

# Executive Summary

The long-term strategic goal of climate change strategy should be to limit the average global temperature increase to within 2 degrees Celsius above pre-industrial levels. It is clear that the Labour Government's aim of a 60 per cent cut in carbon dioxide emissions by 2050 will not be enough. A reduction in emissions of the magnitude that we are advocating will only happen if developed countries such as the UK take the lead by cutting their own emissions. The objective of climate change strategy must be to make the UK carbon neutral over the longer term.

An international approach to tackling climate change is essential, with developed countries taking the lead in transforming themselves into low carbon, high energy efficiency economies.

Liberal Democrats will therefore:

Provide UK leadership for an international framework that will enable each country to manage the transition to a low carbon economy by:

- Reaching agreement on a much more ambitious set of targets in the negotiations for the second commitment period of the Kyoto Protocol and beyond.
- In the short term, developing a post-2012 framework that allows different countries to participate according to their national circumstances through a multi-stage approach.
- In the medium term, allocating emissions on a per capita basis, first to developed countries, but eventually to all countries.

Within the UK, there are three key elements of a mitigation policy response: pricing carbon through trading, tax or regulation; encouraging development, demonstration and deployment to bring forward a range of low carbon technologies; and encouraging long-term behavioural changes.

Liberal Democrats would introduce credible and predictable mechanisms for pricing carbon by:

- Strengthening the EU Emissions Trading System, by linking it to the EU target to reduce greenhouse gas emissions, setting national emissions caps for rolling five year periods on an incrementally reducing basis, aiming for full auctioning of allowances and broadening the scheme to cover aviation, shipping, and road transport through fuel suppliers.
- Reforming Labour's Climate Change Levy into a carbon tax that would apply to primary fuels as they enter the economy, once our energy efficiency measures have become effective in tackling fuel poverty, using revenues to cut other taxes.
- Making a green tax switch by more steeply graduating Vehicle Excise Duty (VED) for new vehicles, based on carbon emissions, reforming the per ticket Air Passenger Duty into a per flight Aircraft Tax, and indexing fuel duty to GDP growth except in periods of oil price spikes, using the revenue to cut income tax.

Liberal Democrats would bring forward environmentally sustainable technologies by:

- Setting a target for 30 per cent of the UK's electricity to come from clean, non-carbon emitting sources by 2020, rising to 100 per cent by 2050, providing new incentives for renewable energy sources and small-scale micro-generation through guaranteed prices ('feed-in tariffs').

## Zero Carbon Britain – Taking a Global Lead

- Providing new incentives for renewable heat technologies.
- Promoting transitional technologies such as carbon capture and storage.
- Rejecting a new generation of nuclear power stations.
- Working to introduce mandatory UK/EU average vehicle emissions targets of 120g CO<sub>2</sub>/km by 2015, 95g/km by 2020, and zero carbon for all new cars by 2040.
- Increasing the Renewable Transport Fuels Obligation to require at least 10 per cent of all fuel sold on UK forecourts to come from renewable sources by 2015.

Liberal Democrats would encourage behavioural changes by:

- Requiring all new homes to be built to the GreenHouse standard no later than 2011 (this is the best known standard for building homes that require no fossil fuels for their space heating).
- Introducing 'WarmHomes' packages of improvements available for existing houses funded through 'green mortgages', which enable people to use the savings from their lower energy use to pay back the cost of the package through their quarterly energy bill.
- Setting up a Future Transport Fund to invest in key rail and light rail improvements and extensions, including High Speed Rail, by using the proceeds from charging road freight for using the motorways and the proceeds from a climate change charge on air flights within the UK, exempting 'lifeline' flights.

Liberal Democrats would also enhance the UK's ability to adapt to the effects of climate change by:

- Developing a UK national adaptation plan to educate individuals and businesses about what adaptations are necessary in response to climate change.
- Ensuring that government departments are given a clear responsibility for planning for the effects of climate change.
- Investing in flood management systems.

Liberal Democrats would help developing countries mitigate and adapt to climate change by:

- Working for the establishment of an International Leapfrog Fund to facilitate the development of low carbon technologies, energy efficiency and renewable energy technologies in developing countries.
- Advocating a new UN Adaptation Fund.

Liberal Democrats would ensure that UK climate change strategy is credible and capable of being implemented by:

- Placing a legal duty on ministers to achieve the long-term goal of a carbon neutral UK and producing annual carbon budgets.
- Setting up a Cabinet Committee on climate change
- Creating a new Department of Environment, Energy and Transport.

