

ENDS Special Reports

Smart Grids 2015

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This editorial synopsis must not be amended by anyone other than the Editor.

The following feature articles are planned (this list is provisional):

1) Introduction – tackling the trilemma

European power grids are facing the triple challenge of delivering affordable, secure, low-carbon electricity. The smart grid concept is universally acknowledged as a key part of the answer to these problems, delivering in particular reliability, efficiency and security and enabling much greater penetration of the renewable power sources necessary for decarbonisation.

2) Smart grid projects overview

The European Commission reports that there are more than 450 smart grid projects operating across Europe with a total budget of €3.15 billion. Leaders include the UK. Smart Network Management and Smart Customer / Smart Home are the most targeted applications. Focus on power storage is on the rise.

3) Grid operators and the smart grid

The challenge being posed to Europe's grid operators and network utilities by the emerging smart grid is how to evolve from a historic role as purely distributors of centrally generated power. Some firms in the sector are leading the way in discovering how they can continue to be profitable in a new smart, distributed power future.

4) Renewables and distributed generation

Renewable generation technologies like wind and solar pose challenges of intermittency and variability but are also part of the solution to smarter grids, with small-scale and community schemes delivering distributed generation, close to end users, with potential to increase overall grid efficiency and reduce transmission losses.

5) Demand side management

Smart techniques to manage user demand are a key part of smart grids. Supply contracts including supply reduction or break options, smart metering and enhanced control over voltage are all elements that are being explored and rolled out.

6) Power storage

Power storage is a major focus of work to balance out variability in renewable power generation, as well as dealing with normal variability of demand. Promising technologies in addition to already widely used pumped storage hydro and flywheels include next generation batteries.

7) Grid connectivity

Geographical interconnections can do a lot to balance out demand fluctuations, cutting cost and increasing penetration of low carbon sources, whether on a seasonal or daily timescale. European heads of state have backed a target of 10% interconnection for every EU state. The issue remains in the political spotlight.