

H2020 Challenge Secure, clean and efficient energy system: Smart Citizen-Centered Energy System

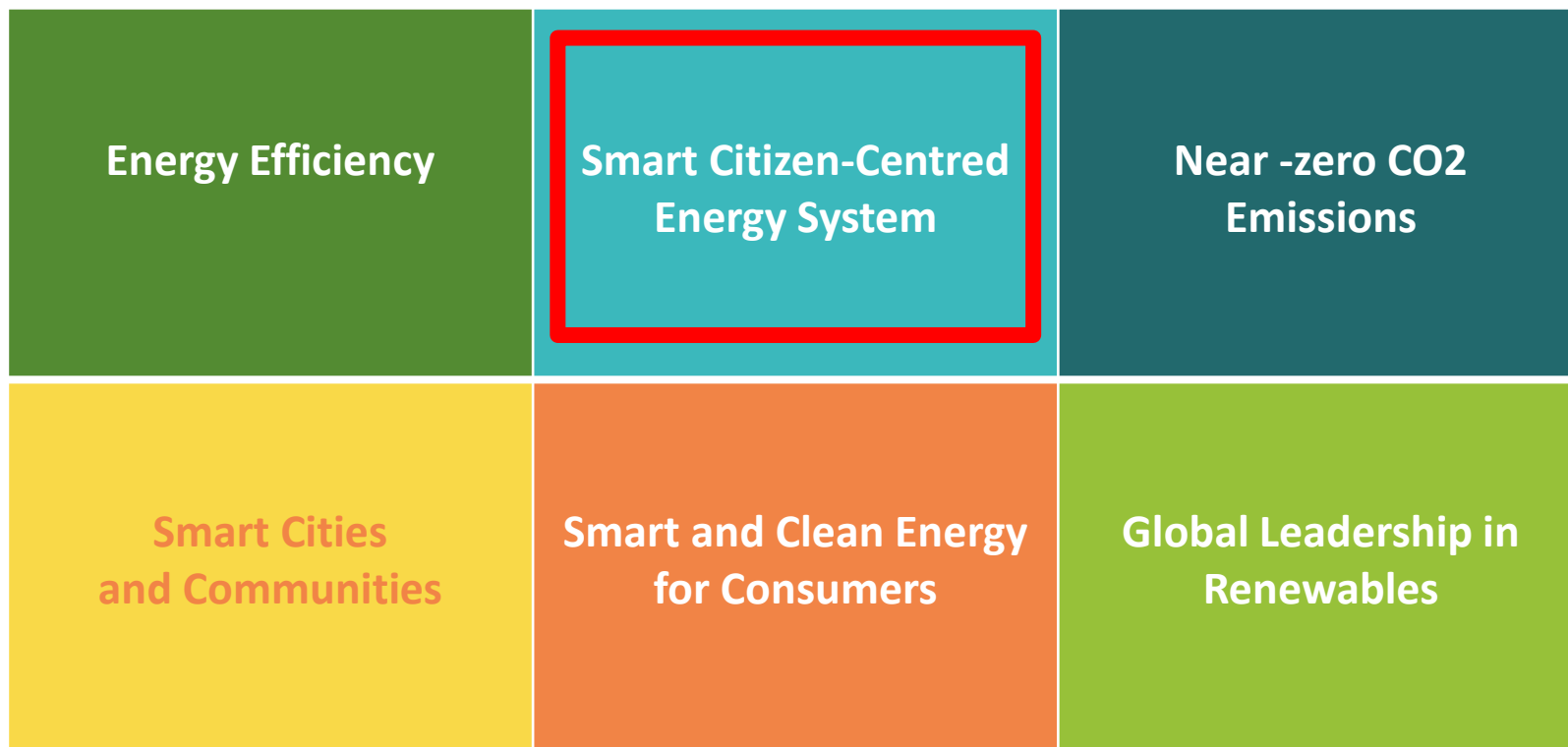


