

SMART GRIDS

Background

A smart grid is modernisation of electricity distribution as we know it – using communications technology to gather and act on behavioural information about suppliers and users. Utilities then use the information collected to achieve improvements to the efficiency, effectiveness and reliability of the electricity distribution system.

t-mac action points

- Metering and visualisation of data are key – the more we can measure, the more we can see and the more we can control.
- Many businesses already use smart technology such as Building energy Management Systems (BeMS) to analyse and report on their energy use, then apply controls to make savings. Smart meters – and smart grids – will bring similar controls-based demand management to all.

Lisa Gingell, director of t-mac Technologies Ltd, says:

Our increasing demands for more electricity must be delivered reliably, safely and economically. To do so, our [National Grid](#) needs an upgrade, which will come in the form of the evolving smart grid.

Essentially, smart grids enable two-way communication of how electricity is generated, distributed and consumed. [Smart meters](#), which transmit almost-instant information on energy usage to the utility companies who provide it, are central to smart grids, as are electricity distribution management systems, network management software and other technologies designed to add intelligence to the way power is generated, distributed and used.

Smart grids can help UK PLC meet the EU's 20-20-20 targets (20 per cent increase in energy efficiency, 20 per cent reduction of CO2 emissions and 20 per cent renewables by 2020). To do so, the energy industry must become far more flexible.

In business, [Building energy Management Systems](#) (BeMS) already play a crucial role, specifically through implementing controls-based demand management, leading to energy-use reduction. BeMS connect to air conditioning, heating, ventilation, lighting and security systems to ensure they are controlled according to the requirements of the building – managing demand on site.

In a similar way, utilities can already use [demand response systems](#) to step in and reduce the distribution of electricity to businesses which sign up for the service. This might include altering a business's air conditioning thermostat if the utility is seeing too much demand on

its network, or scheduling equipment such as supermarket freezers to stop running during short periods of high national demand. In return, the businesses involved save money on energy bills.

With more and more renewables generation coming on-line, this flexibility is crucial. Wind generation, in particular, does not provide capacity at all times, meaning successfully managing grid demand becomes even more important.

For utilities, smart grids mean an opportunity to make savings by cutting out the traditional meter reader and regulating how much power is sent where and when. In fact, the Department of Energy and Climate Change (DECC) estimates UK utilities will save [£6.76bn](#) when the country's smart meter rollout is complete post-2014.

For customers, smart grids also mean savings. Again, DECC tell us customers stand to save slightly more than the utilities: [£6.80bn](#). Much of these savings will come from allowing users, both domestic and commercial, to see what they are using and where – as discussed in t-mac's "[Psychology of Energy Management](#)" Green Paper.

[Energy dashboards](#), which present real-time energy consumption data back to staff on public display screens, are already changing the way people see energy. Smart meters will bring that process to the masses, and smart grids will take the process global.

These are exciting times for the electricity industry, and they should be exciting times for consumers, too. There are big savings to be made – and who could say no to those in the current economic climate.