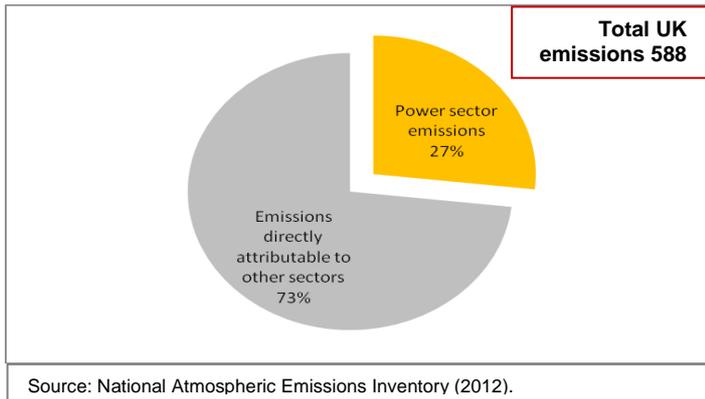


What does this sector include?

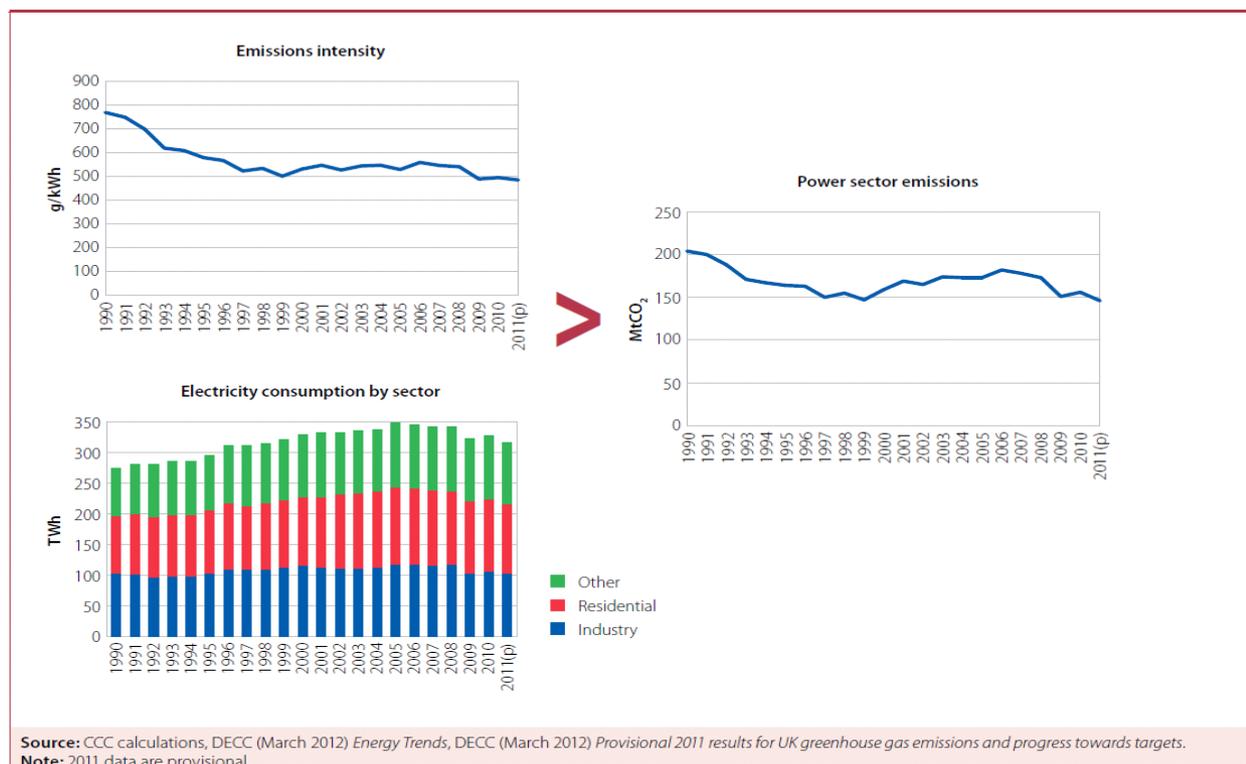
The power sector comprises the large-scale production of electricity for industrial, residential, and rural use. In 2010 the power sector accounted for 27% of total greenhouse gas emissions in the UK (Figure 1).

Figure 1. Greenhouse gas emissions from power sector (2010)



Power sector emissions have been declining since 2007 due to increased low-carbon generation and a fall in consumption partly caused by the recession and improved energy efficiency (Figure 2). In 2011, 70% of power generation in the UK came from fossil fuels which emit CO₂. The remainder came from low-carbon technologies – 20% from nuclear and 10% from renewables (e.g. wind).