**#H2020Energy
info day**

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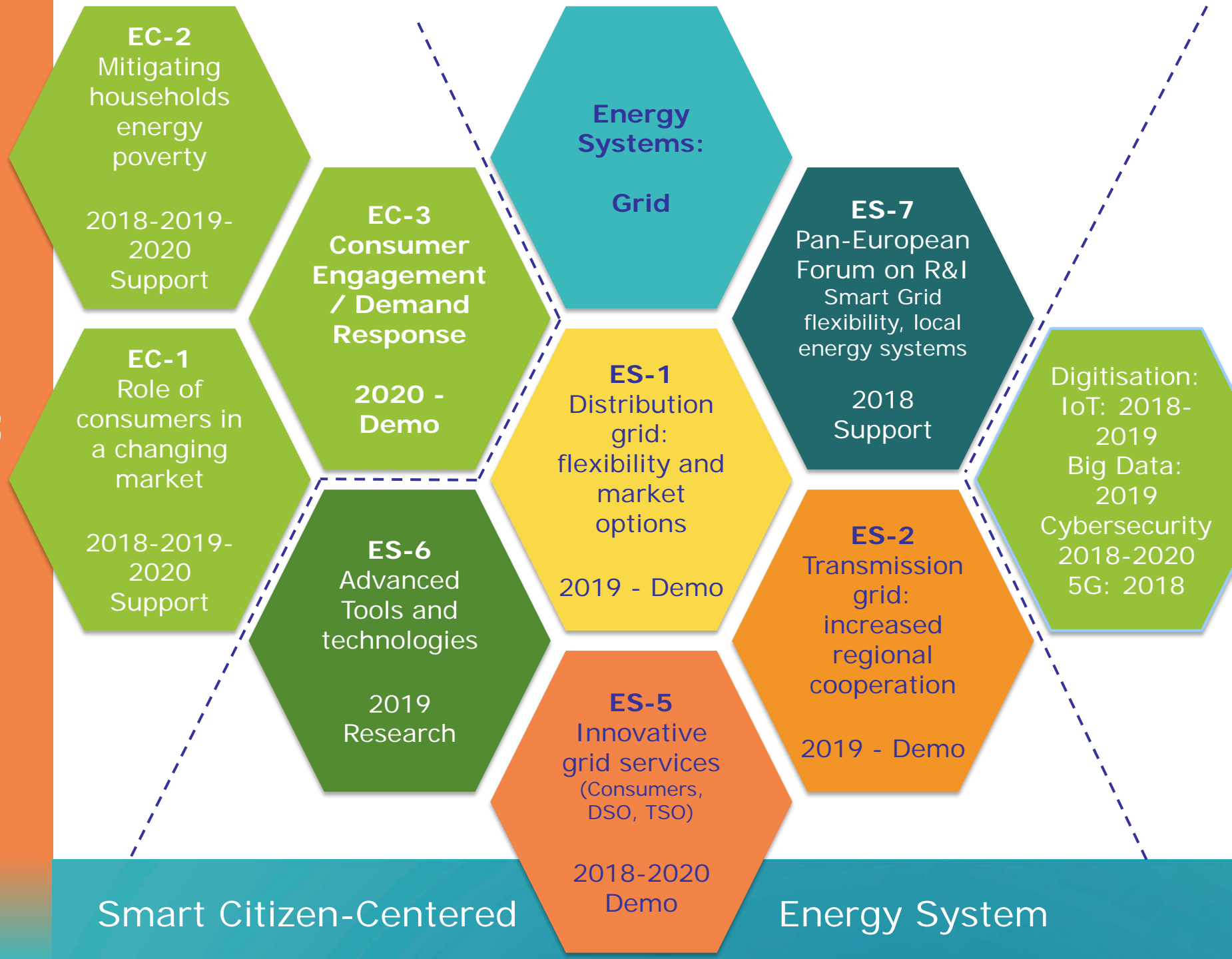