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# 1. Introduction

- 1.0.1 Climate change is here. It is a fact. Dealing with climate change is the number one challenge facing the world today
- 1.0.2 With this policy paper, Liberal Democrats are the first party to aim for a carbon neutral Britain, where the country absorbs as much carbon as it emits, by the middle of this century. We set ourselves ambitious targets and back them up with bold, commonsense policies. There is no choice because the task is so important and the challenge so urgent.
- 1.0.3 Last year, the *Stern Review on the Economics of Climate Change* found that the scientific evidence is now overwhelming that climate change is serious and demands an urgent response. If no action is taken to reduce greenhouse gas emissions, global temperatures could rise by 2 degrees Celsius from pre-industrial levels by 2035; by the end of the century, there is a 50 per cent chance that the temperature rise could exceed 5 degrees Celsius during the following decades. The Stern Review also considered the costs of climate change if present trends continue and calculated that over the next century, global economic output could be reduced by between 5 and 20 per cent. All countries would be affected, with developing countries the hardest hit.
- 1.0.4 The Intergovernmental Panel on Climate Change (IPCC) has explained what will happen if average global temperatures are allowed to rise by more than 2 degrees Celsius above pre-industrial levels. There will be dangerous levels of climate change and a greatly increased risk of rising sea levels, drought, floods and extreme weather events. These impacts are projected to increase if temperatures rise significantly above the 2 degrees level. One result will be large disruptions to ecosystems and these may be irreversible. Consequently, the European Union's long-term strategic goal is to limit the average global temperature increase to within 2 degrees Celsius. That goal seems to be shared by all the major political parties in the UK.
- 1.0.5 The question is: how do we achieve that strategic goal? A reduction in emissions of the magnitude that we are advocating will only happen if developed countries such as the UK take the lead by cutting their own emissions. In 2003, the Labour Government adopted a target of a 60 per cent cut in UK carbon dioxide emissions by 2050. It acted on the basis that this figure represented its ambition for the world's developed economies to cut emissions of greenhouse gases. The Labour Government suggests that the concentration of carbon dioxide in the atmosphere should be kept within a range of 450 to 550 parts per million (ppm). Earlier this year, however, the IPCC found that a range of 485 to 570 parts per million of carbon dioxide alone – very similar to what the Government have been suggesting – would lead to a global mean temperature increase of between 3.2 degrees and 4 degrees Celsius; in other words, potentially twice the safety threshold.
- 1.0.6 The IPCC also showed that holding global warming to 2 degrees to 2.4 degrees Celsius would require an atmospheric concentration of 445 to 490 ppm of carbon dioxide equivalent. At the moment, the concentration of greenhouse gas emissions stands at around 430 ppm of carbon dioxide equivalent and, due to human activities, is increasing at a rate of nearly 3 ppm carbon dioxide equivalent per year. Under 'business as usual', they will reach 550 ppm of carbon dioxide equivalent by 2035. The IPCC data suggests it may be necessary to achieve a reduction in CO<sub>2</sub> emissions approaching 100 per cent between 2000 and the year 2050, to stabilise

atmospheric concentrations of greenhouse gases at a level of 450 ppm carbon dioxide equivalent or less. This requires urgent, substantial action to reduce emissions to ensure that emissions peak in the next few years and to make the rate of decline in emissions as low as possible. If action is delayed, it will become harder and more costly to stabilise emissions.

- 1.0.7 An international approach to tackling climate change is essential. Climate change is a global environmental challenge – all countries emit greenhouse gases and no country can make all the cuts on its own. Developed countries need to transform themselves into low carbon, high energy efficiency economies. Rapidly growing developing countries will also need to make the switch over the longer-term. Their shares of emissions are set to increase and, ultimately, overtake those of developed countries – and reducing global emissions must be the aim. Therefore, coordinated and multilateral action is key to reducing emissions. This paper sets out how Liberal Democrats would work to build an international framework that will put all countries on the 2 degrees Celsius pathway as a matter of urgency.
- 1.0.8 A reduction in emissions of the magnitude that we are advocating will only happen if developed countries such as the UK take the lead by cutting their own emissions. We have to show by example that that we can combine prosperity and care for the planet. Developed countries start from a higher level of emissions and are responsible for more of the carbon in the atmosphere than developing countries. It follows that the objective of climate change strategy over the longer term must be to make the UK carbon neutral. That is why we have called this policy paper *Zero Carbon Britain – Taking a Global Lead*.
- 1.0.9 The Stern Review identified three elements of an appropriate mitigation policy response: pricing carbon through trading, tax or regulation; encouraging development, demonstration and deployment to bring forward a range of low carbon technologies, and encouraging long-term behavioural changes. It also highlighted the need for adaptation to the consequences of climate change. In this policy paper, Liberal Democrats use the Stern Review framework to set how we would set this country on the path to a carbon neutral future.

## 2. International Action

- 2.0.1 Climate change is a global challenge – all countries emit greenhouse gases – and cannot be solved by the UK on its own. All countries need to work together to reduce global emissions.
- 2.0.2 International collective action takes place in a wide variety of forms. These include multilateral frameworks such as the UNFCCC and Kyoto Protocol; coordinated action, such as the Gleneagles Dialogue; organisations such as the International Energy Agency; and parallel approaches, for example, as between the EU, China and California. Performance to date has been mixed. The Stern Review was clear that more co-ordinated multilateral action is required to stabilise concentrations of greenhouse gases in the atmosphere.

### 2.1 UK Leadership for a New International Framework

- 2.1.1 Liberal Democrats seek an international framework that will enable each country effectively to manage the transition to a low-carbon economy. We would aim to get every country on to the 2°C pathway as a matter of urgency, with each country having common but differentiated responsibilities.
- 2.1.2 The UK has played an active leadership role in the development of international frameworks. Climate change was placed at the top of the agenda for the UK's twin Presidencies of the G8 and EU in 2005 and this country has continued to play an effective role in the development of international climate policy through, for example, the commissioning of the Stern Review of the Economics of Climate Change and its efforts to strengthen the Kyoto Protocol.
- 2.1.3 Liberal Democrats believe that the UK should take an even stronger role in making international policy on climate change. The survival of the multilateral climate regime beyond the end of the first commitment period in 2012 is essential to ensure that effective action is taken against global warming. In the negotiations for the second commitment period and beyond, we would aim to reach agreement on a much more ambitious set of targets, taking a transitional approach that would seek to deepen commitments over the longer term by allocating emissions on a per capita basis, first to developed countries, but eventually to all countries. This is based on 'contraction and convergence' – contraction of global carbon emissions and convergence of per capita emissions across the global population – and reflects the great difference in emission levels per head between nations.
- 2.1.4 Liberal Democrats would seek to broaden engagement to include the key Parties outside the Kyoto Protocol, the US and Australia, by collaborating with individual states and business in the absence of engagement by governments. We would work to ensure that the next set of greenhouse gas reduction targets includes developing countries (which are almost all already parties to the Protocol). Wholesale commitment by all developed countries will be necessary if developing countries are to be persuaded to undertake their own commitments.
- 2.1.5 In the short term, Liberal Democrats would seek to develop a post-2012 framework that allows different countries to participate according to their national circumstances through a 'multi-stage' approach. Each country would work towards the 2°C pathway, but the stringency of their commitments will depend on their economic, developmental and environmental circumstances. Industrialised country emissions would be allocated on a per capita basis, whereas developing countries

will take on emission limitation targets or intensity targets or no commitments at all, depending on their level of development.

