



Department for  
Business, Energy  
& Industrial Strategy

**ofgem**

Making a positive difference  
for energy consumers

# ENERGY STORAGE AND SMART SYSTEMS POLICY

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# 1. System challenges and benefits of smart energy

# Our electricity system faces new challenges as we look ahead...

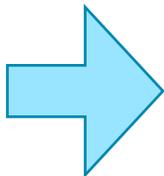


Increasing intermittency & inflexibility

Increasing distributed generation

Changes in consumer behaviour

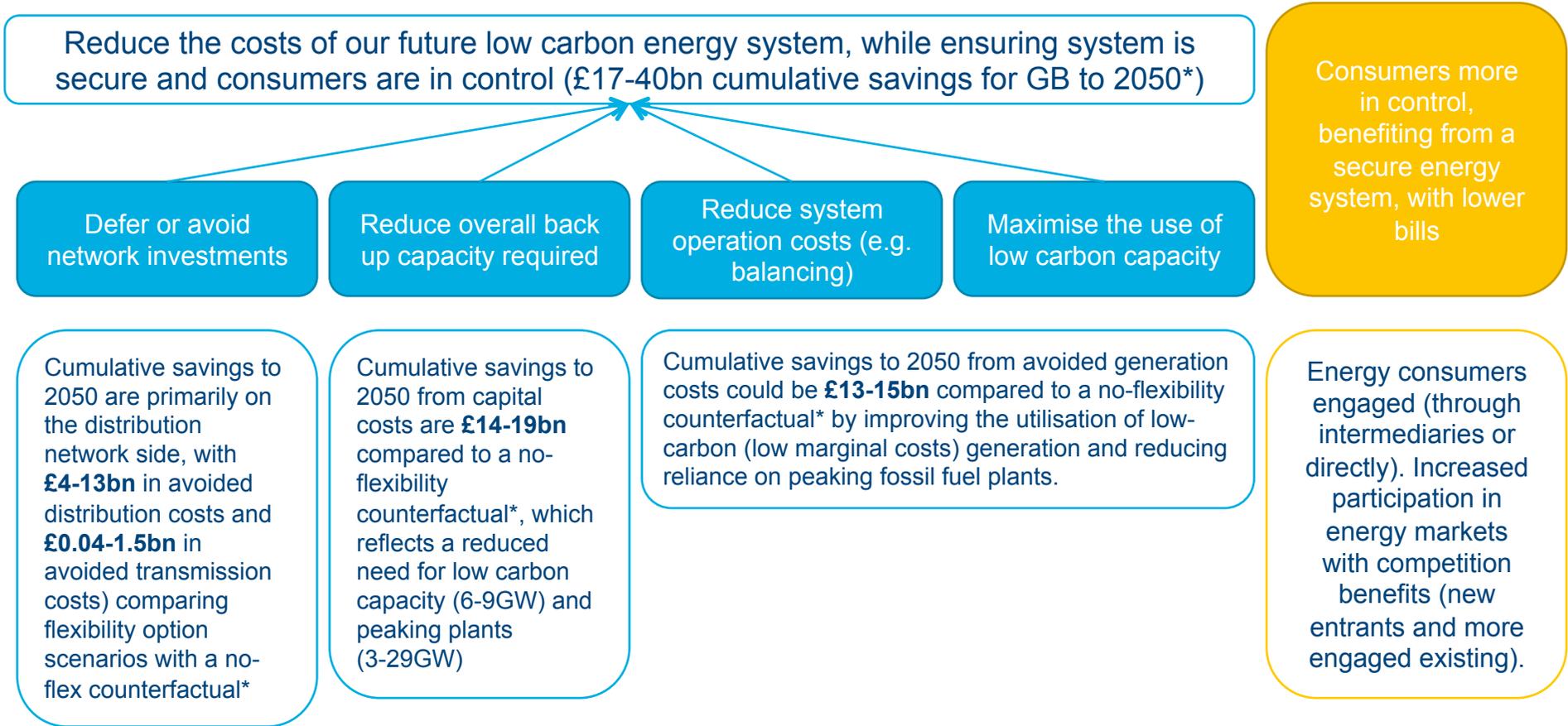
Increasing demand – EVs & heat



Delivering secure affordable and clean energy now and in the future



# What are the key benefits of smart?



Source: DECC Least regret flexibility project (2016)

\*Cost savings in DECC Least-regret flexibility project reflects the benefits of all flexibility options, i.e. not just storage and DSR but also interconnection and flexible CCGTs

## Smart & storage could save the UK taxpayer £billions

- Deployed optimally, a portfolio of storage technologies could significantly benefit the UK through a myriad of system services.
- The recent National Infrastructure Commission report *Smart Power* estimated the benefits of a smart energy system, including storage, at £3-8bn a year in 2030. Similar savings, of £17-40bn cumulative to 2050, were estimated by a Government-commissioned study carried out by Imperial College.
- Another study by Imperial College (in partnership with BEIS and the Carbon Trust) puts the benefits to the UK of storage alone at £2-7bn per year by 2030, saving the average consumer £50/year or more.



