (NECP) 2021-2030

December 2019

The UK's draft integrated National Energy and Climate Plan (NECP)

PROJET de

PLAN NATIONAL INTEGRE ENERGIE-CLIMAT

de la FRANCE

Janvier 2019

4



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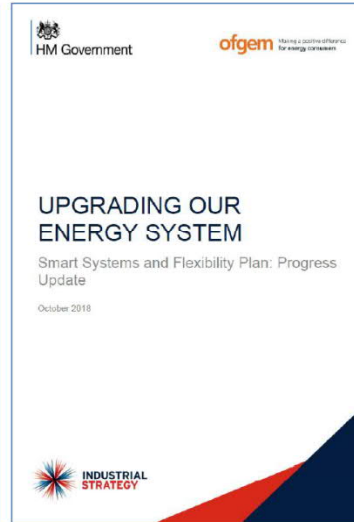
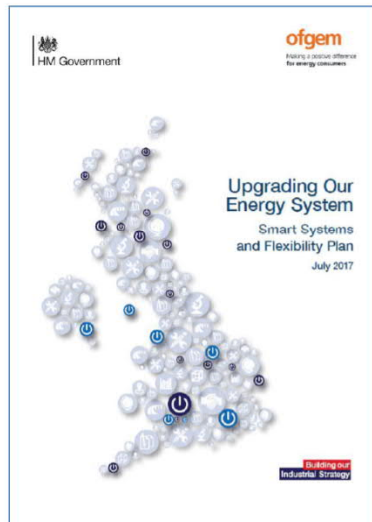
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# STORY

## UK Flexibility plan and progress report



28.05.2019

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## Issues related to energy storage



- Regulatory clarity
- Network charges
- Ownership
- Co-location with renewables
- Balancing service design

28.05.2019

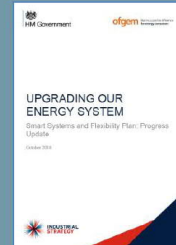
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**Storage is not defined in primary legislation. Its regulatory status within the electricity system and planning regimes is unclear**

**AGREE/ DISAGREE?**

## UK Flexibility plan and progress report

Storage is not defined in primary legislation. Its regulatory status within the electricity system and planning regimes is unclear.	<b>IN PROGRESS</b>	
	1.2	<p>Ofgem has consulted on a modified generation licence for storage.</p> <p>The Government has completed preparatory work to define storage in primary legislation.</p> <p>The Chief Planner in England notified Planning Authorities of the need to <b>treat electricity storage facilities in the same way as generating stations in the planning system.</b></p>
		<p>Ofgem will implement <b>changes to the generation licence to include storage via statutory consultation.</b></p> <p>The Government will <b>define storage in primary legislation when Parliamentary time allows.</b></p> <p>The Government intends to consult on the treatment of electricity storage facilities with respect to the national planning threshold.</p>

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## EU clean energy package



'energy storage' means, in the electricity system, deferring *the final use of* electricity to a *later moment than when it was generated or 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 or use as another energy carrier.*

28.05.2019

 Council of the European Union		Brussels, 11 January 2019 (OR: en)
Interinstitutional File: 2016/0386(COD)		5076/19
		ENER 3 ENV 3 CLIMA 2 COMPET 9 CONSOM 3 REG 12 CODEC 17
<b>NOTE</b>		
From:	General Secretariat of the Council	
To:	Permanent Representatives Committee	
No. Clon doc.:	15150/1/16 REV 1 + ADD 1 REV 1	
Subject:	Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast) - Analysis of the final compromise text with a view to agreement	

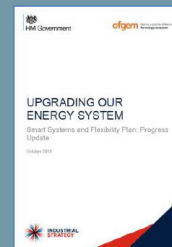


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**Network charges can, in some scenarios, put storage at a relative disadvantage to other network users, preventing a level-playing field**

**AGREE/ DISAGREE?**



## UK Flexibility plan and progress report

Issue	Action	What we have done	What we will do next
Network charges can, in some scenarios, put storage at a relative disadvantage to other network users, preventing a level playing field.	IN PROGRESS		
	1.1	<p>Ofgem published its Targeted Charging Review setting out its view that, for storage, industry should bring forward modification proposals to make changes within the current charging framework.</p> <p>Industry has raised modifications for reform of <b>transmission, distribution and balancing charges</b> which aim to reduce disproportionate network charges for storage.</p> <p>The Energy Networks Association (ENA) published a statement that Distribution Network Operators (DNOs) consider that electricity storage falls within the <b>definition of non-intermittent generation</b>.</p>	Industry will finalise charging code modifications to address the storage issues identified in the Plan, and it is expected that these will be <b>submitted promptly to Ofgem for approval</b> .

