

Decarbonising the UK Energy System – It's Electrifying

Energy demand is electrifying and shifting towards a renewable or low carbon source. This will deliver over 75% of the greenhouse gas emissions abatement required to decarbonise the UK energy system between now and 2050, according to [Bloomberg NEF's Net Zero scenario](#). Randolph Brazier, Global Head of Clean Power Systems at HSBC, provides insight.



The UK's electricity system is undergoing a fundamental shift. It's moving from a one-way system where power is generated centrally by fossil-fuel generators, to one with many decentralised generators connected to all parts of the grid, generating electricity from intermittent renewable sources with power flowing in all directions. Renewables, already the cheapest form of generation in the UK, increase energy security and remove exposure to international fossil fuel markets. Millions of new sources of demand are also connecting to the grid in the form of electric vehicles and heat pumps.

The electricity grid needs to become much smarter to facilitate these changes. This means taking advantage of advanced telecoms, automation, energy storage, new markets and grid-edge devices. These trends of decentralisation, digitalisation and decarbonisation pose many opportunities for new technologies, business models, markets and entrants from other sectors.

Closing thoughts

Clean electrification is the backbone of Net Zero, and significant investment is required in the associated technologies, supply chains and projects to deliver it. Technologies are at various levels of maturity. Energy-related start-ups and innovation, collectively known as 'EnTech', is a particularly exciting and growing space. Businesses with clean electrification needs in all sectors and at all stages of their journey can be supported; from fundraising for start-ups through to project finance for multi-billion-dollar infrastructure. Today, we finance a number of industries that significantly contribute to greenhouse gas emissions. We have a strategy to help our customers to reduce their emissions and to reduce our own. For more information, visit [hsbc.com/sustainability](https://www.hsbc.com/sustainability).

Investment in supply and demand technologies required to achieve Net Zero in the UK is estimated at USD3.6tn (c.GBP2.8tn), according to [BNEF](#) under a Net Zero scenario. Around two thirds of that investment is required for electric vehicles and heat pumps alone. Demand for electricity in the UK is expected to more than double by 2050. Every sector will be affected. Demand growth is expected to significantly increase especially for the transport, heating and industrial sectors. Generation capacity required to deliver this electricity also needs to increase, as fossil fuel baseload is replaced by intermittent renewables. [BNEF estimates](#) that renewables and storage capacity in the UK needs to increase 4.8x by 2050.

The electricity grid is an essential element of Net Zero, connecting supply and demand across local, national and international regions. The grid doesn't only need to become smart, but requires significant investment in poles, transformers and wires – the length of the grid must grow 1.7x in the UK by 2050.

Many of the energy-related technologies that are required to get to Net Zero are currently available, and investment is required in these mature technologies and associated supply chains (for example metals and critical minerals) to scale them up and roll them out at pace. However, according to [the IEA's Net Zero Scenario](#), over 50% of the energy-related technologies required by 2050 are classed as new.

There are a wide range of less mature energy technologies that require further innovation and development, which could play a role in achieving Net Zero. These include, but are not limited to, advanced batteries, hydrogen electrolyzers, long duration energy storage, small modular reactors and vehicle-2-grid charging points. These new technologies, coupled with a range of new consumer-focussed business models such as Energy-as-a-Service or Community Energy, present opportunities for a range of stakeholders across the energy landscape.



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