



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

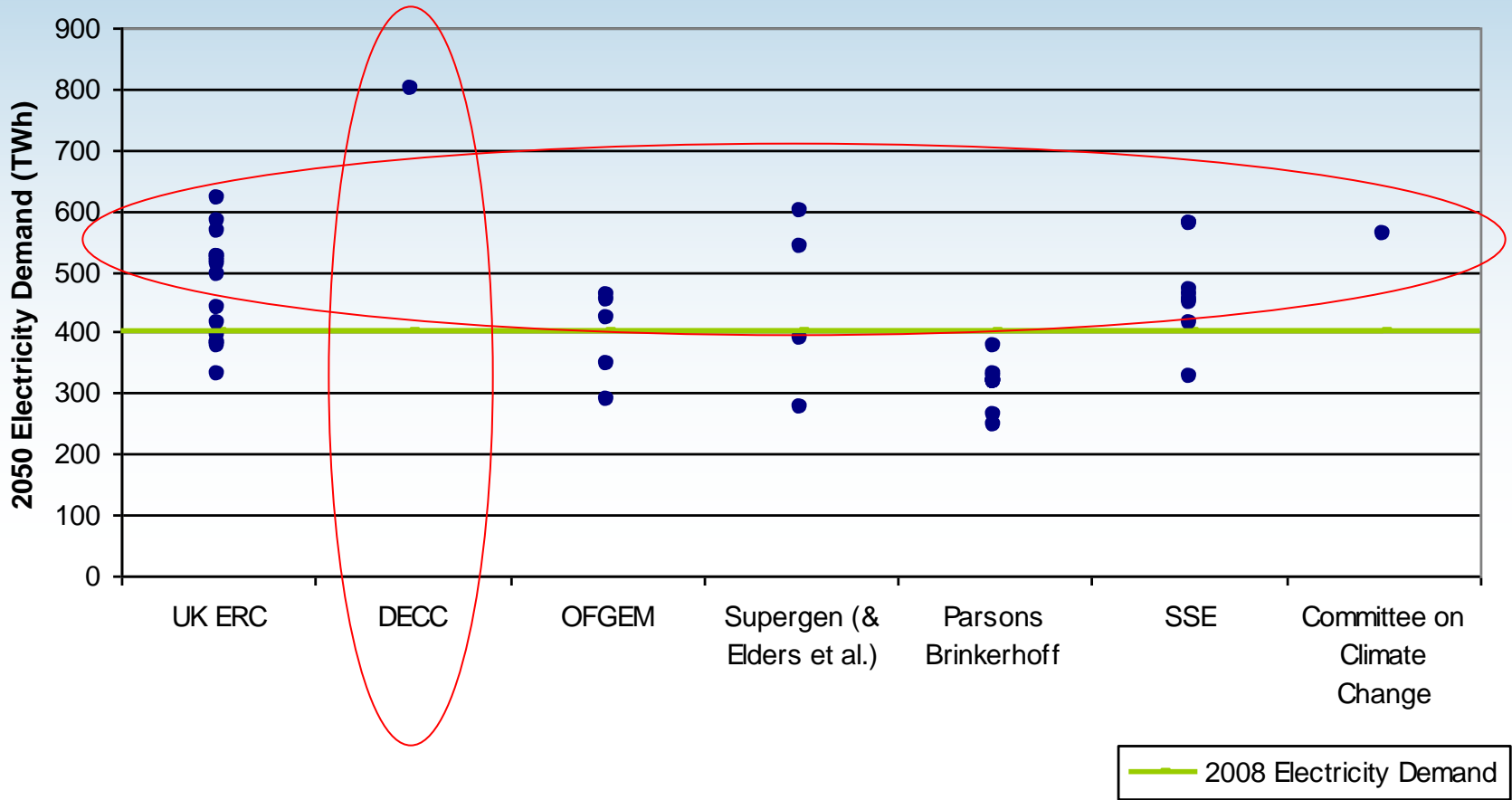
Renewables focus

Electrical heritage



The vision

2050 Electricity Demand Scenarios



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 (\Rightarrow 4% to 22% of current heat demand)

...all to 2050

*Not a prediction.

