Is the future electric?
- Utility perspective on heat

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A vested interest?

Second largest UK supplier and generator
Involved in distribution of electricity and gas
Renewables focus
Electrical heritage
The vision

2050 Electricity Demand Scenarios

2050 Electricity Demand (TWh)

UK ERC  DECC  OFGEM  Supergen (& Elders et al.)  Parsons Brinkerhoff  SSE  Committee on Climate Change

2008 Electricity Demand
The vision

SSE scenario*:

• + 45 to 145 TWh underlying demand due to new buildings (net of demolitions) and economic growth
• - 65 to 85 TWh efficiency savings
• + 20 to 75 TWh transport
• - 8 to 33 microgeneration
• + 8 to 33 TWh heat pumps (↩ 4% to 22% of current heat demand)

...all to 2050

*Not a prediction.
The vision

DECC pathway 1 (spread effort):
• Heat loss coefficient of homes reduced by 1/3
• 75% electrification of domestic heat
• 86% electrification of non-domestic heat

Zero carbon Britain
• Domestic heating demand reduced by 70%
• 148 TWh heat generation from heat pumps (54% domestic and 40% non domestic heat demand)
Next generation storage heaters

Traditional storage heater

New storage heater

Temp

Time
The need for a smart system

ENA/Imperial College:

• Full penetration of heat pumps and EVs to 2030 could increase electricity consumption by 50% and double the peak
• Optimising demand response could limit peak increase to 29%
• Smart reduces costs of network investment by at least 50% compared to BAU
Electrification of heat

Decarbonisation agenda
Customer preferences and protection
Heat pump performance

Infrastructure
• Low carbon supply
• System must be smart
• Storage

Interdependencies
• Thermal efficiency
• Non-heating demand for electricity
Is the future electric?

Is electrification inevitable?
Is electrification the answer?
Is there flexibility in heat demand?
Are support mechanisms sufficient/appropriate?
What do we need to do to make it happen?

Mismatch between vision and short term policies
  • Ecodesign directive
  • Building regulations / SAP

Need a deeper understanding of systems
  • Smart
  • Storage

Need to overcome consumer inertia

Need to integrate heat and energy efficiency policy

Do we need more central planning?
“I am interested in the heat, not the flames”
  • Artist Andy Goldsworthy, possibly extolling the virtues of an energy services model.

“If you saw a heat wave, would you wave back?”
  • American comedian Steven Wright

“If you can’t stand the heat, don’t tickle the dragon”
  • Someone’s T-shirt