Figure 2. Emissions intensity of electricity supply, electricity demand and CO₂ emissions from the power sector (1990 – 2011)



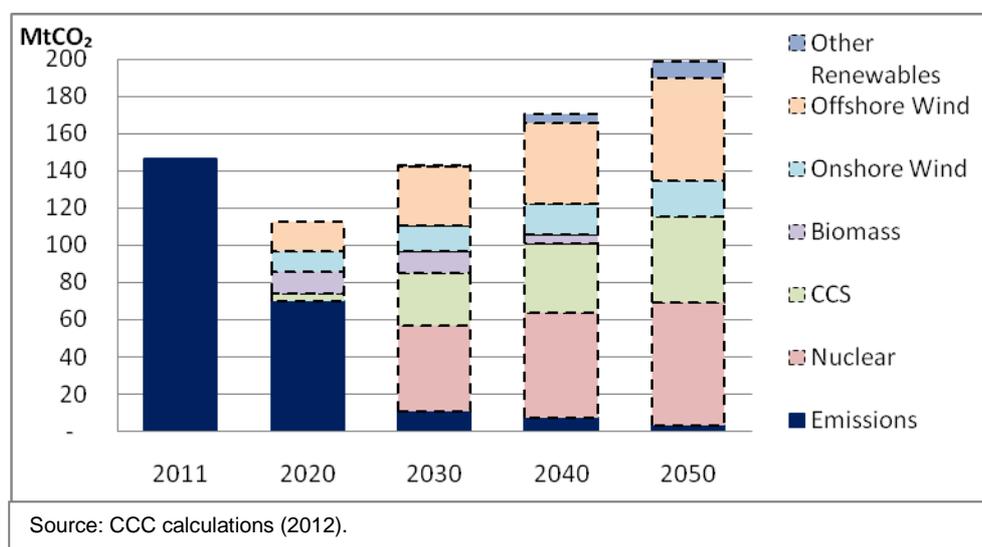
What can be done to reduce emissions in this sector?

Reducing power sector emissions can be achieved from a combination of decreasing emissions intensity (increasing use of low-carbon generation) and reducing demand (energy efficiency).

- Low-carbon sources of generation include renewables (such as offshore and onshore wind, hydro, solar, biomass and marine), nuclear and carbon capture and storage.
- Energy efficiency opportunities are available through a range of sources, including more efficient lights and appliances and small changes in how we use electrical products.

Figure 3 is a simple illustration of potential abatement up to 2050 from low-carbon generation. This is compared to a world where this low-carbon generation comes from gas. The increase in total generation is partly due to additional demand from electrification of other sectors (e.g. vehicles). By 2030, power sector emissions could be as low as 11MtCO₂. The CCC estimate that the costs of power sector decarbonisation would be of the order 0.4% of GDP in 2030. Investment requirements in generation capacity through the 2020s are estimated to be of the order £100 billion.

Figure 3. Potential abatement from low-carbon technologies 2011 - 2050



What is Government doing?

- **Renewables Obligation** is a requirement on electricity suppliers to source increasing amounts of electricity from renewable sources by purchasing Renewables Obligation Certificates (ROCs).
- The **EU Emissions Trading System** is a carbon trading system which covers large industrial users of energy and power generators in the EU. The **Carbon Price Floor** is a UK policy covering electricity generation and designed to guarantee a minimum level for the carbon price by topping it up to a pre-determined target level, beginning at £16/tCO₂ in 2013/14 and rising to £32/tCO₂ in 2020/21.
- **Electricity Market Reform (EMR)** is a package of measures being introduced as part of the 2012/13 Energy Bill to reform the electricity market to deliver low-carbon investment in electricity generation. Low-carbon generation will be offered price certainty through long-term Contracts for Difference around agreed strike prices. EMR will also introduce a capacity market to ensure the system remains secure.

What is the CCC's position?

- **Wind.** Investment in wind generation in 2011 was one third the rate required annually by the end of the decade. The pipeline for future projects remains strong, with sufficient projects in planning, awaiting construction or in construction to meet our indicators to at least 2017. Delivering these investments will require resolution of policy uncertainties (namely, support under EMR).
- **Carbon capture and storage (CCS).** The CCS competition has been launched to fund four commercial-scale demonstration projects. It will be crucial to maintain momentum through to timely delivery of these projects (2016 – 2020) to ensure CCS can contribute in the 2020s. The demonstration programme should be supported by development of a strategy for follow-on CCS projects and CO₂ infrastructure.
- **Nuclear.** Progress has been made in approval of the nuclear National Policy Statement, interim approval of the generic reactor designs and submission of the first planning application for new nuclear. The Weightman Report on the implications of Fukushima concluded that the UK had displayed a strong safety culture and existing procedures were adequate. However, the project pipeline is weak, reflecting significant financial risks. The key determinant of whether nuclear investment proceeds will be the successful implementation of EMR.
- The **Electricity Market Reform** will go some way to resolving these issues. Long-term contracts offer the best chance to bring forward required investment in low-carbon technologies at least cost to the consumer. A clear decarbonisation target for the long-term will be important to provide investor confidence that there will be a market for low-carbon technologies built to schedule and cost, and that there will not be a second 'dash for gas'. However the decision to set a carbon objective for power sector emissions in 2030 has been delayed until 2016, upon setting the fifth carbon budget. The **Levy Control Framework** is the budget covering the Renewables Obligation, Feed-in-Tariffs, and Warm Homes Discount and will provide funding for Contracts for Difference. The budget for 2020 has been agreed at £7.6 billion (real 2012 prices). This compares to the CCC estimate of 'around £8 billion' needed to fund essential investment (£8.2bn, real 2011 prices). Further details on the LCF are still to be made – for example, the budget is yet to be set for 2014 – 2019 and whether it will include any funding for electricity demand reduction remains undecided.

Links to recent work by the CCC

- **Fourth Carbon Budget**, Chapter 6 – Power sector decarbonisation to 2030.
<http://www.theccc.org.uk/reports/fourth-carbon-budget>
- **2012 Annual Progress Report**, Chapter 2 – Progress decarbonising the power sector.
<http://www.theccc.org.uk/reports/2012-progress-report>
- **International Aviation and Shipping Review**, Chapter 2 – Decarbonising the power sector.
<http://www.theccc.org.uk/reports/international-aviation-a-shipping>