Glossary

Adaptation
Adjustment of behaviour to limit harm, or exploit beneficial opportunities, arising from climate change.

Aerodynamic fairings
Aerodynamic fairings are additional add on's to trailers and cabs that help reduce aerodynamic drag, reducing fuel consumption. They may be retrofitted to tractors and trailers to give significant emissions reduction. A large number of different fairings are available giving variable benefits.

Anaerobic Digestion (AD)
A treatment process breaking down biodegradable, particularly waste, material in the absence of oxygen. Produces a methane-rich biogas that can substitute for fossil fuels.

Battery Electric Vehicle (BEV)
A vehicle that receives all motive power from a battery.

Biofuel
A fuel derived from recently dead biological material and used to power vehicles (can be liquid or gas). Biofuels are commonly derived from cereal crops but can also be derived from dead animals, trees and even algae. Blended with petrol and diesel biofuels it can be used in conventional vehicles.

Biomass
Biological material that can be used as fuel or for industrial production. Includes solid biomass such as wood and plant and animal products, gases and liquids derived from biomass, industrial waste and municipal waste.

Biomethane
Pipeline quality methane of biological origin (effectively renewable natural gas), generally produced either by cleaning up the biogas that results from anaerobic digestion or via a 'methanation' process to produce methane from the synthesis gas resulting from biomass gasification.

Bunker Fuels (international)
Fuels consumed for international marine and air transportation.

Cap and trade schemes
Cap and trade schemes establish binding controls on the overall amount of emissions from participants. Within this quantity ceiling, entities covered by the scheme are then free to choose where best to deliver emissions reduction within the scheme by trading units which correspond to quantities of abatement.

Capacity payment
Payment to energy supplier for providing a guaranteed level of capacity over a period of time.

Carbon Capture and Storage (CCS)
Technology which involves capturing the carbon dioxide emitted from burning fossil fuels, transporting it and storing it in secure spaces such as geological formations, including old oil and gas fields and aquifers under the seabed.

Carbon Cycle
The global flow of carbon (in various chemical forms such as carbon dioxide) through the atmosphere, ocean, terrestrial biosphere and lithosphere.

Carbon dioxide equivalent (CO_2e) concentration
The concentration of carbon dioxide that would give rise to the same level of radiative forcing as a given mixture of greenhouse gases.

Carbon dioxide equivalent (CO_2e) emission
The amount of carbon dioxide emission that would give rise to the same level of radiative forcing, integrated over a given time period, as a given amount of well-mixed greenhouse gas emission. For an individual greenhouse gas species, carbon dioxide equivalent emission is calculated by multiplying the mass emitted by the Global Warming Potential over the given time period for that species. Standard international reporting processes use a time period of 100 years.

Carbon leakage
Carbon leakage occurs when there is an increase in emissions in one country/region as a result of emissions reduction by a second country/region with a strict climate policy.

Carbon price
The price at which 1 tCO_2e can be purchased. We use projections for the carbon price as a comparator for judging cost-effectiveness of potential emissions reduction measures.

Carbon Reduction Commitment (CRC)
A mandatory carbon reduction and energy efficiency scheme for large non-energy intensive public and private sector organisations. CRC will capture CO_2 emissions not already covered by Climate Change Agreements and the EU Emissions Trading System and started in April 2010.

Carbon sink
An absorber of carbon (usually in the form of carbon dioxide). Natural carbon sinks include forests and oceans.

CERT
Carbon Emissions Reductions target. *See Supplier Obligation.*

Climate
The climate can be described simply as the 'average weather', typically taken over a period of 30 years. More rigorously, it is the statistical description of variables such as temperature, rainfall, snow cover, or any other property of the climate system.

Climate objective
To keep central estimates of global mean temperature change as close to 2 degrees as possible, and to limit the likelihood of temperature change above 4 degrees to very low levels.

Climate sensitivity
The response of global mean temperatures to increased concentrations of carbon dioxide in the atmosphere. It is typically defined as the temperature increase that would occur at equilibrium after a doubling of carbon dioxide concentration above pre-industrial levels.

Coalition Agreement
The coalition's programme for government, setting out agreements between the parties on various issues. Released in May 2010.

Coefficient of performance
The amount of heat a heat pump produces compared to the total amount of electricity needed to run it.

Co-firing
Combustion of two different materials at the same time.