H2020 Energy Challenge: Secure, clean and efficient energy system

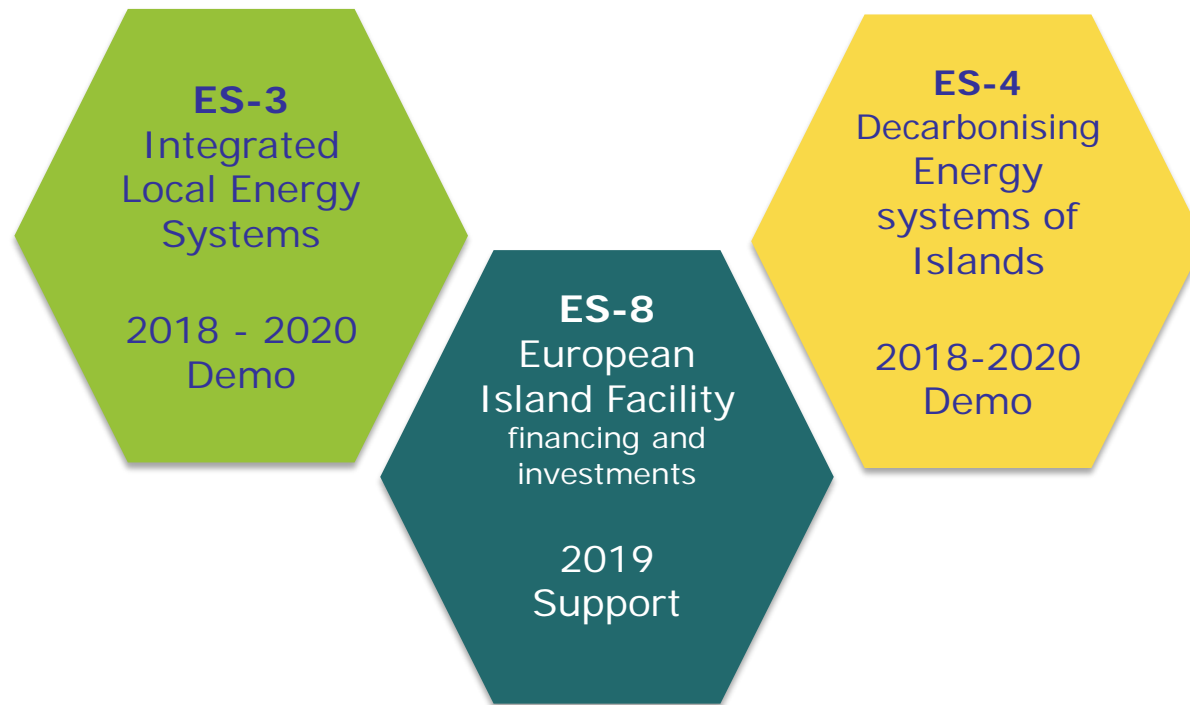


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Smart Citizen-Centered Energy System: Local and Islands



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		Instru ment	TRL	EU funding per project (in M €)	Budget in 2019
EC-3	Consumer Engagement				in 2020
ES-1	Distribution Grid: flexibility and market	IA	5-8	6-8	€ 37.3 M
ES-2	Transmission grid: regional cooperation	IA	5-8	8-10	€ 25 M
ES-5	Innovative Grid services	IA	5-8	13 - 17	in 2020
ES-6	Advanced tools and technologies	RIA	N/A	2-4	€ 28.35 M
ES-3	Integrated local energy systems	IA	5-8	5-6	in 2020
ES-4	Decarbonising energy system of islands	IA	5-8	7-10	in 2020
ES-8	European Island Facility	CSA	N/A	10	€ 10 M

ES total budget 2019	€ 100.65 M
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ES-1-2019: Flexibility and retail market options for the distribution grid