- 2.1.6 In the medium term, Liberal Democrats would seek an equitable allocation between countries of carbon emissions, with rights to emit allocated on a per capita basis. Once universal participation on the 2°C pathway had been established, emissions rights would be allocated to all countries on a per capita basis.
- 2.1.7 Liberal Democrats believe that the UK and EU should seek to apply the Protocol's enforcement mechanism procedure, to ensure that those countries which have not accepted targets or are not keeping to them, are not able to undercut the industries of countries which have. As long as companies are vulnerable to unfair competition from countries that do not accept targets, industry will always find it difficult to improve the carbon-efficiency of its own operations. Where a country exceeds its allowed emissions in the first commitment period, it will be required to make up the difference during the second commitment period, plus a penalty deduction of 30 per cent. The UK and EU must make sure that this is applied as rigorously as possible when it comes fully into force.
- 2.1.8 Once countries responsible for the vast majority of greenhouse gas emissions have agreed new reduction targets, we envisage that, as part of the agreement, there would be mechanisms to prevent unfair competition from the small minority of countries that refuse to accept their obligations to reduce their emissions. This will include action within the WTO to ensure that trade measures within multilateral environmental agreements, such as the Kyoto Protocol, are explicitly recognised and permitted (for more details, see Policy Paper 74, *Britain's Global Responsibilities: The International Rule of Law*).
- 2.1.9 Liberal Democrats would argue for the strengthening of the United Nations Environment Programme, UNEP, including ensuring it has guaranteed international funding. UNEP should have a lead role in coordinating the environmental work of all relevant bodies within the UN system.

## **2.2 Accelerating Technology Transfer**

- 2.2.1 Demand for energy is growing rapidly in the fast-developing economies. These countries have a choice, between investing in infrastructure that could lock them into high greenhouse gas emissions for the next fifty years, or investing in highly energy efficient infrastructure that will help build a low-carbon economy. The Stern Review concluded that technology transfer barriers can be overcome through a combination of formal institutional mechanisms, measures to improve private sector investment and, where necessary, direct funding initiatives. The review found that lending can play an important role in supporting energy efficiency and, while the Global Environment Facility has a strong track record in financing programmes for energy efficiency and renewable energy, it is small relative to the scale of the challenge. The Stern Review also noted that incorporating environmental benefits within the international trade regime could support some aspects of policies to mitigate climate change.
- 2.2.2 Liberal Democrats would work for the establishment of an International Leapfrog Fund, funded by international contributions and managed by UNEP, to provide funds to facilitate the development of low carbon technologies, energy efficiency and renewable energy technologies in developing countries.
- 2.2.3 Liberal Democrats would seek to secure modifications of WTO rules to ensure that trade rules, including those governing intellectual property and technical barriers to

trade, do not undermine environmental objectives. We would aim to establish harmonised international standards for low-carbon goods and services.

- 2.2.4 Liberal Democrats would support the development of new, innovative regional investment frameworks to remove tariff barriers and intellectual property barriers that prevent or slow the dissemination of low carbon technologies. These investment frameworks would encourage innovative financing to facilitate the shift from conventional polluting technologies into new, low carbon technologies, which can then be implemented at scale.
- 2.2.5 We would promote the negotiation of an international ‘Climate Agreement for Africa’ to encourage developed countries to eliminate or reduce intellectual property rights protection on a range of low carbon technologies to facilitate take-up in African countries of these technologies, particularly those that will help the continent respond to the impacts of climate change.
- 2.2.6 We would also work for universal climate-proofing of development assistance and export credit to ensure that climate change is mainstreamed into development programmes and initiatives. This will require coordinated action through the World Bank, IMF and the OECD Group of Export Credit Agencies to ensure that development objectives fully support climate mitigation.

## **2.3 Action at EU Level**

- 2.3.1 The EU has a crucial leadership role to play on tackling climate change and in the development of the low carbon economy.
- 2.3.2 In March 2007, the European Council committed the EU to a unilateral target to reduce greenhouse gas emissions by 20 per cent by 2020. The Council also agreed to increase this to a collective target of 30 per cent for developed countries, if other non-EU industrialised countries are also willing to come on board. This is an important step in the right direction, but the EU needs to go further and faster.
- 2.3.3 Measures to build a low-carbon economy are not integrated sufficiently into the full range of EU policies. For example, to date the Common Foreign and Security Policy (CFSP) has focused on regional affairs rather than global threats, including climate change. The Lisbon Agenda aims to make the EU the most dynamic and competitive knowledge-based economy in the world by 2010. It does not fully embrace the goal of building a low carbon economy, which could make a major contribution to long-term EU competitiveness, if it was fully incorporated into EU policies and targets on growth and jobs. Liberal Democrats support:
- An increase in the EU emissions reduction target to 30 per cent by 2020, based on 1990 levels, as recommended by the European Parliament.
  - Re-aligning the European Budget to ensure that the political and policy commitments on climate change are matched by financial backing.
  - Incorporating climate change into EU external affairs policy by bringing climate change into the EU’s Common Foreign and Security Policy.
  - Full integration of climate change into the Lisbon Agenda (or its successor).
  - Measures to strengthen the EU emissions trading scheme.

## **2.4 UK Priorities**

- 2.4.1 Further ‘joined up’ actions can also be taken at domestic level to strengthen the UK’s involvement in making international climate change policy.

