Grids, renewables and e-mobility
Panel 3:
What policies can foster these technologies?

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We all know that our energy system is in the midst of a significant transformation. The growth of EVs forms part of these wider changes. Innovation in technologies and business models has also led to rapid evolution within the energy system.

These wider changes in the energy system are presenting both challenges and opportunities. We consider that if these changes are harnessed to develop a more flexible and efficient system, consumers will benefit from an affordable, secure and responsive energy market.
Lithium-ion battery costs plummeting – by more than 50% since 2010 (are we at the threshold of cheap storage)

EVs have strong brand recognition; large-scale rollout & charging infrastructure are under development (future possibilities also for V2G)

Smart meter roll out is underway – leading to more consumer choice/control in the home and how we buying energy (rise of the engaged consumer)

Aggregators working with market leaders to deliver and monetise DSR, helping them to reduce bills (changing role of energy supply company)
Facilitating change in the future energy systems is an important part of our forward work programme.
The Smart Systems and Flexibility Plan

29 point plan with actions for Ofgem, Government and Industry (most of which are due to be in place by 2019)

• Removing Barriers to new smart technologies
• Enabling Smart Homes and Businesses
• Markets that work for Flexibility

Progress report due out shortly (October).
Unlocking the potential

The Smart Systems and Flexibility Plan

Removing barriers to smart technologies

- Defining storage in regulation,
- Providing Innovation funding,
- Creating a Storage licence,
- Review policy, network and connection charges for storage,
- Enabling storage colocation with renewables.

Smart homes and businesses

- Deliver smart meters, Half hourly settlement,
- Smart appliance standards,
- Cyber security,
- EV legislation (require smart charging),
- Consumer protections, Support for DSR trials

 Markets that work for flexibility

- DSO/TSO evolution,
- Capacity Market and rule amendments,
- Balancing Market access for aggregators,
- Simplification of Ancillary Service and products,
- Review of Network and Access Charging,
- Trial funding

We also created the Smart Systems Forum, consisting of industry and academic experts to help implement and steer Plan
Research by the Carbon Trust & Imperial College estimates the benefits of a smart, flexible energy system at £17-40bn between now and 2050.

Report investigates a range of future scenarios, with diverse energy needs, together with a range of flexible technologies.

*Key flexibility technologies including demand side response (DSR), storage and interconnectors. EVs also have the potential to enhance flexibility.*

Value of flexibility is threefold:

- Reduces the capacity of low carbon generation needed to achieve carbon reduction targets
- Enables system balancing at a lower cost by displacing higher cost alternatives at peak
- Improves the utilisation of existing generation infrastructure and minimises additional investment in transmission and distribution network reinforcement
Opportunities for EVs

- EVs are important to help decarbonise transport and achieve climate change goals.
- We see our role as a regulator to **facilitating these goals**, while ensuring that **energy consumers** [especially vulnerable consumers] are protected.

### Electricity system and networks impacts from EVs

- The growth of EVs could increase significantly the amount of network capacity required on different parts of the electricity network.
- If not managed proactively, this could lead to local network constraints and additional costs for consumers.
- EVs could however also be a huge new source of flexibility for the system, if their impact on peak demand can adequately managed.

### Consumer opportunities for EVs

- The rollout of EVs could provide consumers with more opportunities to engage with the retail market in non-traditional ways (eg vehicle-to-grid or disaggregate of EV consumption from total household electricity bills).
- Consumers who proactively modify their behaviour and help reduce overall costs for the system, **should be adequately rewarded**.
- Consumers do however have choice, and should also contribute more towards system costs **where their actions result in additional costs**.
Encouraging EV Smart charging through customer interaction

‘Non-smart’ EV charging - at peak

- Dumb charging adds to system peak
- Likely to result in extra peak generation, transmission and distribution network reinforcement
- Will **increase overall system costs** for system balance and reliability
- Rapid charging exacerbates impact on local network (especially when single phase)

- ... does however provide customers with the most freedom

‘Smart’ EV charging - avoids peak

- Smart charging avoids system peak, seeking period of low demand
- Reduces the need for additional new infrastructure and reinforcement
- **Could mitigate and reduce overall** costs to the system, especially if used to provide additional system flexibility
- Slower charging minimises impact on local network, although rapid smart charging can be scheduled to avoid overlap

- ...does however require customers to engage and modify behaviour
Incentives on EV owners to be flexible about when they charge their EVs

- Provide adequate price signals on when to charge – which requires smart meters and usage data, market wide HH settlement, smart EV charging
- New access arrangements could offer more choice for consumers to gain network access (eg. firm vs non-firm).
- Changes to forward looking charges that drive users to adjust their behaviours and more efficient use of the network.

Incentives and obligations on networks operators to manage the impact of EVs.

- Price control through RIIO
- Revenue = Incentives + Innovation + Outputs
- Better system operation (new products, new markets, whole systems view)
Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.

We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers’ experiences and the operation of energy systems and markets.