28.05.2019

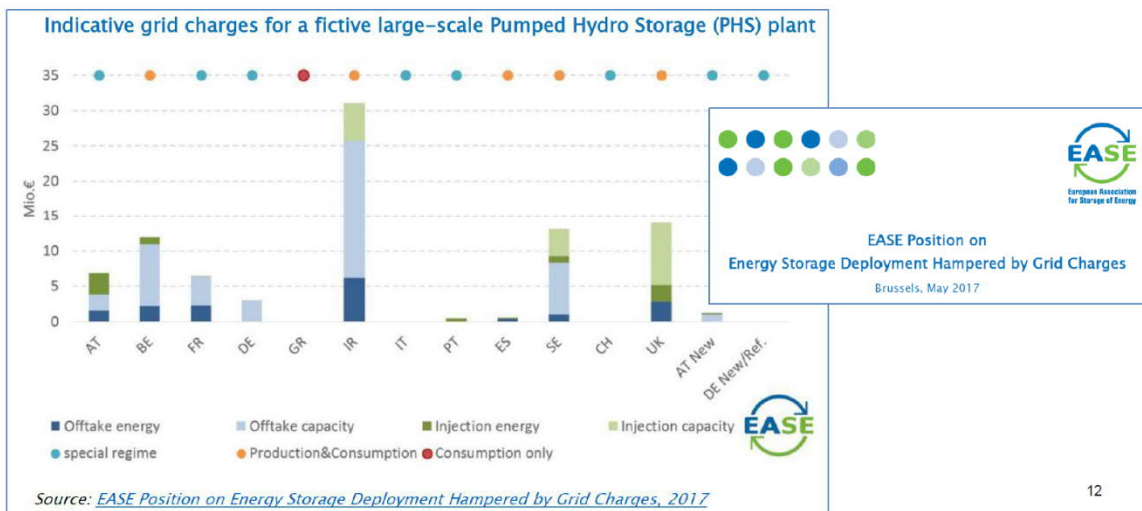
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## Transmission network charges

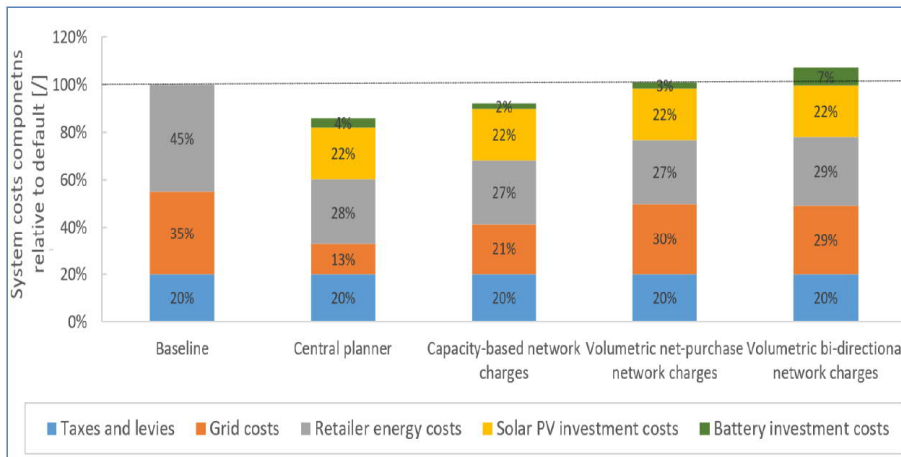


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## Distribution network charges



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## Belgium: Exemption of network tariff for Storage installations in transmission network

- Exemption lasts 10 years for installations after July 1st 2018.
- 80% exemption during 5 years to installations extended by more than 7.5% of their capacity.



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§ 9. De installaties voor de opslag van energie aangesloten op het transmissienet of op netten met een transmissiefunctie en waarvan de indienststelling gebeurt na 1 juli 2018 genieten gedurende een periode van tien jaar na hun initiële indienststelling van een vrijstelling op de transmissienettarieven, met uitzondering van de tarieven voor de aansluiting.

