Barriers to District Heat and policies to overcome them

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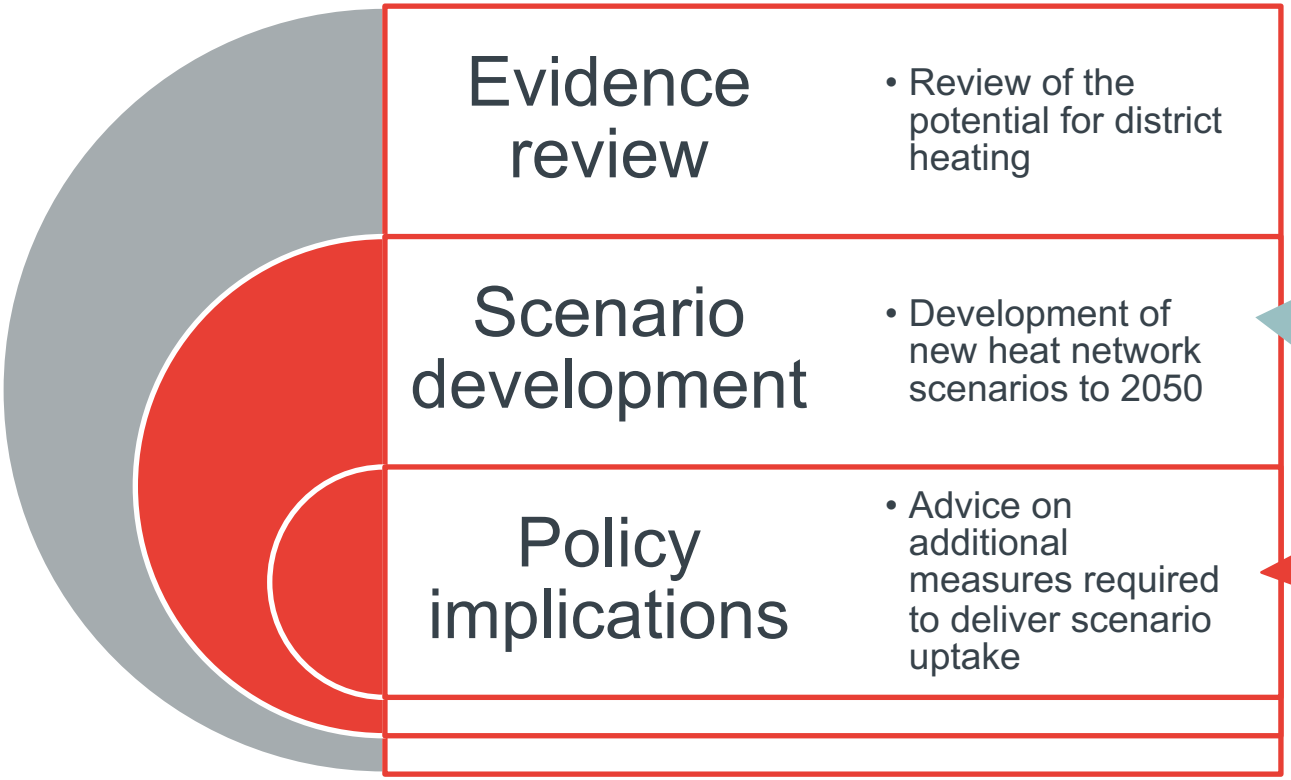
What have I been asked to do?