The vision

DECC pathway 1 (spread effort):

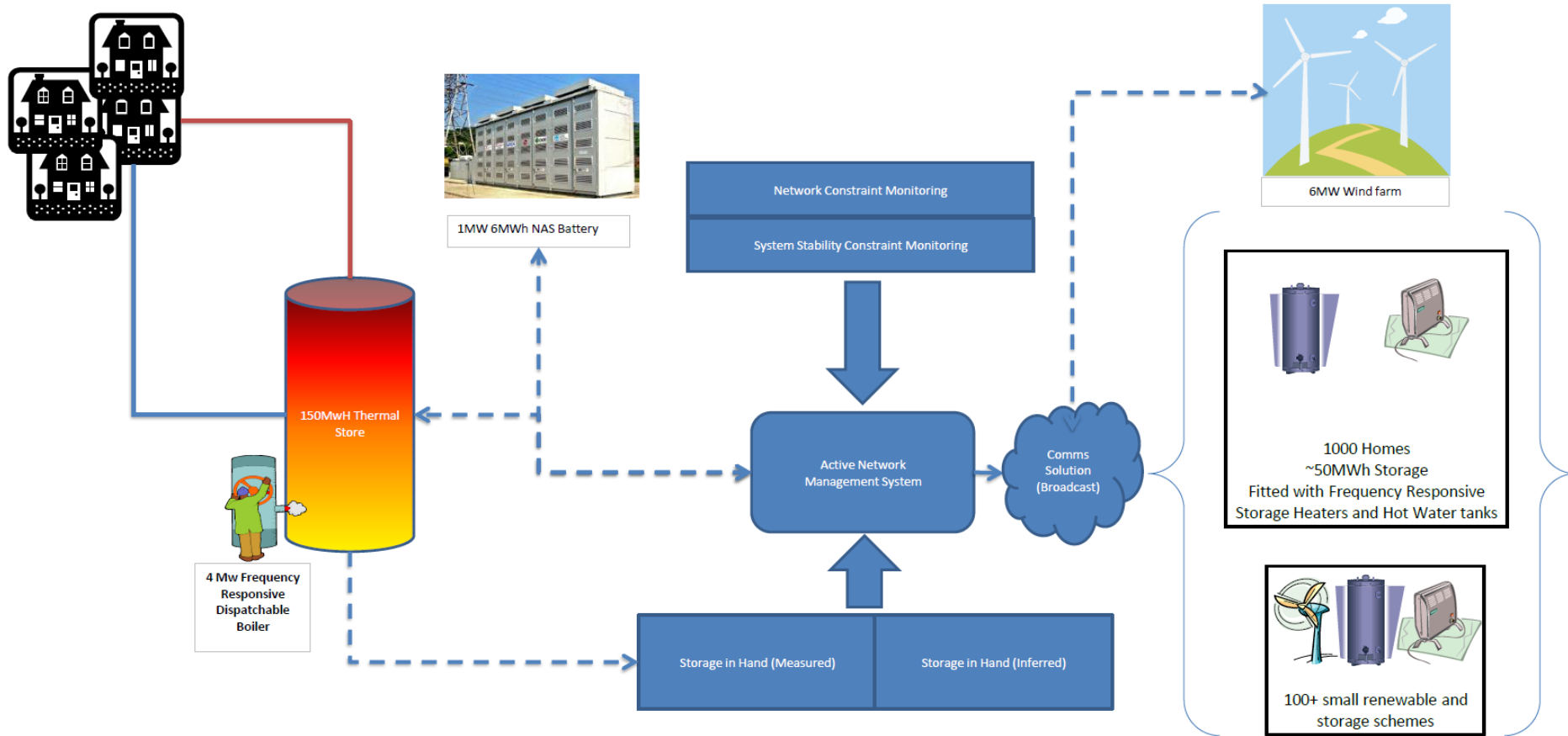
- Heat loss coefficient of homes reduced by 1/3
- 75% electrification of domestic heat
- 86% electrification of non-domestic heat