De installaties voor de opslag van energie aangesloten op het transmissienet of op netten met een transmissiefunctie waarvan zowel het geïnstalleerd vermogen als de opgeslagen energie na uitbreidingswerken verhoogd werden met meer dan 7,5% in vergelijking met hun niveau op 1 juli 2018 genieten van een vrijstelling van 80% op de transmissienettarieven, aansluitingstarieven uitgezonderd, en dit gedurende een periode van vijf jaren na het opnieuw in dienst stellen na de uitgevoerde werken. Deze opslaginstallaties kunnen vanaf het einde van de eerste fase van de uitbreidingswerken (geïnstalleerde capaciteit of opgeslagen energie) van deze vrijstelling genieten, echter, de vrijstelling moet binnen de twee maanden aan de transmissiebeheerder terugbetaald worden indien de tweede fase van de uitbreidingswerken (opgeslagen energie of geïnstalleerde capaciteit) niet zijn beëindigd binnen de drie jaar na het einde van de eerste fase van de uitbreidingswerken.

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## UK Flexibility plan and progress report

Issue	Action	What we have done	What we will do next
Electricity procured by storage facilities from suppliers anomalously includes the cost of final consumption levies.	IN PROGRESS		
	1.3	<p>Ofgem has consulted on a modifying the generation licence to include storage and will finalise these changes shortly. Holding the licence will enable electricity storage facilities to avoid overpayment of final consumption levies (FCLs). Electricity supplied to generation licence holders is excluded from the supply volumes used to calculate the costs of the Renewables Obligation (RO) and Feed in Tariff (FIT) schemes (which currently make up over two thirds of FCLs), and this will also apply to the Contracts for Difference (CFD) scheme and Capacity Market auctions.</p> <p>The Government has clarified that the electricity received and stored by electricity storage facilities may be supplied to them free from the Climate Change Levy, where relevant conditions are met.<sup>54</sup></p>	<p>The Government and Ofgem are working with Elexon, the Low Carbon Contracts Company and the Electricity Settlements Company to ensure that the supply volumes used to settle amounts due under the CFD scheme and Capacity Market auctions are calculated appropriately for storage.</p>

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**Where flexibility assets are owned and/or operated by network operators there is a potential to distort competition in markets for flexibility services or deter new entrants.**

**AGREE/ DISAGREE?**



## EU clean energy package

Member States shall ensure that active customers owning a storage facility:

- (a) have the right to a grid connection within a reasonable time following the request if all necessary conditions such as balancing responsibility and adequate metering are fulfilled;
- (b) are not subject to any double charge, including network charges, for stored electricity remaining within their premises and when providing flexibility services to system operators;
- (c) are not subject to disproportionate licensing requirements and fees;
- (d) are allowed to provide several services simultaneously, if technically feasible.



Brussels, 11 January 2019  
(OR. en)

5076/19

Interinstitutional File:  
2016/0380(COD)

ENER 3  
ENV 5  
CLIMA 2  
COMPET 9  
CONSOM 3  
FISC 12  
CODEC 17

**NOTE**

From: General Secretariat of the Council  
To: Permanent Representatives Committee  
No. Cion doc.: 15150/1/16 REV 1  
+ ADD 1 REV 1  
Subject: Proposal for a Directive of the European Parliament and of the Council on common rules for the internal market in electricity (recast)  
- Analysis of the final compromise text with a view to agreement

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## UK Flexibility plan and progress report

	IMPLEMENTED		
Where flexibility assets are owned and/or operated by network operators there is potential to distort competition in markets for flexibility services or deter new entrants. More clarity on the application of existing unbundling rules to storage is required and further consideration is needed on the necessity to strengthen those rules.	1.8	Ofgem has consulted on a new condition in the electricity distribution licence to ensure that DNOs cannot operate generation, including storage, without Ofgem's consent.	Ofgem published draft guidance alongside its statutory consultation. If after considering responses, these licence changes are implemented, Ofgem will publish the final guidance with the decision document that implements the licence changes.

