8th Smart Grids Cleanpower Conference
Cambridge, UK 19-20 June 2017
www.cir-strategy.com/events

SMART ENERGY INNOVATION (REVISITED!)

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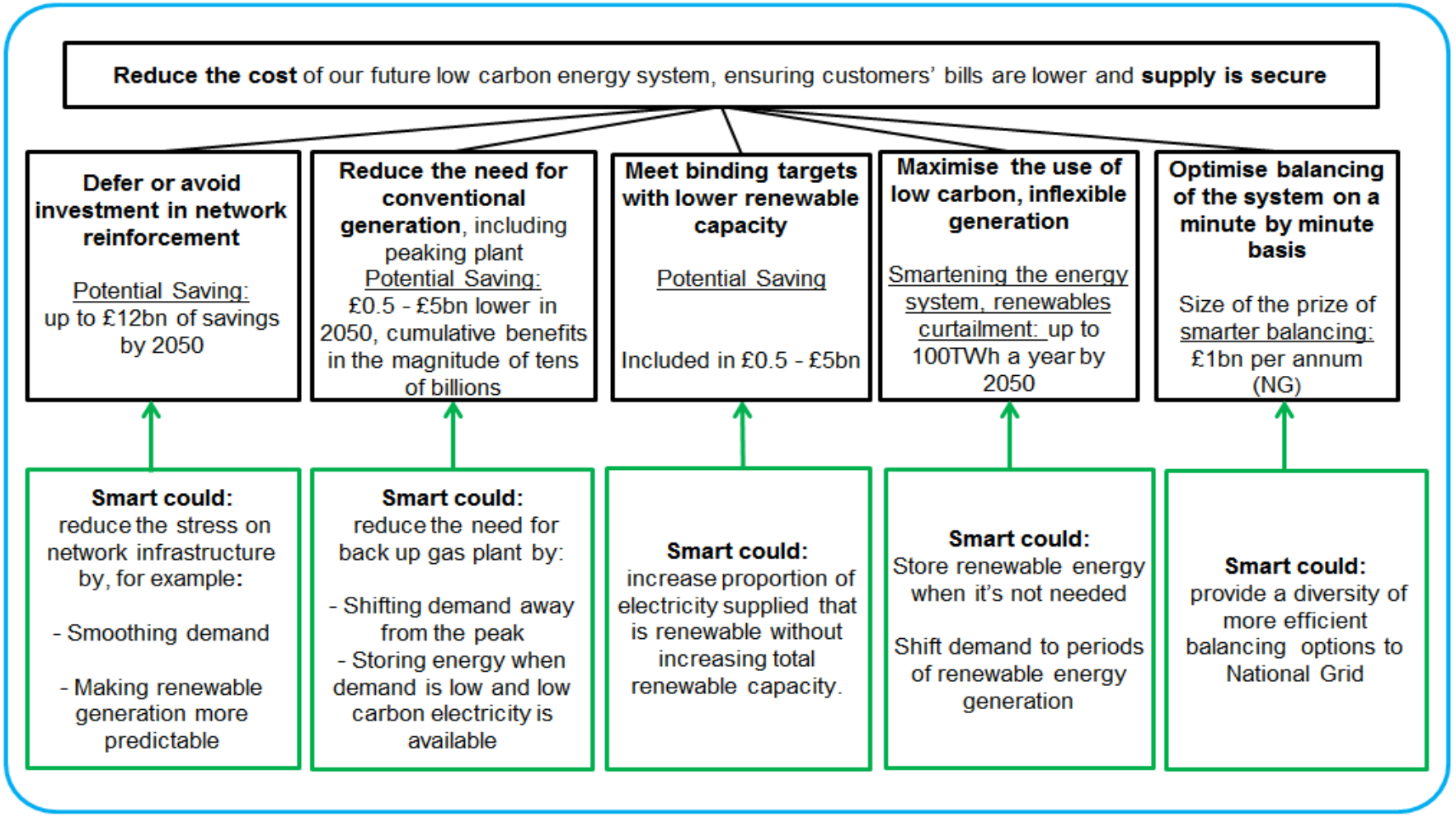
June 2017…join the follow up 9th SGCP18 26-27 June Cambridge, UK

Innovation Landscape - Overview

Organisation/Programme (National Programmes Only)	Early stage Research	Applied R&D	Dev & Demo	Pre-commercial	Commercial Deployment
BEIS					
Innovation Programme (£505m to 2021) & Heat Network Funding (£300m)					
Industrial Strategy & IS Challenge Fund					
Innovate UK – to become part of UK Research & Innovation (UKRI)					
Catapults: e.g. Offshore Renewables Catapult & Energy Systems Catapult					
Research Councils UK (RCUK); to become part of UKRI					
DfT					
OLEV (Ultra Low Emission Vehicles) - funded jointly with BEIS					
Advanced Biofuels Demonstrator Competition					
DEVOLVED ADMINISTRATIONS					
Scotland, Wales & Northern Ireland					
OFGEM					
Network Innovation Competition & Allowance (NIC/NIA) and RIIO controls					
PUBLIC-PRIVATE					
Energy Technologies Institute (ETI) (to 2017)					
Energy Research Partnership (ERP)					
INTERNATIONAL					
H2020 and Mission Innovation					

Benefits of a Smart, Flexible Energy System



Key Enablers

- Removing policy & regulatory barriers – “levelling the playing field”.
- Using innovation to help drive down costs & optimise performance.
- Developing supply chains.