## 2. The UK landscape for storage

# Our energy system will need all types of storage

Market Conditions	<p>Highest absolute capex with longest build time, but longest life</p>	<p>Expected rapid price decline, but very expensive now; reliant on Li-ion batteries but new technologies could reduce costs</p> <p>National Grid's Enhanced Frequency Response tender will see a huge surge in deployment starting next year</p>	<p>Due to declining battery prices, most likely to hit plug parity first, especially when combined with solar.</p> <p>Electric Vehicle uptake also offers potential of vehicle-to-grid at consumer level</p>
	<p><b>Transmission-scale</b></p>	<p><b>Distribution-scale</b></p>	<p><b>Consumer-scale</b></p>
Deployment	<p>Most GW currently deployed at transmission scale, but least likely to deploy more due to poor financing &amp; site limitations</p> 		 <p>Difficult to predict deployment levels, and impossible to control</p>

While all scales have different challenges and benefits, a mix of all is likely to be needed.

# Opportunities for storage in a smart system



- Opportunities for storage in delivering new EFR
- Potential to go further through multiservice contracts
- Power Responsive campaign outcomes

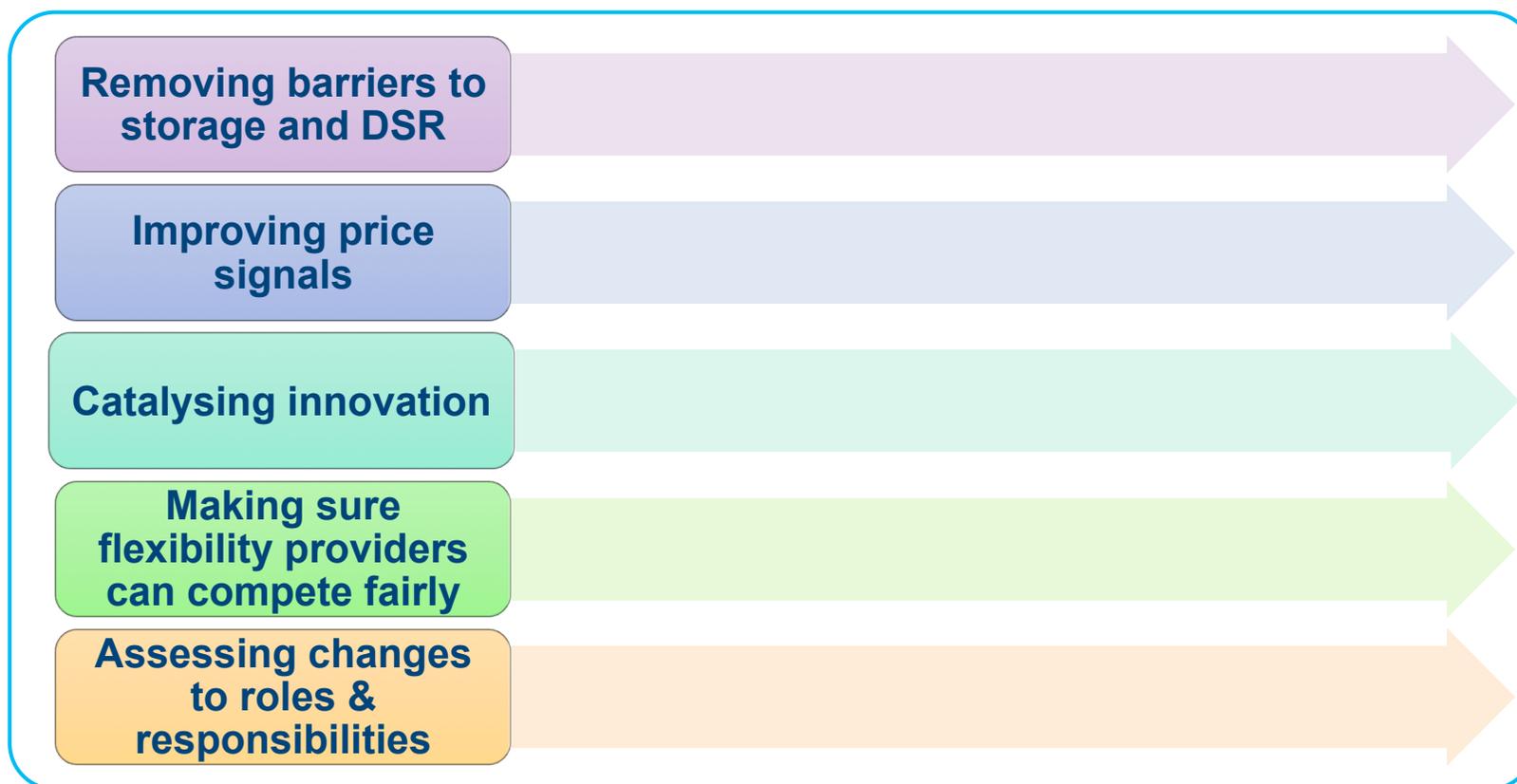
- Diverse business models are emerging simultaneously for storage, ranging from colocation with renewables to domestic consumer offerings through aggregators

- Dramatic cost reduction of Li-ion technology – around 14% pa from 2007-2014 and likely to reduce further. Comparable with drop in solar costs

## 3. Government action

# Call for Evidence on Smart Energy

How can we harness smart solutions to create the most efficient, flexible and productive energy system?