- Talk about some work we did for CCC on barriers to District Heat and policy interventions to overcome them
- Slot into a session on “scenario-focused research to support policy framing”
- Not talk for more than 15 minutes

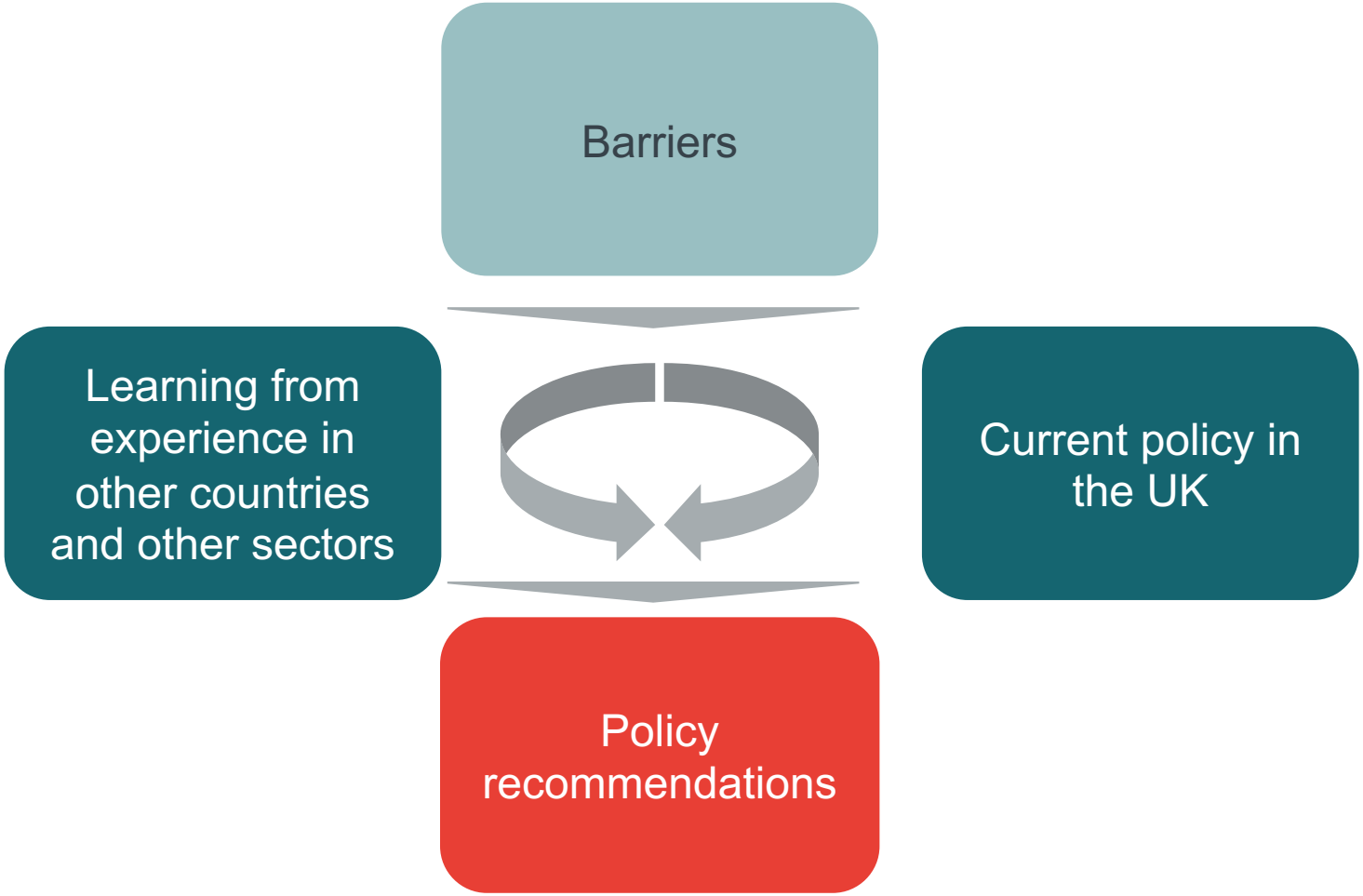
The CCC commissioned us to research the policy action to deliver a step change in district heating for the 5th Carbon Budget