Liberal Democrats would:

- Require all Whitehall departments involved in international affairs, economy policy and trade to prepare policies for developing a low carbon global economy by 2050.
- Require the Foreign and Commonwealth Office (FCO), the Department for International Development (DFID), our proposed Department of the Environment, Energy and Transport (replacing Defra), and the Ministry of Defence (MoD) to link up policies on climate change, energy and security to ensure that these issues do not undermine the delivery of the Millennium Development Goals.
- Explore the policy options available for incorporating climate change and energy into the development agenda and vice versa and set these out in a White Paper from DFID, FCO, DEET and MoD.
- Review the UK's input into the Climate Agreement for Africa and consult on how to speed up the delivery of low carbon technologies, including technologies to alleviate the impacts of climate change, in African countries through removal or reduction of barriers such as intellectual property rights.
- Set up a 'future trends' group to assess the longer-term implications of climate change in relation to other global threats, such as international terrorism, resource competition, displacement of populations and economic shocks.

## 3. Pricing Carbon

- 3.0.1 The first key element of a mitigation policy is a mechanism for pricing carbon. Those who produce greenhouse gas do not face the full social costs of their actions themselves. A carbon price will ensure that emissions reductions are delivered in the most cost-effective way to reflect the marginal damage caused by emissions which rise over time as the total amount of greenhouse gases grows. A carbon price will provide individuals and businesses with incentives to move away from high-carbon goods and services, become more energy efficient, and invest in technologies using low-carbon fuels or to develop innovative low-carbon technologies. Government - or an institution such as the European Commission - needs to develop a mechanism that enables the market to place an appropriate price on current and future carbon emissions.
- 3.0.2 For investors, a carbon pricing policy must be: credible (a belief that it will endure and be enforced); flexible (the ability to change the policy in response to changing circumstances) and predictable (setting out the process and circumstances in which the policy will change).
- 3.0.3 One carbon pricing policy is a 'cap and trade' scheme that places quantitative restrictions on the total volume of emissions, establishes binding commitments and allows countries, companies or people to work out how to deliver emissions reductions. Such schemes allocate emissions as property (permits) and allows trading to take place. In theory, a well-designed emissions trading scheme, by creating an efficient and transparent market in emissions allowances, provides a way of delivering reductions in emissions volumes at least cost. An emissions trading scheme has the advantage that the impacts on the volume of emissions are more certain than they would be under alternative policies.
- 3.0.4 The EU Emissions Trading Scheme (EU ETS) is the best example of a cap and trade mechanism. The EU ETS is the lynchpin of the EU's climate policy and is the largest multi-country, multi-sector, greenhouse gas emissions trading scheme in the world. Our carbon pricing proposals therefore focus on reforming and strengthening the EU ETS scheme, to ensure that it can deliver a carbon price in which investors can have confidence. (Our proposals for the Carbon Reduction Commitment, the government's proposed mandatory emissions trading scheme for larger organisations in the UK, are set out in 5.2.3).

### 3.1 Strengthening the EU Emissions Trading Scheme

- 3.1.1 The EU ETS is designed to assist Member States to fulfil the EU's Kyoto target of reducing emissions by 8 per cent from 1990 levels by the year 2012. The EU ETS keeps emissions within fixed limits while allowing emissions to be reduced at fixed cost through trading. Established in 2005, the scheme covers nearly half of total EU and UK CO<sub>2</sub> emissions and covers over 12,000 installations in the power generation and major industrial sections.
- 3.1.2 Liberal Democrats welcome this progress but recognise that major problems have emerged in Phase I. For Phase II (2008-12), which will cover 52 per cent of UK emissions, the European Commission has made reductions in the total number of allowances for member states that will ensure greater scarcity and reinforce the credibility of the scheme. Liberal Democrats support the Commission's stance.
- 3.1.3 In October 2006, the Government published its Vision Statement for the long-term future of emissions trading and developed these proposals in *Meeting the Energy*

*Challenge: A White Paper on Energy* (May 2007). The aim is to develop the EU ETS as the basis of a global market and forge an EU agreement to a post-2012 framework. The Government supports setting safe, predictable and affordable limits on emissions, which tighten over time; extending the scheme to cover more sectors, including aviation and more greenhouse gases, extending the scheme beyond Europe to form the hub of a global carbon market; and moving towards more auctioning of allowances in future phases.

3.1.4 Liberal Democrats would develop the Government's key proposals in order to increase the long-term credibility of the EU ETS, increase investors' confidence; ensure scarcity in the allowance market; and make the market deeper and more liquid. Our specific proposals include:

- Linking the scheme to the EU target to reduce greenhouse gas emissions, which Liberal Democrats believe should be 30 per cent by 2020, so that there is a predictable direction of travel for the level of emissions required.
- Setting national emissions caps for rolling five year periods, on an incrementally reducing basis, to provide business with more certainty, create the incentive for investment in longer-term projects and reduce market exposure to Government intervention.
- Working towards an equitable allocation between countries of carbon emissions, with rights to emit allocated on a per capita basis.
- As we develop a new international climate change framework, with effective enforcement measures (see section 2.1.7), aiming for full auctioning of allowances to make the scheme more efficient, using the revenue to reduce taxes and invest in clean, low-carbon technologies.
- Developing an independent institution to monitor the implementation of the EU ETS, provide an independent assessment to the market on the efficacy of National Allocation Plans, provide information on actual emissions and verify the delivery by Member States of their national targets.
- Broadening the scheme to cover aviation, shipping, and road transport through fuel suppliers, and other gases so that, in time, the whole economy must face a cost for carbon.

3.1.5 As the EU ETS becomes established, we will consider whether there should be rebates on the Climate Change Levy (or, in future, carbon tax) for firms participating in the scheme.

