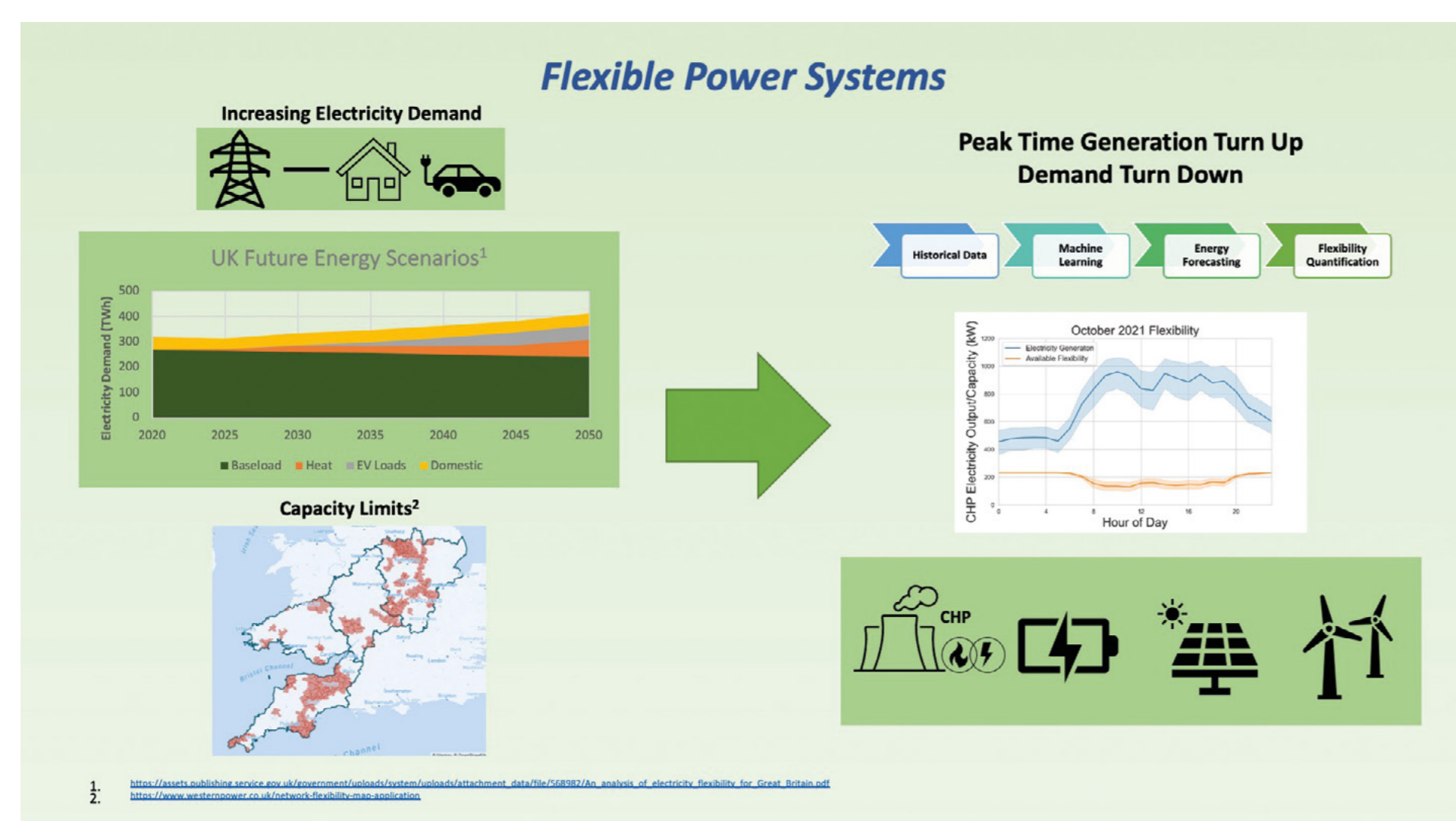


## Energy Demand forecasting for power system flexibility using machine learning techniques

### Summary

The journey to Net-Zero is going to be transformative for the way in which we consume energy, especially with the transition to the electrification of transport and heat. This transition is going to require innovative solutions to dealing with the electricity capacity problems that our future energy grids are going to face such as building flexible energy networks.



Flexible power systems of the future will rely on distributed generation as a means of providing additional power to the grid or reducing power consumption at times of peak demand. Consumers such as hospitals with on-site generation can participate by providing flexibility to the local electricity network.

Machine learning approaches have been developed to provide forecasting of future energy needs, and to quantify how much additional energy production can be utilised to participation in flexible power schemes to support the local electricity network.

### Benefits

Flexible power schemes are still in their infancy and continue to be iterated on. The work conducted in this research project aims to help consumers participate in flexible power schemes, as we transition towards a Net-Zero future.

Unlocking data using machine learning provides accurate and up-to-date energy forecasts which allow energy managers to participate in flexible power schemes, which will benefit both consumers and network operators, and provide a more secure energy future.

### Next steps

Flexible energy networks provide one part of the transition to Net-Zero, the work will feed into how flexible energy networks of the future will operate. There is still uncertainty in how flexible energy networks will operate, and by conducting this research, we can shape the energy networks of the future.

Unlocking energy data can provide vital insights into our future energy usage, and with a drive towards decarbonisation and electrification of transport and heating, gaining knowledge and understanding from our energy data is more important now than ever before.

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