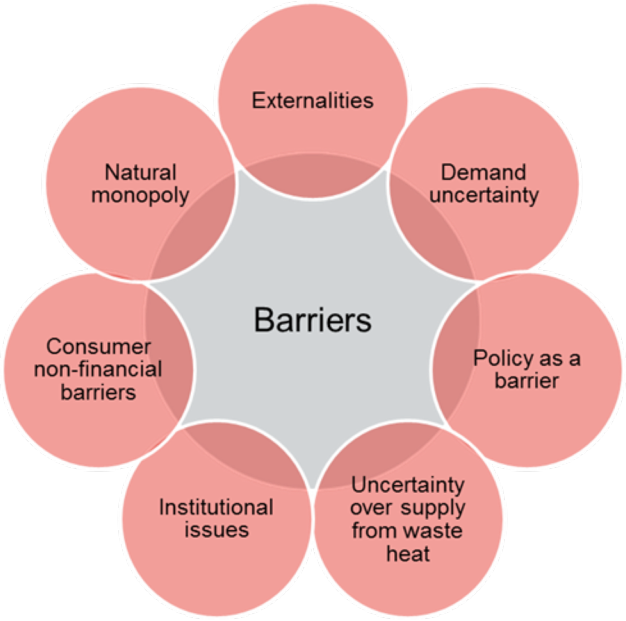
Element Energy found that 9% of building heating demand in 2030 and 18% of heating demand in 2050 could be met cost-effectively with district heat. This would require a step change in uptake.

We focussed on the policy action that could help deliver this step change.