Deadline to apply: 5 Feb 2019

EU funding per project: €6-8 m

Instrument: Innovation Action

Total budget in 2019: €37.3 m

TRL: between 5 and 8

The Challenge

- Large share of **variable renewables** connected to the distribution grid
- **Electrification** for transport / heating and cooling
- **Flexibility** versus infrastructure



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ES-1-2019: Flexibility and retail market options for the distribution grid

The Scope

Develop and demonstrate integrated solutions with **at least two** of the following elements:

- **Flexibility measures** and **grid services** (such as storage, batteries including EVs, power to X, demand response, variable generation)
- **Smart grid** technologies, observability, automation, control
- **Market mechanisms**: dynamic tariffs, tools to resolve congestion, non-frequency ancillary services, better integration of wholesale / retail



ES-1-2019: Flexibility and retail market options for the distribution grid

The Scope

- **Proposals can be submitted under two sub-topics:**
 - Flexibility and retail market option for the distribution grid
 - Flexibility and retail market option for the distribution grid: International cooperation with Canada
- Proposals should include a task on analysis of **obstacles to innovation** in the **current context** and in **future market design** context.
- Proposals should foresee to **coordinate** with similar EU-funded project through the **BRIDGE initiative** (consider additional coordination effort and budget)



ES-1-2019: Expected impact

Contribute to at least two elements:

- **Enhance flexibility** of distribution grids
- **Define the conditions of a well-functioning market** which creates business case for stakeholders willing to provide such flexibility and allow to sustain the necessary investments (e.g. variable price strategies)
- **Improve the capability to manage future energy loads** including electric vehicles
- **Improve distribution grid** operations which guarantee security of supply and the use of flexibility products while integrating large shares of variable renewables avoiding unnecessary investments by solving congestion

Include ad-hoc indicators to measure the progress against specific objectives that could be used to assess the progress during the project life





ES-2-2019 Solutions for increased regional cross-border cooperation in the transmission grid

Deadline to apply: 5 Feb 2019

EU funding per project: €8-10 m

Instrument: Innovation Action

Total budget in 2019: €25 m

TRL: between 5 and 8

The Challenge

- Wholesale **price varies** across Europe
- Optimal use of **interconnector**
- **Cooperation** between TSOs across borders
- Grid services **across borders**



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ES-2-2019 Solutions for increased regional cross-border cooperation in the transmission grid

The Scope

- Develop and demonstrate at least four of the following points:
- **Tools** for communication and grid operations (incl. intraday and real time market)
 - **Prediction** of variable RES production and DR forecast
 - New **cross-border** grid services
 - Well-functioning **wholesale market** , real-time market coupling
 - Enhance **cross-border flow**, trading, exploitation of large scale storage assets
 - Demonstration in a **regional context**
 - **Guidelines** to avoid distortion resulting from the non-harmonisation of regulations between countries



ES-2-2019 Solutions for increased regional cross-border cooperation in the transmission grid

The Scope

- Proposals should include a task on analysis of **obstacles to innovation** in the **current context** and in **future market design** context.
- Proposals should foresee to **coordinate** with similar EU-funded project through the **BRIDGE initiative** (consider additional coordination effort and budget)



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ES-2-2019: Expected impact

Contribute to enhancing regional cooperation in:

- Operation of **transmission grids** so as to bring **additional flexibility**
- **Optimising infrastructure investments** and making best use of large scale assets
- **Improved** functioning of the **wholesale market across borders**
- Development of future **common approaches** to **grid services**

Include ad-hoc indicators to measure the progress against specific objectives that could be used to assess the progress during the project life.



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ES-6-2019: Research on advanced tools and technological development

Deadline to apply: 5 February 2019

Instrument: Research and Innovation Action

EU funding per project: €2-4 million

Budget in 2019: €28.35 million

The Challenge

- Tools and future technologies to prepare the energy system of 2030 and beyond



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ES-6-2019: The Scope

Proposals must address partially or entirely **only one of four sub-topics**

Sub-topic 1 - Advanced modelling tools for:

The future electricity market: design and impact of **electricity pricing structure** from the wholesale markets to real-time markets and retail markets

Modelling and forecasting energy production from variable renewables, associated frequency and voltage controls issues in the electricity grid and benefits of energy storage use.