Combined Cycle Gas Turbine (CCGT)
A gas turbine generator that generates electricity. Waste heat is used to make steam to generate additional electricity via a steam turbine, thereby increasing the efficiency of the plant.

Combined Heat and Power (CHP)
The simultaneous generation of heat and power, putting to use heat that would normally be wasted. This results in a highly efficient way to use both fossil and renewable fuels. Technologies range from small units similar to domestic gas boilers to large scale CCGT or biomass plants which supply heat for major industrial processes.

Contract for Difference
Form of hedging on the future price of a commodity in which a strike price is pre-specified. Payments are made between counterparties depending on the difference between the strike price and the market price at the time.

Contrail
Condensation trail (i.e., white line-cloud often visible behind aircraft).

Copenhagen Accord
The document that delegates of the 15th Conference of Parties to the UNFCCC agreed to 'take note of' in December 2009. The text endorsed the continuation of the Kyoto Protocol, but is not legally binding.

Credits
Carbon credits purchased in international carbon markets, generally corresponding to 1 tCO_2e per credit. Also referred to as 'carbon units' in the Climate Change Act. It is not clear how carbon markets will develop by the 2020s. Therefore, where we refer to credits for the 2020s these could be allowances purchased in schemes such as the current EU ETS, or offset credits from project-based schemes (e.g. such as those generated under the Kyoto treaty's project-based flexibility mechanisms, Joint Implementation and Clean Development Mechanism).

Devolved powers
Policy areas governed by the relevant national authority, as defined by the relevant devolution agreement(s) and legislation.

Discount rate
The rate at which the valuation of future costs and benefits decline. It reflects a number of factors including a person's preference for consumption now over having to wait, the value of an extra £1 at different income levels (given future incomes are likely to be higher) and the risk of catastrophe which means that future benefits are never enjoyed. For example the Social Discount Rate (3.5%) suggests future consumption of £1.035 next year is equivalent in value to £1 today. Discount rates in the private sector generally reflect the real cost of raising capital, or the real interest rate at which consumers can borrow.

Domestic Action budget
Our proposed Domestic Action budget (for 2023-27) reflects our assessment of feasible abatement in the UK through the 2020s that is cost-effective and/or necessary on the path the 2050. It should be legislated in the first instance, with the aim to deliver it through domestic emissions reduction (i.e. without relying on credits).

Drivetrain
The group of components in a motor vehicle that generate power and deliver it to the road surface.

Eco-driving
Eco-driving involves driving in a more efficient way in order to improve fuel economy. Examples of eco-driving techniques include driving at an appropriate speed, not over-revving, ensuring tyres are correctly inflated, removing roof racks and reducing unnecessary weight.

Electric vehicle
Vehicle capable of full electric operation fuelled by battery power driven by an electric motor. These include battery electric (BEV), plug-in hybrid electric (PHEV) and hydrogen fuel-cell vehicles.

Electrolysis
The use of electricity to split water into its constituent parts: hydrogen and oxygen.

Energy intensity
A measure of total primary energy use per unit of gross domestic product.

Enteric fermentation
Fermentation process that takes place in the digestive systems of ruminant animals (e.g. cattle and sheep) to break down hard-to-digest grassy materials, leading to the release of methane.

EUA
European Union Allowance. Units corresponding to one tonne of CO_2 which can be traded in the EU ETS.

European Commission
Executive arm of the European Union.

European Union Emissions Trading Scheme (EU ETS)
Cap and trade system covering the power sector and energy-intensive industry in the EU.

Extended Ambition scenario
Emissions reduction scenario for measures to 2020, developed in our 2008 report and updated in our 2009 and 2010 progress reports. We recommended that the measures in this scenario should be implemented given the need to prepare for the 2050 target and the relative cost-effectiveness of many of the measures.

Feed-in-tariffs
A type of support scheme for electricity generators, whereby generators obtain a long term guaranteed price for the output they deliver to the grid.

Fischer- Tropsch (FT) process
Catalytic production process for the production of synthetic fuels. Natural gas, coal and biomass feedstocks can be used either in gasofication or reforming processes.

Fluorinated Gases (F-gases)
Family of greenhouse gases containing fluorine. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) are used in industrial processes, refrigeration and air conditioning. They have a high global warming potential.