Enablers - Policy & Regulation: BEIS/Ofgem Call for Evidence on Smart Energy

Removing barriers to storage and DSR	•**Clarify role of aggregators**, •explore the need for policy intervention and regulatory oversight, •evaluate and **address barriers to ownership and utilisation of storage**
Improving price signals	•Consider ways in which we can **encourage and reward consumers** to offer their flexibility (e.g. half hourly settlement, smart appliances, etc)
Catalysing innovation	•Ensuring **HMG's innovation funding** supports those areas critical to the development of a smart energy system, including **evaluating the public sector's role** in supporting smart.
Assessing changes to roles & responsibilities	•Considering what **institutional and market frameworks** may be required in a future smart energy system to **maximise benefits** while managing the risks; and how roles and responsibilities may need to change in light of these (e.g. from DNO to DSO).
Developing our analysis and evidence base	•Considering the **costs and benefits** in more detail; how much flexibility might be '**least regrets**'; and identifying **evidence gaps** more broadly in this area.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/576367/Smart_Flexibility_Energy_-_Call_for_Evidence1.pdf

Enablers - Industrial Strategy

Focus on:

- R&D and Innovation, specifically including ‘Smart Energy’ – including energy storage and smart grid technologies;
- Industrial Strategy Challenge Fund announced (Multi £Bn);
  - Including £246m over 4 years for the ‘Faraday Challenge’ – “to help UK businesses seize the opportunities presented by the transition to a low carbon economy, to ensure the UK leads the world in the design, development and manufacture of batteries for the electrification of vehicles”.

More information:
https://www.gov.uk/government/news/developing-a-modern-industrial-strategy

Enablers – Innovation (BEIS Energy Innovation)

- £505m budget overall for Energy Innovation;
- Overall Energy Innovation Programme will include innovation support for the following areas:
  - Nuclear;
  - Smart Energy (Government has committed at least £50m for Smart Energy innovation over the next 4-5 years; further details of the Smart Energy Innovation Programme overleaf). Also: https://www.gov.uk/guidance/funding-for-innovative-smart-energy-systems
  - Built Environment (e.g. Hydrogen Project; Smart Systems & Heat);;
  - Industrial Efficiency (e.g. Industrial Energy Efficiency Accelerator);
  - Renewables (e.g. ERANET Cofunds for OSW and Bioenergy); and
  - Cross-Cutting (e.g. Energy Entrepreneurs Fund).

BEIS Smart Energy Innovation

BEIS Smart Energy Innovation Programme - priority areas (set out in the CfE):

- **commercial and residential DSR -** to catalyse innovative DSR services for residential and SME customers; could explore approaches involving intelligent automation of flexible loads;
- **flexibility trading/optimisation platforms –** support approaches which can optimise flexibility solutions (including storage & DSR) & mitigate prioritisation conflicts between multiple users of flexibility;
- **storage costs -** innovation support to catalyse the development of alternative storage technologies; e.g. with potential to be more cost-effective than established technologies in future for a range of grid-scale flexibility applications; could be demonstrators of large-scale storage technologies, e.g. compressed air or power-to-gas, or support for component level development, manufacturing process, or efficiency improvements; and
- **vehicle to grid -** innovation to test availability and cost of infrastructure, viability of stacking services, and models that work for both business fleets and private consumers as well as to encourage development of offerings which could incentivise EV owners to shift charging away from the peak loads.

BEIS Smart Energy Innovation Competitions

Three new Competitions launched in January 2017: two supporting energy storage and one for non-domestic DSR innovation:

Funding for energy storage cost reduction and feasibility studies (£9.6m)

Up to £9 million available to reduce the cost of energy storage technologies (including electricity storage, thermal storage, and power-to-gas technologies). And a further **£600,000** to support feasibility studies for a potential first-of-a-kind, large-scale future storage demonstrator.

Funding for innovative non-domestic Demand Side Response demonstrations (£7.6m)

Up to £7.6 million for innovative demonstrations of energy demand side response technologies in UK businesses or public sector organisations to reduce their energy use in peak times and provide flexibility to the energy system.

Mission Innovation: Smart Grids Challenge

- Through Mission Innovation, 22 countries and the European Union are taking action to **double their public clean energy R&D investment** over five years.
- Mission Innovation has identified 7 challenge areas, including: Smart Grids;
- Smart Grids Challenge is led jointly by China, India and Italy;
- Objective is: “To enable future smart grids that are powered by affordable, reliable, decentralised renewable electricity systems”;
- UK active in the Group – which also includes members from: Australia, Brazil, Canada, Denmark, the European Commission, Finland, France, Germany, Indonesia, Mexico, Norway, Saudi Arabia, Republic of Korea, Sweden, the Netherlands and the United States.
- Activities currently focused on information sharing and identifying common priority areas for Smart Grids activity – but could lead to collaborative projects.
  http://mission-innovation.net/ and
  http://mission-innovation.net/our-work/innovation-challenges/smart-grids-challenge/

What next……?

- Smart Systems Plan….
- Innovation Competitions…..
- Industrial Strategy & Challenge Fund…..