Too many technologies and not enough infrastructure: How do we reach sustainability?

Heating & Cooling to 2020 and beyond
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New low carbon heating technology will be important in the UK if carbon targets are to be met

The limitations of the energy system infrastructure create a need for a balanced transition involving many technologies

There are customer and installer challenges to overcome

Disruptive business models & connectivity in the home may support change in the heating sector
This presentation

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UK heating market today

1.8 million

- Gas boilers
- Oil / LPG
- Electric Storage Heater
- Low Carbon Appliances

Gas boilers are responsible for the vast majority of CO₂ emissions from domestic heat

Source: Delta-ee UK Pathways & Roadmap: Reference Scenario
Reaching Sustainability: Decarbonising the heating market requires lower carbon gas boiler alternatives

The scale of the challenge: 2015 residential heat emissions

Source: Delta-ee Heat Study for Energy Networks Association
UK heating market in 2025 – growth of low carbon appliances

1.8 million

Source: Delta-ee UK Pathways & Roadmap: Reference Scenario
Which technologies will make up the 400,000 low carbon appliances – which can displace gas boilers?

1.8 million

Low Carbon Appliances

1.8 million

2012
2025

Gas boiler

Electric Storage Heater

Oil / LPG

1.8 million

400,000

Gas boiler plus solar thermal

Biomass

Fuel cell

Micro-CHP

Gas heat pump

Hybrid heat pump gas boiler

Hybrid heat pump oil boiler

ASHP

GSHP

Source: Delta-ee UK Pathways & Roadmap: Reference Scenario
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The limitations of the energy infrastructure

2010 UK heat & electricity hourly demand variability

Design point for heat delivery system

Peak electricity demand will exceed electrical grid capacity in future

Design point for electricity delivery system

Source: Energy Technologies Institute, 2012
What happens under a more balanced scenario?

Role for electric HP, hybrid, gas HP, micro-CHP... storage, demand response...

90% carbon emissions reduction

Half the additional peak capacity required in the full electrification & heat networks scenario (24 instead of 48 GW)

Half the infrastructure investment costs required in full electrification (half of £16–28bn distribution grid, £4bn – gas grid shut-down)

Source: Delta-ee Report for the Energy Networks Association - Balanced Transition Scenario
New low carbon heating technology will be important in the UK if carbon targets are to be met.

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Disruptive business models & connectivity in the home may support change in the heating sector.
Customer proposition for low carbon technologies...

The upfront cost of low carbon technology will fall over time....

But running cost savings alone may not be enough – especially without incentives

Policy intervention is the market will be critical for new low carbon technologies
In reality, there are challenges gaining customer buy-in

Air source heat pump sales in 2012

- Majority of the market Social Housing
- Owner occupiers are challenging

No customer pull?
“Renewables very rarely feature in my customers’ list of desires… customers go off the idea with price and complexity of installation”

Costly & time-consuming?
“The primary barriers to renewables are the cost and time for training, and for membership of an approved body.

…and there is a lack of interest from my customers”

Source: Delta-ee Microgen Insight Service
In reality, there are challenges gaining customer buy-in

**Lack of awareness / trust?**

“I want information from someone who does not have a vested interest in selling it”

“[I would want] documented evidence that these [fuel bill] savings can be delivered”

“I don’t know how safe it is”

“I would need a much longer warranty”

**Too expensive?**

“A big concern is the actual upfront cost”

“finding the capital would be difficult”

“if someone said they’d put it in for free, I’d say no problem, do it.”

**Difficult customer journey so far?**

“I want information from someone who does not have a vested interest in selling”

“I’m standing here with £8K and saying somebody please come and give me one of these things and the industry is saying no”

**Customers don’t like change?**

“I don’t really see the need to be changing my system”

“[my gas boiler] is just very effective”

Source: Delta-ee Microgen Insight Service
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- New low carbon heating technology will be important in the UK
- The limitations of the energy system infrastructure create a need for a balanced transition involving many technologies
- But there are customer and installer challenges to overcome
- Disruptive business models & connectivity in the home may support change in the heating sector
A glimpse into the future…. ? Business models…

The Flow microCHP gas boiler
Get a free Flow boiler with free installation by being part of our ground-breaking pilot

Energy Services
- Preparing for installation
- Paying quarterly heat bills
- Fixed heat price per kWh

“Removing the ‘risk’ of poor performance through a ‘real’ ESCo is key to gaining consumer confidence in a new heating system”
Wolfram Moritz, MPW Legal & Tax (ESCo expert)

“We are selling a lot of heat pumps for multi-family homes in Switzerland because of the heat contracting offer from local utilities”
Major European Heat Pump Manufacturer

Source: Delta-ee Heat Pump Service
A glimpse into the future…. ? Connectivity…

“ABB, Bosch, Cisco & LG Consortium Develops Open Standard for Smart Home Appliances”

“Microsoft has a long term plan that has the console as the center of an automated home system”

“save energy, heating costs and environment…”

“…simple, easy to understand heat pump controls and remote diagnostics”

NIBE Uplink™

“monitor and control the heating & domestic hot water comfort”
UK one of leading countries in Europe for connected home energy products

Annual sales of connected home energy products

- 10,000s
- 1,000s
- 100s or less

Battle between the utilities offering low cost, low functionality products

Source: Delta-ee Connected Home Service
Changing our relationship with heating: How will connectivity support the low carbon transition?

- Builds consumer confidence through performance visibility
- Better control / more intelligence… lower running costs
- Remote diagnostics reducing poor performance and reducing servicing costs
- Enables demand side participation in energy markets…
New low carbon heating technology will be important in the UK – technologies to displace gas boilers are critical to achieve decarbonisation.

The limitations of the energy system infrastructure create a need for a balanced transition involving many technologies – with a role for electricity and gas.

Gaining customer buy-in to low carbon technologies is critical – incentives will help but there is still a need for awareness-raising, information dissemination and a strong focus on a positive “customer journey”.

Disruptive business models can support this change in the heating sector through breaking down customer barriers (e.g. ‘upfront cost’, ‘risk’).

Connectivity in the home can be a positive driver of low carbon heating through enhancing the customer experience, and changing out relationship with our heating system.