We developed policy recommendations based on research, interviews and analysis

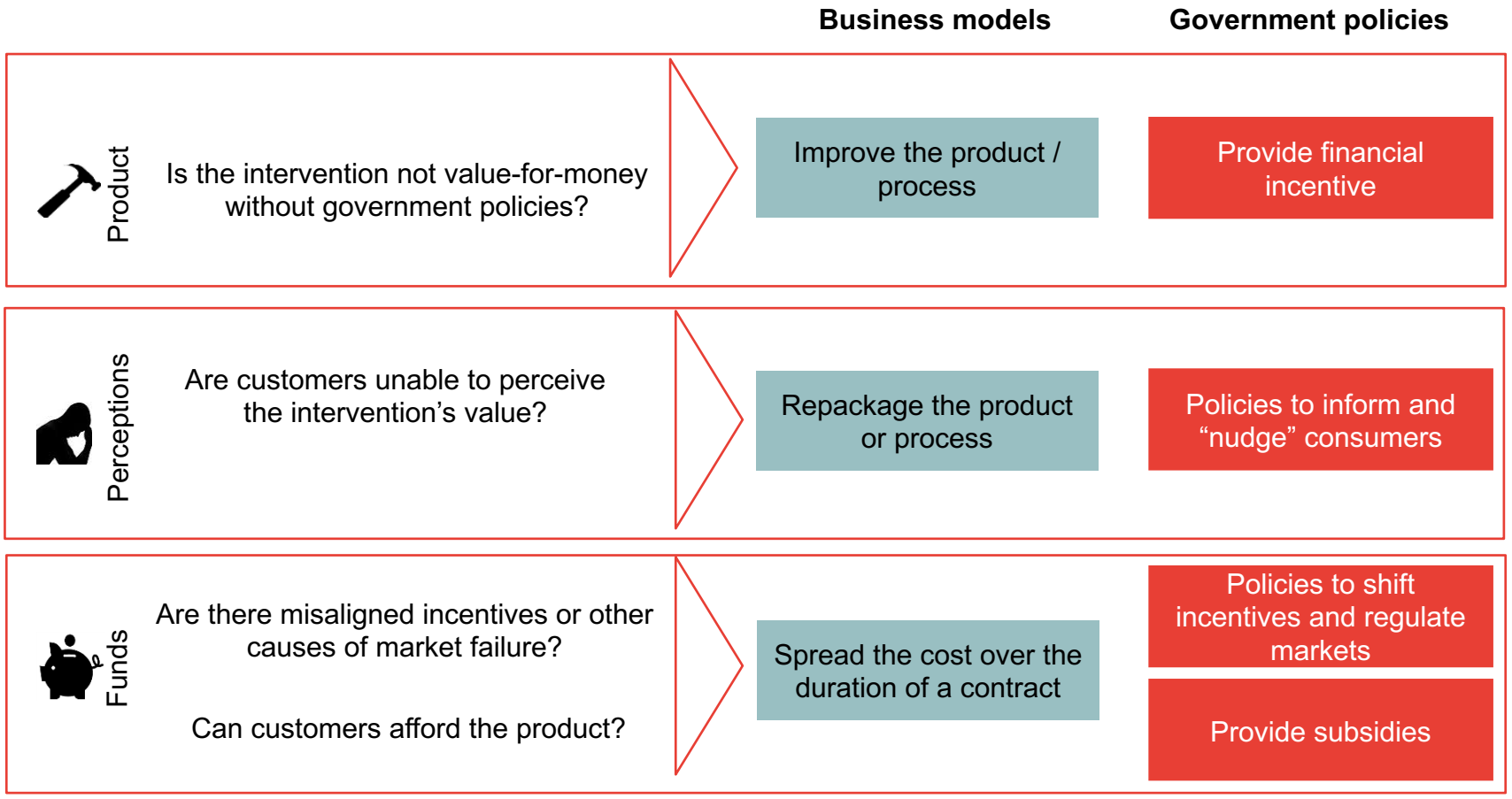


Barriers to district heat



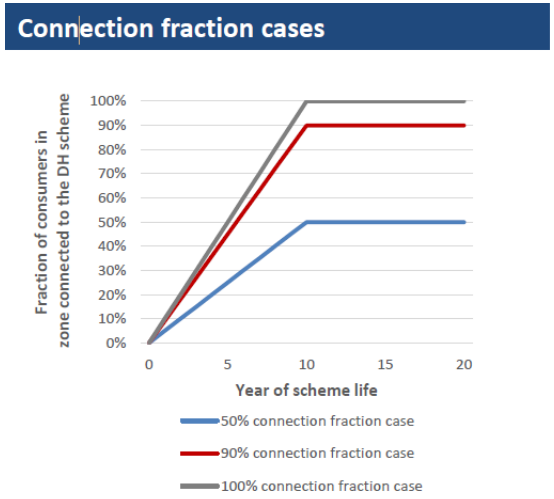
Externalities	•	District heat produces fewer carbon emissions than most incumbent heating technologies, but this carbon saving is not reflected in the price of heating.
Natural monopoly	•	The high fixed costs of district heat networks mean that it is more efficient for one operator to serve each local market.
Demand uncertainty	•	Economies of scale mean that the viability of investments will be very sensitive to the level of demand secured.
Barriers associated with policy	•	*Policy uncertainty.* District heat investments are capital-intense and have long asset lives.
	•	*Policy conflicts.* Policies with different aims (e.g. to incentivise renewable heating) or policies applied to only certain sectors (e.g. the EU ETS) may reduce the incentive to invest in district heat.
	•	*Policy-created entry barriers*. Regulation such as restrictive planning policies can create barriers.
Consumer non-financial barriers	•	Awareness of district heat is low. Even where people are aware, they may lack interest. Lack of trust, the perceived hassle of connecting to a district heat network, and perceptions of poor quality also need to be tackled.
Institutional issues	•	There may be institutional issues within the sector, in particular relating to local authority resources and more general skills and knowledge gaps within the sector.
Barriers to the use of waste heat	•	It may be difficult for investors to gain information on the availability of waste heat (for example from power stations and waste incinerators).

