nationalgrid

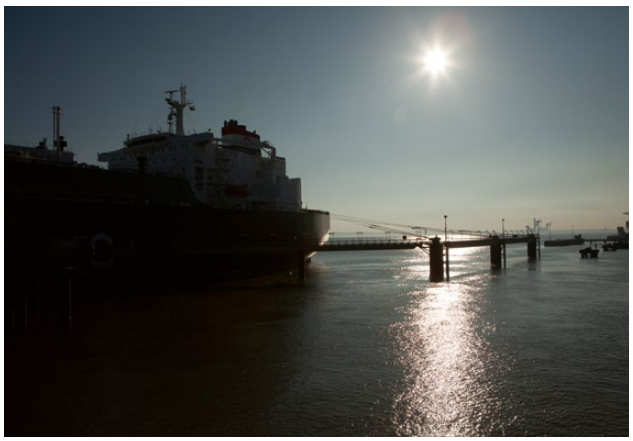
factsheet

The Energy Challenge

A significant challenge for National Grid and the UK energy industry is to deliver low carbon energy in an affordable, secure and sustainable way. This is a challenge that will require an estimated £110 billion of investment in electricity generation and transmission up to 2020 to transform the UK's energy infrastructure.

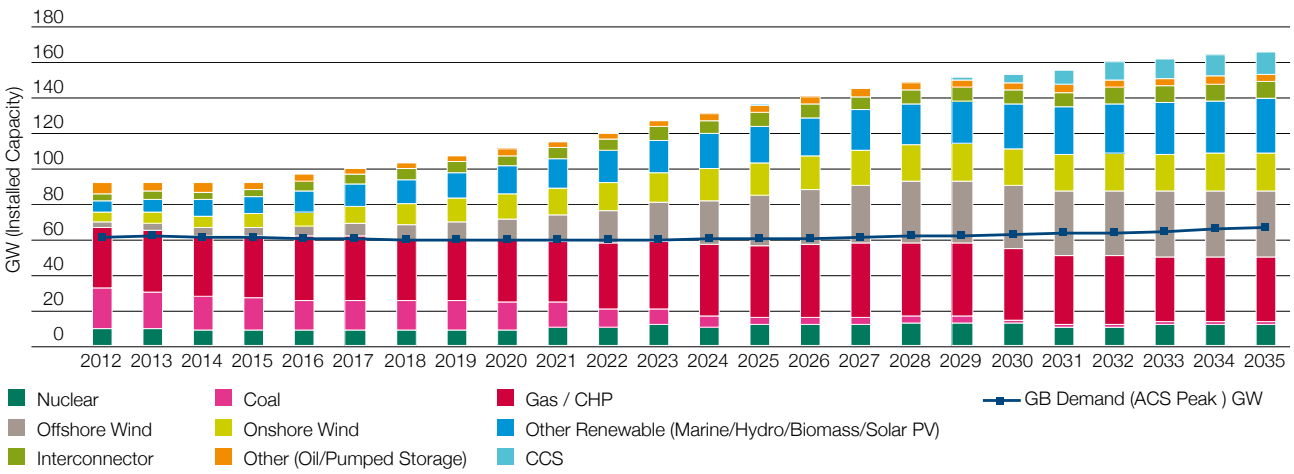
Peak demand for electricity (the largest amount of electricity used at peak time on a cold day) in Great Britain is currently 61.1 gigawatts (GW) while in a year around 328 TWh are generated and consumed. The majority of electricity is generated by burning gas or coal, and by nuclear power stations.

There is potential for around 20 per cent of generating capacity to be removed from the electricity transmission network by 2020 as power stations close because they have reached the end of their operating lives or are unable to meet tough climate change standards. This means a huge investment in new generating capacity is needed to replace them to meet future electricity demand.



A cargo of Liquified Natural Gas (LNG) at the Isle of Grain Gas Importation terminal

Changes in fuel mix (Source: National Grid's UK Future Energy Scenarios document – Changes in fuel mix for the Gone Green scenario – July 2013)



We need electricity from renewable sources such as wind power, and also from nuclear power, to help us tackle climate change.

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 is 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 (CO_2), which is the major greenhouse gas. The UK government is committed to reducing emissions by 34% from 1990 levels by 2020 and this will mean a move from 4% of energy being produced from renewable sources (in 2012) to 15% from renewable sources by 2020.

We need electricity from renewable sources such as wind power, and also from nuclear power, to help us tackle climate change. Currently Britain has over 7GW of wind generation. There are plans for another 16 GW of wind generation onshore, while licenses have been issued to develop a further 38GW of offshore wind generation by 2020.

The Government has identified eight potential sites for new nuclear power stations and National Grid has already received applications from companies wanting to build and connect new nuclear stations at six of these sites. Meanwhile, the Government has introduced schemes to support the demonstration of CO_2 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 CO_2 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.