Zero carbon Britain

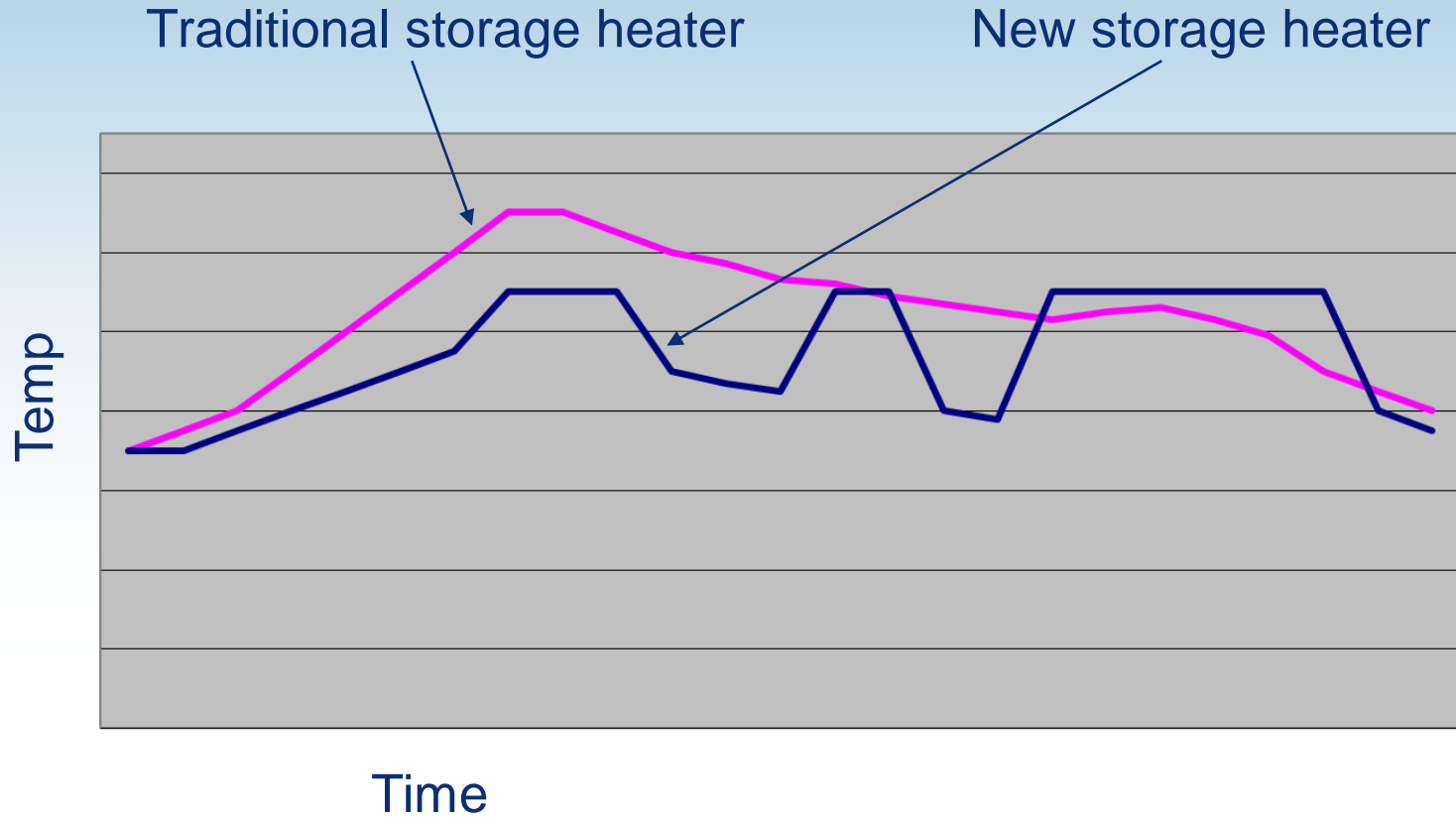
- Domestic heating demand reduced by 70%
- 148 TWh heat generation from heat pumps (54% domestic and 40% non domestic heat demand)

Northern Isles New Energy Solutions (NINES)

NINES Project
Simplified architecture



Next generation storage heaters



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