Flywheel hybrid
A hybrid vehicle that uses a high speed carbon fibre flywheel that stores and releases energy from/to the vehicle driveline. The flywheel stores energy, while braking for example, releasing it to supplement or temporarily replace the engine output. The technology has been used in F1 racing cars.

Fuel cell
A device that can be used to convert hydrogen or natural gas into electricity. Various types exist that can be operated at temperatures ranging from 80 degrees Celsius to 1,000 degrees Celsius. Their efficiency ranges from 40% to 60%. Their use is currently limited to niche markets and demonstration projects due to their high cost and the immature status of the technology, but their use is growing fast. Their use in vehicles generates electricity as required from hydrogen stored in the fuel tank.

Fuel Duty
A tax on petrol and diesel. In Nov 2010, the UK tax was £0.58 per litre for petrol and diesel.

Fuel Poverty
A household is said to be in fuel poverty if it needs to spend more than 10 per cent of its income on fuel to maintain an adequate level of warmth.

Gasification
Process in which the solid energy-containing materials are subjected to high temperatures in the presence of small amounts of oxygen. Instead of full combustion, this breaks down the material into an energy-rich 'synthesis gas', which typically contains a mixture of hydrogen, carbon monoxide, carbon dioxide and various other hydrocarbons. This mixture can then be used to generate electricity and/or heat or to to produce other forms of energy such as methane, biodiesel (via the Fischer-Tropsch process) or pure hydrogen

Geothermal energy
Geothermal energy exploits heat contained in or near the earth's crust, either for electricity production or to extract usable heat.

Global Offer budget
Our Global Offer budget (for 2023-2027) represents an indicative UK contribution to a global pathway consistent with our climate objective. It shows that the UK should be prepared to go beyond the Domestic Action budget in the context of a global deal, with the option to deliver the extra effort through credit purchase or increased domestic effort.

Global Warming Potential (GWP)
A metric for comparing the climate effect of different greenhouse gases, all of which have differing lifetimes in the atmosphere and differing abilities to absorb radiation. The GWP is calculated as the integrated radiative forcing of a given gas over a given time period, relative to that of carbon dioxide. Standard international reporting processes use a time period of 100 years.

GLOCAF
DECC's Global Carbon Finance model, developed to looks at the costs to different countries of moving to a low-carbon global economy, and the international financial flows and implied carbon prices this might generate.

Green Deal
The Green deal is the Coalition Government's initiative to support the implementation of energy efficiency measures to households and businesses without needing to meet any upfront costs.

Greenhouse Gas (GHG)
Any atmospheric gas (either natural or anthropogenic in origin) which absorbs thermal radiation emitted by the Earth's surface. This traps heat in the atmosphere and keeps the surface at a warmer temperature than would otherwise be possible.

Gross disposable annual household income
The amount of money available to households after taxes, National Insurance, pension contributions and interest have been paid.

Gross Domestic Product (GDP)
A measure of the total economic activity occurring in the UK.

Gross Value Added (GVA)
The difference between output and intermediate consumption for any given sector/industry.

Gt
A gigatonne (1,000 million tonnes).

Heat pumps
Can be an air source or ground source heat pump to provide heating for buildings. Working like a 'fridge in reverse', heat pumps use compression and expansion of gases or liquid to draw heat from the natural energy stored in the ground or air.

Heavy Good Vehicle (HGV)
A truck over 3.5 tonnes (articulated or rigid).

Hybrid Vehicle
A vehicle powered by an internal combustion engine and electric motor that can provide drive train power individually or together. E.g. Toyota Prius.

Hydrocarbon
A chemical compound comprised of hydrogen and carbon atoms, often of fossil fuel origin. Examples include methane, crude oil and oil products (e.g. petroleum, diesel and kerosene). Hydrocarbons release CO_2 upon combustion.

Intended budget
As proposed in our 2008 report, the Intended budget (2008-2022) corresponds to the UK share of an EU 30% 2020 target. We recommended it should be enacted in the context of a global deal to reduce emissions.

Intergovernmental Panel on Climate Change (IPCC)
The IPCC was formed in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). It is designed to assess the latest scientific, technical and socio-economic literature on climate change in an open and transparent way which is neutral with respect to policy. This is done through publishing a range of special reports and assessment reports, the most recent of which (the Fourth Assessment Report, or AR4) was produced in 2007.