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## Regulators have given consent in exceptional cases

Table 5.1 System operator investments in storage

Project owner	Location	Year	Size	R&D	Emergency	Temporary	Small-scale
UK Power Networks	Leighton Buzzard, UK	2013	6 MW	✓			
Scottish and Southern Energy Power Distribution	Orkney Islands, UK	2013	2 MW	✓			✓
Terna – EI	Southern Italy	2011	34.8 MW 3 locations		✓	✓	
Terna – PI	Sicily and Sardinia	2013	16 MW + 24 MW (planned)	✓			
Electric Transmission Texas	Presidio, Texas	2010	4 MW		✓	✓	

Source: [www.energystorageexchange.org/](http://www.energystorageexchange.org/)

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## EU clean energy package

*'fully integrated network components' means network components that are integrated in the transmission or distribution system, including storage facility, and are used for the only purpose of ensuring a secure and reliable operation of the transmission or distribution system but not for balancing nor congestion management;*



Brussels, 11 January 2019  
IP/19-013

Informational File:  
#1910016REV1

ENER 3  
EN 1  
CLIMA 3  
COMEN 3  
FISIC 12  
GROW 17

NOTE  
From: General Secretariat of the Council  
To: Permanent Representatives Committee

No. Cser doc.: 1310016 REV 1  
+ ACCE 11803 1

Subject: Proposal for a Directive of the European Parliament and of the Council on general rules for the internal market in electricity (recast)

- Analysis of the final compromise text with a view to agreement

#### Article 54

Ownership of **energy storage facilities** by transmission system operators

1. Transmission system operators shall not be allowed to own, **develop**, manage or operate energy storage facilities .
2. By way of derogation from paragraph 1, Member States may allow transmission system operators to own, **develop**, manage or operate **energy storage facilities which are fully integrated network components and the regulatory authority has granted its approval** or, if **all** of the following conditions are fulfilled:

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#### Article 36

Ownership of **energy storage facilities by distribution system operators**

1. Distribution system operators shall not be allowed to own, develop, manage or operate energy storage facilities.
2. By way of derogation from paragraph 1, Member States may allow distribution system operators to own, develop, manage or operate **energy storage facilities which are fully integrated network components and the regulatory authority has granted its approval** or if **all** of the following conditions are fulfilled:

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## Alternatives to system expansion EU clean energy package

The **development of a distribution system** shall be based on a transparent network development plan that distribution system operators shall **publish at least** every two years **and submit** to the regulatory authority. **The regulatory authority may request amendments to the plans.** The network development plan shall **provide transparency on the medium and long-term flexibility services needed**, contain the planned investments for the next five to ten years, with particular emphasis on the main distribution infrastructure which is required in order to connect new generation capacity and new loads including re-charging points for electric vehicles. **The network development plan shall also include the use of demand response, energy efficiency, energy storage facilities or other resources that distribution system operator is using as an alternative to system expansion.**



When elaborating the **ten-year network development plan**, the transmission system operator shall **fully take into account the potential of the use of demand response, energy storage facilities or other resources as an alternative to system expansion in addition to expected consumption and trade** with other countries **and** investment plans for regional and Union wide networks.

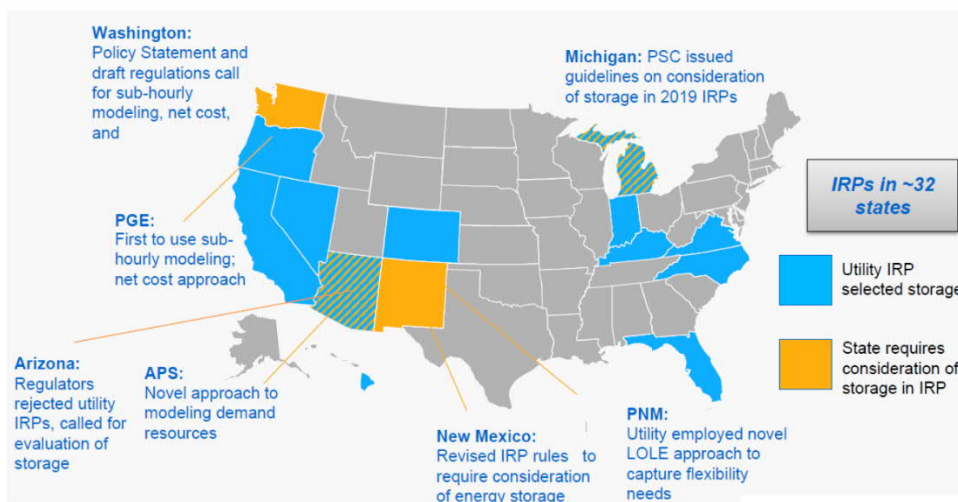
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## Trade-offs between network reinforcement and flexibility



