

Costs of network reinforcement to support the roll-out of heat pumps and how the grid is placed to accommodate greater electric heating (whether or not that is via heat pumps)

The electricity network is a key enabler for our Clean Energy Superpower Mission but it needs to be transformed at an unprecedented scale and pace.

The Government is working with Ofgem and the DNOs to ensure that the capacity required on the distribution network distribution networks to facilitate the connection of heat pumps (and other low carbon technologies) onto the system is built strategically and ahead of need. We are also taking steps outlined in the Clean Power 2030 Action Plan to support deployment of electricity storage technologies, including domestic and grid-scale batteries, which allow excess renewable generation to be stored up for when the system most needs it, reducing peak demand requirements.

Our analysis indicates that significant load-related distribution network investment will not be required until the 2030s, despite electricity demand increasing in the late 2020s. This is due to the presence of significant amounts of spare thermal capacity in the distribution network, which is expected to delay the need for significant network reinforcements, although localised issues do already exist on the network and will need to be addressed earlier.

The recent National Infrastructure Commission (NIC) study examined how to ready the distribution network for net zero. In the core modelling scenarios £37-50bn of network investment could be required by 2050 to ensure the distribution network can support the net zero transition, including the electrification of heat. The scenarios tested different uptake for low carbon technologies and different levels of flexibility for heat pumps, electric vehicles, and batteries. The higher end of the range is associated with an increased reliance on resistive electric heating and reduced flexibility levels.

One of the recommendations involved mandating smart functionality for electric heating appliances, including heat pumps. As part of the Smart Secure Electricity Systems (SSES) programme, the government will introduce regulations requiring new heat pumps and other electric heating appliances, up to 45kW, to be smart enabled from 2027.

This will enable their participation in consumer-led flexibility services to help manage the increased demand on the network and ensure smart heating is adopted at the necessary rate to achieve benefits for the grid. More generally, government welcomes the overall thrust of the National Infrastructure Commission's study; we are reviewing the detailed recommendations with our key delivery partners and will publish a response this spring.

Ofgem is also conducting an end-to-end review of connections. This will be a crucial vehicle for strengthening existing standards and introducing new conditions on network companies to improve the customer experience and timely delivery of connections, including for customers connecting heat pumps. The first consultation under the end-to-end review closed on 13 February 2025 <https://www.ofgem.gov.uk/consultation/connections-end-end-review-regulatory-framework> Ofgem will publish an initial response to this with proposals at the end of Summer.