Realising opportunities from the smart grid

Smart Energy Wales, 22nd September 2016
Filippo Gaddo
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What makes the system smart?

- Market structure established when electrons flowed one way and payments the other
What makes the system smart?

- Market structure established when electrons flowed one way and payments the other
- New means of generation have changed this
- And soon everything will be inter-communicating
What makes the system smart?

In many of the established urban environments total energy demand is currently up to 6x the energy provided by the electrical network (3x heat oil/gas and thermal, 2x transport fuel, 1x electrical)

HEAT : FUEL : POWER
3             2             1
Where is the investment going?

Average annual expenditure 2010-2015

- Generation: £25-30bn
- Transmission: £2-5bn
- Distribution: £12-15bn
- DSR: £2-5bn
- Distributed generation
- Consumption / Retail: £10-15bn
Where is the investment going?

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Storage

Average annual expenditure 2010-2015

Where is investment needed the most to make system ‘smart’?
Where is the investment going?

- Energy spend is growing by almost £40bn by 2030
- Energy spend in Smart Energy could be between 2% and 10% of this
What is the opportunity?

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• DES categories include: power generation, combined heat and power, energy storage (including electric vehicles) and distributed energy management systems.

• DES covers energy in the forms of electricity, heating and cooling.
Distributed Energy System

- In the UK current investments into DES stand at about £2.5 billion with an installed capacity of 3.7 GW in 2013. This is set to reach by 2019 a capacity of 7 GW and exceed £5bn investment.

- Operational cost reductions from DES is ranging between 8% and 28% and a return on investment (ROI) between 3-7 years compared to a business as usual.

- The rise of DES is fostering new actors in the energy industry and is redefining the roles of the previously existing ones:
  - Prosumers
  - Performance-Based Solution Providers
  - Developers and 3rd Party Ownership
  - Aggregators
  - Community Energy
  - New financing mechanisms
Challenges and opportunities

• Challenges
  - What regulatory / policy actions are needed?
  - Where consumer engagement is essential?
  - Do we need new business models?

• Externalities / opportunities
  - Impact on energy sector
    - Systems
    - Industry
  - Impact on prices
  - Impact on wider economy
Thank you

Filippo Gaddo
Head of Energy Economics | Business and Investor Advisory
Arup
13 Fitzroy Street  London W1T 4BQ  United Kingdom
d +44 20 7755 2015 m +44 7876 871478
f +44 20 7755 3716
www.arup.com