3.1.6 The long-term aim must be to seek cost-effective global emissions reduction by deepening and strengthening international emissions trading. Liberal Democrats support moves to extend the EU ETS and to make it capable of being linked to, and eventually inter-operable with, international policy measures and governance arrangements that will help to deliver our strategic goal to limit the average global temperature increase to within 2 degrees Celsius above pre-industrial levels.

## **3.2 Pricing Carbon in Different Sectors of the Economy**

3.2.0 The Stern Review notes that different sectors of the economy vary widely in terms of the current availability and average costs of options for reducing emissions. In order to keep the cost of carbon saving measures as low as possible, the carbon price should be equalised across sectors. Elsewhere in this paper, we discuss the technology and efficiency policies we would apply in different sectors. We have also considered climate change in conjunction with other policy objectives in particular sectors. As the Stern Review notes, a mix of policies and instruments may be used

to make the transition to full carbon pricing and these are influenced by the characteristics of different sectors.

## **Energy**

- 3.2.1 In 2005, energy industries accounted for 35 per cent of UK carbon emissions, making them the largest single source. The main sources of UK energy are natural gas (40 per cent), petroleum (33 per cent), coal (17 per cent), nuclear electricity (8 per cent) and renewables and waste (2 per cent).
- 3.2.2 Labour has brought in a Climate Change Levy (CCL) but the CCL is too complex, has too many exemptions and suffers from a confusion of objectives. For some years, Liberal Democrats have advocated reforming the CCL into a carbon tax, once our energy efficiency measures have become effective in tackling fuel poverty.
- 3.2.3 A carbon tax is a tax on energy sources which emit carbon dioxide into the atmosphere, as used in Sweden, Norway and the Netherlands. Such a tax has a number of advantages. First, the price that consumers will pay is known in advance. Second, in examining the choice of instruments under uncertainty, some studies show that a carbon tax is more likely to deliver lower emissions than an instrument based on permits. Further, such a tax can be adjusted as new information about climate change comes to light. A carbon tax could be a more credible policy instrument than a cap and trade scheme provided that the criteria and process by which the tax is altered were set out in advance.
- 3.2.4 Some studies show that a carbon tax is more efficient than carbon permits, though others suggest that a hybrid policy is better still; in other words, with other emissions trading schemes, such as the EU ETS, the proposed Carbon Reduction Commitment in the UK and a carbon tax would work alongside each other. Liberal Democrats retain our commitment to reforming Labour's Climate Change Levy into a carbon tax that would apply upstream to primary fuels, once our energy efficiency measures have become effective in tackling fuel poverty. We would:
- Set the carbon tax so as to achieve a level of emissions reduction that is not otherwise achieved through emissions trading schemes, with a year-on-year reduction in emissions.
  - Adjust the carbon tax in order to maintain progress towards our long-term target of carbon neutrality, with any changes to the tax rate notified well in advance, to give investors time to adjust.
  - Use the revenues to cut other taxes, so that the net effect on the overall tax burden was neutral.
- 3.2.5 In addition to our proposals to reform the EU ETS and bring in a carbon tax at the appropriate time, Liberal Democrat policies for pricing carbon in the energy sector include introducing feed-in tariffs for renewable energy generators (see section 4.2.6) and strengthening the Carbon Reduction Commitment (see section 5.2.3).

## **Road Transport**

- 3.2.6 In 2005, the domestic transport sector accounted for around 21 per cent of total UK carbon emissions. Transport has the fastest growing source of emissions and is the only sector of the economy where carbon emissions are expected to be higher in 2020 than they were at the Kyoto baseline date of 1990.
- 3.2.7 The road sector is the largest source of carbon emissions from transport in the UK. Nearly two-thirds comes from private cars, and a large amount from freight – heavy

goods and light duty vehicles. When it dropped the fuel price escalator in 2000, the Labour Government lost the most effective policy tool for keeping down demand for road travel. The Government has since brought in a graduated Vehicle Excise Duty (VED) but this does not set a large enough price differential between different types of car to provide motorists with a real incentive to be more environmentally responsible. As part of our 'green tax switch', Liberal Democrats would:

- More steeply graduate VED for new vehicles, based on carbon emissions, with a higher level for the higher emissions band.
- Abolish VED altogether for the lowest carbon vehicles, funded by increasing the amount of VED charged on the most polluting vehicles.
- Index fuel duty to GDP growth except in periods of oil price spikes.

3.2.8 Liberal Democrats would support the inclusion of fleet and freight companies, public transport operators, as well as fuel suppliers within the EU Emissions Trading Scheme from 2012. We would also support the introduction of a mandatory system of colour coded fuel-efficiency labelling across the EU.

### **Aviation**

3.2.9 Since 1990, the proportion of carbon emissions from aviation has more than doubled, from 2.5 per cent to 5.8 per cent. The Government's Aviation White Paper (published in 2003, and reviewed in 2006) allows and encourages expansion of major airports. As a result, emissions from air travel are now due to rise by 83 per cent on 2002 levels by 2020 and could amount to about a quarter of the UK's total contribution to global warming by 2038. The impacts are amplified further by the impacts of radiative forcing, which identifies the total impact of all aviation emissions on climatic change, and can be represented by multiplying the volume of CO<sub>2</sub> released by a factor of 2.7.

3.2.10 At the moment, the prices charged for aviation do not remotely reflect its economic or environmental costs. The Air Passenger Duty (APD), which the Government doubled in Budget 2007, provides no incentives to change behaviour. APD is an incentive on the passenger rather than the airline and is not an effective environmental tax. It does not include freight flights, and an empty plane pays nothing, whereas the busiest flights – which are much more efficient in terms of use of capacity – pay much more. This is a perverse incentive.

3.2.11 The joint HM Treasury and Department for Transport publication *Aviation and the Environment: Using Economic Instruments* (2003) concluded that a charge that applied per air traffic movement would provide an incentive to use planes at a higher load factor and to bring forward potential supply side improvements.