An aside on barriers to heat uptake and policy intervention

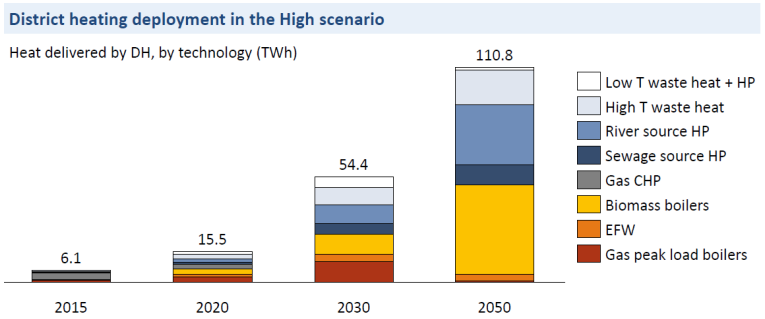


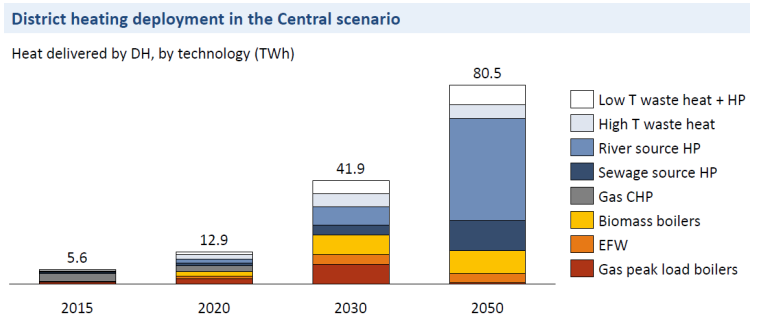
Policy should be focussed on those areas which business models cannot solve by themselves