Interim budget
As proposed in our 2008 report, the Interim budget corresponds to the UK share of an EU 20% 2020 target. This is the current set of legislated budgets.

Ionophores
Feed additives that can improve the performance of cattle. They are currently banned in the EU.

Joule
The standard international unit of energy. Related units are: Kilojoule (KJ) = 1000 Joules, Megajoule (MJ) = 1 million Joules, and Gigajoule (GJ) = 1 billion Joules.

Kilowatt-hour (kWh)
A unit of energy, equal to the total energy consumed at a rate of 1,000 watts for one hour. Related units are: Megawatt-hour (MWh) = 1,000 kWh, Gigawatt-hour (GWh) = 1,000 MWh and Terrawatt-hour (TWh) = 1,000 GWh. The kilowatt-hour is equal to 3.6 million joules.

Kyoto gas
A greenhouse gas covered by the Kyoto Protocol.

Kyoto Protocol
Adopted in 1997 as a protocol to the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol makes a legally binding commitment on participating countries to reduce their greenhouse gas emissions by 5% relative to 1990 levels, during the period 2008-2012. Gases covered by the Kyoto Protocol are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).

Levelised cost
Lifetime costs and output of electricity generation technologies are discounted back to their present values to produce estimates of cost per unit of output (e.g. p/kWh).

Life-cycle assessment
Methodology used to quantitatively assess the environmental performance (e.g. emissions) of a product or service from its cradle to grave.

Lightweighting
An option to reduce fuel consumption of vehicles by reducing the vehicle weight.

Liquefaction
Process for turning a gas into a liquid by cooling it to below its boiling point.

Lithium-ion batteries
Modern batteries with relatively high energy storage density. Presently used widely in mobile phones and laptops and likely to be the dominant battery technology in the new generation of plug-in hybrid and battery electric vehicles.

Low Carbon Transition Plan (LCTP)
White paper from the Department of Energy and Climate Change (DECC) published in 2009.

Marginal Abatement Cost Curve (MACC)
Graph showing costs and potential for emissions reduction from different measures or technologies, ranking these from the cheapest to most expensive to represent the costs of achieving incremental levels of emissions reduction.

Medium abatement scenario
The scenario for emissions reduction measures through the 2020s that is our best estimate of the appropriate level of ambition to currently plan for.

Methane (CH_4)
Greenhouse gas with a global warming potential of 20 (1 tonne of methane corresponds to 20 tonnes CO_2e). Arises in the agriculture sector from the digestive systems of ruminant animals (e.g. cattle and sheep) as well as in manures.

Mitigation
Action to reduce the sources (or enhance the sinks) of factors causing climate change, such as greenhouse gases.

$MtCO_2$
Million tonnes of Carbon Dioxide (CO_2).

National Atmospheric Emissions Inventory (NAEI)
Data source compiling estimates of the UK's emissions to the atmosphere of various (particularly greenhouse) gases.

National authority
In the Climate Change Act, "national authority" means any of the following: the Secretary of State; the Scottish Ministers; the Welsh Ministers; the relevant Northern Ireland department.

Nitrification inhibitors
Chemical additives that slow the rate of conversion of fertiliser ammonium to nitrate and reduce the chances for nitrogen loss.

Nitrous oxide (N_2O)
Greenhouse gas with a global warming potential of 300 (1 tonne of nitrous oxide corresponds to 300 tonnes of CO_2e). Arises naturally in agricultural soils through biological processes and is influenced by a variety of soil and nutrient management practices and activities (e.g. synthetic fertiliser application).

NO_x
Oxides of nitrogen, defined as the sum of the amounts of nitric oxide (NO) and nitrogen dioxide (NO_2).

OECD member countries
Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

Offset credits
See credits.

Ofgem (Office of Gas and Electricity Markets)
The regulator for electricity and gas markets in Great Britain.

Ozone
A greenhouse gas that is formed naturally in the stratosphere by the action of ultraviolet radiation on oxygen molecules. A molecule of ozone is made up of three atoms of oxygen.

Peaking plant
Electricity generation plants that run only at times of peak demand or troughs in supply from other sources.

Plug-in hybrid Electric Vehicle (PHEV)
A vehicle that receives motive power from both a battery and a secondary source (e.g. an internal combustion engine). The battery will generally be charged in the same way as that in a BEV, but all electric range will be more limited (e.g. 40 rather than 100 miles).