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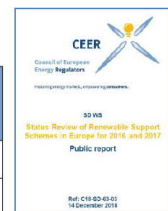
**Some renewable generators receiving support under the RO, CFD, or FIT schemes are concerned they may put their accreditation at risk if they apply to install storage assets on the same site**

**AGREE/ DISAGREE?**

## Do I loose my RES-Support if I self-consume?

#### Annex 23 – Right to Self-consumption of Electricity

Member	Is self - consumption in principle allowed?	Is self-consumption of self-generated RES electricity allowed in combination with a support payment?	If 'yes', please specify in the comment box below.
Estonia	Yes	Yes	If there is a direct line between the producer and the consumer (may be one person)
Austria	Yes	Yes	There are no restrictions to self-consumption for supported RES plants. For PV-installations you even have to indicate an estimated self-consumption share when you apply for a FIT and the plants are ranked according to this share (the more you will consume on-site the better you'll be ranked). FIT is granted on a FCFS basis.
Belgium	Yes	Yes	Green certificates for RES production, except for PV installed after January 2015 in the Flemish and Walloon region with a capacity less than 10 kVA. In the Brussels region, PV installations smaller than 10kW still receive
UK	Yes	Yes	For FITs, payments are received separately on generation and export. However, installations <30kW can 'deem' their export, meaning it is assumed they export 50% of their generation, in the absence of an export meter. This currently means that if they introduce storage and use all of their generation themselves, they still receive payments for export. This can be the case even if an export meter is installed. For RO, self-consumption is allowed for the operation of the generating station itself but not for other uses.



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## UK Flexibility plan and progress report

	IMPLEMENTED	
Some renewable generators receiving support under the RO, CFD, or FITs schemes are concerned they may put their accreditation at risk if they apply to install storage assets on the same site.	1.4	Ofgem has published guidance for participants of the RO and FIT schemes who are considering co-locating electricity storage facilities with their accredited RO generating station or FIT installation, without risking their existing accreditations. This follows guidance that had been issued previously for the CFD scheme.

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**Balancing services can suffer from complexity, overlap and lack of transparency. They may also reflect a historical focus on generation**

**AGREE/ DISAGREE?**





# STORY

## National Grid- Enhanced frequency response



201 MW procured from storage in first tender in 2016

### Enhanced frequency response (EFR)



Enhanced frequency response (EFR) is a dynamic service where the active power changes proportionally in response to changes in system frequency. This service is aimed at improving the management of system frequency pre-fault to maintain system frequency closer to 50Hz.



Provider Name	Site Location/Name	Type of service	Provider Type	Enhanced Response (MW)	Estimated Start Date	Total Cost of tender Em	GWh of EFR holding	Service Hours	Average price of tender €/MWh of EFR/ h	Does this tender exclude typical TRIAD hours
EDF Energy Renewables	T_WBURB-4	Service 2	Storage	49	Dec-17	£ 12.035	1719.312	35088	£ 7.00	FALSE
Vattenfall	Pen Y Cymoedd	Service 2	Storage	22	Apr-17	£ 5.749	771.936	35088	£ 7.45	FALSE
Low Carbon	Cleator	Service 2	Storage	10	Dec-17	£ 2.681	337.6	33760	£ 7.94	TRUE
Low Carbon	Glassenbury	Service 2	Storage	40	Mar-18	£ 12.668	1350.56	33764	£ 9.38	TRUE
E.ON UK	Sheffield	Service 2	Storage	10	Nov-17	£ 3.891	350.88	35088	£ 11.09	FALSE
Element Power	TESS	Service 2	Storage	25	Feb-18	£ 10.079	877.2	35088	£ 11.49	FALSE
RES	RESEFR7-PT	Service 2	Storage	35	Feb-18	£ 14.651	1228.08	35088	£ 11.93	FALSE
Belectric	Nevendon	Service 2	Storage	10	Oct-17	£ 4.200	350.88	35088	£ 11.97	FALSE
<b>Total</b>				<b>201</b>		<b>£ 65.954</b>			<b>£ 9.44</b>	



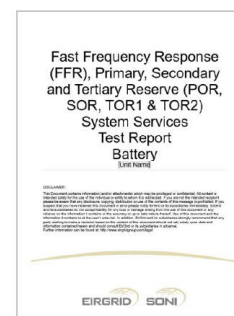
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646426

Project STORY - H2020-LCE-2014-3

## Ireland & Northern Ireland- DS3 System Services



- Batteries can tender to provide reserve services:
  - Fast frequency response
  - Primary, secondary, and tertiary reserve.



