Spring Symposium 2018

Multi-vector, Multi-Market

THE ELECTRICITY STORAGE NETWORK™

"We have one of the best electricity systems in the world" said David Gill of Northern Gas Networks, at our meeting on Monday as part of the series of presentations on multi vector systems. David went on to talk about the InTEGRel project which links the electricity, gas and transport networks in a large demonstration in the north east. David was one of the excellent speakers who gave their valuable insight into what is possible with a broader and more integrated energy system. The InTEGRel project includes Northern Gas Networks, Northern Powergrid and Newcastle University as partners. It will include production of hydrogen which can be used as a fuel for both stationary and mobile applications. The hydrogen can be mixed into the gas network and a central room will link the electricity and gas networks optimising interoperability between the sectors, and provide a platform for investigating further decarbonisation of our energy supply.

During the day, we considered the role of power to gas, and the economics, status and implications of linking the electricity system to the gas system. Patrick Clerens, the Secretary General of EASE has been observing the development of storage throughout Europe for many years. Engineers and scientists have moved the power to gas (P2G) concept from lab scale experimentation to large scale demonstration and it is now time for the business case to catch up. The challenge is that manufacturing of synthetic natural gas is only worthwhile when power prices for electrolysis are low enough, and recent studies suggest that commercial viability is still many years away.

Professor Phil Eames of Loughborough University gave a detailed description of how we could re-order the nation's heat, transport, gas and electricity systems to not only meet the national sustainability targets, but to also make good economic sense. Professor Eames pointed out the benefits of high temperature thermal storage in the power system. These stores can be

economical, and with high efficiency, they complement both renewable generation and allow large scale thermal or nuclear generation to operate at optimum production levels.

The economics and commercialisation of technology were themes running throughout the day with some timely advice on how to change perceptions to achieve commercial sense. It's not just saying energy efficiency, but selling the concept of resource productivity as a way to get storage onto the network - in particular in behind the meter applications. Alex Gilbert of Amber Infrastructure reminded us of the need to look at both the CapEx and OpEx of thermal systems and thermal storage. Amber is active in the £112 million London Energy Efficiency Fund, which will be replaced by the Mayor of London's Energy Efficiency Fund of £400 million.

There is no doubt that the market place for energy storage and energy products is constantly changing, because many developers are now involving their lawyers and professional advisors at an early stage in their projects. Although seemingly mundane, details of land rights, leases and connection agreements are of ever increasing importance, and as projects often now cover more than one activity there is a greater need to be diligent in making sure that a project can meet its objectives. Maria Connolly of TLT LLP, who has been active in the energy storage sector for several years gave examples from her legal experience of multi-disciplinary projects, many including co location of generation and storage.

Sally Fenton, Head of innovation at BEIS wanted to talk to us about the Industrial Strategy Challenge Fund and indicated that announcements would soon be made about support for industry under the Government's proposals for "prospering from the energy revolution." Current thinking within government is very much aligned with the concepts of multiple energy vectors that had been discussed in previous presentations.

Gavin McCormick's role at Beond group is to recruit larger C & I customers, often businesses with nationwide operations, to reduce their energy bill by harnessing the benefit of technology, including storage. Gavin's humorous presentation slides brought some light relief to the subject, but they still packed a punch when it came to describing the tough commercial world of 2018. Revenue streams for battery storage are not the most promising, and Gavin gave examples of the win rates for battery storage in the latest capacity market auctions and

the trading revenues for a battery system buying and selling energy through the market on a regular basis. The advice was clearly to look at integrating the storage solution with other parts of the energy infrastructure, whether demand, use of gas, on-site generation or balancing intraday prices which may be distorted by increased penetration of renewable energy. Payback is an issue – investment terms demanding paybacks in the short term would not be satisfied by estimates of payback of 6 years or more.

National Grid, represented by Alice Etheridge and Ian Pashley, is the incumbent TSO for Great Britain. Its requirements for ancillary services provide many opportunities for developers to enter into commercial arrangements with National Grid, and it is fascinating to see how these services evolve, reflecting the changes on the power system as well as changes in technology. Alice and Ian addressed the question of whether the ancillary services market had become saturated – leaving many suppliers of balancing services feeling very much "out of the money." However, as the system evolves, and the energy mix changes, new products, and they way that they are traded, will emerge. The plans for the transmission network take into account changes in technology and different means of operation, and the National Grid staff were very keen to seek views and opinions from the delegates.

One such view was provided by Marek Kubik of Fluence, the new joint venture company between AES and Siemens. Staff at Fluence have been studying inertia on the power system: its importance, the growing need for it and how it might be provided. A recent study examined the role of battery storage and inertia on the island of Ireland, and Marek is keen to see battery and digital solutions applied wisely in the grids of the future.

The enthusiasm for bringing new technology into the power system was shared by Nigel Turvey of WPD. The current "Open LV" project looks at how data exchange can be of benefit in network planning and operation. In the new world of increased distributed resources for generation, demand and storage, there is a huge prize if these resources can be successfully integrated. There are ways to use flexible resources to manage peak demand, to restore the network in the unlikely event of system failure and to dynamically manage the network during times of maintenance.

The afternoon session included a panel debate bringing together the views of National Grid as the system operator, the overlap with the distribution network owners as they morph into distribution system operators as well as input from traders.

We would like to thank all our speakers for their contributions to an excellent day:

Patrick Clerens - Secretary General, European Association for Storage of Energy
Professor Philip Eames - Loughborough University
Alex Gilbert - Investment Manager, Amber Infrastructure
David Gill - Director of Stakeholder Relations, Northern Gas Networks
Maria Connolly - Head of Energy & Renewables, TLT LLP
Sally Fenton - Head of Innovation, BEIS
Alice Etheridge - Network Development Strategy Manager, National Grid
Ian Pashley - System Operator Function, National Grid
Dr Marek Kubik - Market Director, Fluence
Gavin McCormick - Consulting Director, BeOnd
Nigel Turvey - Network Strategy and Innovation Manager, Western Power Distribution
Jeremy Yapp - Flexible Energy Systems Portfolio Manager, BEAMA
Randolph Brazier - Head of Innovation and Development, Energy Networks Association