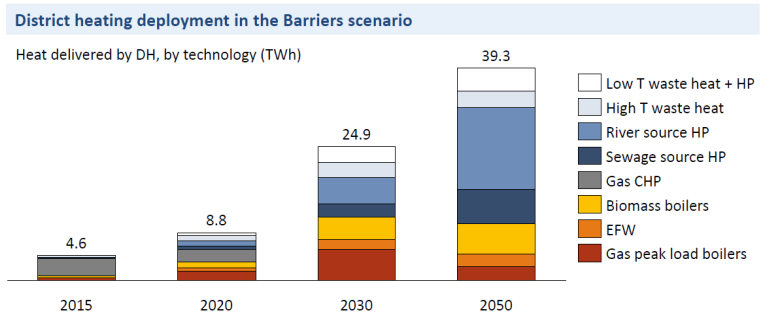
Link between policy choice and scenario



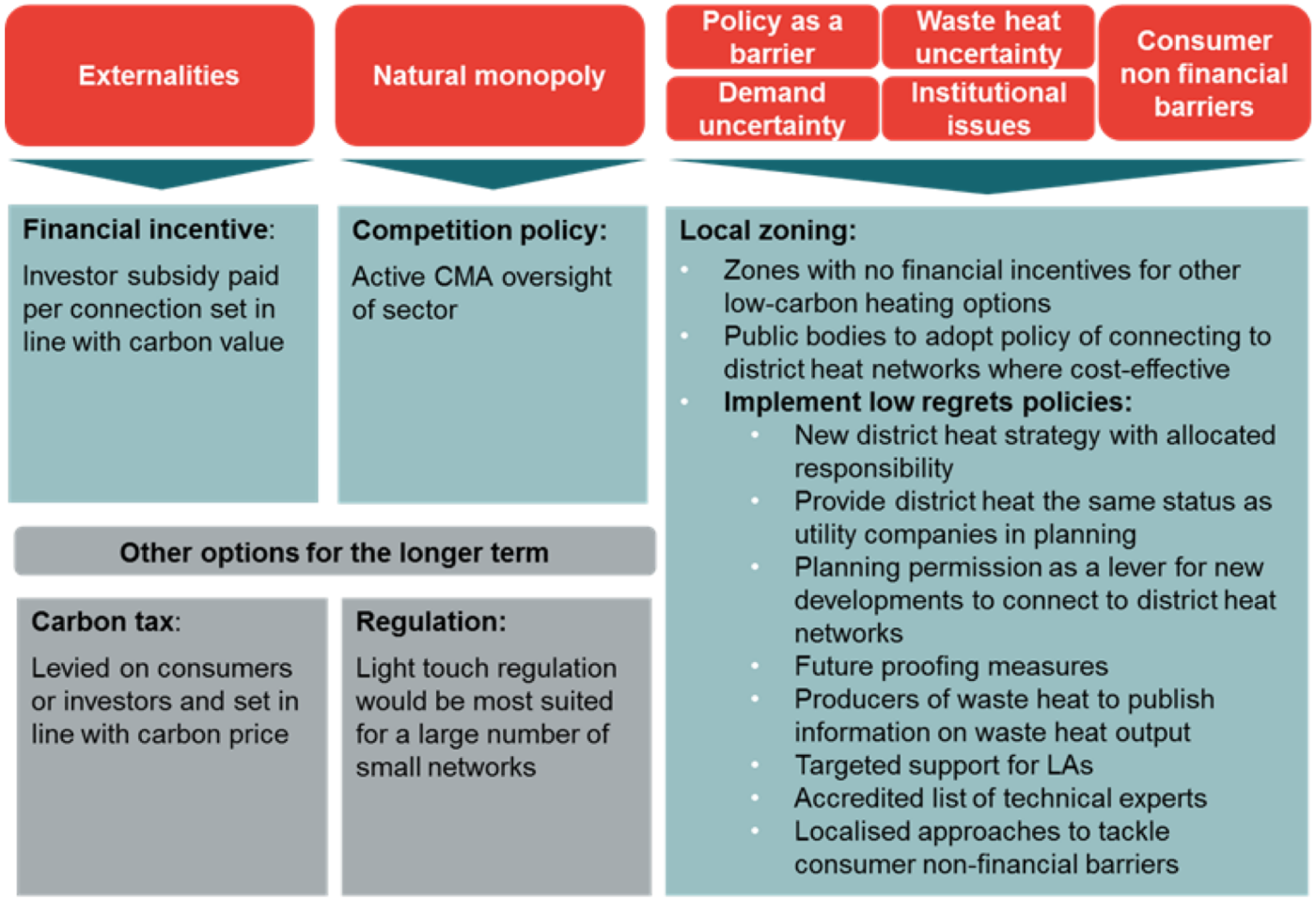
- 'Connection fraction' is the fraction of consumers within a zone connected to a DH scheme
- While the cost of required heating plant and heat sales revenue are strongly dependent on the connection fraction, the cost of the distribution pipework is largely independent
- 90% and 100% connection fraction: most / all barriers overcome through policies
- 50% connection fraction: barriers to consumer connection remain







Policy recommendations for district heat



Some further reading

Report for CCC on barriers to District Heat:

https://www.theccc.org.uk/wp-content/uploads/2015/11/Frontier-Economics-for-CCC-Research-on-district-heating-and-overcoming-barriers-Annex-1.pdf

Report for BEIS on frameworks for low carbon gas system:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/699678/Final_BEIS_low_carbon_gas_070318_clean-STC.pdf

Report for ETI on barriers:

http://www.eti.co.uk/programmes/smart-systems-heat?size=10&from=50&_type=eti-document&publicOnly=false&query=&programmeName%5B0%5D=Smart+Systems+and+Heat

Report for CCC on future regulation of the gas grid:

https://www.theccc.org.uk/publication/future-regulation-of-the-gas-grid/

Report for EEIG on an Action Plan for a comprehensive Buildings Energy Infrastructure Programme:

https://www.frontier-economics.com/media/2248/affordable-warmth-clean-growth.pdf

Report for CCC on heat pump pathways:

https://www.theccc.org.uk/wp-content/uploads/2013/12/Frontier-Economics-Element-Energy-Pathways-to-high-penetration-of-heat-pumps.pdf