DS3 Programme



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## Northern Ireland- DS3 System Services

Technology Specific Trials

### Procurement Process

- Tenderers are invited to submit a tender for one or more or all of the applicable Lots in accordance with the RFP:
  - Lot 1: Solar Technology Trial
  - Lot 2: Aggregated Residential Services Trial
  - Lot 3: Other Technology Trial
  - Lot 4: Alternative Communications Method Trial
- Interested Tenderers must submit a tender response **through the eTenders portal** in respect of the relevant Lot.
- Tender box close time **12 noon, Irish Time**, on **5<sup>th</sup> April 2019** – eTenders will not allow upload after this time.



### DS3 Programme

Our Delivering a Secure Sustainable Electricity System (DS3) programme seeks to address the challenge of integrating world-leading levels of renewable generation onto our power system.

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## Northern Ireland- DS3



For each DS3 System Service, the "Proven List" sets out the technologies which the TSOs consider to be proven at this time for procurement purposes. The designation of a technology as "proven" does not entitle any individual System Services contract. Each individual service provider must pass the compliance assessment and meet all service provision standards in terms of performance. Also, while a technology may be considered proven for multiple services, this does not mean that it can provide all of these services at the same time. Some services can only be provided in certain operational modes. Finally, for some types of service provider (e.g. windfarms, pumped hydro), the ability of the service provider is dependent on the underlying technology used.

Proven Technology List		FFR	POR	SOR	TOR1	TOR2	RR (S)	RRD	RM1	RM3	RM8	S
Thermal/Hydro - Centrally Dispatched Generating Unit - CDGU	Coal	x	x	x	x	x	x	x	x	x	x	x
	Combined Cycle Gas Turbine - CCGT	x	x	x	x	x	x	x	x	x	x	x
	Open Cycle Gas Turbine - OCGT	x	x	x	x	x	x	x	x	x	x	x
	Distillate Oil	x	x	x	x	x	x	x	x	x	x	x
	Peat	x	x	x	x	x	x	x	x	x	x	x
	Anaerobic Digester / Waste to Energy	x	x	x	x	x	x	x	x	x	x	x
	Combined Heat and Power	x	x	x	x	x	x	x	x	x	x	x
	Biomass	x	x	x	x	x	x	x	x	x	x	x
	Hydro		x	x	x	x	x	x	x	x	x	x
Wind Power - WFPS	Wind Farm	x	x	x	x							
Storage	Solid State Batteries e.g. Lithium Ion	x	x	x	x	x	x	x	x	x	x	x
	Flywheels (Non-Synchronous)	x	x	x	x							
	Pumped Hydro	x	x	x	x	x	x	x	x	x	x	x
	Compressed Air Energy Storage	x	x	x	x	x	x	x	x	x	x	x
Synchronous Compensator	Synchronous Compensator	x	x	x	x	x	x	x	x	x	x	
HVDC Interconnector	Direct Current – Voltage Source Converters - VSC	x	x	x	x							
	Direct Current – Line Commutated Converter LCC	x	x	x	x							
Aggregated Service Providers	Aggregated Generation Units (fossil-fuel based) - AGU	x	x	x	x	x	x	x	x	x	x	x
	Industrial Demand Side Units (demand response) - DSU	x	x	x	x	x	x	x	x	x	x	x
	Residential Demand Side Management (demand response) - RDSM											
Solar Power	Solar Photovoltaic											
	Solar Thermal											
	Concentrated Solar											



## FERC Order 755

and ISOs result in rates that are unjust, unreasonable, and unduly discriminatory or preferential. Specifically, current compensation methods for regulation service in RTO and ISO markets **fail to acknowledge the inherently greater amount of frequency regulation service being provided by faster-ramping resources**. In addition, certain practices of some RTOs and ISOs result in economically inefficient economic dispatch of frequency regulation resources.

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S OF AMERICA  
LATORY COMMISSION

18 CFR Part 35

[Docket Nos. RM11-7-000 and AD10-11-000; Order No. 755]

Frequency Regulation Compensation in the  
Organized Wholesale Power Markets

Docket Nos. RM11-7-000  
AD10-11-000

(Issued October 20, 2011)

28.05.2019



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Project STORY - H2020-LCE-2014-3

## PJM Fast response

“The RegD signal would sometimes move in the opposite direction of the area control error [ACE], exacerbating the frequency regulation problem,” Eric Hsia, manager of performance compliance at PJM, told Utility Dive.