3.2.12 Liberal Democrats would replace the Airport Passenger Duty with a pollution charge covering both passenger and freight flights to all destinations. In addition, we would establish a climate change levy set initially at £10 per passenger on flights that originate and terminate within the United Kingdom, payable as part of the endowment of the 'Future Transport Fund' (see section 5.4.3). This would exclude essential 'lifeline' flights, but is projected to raise around £150-200m per year for the fund.

3.2.13 Liberal Democrats back strong and effective EU action on aviation. The EU must set a minimum tax rate on aviation fuel (kerosene) to be collected by member states, apply value added tax to air tickets, and put aviation into the EU emissions trading system. In addition, Liberal Democrats would:

- Draw aviation into the UK and IPCC emissions inventories, and ensure that the target emissions for the UK include aviation.
- Continue to support the inclusion of aviation in the European Union Emissions Trading Scheme, at a level which reflects the impacts of emissions at altitude.
- Promote new developments and mechanisms such as internationally agreed aviation fuel duty.
- Rule out major expansion including a second runway at Stansted and the third (and short) runway at Heathrow, retain runway capacity at around the current level and permit the auctioning and secondary trading of airport slots.
- Clamp down on the regulation that effectively means retail rents subsidise the charge an airline operator pays to land at the busiest airports.

3.2.14 Our policy proposals for aviation are set out in policy paper 71, *A Soft Landing: Creating a Sustainable Market in Aviation*.

### ***Agriculture, Forestry and Land Use***

- 3.2.15 Liberal Democrats are committed to using trading mechanisms to help deliver greenhouse gas reductions in the agriculture, forestry and land management sectors. The Stern Review noted the difficulties associated with measuring agricultural emissions, such as from fertilisers and changing land use practices. Therefore, it is difficult to incorporate greenhouse gas emission from agriculture into trading schemes. For example, the Chicago Climate Exchange creates soil carbon offsets through the use of conservation tillage and grass planting.
- 3.2.16 We would consult on the inclusion of the agriculture, forestry and land management sectors in the proposed new Carbon Reduction Commitment (UK emissions trading scheme), subject to the development of workable greenhouse gas emission 'proxies'.
- 3.2.17 Britain's woodlands and forests are a rich natural resource which can promote biodiversity, provide biomass to help cut carbon emissions and produce hardwood for environmentally sustainable buildings, but they are not being used effectively for these purposes at present. Liberal Democrats would therefore amend Inheritance Tax relief so that it would only apply to sustainable forestry, as defined by the Government's sustainable timber procurement criteria, and review other incentives to promote sustainable and managed forests and woodland.

## 4. Shifting to Low Carbon Technologies

- 4.0.1 The second element in our mitigation policy framework is a programme of measures to encourage the shift to low carbon technologies, especially in the areas of energy and transport.
- 4.0.2 The UK urgently needs to develop a portfolio of low-carbon technologies. Many are ready for deployment while others are at a far earlier stage in development. The new technologies could also be the basis for a new industrial revolution. Markets for low-carbon technologies will be worth at least \$US500bn by 2050, and perhaps much more, and Britain could be a leader in this new global market.
- 4.0.3 The policy framework for encouraging emissions reductions set out in this paper, including our carbon pricing policies, will provide incentives for businesses and universities to develop real solutions for climate change. Businesses and individuals will be encouraged to take least cost actions, such as improving energy efficiency. On its own this will not be enough. Other policies are needed to overcome a number of market barriers to the full development of low-carbon technologies. For example, energy technologies can take some years, if not decades, to become commercially viable, which creates a financing gap between the cost of Research and development (R&D) and returns to the company. Investors have tended to overestimate the costs of new technologies and assumed, incorrectly, that costs in the future will be the same today. This tends to lock them into existing, high-carbon technologies. Other barriers can include the lack of reliable financial support through government policies and political risk.
- 4.0.4 Non-market barriers must also be addressed. For example, delays in securing planning permission can slow down some renewable energy developments (particularly in wind) and significantly increase costs or, in many cases, prevent investments taking place. Liberal Democrats would:
- Increase support for research and development and demonstration, recognising that some of this has to be done by government and some by the private sector.
  - Provide focused, market-based incentives (such as price guarantees) for the deployment of clean, low-carbon energy, heat and transport technologies.
  - Tackle non-market barriers to the development of clean, low-carbon technologies, including land use planning, the role of electricity grids and constricted rail network capacity.

### 4.1 Promoting Innovation

- 4.1.1 Liberal Democrats believe that, in addition to setting the long-term framework for encouraging emissions reductions, the role of government should be to support basic research and early-stage technologies. We would:
- Increase funding for basic research on climate change and low carbon technologies in universities and in Research Laboratories through the Research Councils.
  - Work with universities and the energy industry to increase the number of science and engineering graduates and staff qualified in relevant disciplines.
  - Support international cooperative research, including through European research funds and the new UN Climate Fund.

## **4.2 Promoting Clean, Low-Carbon Sources of Electricity and Heat**

- 4.2.1 Electricity supply accounted for 31 per cent of UK carbon dioxide emissions by source category in 2005. The main sources of UK electricity were gas (39 per cent), coal (33 per cent), nuclear (19 per cent), renewables (just over 4 per cent) and imports and storage and other sources (4 per cent). It is clear, therefore, that low carbon energy sources must be developed, so that they play a much greater role in the energy mix. Liberal Democrats would set a target for 30 per cent of the UK's electricity to come from clean, non-carbon emitting sources by 2020, rising to 100 per cent by 2050. We would also set targets for increasing the amount of heat produced from renewable sources, including gas (i.e. biogas from animal by-products and organic waste). By 2050, all gas used in heating should be from such sources and therefore zero carbon.
- 4.2.2 We would reform the electricity markets, to provide incentives to save carbon. At the moment, available electricity capacity is brought on line by the grid simply in order of price charged. Once there is a more mature market for renewable electricity, Liberal Democrats would ensure that the grid brings available generating capacity on line in order of the cost of carbon saved when electricity is generated.