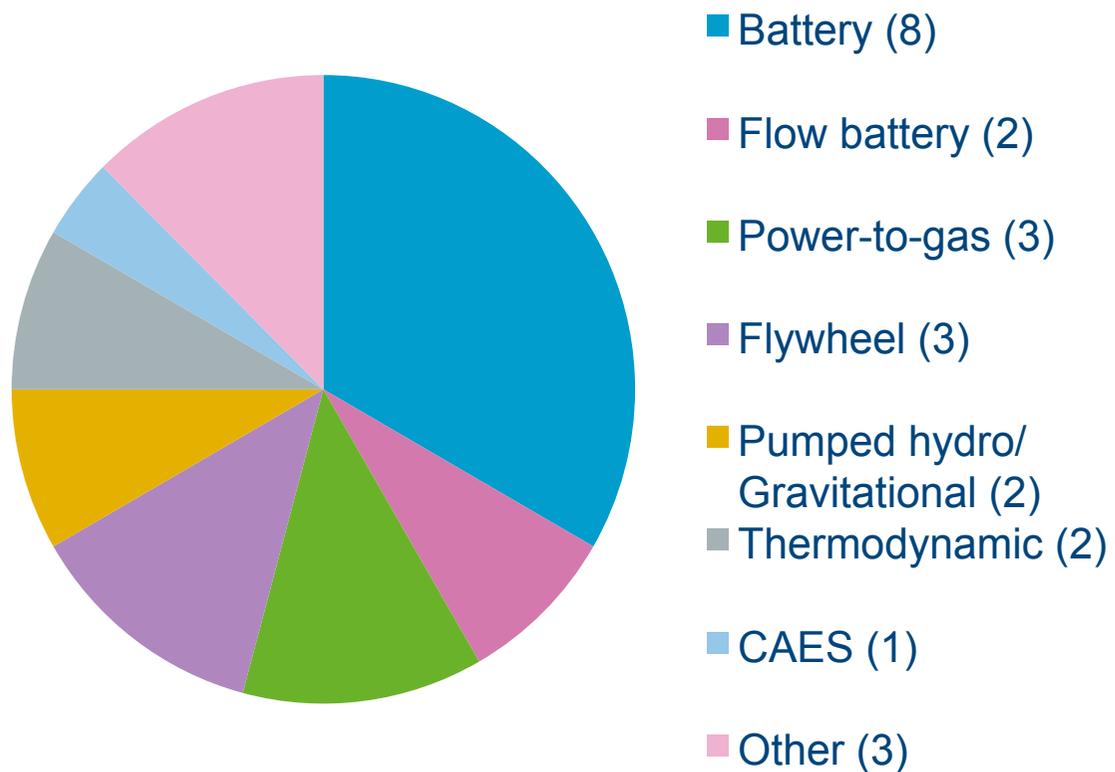
## Focus on Storage: Addressing and Removing Barriers

Licensing	• <b>BEIS-led</b> : what role licensing should play to improve regulatory clarity for storage
Planning	• <b>BEIS-led</b> : to ensure that the planning process does not act as a disincentive to storage projects
Policy Costs	• <b>BEIS-led</b> : to ensure that Final Consumption Levies (e.g. FiTs, RO, CfD) are not overpaid
Ownership	• <b>Ofgem-led</b> : consider legal / market implications of regulated monopolies owning / operating storage
Network Charging	• <b>Ofgem-led</b> : issue of 'double-charging' on import and export
Network Connections	• <b>Ofgem-led</b> : to ensure that storage can access timely and fairly priced connections to network

## Focus on storage: public sector funds supporting a variety of technologies

- £80m public sector support since 2012 for energy storage RD&D
- £15m BEIS support for development of technology demonstrators
- £50m committed in Budget 2016 to help innovation in storage, DSR and other smart technologies over the next 5 years

### BEIS energy storage innovation projects by technology type



## ... Including 4 storage demonstration projects to date

**Moixa – Distributed domestic battery storage for consumers, distribution network & grid needs.**



**EVEREST – modular battery storage solution, partly using recycled batteries from EVs.**



**REDT – 1.2MWh Vanadium flow battery system on the Isle of Gigha (Scotland).**



**Highview & Viridor – 5MW/15MWh liquid air system; using waste heat to increase efficiency.**



## Our next steps...

- We will respond to the call for evidence using information gathered from stakeholders' responses and through informal engagement sessions.
- We will publish a Smart Systems Plan in spring, outlining the actions we will take to remove barriers for smart solutions and provide a longer term direction for the transition to a smart energy system.
- We are analysing your responses and encourage continued engagement with us on how we can address barriers to storage and smart.



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# Q&A

