

Innovate with us.

Open Innovation Day. 23 March 2018.



Open Innovation Day seeks to address five of National Grid System Operator's 16 innovation priorities

See below for additional information on these priorities

Developing Distribution System Operators (DSOs) & whole system operability

As increasing amounts of energy resource connect to distribution networks, and as consumers gain the ability to actively manage demand, network operators are changing their behaviours to support and enable this. Joined up approaches across transmission and distribution, and across energy vectors, need to be developed to meet these challenges. We are looking for ideas especially related to:

- Moving away from transmission-related solutions and looking towards DNO alternatives
- Looking into Grid Supply Point boundary limits:
 - Innovation around applying/evaluating large volumes of data
 - Innovation around understanding system operability with commercial agreements
- Voltage assessments, recognising that the network is experiencing an MVAR reduction at the Grid Supply Point
- Bringing together the patchwork of ideas from the Future of Gas work

Enabling more non-synchronous connections

Inverter-connected power generation is sensitive to rates of change of frequency (RoCoF), meaning that more actions are required to manage the electricity system and mitigate the risk of generator disconnection, which increases operating costs. We need to better understand the system impacts of high penetration of inverter-connected power generation, and find efficient approaches to integrating this technology. We are looking for ideas especially related to:

- Voltage assessments, recognising that the network is experiencing an MVAR reduction at the Grid Supply Point
- Better understanding Rate of Change of Frequency (RoCoF)
- Sync Torque Power (Voltage Stability Ref.)

- Preventing Voltage Collapse
- Preventing Sub Sync Oscillations / Sync Gen Compatibility
- High Frequency Stability
- RMS Modelling
- Fault Level
- Post Fault Over Voltage
- Harmonic and Imbalance
- Putting in synchronous compensators
- Innovation to make asynchronous generators work as Virtual Synchronous Machines

Enhancing visibility of Distributed Energy Resources

We have varying degrees of visibility around the connection, capacity and output of distributed energy resources. Their growing prominence will affect our ability to maintain a balanced system and procure and settle firm, cost-effective balancing services. We will explore new approaches to sharing more real-time data with network operators and other market participants. We are looking for ideas especially related to:

- Understanding how can we reduce the burden on residential DSR when it comes to prequalification and testing of assets, and increasing SO confidence in delivery as contracted

Unlocking Flexibility

Flexibility on the electricity system has traditionally been supplied by a combination of dispatchable generation and large-scale storage (pumped hydroelectric). However, as the proportion of conventional flexible generation declines, NGSO has fewer options available to carry out our role in managing system balance and operability. Flexibility will also become progressively more important for the gas network, as gas fired power stations are increasingly used to provide backup and flexibility for intermittent electricity generation, as well as more volatile energy sources and other demands for gas. We will test new technologies and markets for flexibility. We are looking for ideas especially related to:

- Understanding how can we reduce the burden on residential DSR when it comes to prequalification and testing of assets, and increasing SO confidence in delivery as contracted

Embracing gas specification diversity

The current gas quality standards needed to enter the NTS are based on North Sea gas; however GB is becoming increasingly reliant on imported gas which does not meet these standards. This requires work to ensure gas quality does not become a barrier to trade or to new sources of gas.