Power Purchase Agreement
Agreement to purchase some pre-specified quantity of energy over a specified future time period.

Pre-Industrial
The period before rapid industrial growth led to increasing use of fossil fuels around the world. For the purposes of measuring radiative forcing and global mean temperature increases, 'pre-industrial' is often defined as before 1750.

Propionate precursors
Feed additives that reduce the production of methane in ruminants.

Pumped storage
A technology which stores energy in the form of water, pumped from a lower elevation reservoir to a higher elevation. Lower cost off-peak electric power is generally used to run the pumps. During periods of high electrical demand, the stored water is released through turbines.

Radiative forcing
A measure of the atmospheric warming or cooling effect of various climate drivers such as solar radiation, greenhouse gas concentrations, or volcanic activity. Radiative forcing is expressed in units of Watts per square metre (Wm^{-2}) and is usually taken as a global average value in a given year, relative to the balance during pre-Industrial times.

Reforming
Process that converts hydrocarbons such as methane into a mixture of hydrogen and carbon monoxide. This mixture can then be used to produce other forms of energy such as biodiesel (via the Fischer-Tropsch process) or pure hydrogen. Around 95% of global production of industrial hydrogen is produced via reforming of hydrocarbons.

Renewable Heat Incentive (RHI)
Will provide financial assistance to producers (householders and businesses) of renewable heat when implemented in June 2011.

Renewables
Energy resources, where energy is derived from natural processes that are replenished constantly. They include geothermal, solar, wind, tide, wave, hydropower, biomass and biofuels.

Reserved powers
Policy areas governed by the UK Government. Also refers to 'excepted' matters in the case of Northern Ireland.

Sequestration
The process of removing CO_2 from the atmosphere and capturing it, particularly in biomass and soils.

Shale gas
A form for natural gas resource that has traditionally been categorised outside mainstream 'conventional' sources. Recent developments in drilling techniques have now enabled it to be produced at a cost potentially competitive with more conventional sources of natural gas, for example in the US.

Smart grid
A smart grid is an electricity network which makes use of information and communications technologies (ICTs), enabling more dynamic 'real-time' flows of information on the network and more interaction between suppliers and consumers.

Smart meters
Technology which can provide information on energy use directly to energy consumers (for example through display units or through the internet) with the potential to provide gas and electricity customers with accurate bills as well as real time information that could help them use less energy.

Smarter Choices
Measures that influence people's travel behaviour towards less carbon intensive alternatives to the car such as public transport, cycling and walking by providing targeted information and opportunities to consider alternative modes.

Social Tariffs
Discounted energy tariffs for those who find it difficult to heat and light their homes.

Solar photovoltaics (PV)
Panels that generate electricity from daylight.

Solar water heating
Solar technology which uses the warmth of the sun to heat water to supply hot water in buildings.

Standard Assessment Procedure (SAP)
Measures that influence people's travel behaviour towards less carbon intensive alternatives to the car such as public transport, cycling and walking by providing targeted information and opportunities to consider alternative modes.

Super-grid
An electricity transmission system, mainly based on direct current, which could potentially facilitate the transmission across Europe and beyond of large-scale power generation from remote areas to centres of consumption.

Supplier Obligation
An obligation that the Government places on energy suppliers, to help householders reduce their carbon footprint. The current policy is the Carbon Emissions Reductions Commitment (CERT) running from April 2008 to 2012.

Technical potential
The theoretical maximum amount of emissions reduction that is possible from a particular technology (e.g. What would be achieved if every cavity wall were filled). This measure ignores constraints on delivery and barriers to firms and consumers that may prevent up take.

Turbocharging
A type of forced induction system, which compresses the air flowing into a petrol or diesel combustion engine, squeezing more air into a cylinder, then allowing more fuel to be added. A turbocharged engine produces more power overall from each explosion in each cylinder, improving the power-to-weight ratio of the engine. One advantage is that it reduces fuel consumption without compromising engine performance.

Vehicle Excise Duty (VED)
Commonly known as road tax, an annual duty which has to be paid to acquire a vehicle licence for most types of motor vehicle. VED rates for private cars have been linked to emissions since 2001, with a zero charge for the least emitting vehicles (under 100g CO_2/km).

Vulnerable household
Households with children, the elderly, sick or disabled which, because of their additional heating requirements are deemed vulnerable to fuel poverty.