DEEP DIVE

### Is the bloom off the RegD rose for battery storage in PJM?

Frequency regulation has ups and downs, but with pending changes to PJM's RegD market, it seems more down than up.



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Project STORY - H2020-LCE-2014-3



## Bidding arrangements should consider physical characteristics of storage.

### FERC Order 841: Electric Storage Participation in Wholesale Power Markets

BRIEF AUTHORS : Manfei He

BRIEF EDITORS : Daniel Copple, Jack Zhou, PhD

Requires wholesale electric power markets to create new rules that will allow for the participation of energy storage resources in energy wholesale markets.

This rule mandates that:

- Storage participating in wholesale markets should be able to recover costs through both cost-based and market-based rates.
- Storage should be allowed to provide all capacity, energy, and ancillary services according to its technical capability. This requirement recognizes the rich service potential of storage, including the ability to provide services that certain ISO/RTOs do not procure from organized market mechanisms, e.g., **blackstart services**, **frequency regulation**, and **reactive power services**. In the event that ISO/RTOs provide compensation for these services outside of market mechanisms, storage should be eligible for that compensation.
- The proposed bidding parameters should consider the physical and operational characteristics of different storage technologies.
- The general pricing rules for storage should be the same as energy resources. Storage would participate in the market both as wholesale buyers and wholesale sellers, and should be able to set the **wholesale market clearing price**. The buying and selling prices of energy storage should be the **locational marginal price**, or the price specific to a given location.
- The minimum size requirement to participate in the wholesale market must not exceed 100 kW.

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Project STORY - H2020-LCE-2014-3

## UK Flexibility plan and progress report

Issue	Action	What we have done	What we will do next
To balance the system, the Electricity System Operator (ESO) contracts for balancing services from providers, including frequency response and reserve. Balancing services can suffer from complexity, overlap and lack of transparency. They may also reflect a historical focus on generation rather than demand-side balancing solutions.	<b>IMPLEMENTED</b>		
	3.3	<p>The ESO has reviewed how it can improve and simplify the way it procures balancing services and has <b>published roadmaps</b> on frequency response and reserve, restoration and reactive power and wider access to the balancing mechanism.</p> <p>Ofgem published a decision on the ESO's regulatory <b>incentive framework</b> running from April 2018 to 2021 in February 2018.<sup>69</sup> The new framework will take a more 'principles-based' approach to regulating the ESO. In September, Ofgem launched a call for evidence for stakeholders to provide views on the ESO's performance across all its regulatory principles, from April to September. This information will form part of the assessment under the ESO's new performance framework.</p>	<p>The ESO will deliver actions set out in its roadmaps on frequency response and reserve, restoration and reactive power and wider access to the balancing mechanism. This includes trialling innovative, closer-to-real time procurement for frequency response by spring 2019. Ofgem will be reviewing this delivery and stakeholder feedback as part of their assessment of the ESO under their incentives framework. Ofgem is appointing an independent <b>panel of experts</b>, who will assess the ESO's performance and stakeholder feedback and will provide recommendations to Ofgem on whether any <b>incentive payments or penalties</b> should be paid. This panel will be in place for the ESO's mid-year review in November.</p>

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Project STORY - H2020-LCE-2014-3





# STORY

## EU Clean Energy Package



In order to raise efficiencies in the electricity distribution networks in the Union and ensure close cooperation with transmission system operators and ENTSO for electricity, a European entity of distribution system operators in the Union ("EU DSO entity") should be established. **The tasks of the EU DSO entity** should be well-defined and its working method should ensure efficiency, transparency and representativeness amongst the Union distribution system operators. The EU DSO Entity should closely cooperate with ENTSO for Electricity on the preparation and implementation of the **network codes** where applicable and should work on providing guidance on the integration inter alia of **distributed generation and storage in distribution networks** or other areas which relate to the management of distribution networks. *The EU DSO entity should also take due consideration of the specificities inherent in distribution systems connected downstream with electricity systems on islands which are not connected with other electricity systems via interconnectors.*



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Project STORY - H2020-LCE-2014-3

## Thank you!



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