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ES-6-2019: The Scope

Proposals must address partially or entirely **only one of four sub-topics**

Sub-topic 2 - Advanced tools for:

Design, planning and operation of distribution and transmission grid infrastructure, taking into account environmental concerns, new constraints from variable renewable generation, place of storage and flexibility; Optimisation of the use of existing assets and network

Grid predictive management strategies for maintenance with uncertainty (forecasting plus stochastic grid management tools)

TSO / DSO collaboration and coordination tools, secure data exchange across networks along whole the value chain, ICT tools for cross-border trading for nearly real-time balancing; automated digital cross-border electricity market.

Enabling technologies for reliable and resilient European electricity grids, making use of the specific features of EGNOS and Galileo.





ES-6-2019: The Scope

Proposals must address partially or entirely **only one of four sub-topics**

Sub-topic 3 - Technological developments

Reliable, robust and cost-effective energy **storage technologies** (high specific energy rates, large number of life cycles, fast response and low maintenance);
storage management systems

Power electronics for batteries and software to manage combined or hybridised decentralised energy systems combining several energy vectors, key focus on cost reduction.



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ES-6-2019: The Scope

Proposals must address partially or entirely **only one of four sub-topics**

Sub-topic 4 – Mission Innovation: International cooperation with non-EU/Associated countries on MI Challenge 7 on affordable heating and cooling for buildings

Develop **compact thermal energy storage** for electricity load shifting that will take up electricity from the grid at peak times, to be used for heating, cooling or hot tap waters at later times. **Integration into the building heating system and in the smart electricity grid** is a key development.



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ES-6-2019: The Impact

Advanced modelling tools

Knowledge on how to design price structure and magnitude in order to be able to finance e.g. infrastructure and R&I;

Enhance the accuracy of the prediction of electricity production from variable renewables and better qualify and quantify associated issues and remedies

Advanced tool

New approaches to electricity grid planning, monitoring and maintenance that are better suited to future characteristics of the grid and enable savings on infrastructure costs



ES-6-2019: The Impact

Technological developments

Reduce costs of key technology components;
Integration of battery systems enabling high shares of renewable electricity

International cooperation on MI #7 on affordable heating and cooling for buildings

Contribute to the objectives of Mission Innovation;
provide efficient innovative small scale power to heat/cool flexibility measures that can be deployed in a large number of buildings

Include ad-hoc indicators to measure the progress against specific objectives that could be used to assess the progress during the project life



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ES-6-2019: The Selection of projects

- **Separate ranking list** in each of the 4 sub topics
- The **top-ranked proposals** in each sub-topic will be selected



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Common requirements ES-1 ES2- ES-6

Applicants should demonstrate a good knowledge and compatibility with:

- Current **regulations**
- Available or **emerging standards** and **interoperability issues** (*see work of the Smart Grid Task Force and its Experts Groups in the field of Standardization - CEN-CLC-ETSI M/490*)
- Smart grid deployment, infrastructure and industrial **policy** ([link](#))
- A high level of **cyber security**; compliance with relevant EU security legislation, due regard of best available techniques
- **Regulatory environment** for privacy, data protection, data management and alignment of data formats (*see “My Energy Data” and its follow-up, General Data Protection Regulation and industry standards, Data Protection Impact Assessment Template*)



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BRIDGE

Accelerating smart grid and storage deployment by
removing barriers to innovation



BRIDGE

- Is a **European Commission** initiative
- Gather Horizon 2020 **Smart Grid and Energy Storage** demonstration projects
- Creates a **structured view** of obstacles to innovation.
- Fosters continuous **knowledge sharing** amongst projects
- Deliver **conclusions and recommendations** with a single voice

Data
management

Business Models

Regulations

Customer
engagement



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Thank you!

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