### ***Renewable Energy***

- 4.2.3 The UK has great potential for developing renewable sources of energy. This country has considerable wind, tidal and marine energy resources, as well as land resources for biomass production. Recent studies have suggested that, in time, renewable resources could supply all the UK demand for electricity.
- 4.2.4 The Government has a long-standing target that 10 per cent of the UK's electricity should come from renewable sources by 2010, with an 'aspiration' that this should rise to 20 per cent by 2020. The March 2007 European Council target that 20 per cent of overall EU energy consumption should come from renewable energies by 2020 translates to around 34 per cent of UK electricity consumption. At the moment, renewable energy sources account for just over 4 per cent of the UK's electricity consumption, leaving this country lagging well behind many others in Europe.
- 4.2.5 The Labour Government's Renewables Obligation (RO) has increased the share of electricity generated from existing, mature renewable technologies, failed to encourage technological development, delivered poor results in relation to its cost and exposed investors in renewable energy projects to significant regulatory risk.
- 4.2.6 Liberal Democrats would work to increase the penetration of renewables, recognising that achieving the targets will rely on the mixing of different technologies. We would introduce 'feed-in' tariffs, which would guarantee minimum prices to generators of particular forms of renewable electricity for the power that they produce. Each renewable generation technology could be eligible for a different price. Feed-in tariffs are the most effective way of developing mature markets for a range of renewable energy technologies. Those countries that have used feed-in tariffs - Denmark, France, Germany and Spain - have seen the largest growth of renewable electricity and the establishment of viable renewable energy manufacturing industries. By guaranteeing a fixed price for the power fed into the grid over a certain period, feed-in tariffs would provide investors with more long-term stability of income than the RO. Over time, feed-in tariffs would replace the RO.

**Renewable Heat**

- 4.2.7 Heat accounts for nearly half of total carbon dioxide emissions. Just under half of all the UK's energy use and nearly 90 per cent of domestic energy use is for heating purposes.
- 4.2.8 Renewable heat supplied from sources could play a major role in reducing emissions. Research by the Energy Saving Trust has found that biomass heating could reduce UK household carbon emissions by 3 per cent. The Carbon Trust has estimated that the maximum carbon savings from solid biomass sources are around 5.6 MtC per annum (equivalent to nearly half the current annual emissions from the agriculture and land use sector), if the material was combusted in larger boilers. The potential carbon savings from all biomass energy sources are estimated to be considerably higher, at over 10 MtC. Greater use of microgeneration could result in a much more efficient uses of gas. The government has acknowledged that, depending on the size of plant, good quality CHP may provide efficiency savings of between 7 and 30 per cent compared to gas-fired generation. Community heating (or district heating) - the production of heat at a central source and then its distribution to a network of close-by buildings via a heat mains - is one of the most effective ways that sustainable heat technologies can be used. However, renewable heat accounts for just 0.6 per cent of the UK's total heat supply.
- 4.2.9 The barriers to renewable heat differ from technology to technology and may include the lack of a carbon price; capital costs; lack of access to capital; a lack of long-term revenue support through the EU ETS or the Renewables Obligation; lack of awareness in the construction and supply sectors (in the case of biomass fired systems), challenges associated with securing local planning consents, fragmented supply chains (biomass), fuel supply risks (biomass); access to capital for business growth (due the pattern of grant support from government), and the costs of establishing the supporting infrastructure and networks to support renewable heat supply.
- 4.2.10 Where policy mechanisms are introduced, they should be designed to reflect the specific circumstances of the sectors or markets in which they are applied. Such mechanisms may be needed to facilitate early-stage investment or overcome particular technical or regulatory hurdles. Liberal Democrats would:
- Develop stable new incentive mechanisms for particular renewable heat technologies, including using grants to facilitate technology development, reflecting the specific circumstances of the sectors or markets in which they are applied.
  - Actively investigate options for a long-term financial incentive framework to promote renewable heat technologies and community heating schemes, including a renewable heat obligation, which would require energy suppliers to source a percentage of heating fuel from a range of renewable sources.
  - Use planning policy to facilitate the use of renewable heat.
  - Continue current schemes aimed at addressing supply chain problems and building critical mass in the biomass sector.

**Microgeneration**

- 4.2.11 Recent research by the Energy Saving Trust indicated that microgeneration technologies for electricity, such as solar and micro-wind, could cut UK carbon emissions by around 15 per cent. The barriers include: conflicting incentives on

Distribution Network Operators (DNOs) to connect microgenerators; a lack of fairness in the way microgenerators are remunerated for the electricity that they export to the grid; cost; a lack of support for some technologies under the Renewables Obligation; and lack of continuity in government funding. The Labour Government's small-scale and underfunded grants programmes have proved inadequate as a way of fostering the transition to a more mature market for microgeneration.

4.2.12 In addition to measures described in paragraph 4.2.10 above, Liberal Democrats would use 'feed-in' tariffs to require utilities to pay preferential minimum prices for electricity produced by small-scale, domestic microgeneration. This could mean that such microgenerators received a return four times greater than the cost of electricity imported from the grid. Below we set out how Liberal Democrats would address the key technical and regulatory barriers to renewable energy, renewable heat and microgeneration.

### ***Promoting Decentralised Electricity and Heat Production***

4.2.13 A decentralised model of electricity and heat production would involve a wide spectrum of differently sized generating plants, closer to the point of demand, and including a large element of home and workplace based microgeneration (see above). However, such technologies tend to have relatively high capital costs and the rewards for exporting excess electricity produced by distributed generators are seen as too small.

