

factsheet

The Energy Challenge

The UK is facing a major challenge in meeting projected energy needs over the next few decades, while at the same time tackling climate change.

Peak demand for electricity (the largest amount of electricity used at peak time on a cold day) in Great Britain is currently over 60 gigawatts (GW), while in a year around 325 billion units of electricity, with a value of around £30 billion, are generated and consumed.

The majority of electricity is generated by burning gas or coal, and by nuclear power stations. However, by 2016, 12 GW of coal-fired power stations will close, as they cannot meet the requirements of European emissions legislation. At the same time, around 7.5 GW of nuclear capacity will come to the end of its life. This means a huge investment in new generating capacity is needed to replace them to meet future electricity demand.

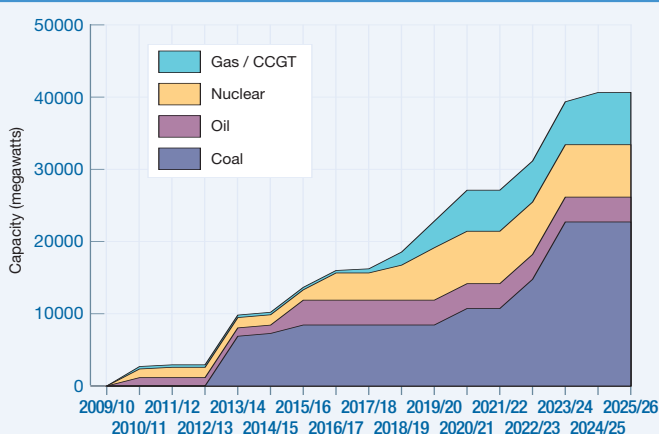


At the same time, North Sea oil and gas are in decline, so Britain's gas-fired power stations are becoming increasingly dependent on imports. And even if existing coal-fired power stations could meet EU emissions legislation, the domestic coal industry is no longer the major force it once was. Britain is therefore no longer self-sufficient in energy and increasingly reliant on imports. The movements in global energy markets have underlined concerns about the price and security of future electricity supplies.

Climate Change

Tackling climate change will also have a significant influence on the electricity industry. Burning fossil fuels such as gas and coal to generate electricity creates large quantities of carbon dioxide (CO₂), which is the major greenhouse gas. But the UK government is committed to reducing emissions by 34% from 1990 levels by 2020 and the Climate Change Committee has advised the Government that much of the reduction should come from the electricity industry, as CO₂ emissions from sources such as heating and transport are harder to reduce.

Cumulative plant closures by fuel type



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We need electricity from renewable sources such as wind power, and also from nuclear power, to help us tackle climate change. Currently Britain has 4.5 GW of wind generation. There are plans for another 20 GW of wind generation onshore, while licenses have been issued to develop a further 33 GW of offshore wind generation by 2020. The Government has identified ten potential sites for new nuclear power stations and National Grid has already received several applications from companies wanting to build and connect new nuclear stations at these sites. Meanwhile, the Government has introduced schemes to support the demonstration of CO₂ capture technology at fossil-fuelled power stations.

As we move to less carbon-intensive methods of generating electricity, the heating and transport industries are likely to reduce their CO₂ emissions by adopting electric heating and electric vehicles. So, even with big improvements in energy efficiency, demand for electricity is likely to go up rather than down.

National Grid's role in meeting the energy challenge

National Grid is responsible for transmitting electricity from where it is generated (for example, power stations and large wind farms) to towns and cities, the main centres of demand. To do this, we use a national network of overhead lines and underground cables which operate at high voltages.

The introduction of new wind generation and nuclear power over the next few years will mean we need to reinforce and extend this network. Most wind generation will be in remote locations, where wind speeds are favourable and sites for



wind farms are available. And although some of the sites identified for new nuclear stations have existing connections to the electricity transmission system, we will need to carry out substantial reinforcement of the system to take the higher output from the new, more efficient designs of nuclear station.

Both the Government and Ofgem, the industry regulator, have recognised the huge investments that National Grid needs to make over the next few years to accommodate the changing patterns of electricity generation.

At the same time, as part of the electricity industry we are developing “smart grid” technologies to make more efficient use of electricity and help us move towards a low carbon economy. For example, National Grid is at the forefront of developing new “smart meters” which will allow real-time adjustment to the electricity consumption of millions of “smart appliances”, such as fridges and freezers, reducing the need for expensive, carbon-intensive generation to meet peak demands. Other “smart grid” technologies may include solar cells and new types of gas-fired central heating boiler that will generate electricity as well as heating the home.

Britain needs all these investments to achieve its targets for a low carbon electricity industry, with safe, secure and reliable supplies.