4.2.14 There are industry barriers as well. The current centralised electricity system and the incentives for DNOs work against distributed generation, such as CHP and microgeneration. Transmission lines are active, with electricity flowing in two directions but distribution lines are largely designed to be passive, with security based on a downward flow with very limited two directional flows. There are physical limits to the amount of decentralised energy production that the system can bear. The current market structure for electricity is intended to protect the system from failure and so treats decentralised production as a threat to be managed rather than as an opportunity. DNOs are rewarded mainly for electricity throughput rather than for connecting more distributed forms of generation.

4.2.15 Liberal Democrats would actively promote more decentralised energy systems, in which district heating schemes, local power generation and microgeneration would be a major element. We would:

- Lead a strategic review of the electricity transmission network and distribution grids and their long-term investment needs, with the aim of enhancing the role of distributed generation and supporting the development of large-scale renewable projects.
- Step up Ofgem's work to ensure that DNOs are better rewarded for connecting more distributed generation, without charging excessive amounts to connect small-scale generators to the grid.
- Encourage Ofgem's work to reduce losses from the distribution networks, which currently stand at seven per cent, thereby providing DNOs with further incentives to connect small-scale generators.
- Promote dynamic demand technologies, smart metering and other technologies that facilitate more effective balancing of supply and demand – by, for example, giving the government powers to set standards for such technologies.

- Promote 'smart grids' that will encourage DNOs to use more active distribution line.
- Encourage the energy regulator to promote innovative projects by network operators, that will facilitate decentralised energy production.
- Review Ofgem's standard terms and conditions to ensure that they do not impose onerous conditions on micro - generators to guarantee supplies to the grid.

### ***Land Use Planning***

4.2.16 The time taken to secure planning consent is a major obstacle to the full deployment of many renewable energy technologies. Around 8,000 MW of onshore wind, potentially representing 6 per cent of UK electricity supplies is currently held up in the planning system. In some respects, this is addressed by the proposals in the Government's Planning White Paper. However, Liberal Democrats have serious concerns about some of the proposals – for example, the abandonment of site inquiries for large energy projects.

4.2.17 Liberal Democrats would reform the planning process for major clean energy projects while adhering to our long-standing principle that planning decisions should pay more attention to local wishes. We would:

- Remove any need to repeat fundamental arguments about the merits of individual clean electricity sources.
- Retain the scope for site specific enquiries, so that local communities retain complete control over the siting of renewable projects.
- Use standards in building regulations for the thermal performance of buildings and, through the planning system, to require the use of low carbon energy and heat sources in major new developments.
- Allow local authorities to put in place policies to maximise the on-site capture of renewable energy in commercial buildings, providing that the developer can show that this does not invalidate the lifetime viability of the building.
- Maximise local community benefit by encouraging, where appropriate, renewables schemes in which the local community has a share in the ownership and profits or benefits from reduced energy prices, for example through part-ownership by a community trust.

## **4.3 Carbon Capture and Storage**

4.3.1 Even with the policy actions we propose, it will take a long time to transform an energy system that is based almost entirely on non-renewable sources to one that is completely renewable. Transitional technologies will be needed.

4.3.2 According to the IPCC, carbon capture and storage (CCS) could reduce carbon dioxide emissions from fossil fuel power stations by as much as 90 per cent. Given that it allows continued use of gas and coal fired power stations, which are flexible in output, CCS is ideal to use in conjunction with some forms of renewable energy, such as wind power. The immediate challenge for the UK is to demonstrate the use of CCS on a commercial scale. The Labour Government has failed to deliver on the deployment of CCS. The Energy White Paper (2007) announced that the much-vaunted competition framework for the UK CCS demonstration had been put off until November 2007.

4.3.3 Liberal Democrats would:

- Actively support the March 2007 European Council decision that Europe should aim for all new fossil fuel generation built after 2020 to be equipped with CCS.
- Make the funding of a CCS demonstration in the UK a priority.
- Investigate the development of incentive schemes, to facilitate the quick and commercially viable deployment of CCS.

#### **4.4 Nuclear**

4.4.1 Liberal Democrats oppose the Labour Government's plan to build a new generation of nuclear power plants. Nuclear power remains an excessively expensive form of energy generation that requires some type of public subsidy, if only to place a cap on liabilities. Building a new round of nuclear power plants will lock this country into centralised and inflexible electricity generation, crowd out investment in renewable energy, microgeneration and CCS and undermine our efforts to promote energy saving. Nuclear generation will continue to produce toxic waste for which there are still no safe and acceptable solutions.

4.4.2 The worldwide growth in civil nuclear generation creates obvious risks of nuclear weapons proliferation by states and the loss of fissile material to terrorist organisations. The UK's credibility in opposing such moves will be undermined if this country builds a new round of civil nuclear power stations.

#### **4.5 Promoting Low-Carbon Transport Technologies**

4.5.1 Within the road transport sector, there are several technologies which can have an immediate and short-term impact on reducing vehicle emissions. There are, however, a number of barriers to entry, including limited initial demand and high capital costs of emerging technologies.

4.5.2 The Renewable Transport Fuel Obligation (RTFO), sets a target for 2010 of 5 per cent of all road fuels from suppliers to be provided by biofuels from 2008. However, without imports, this is unlikely to be met due to a lack of refinery capacity within the UK. Weak targets set by Government for the early stages of the Obligation have failed to incentivise the development of the supply chain. Consequently, the Government's target for 5 per cent of road transport fuels from renewable sources by 2010 may not be met.

4.5.3 Liberal Democrats would increase the RTFO to require at least 10 per cent of all fuel sold on UK forecourts to come from renewable sources by 2015. This would require safeguards to ensure that fuels do not come from crops which have displaced rainforest and other valuable natural habitats and carbon sinks. Full certification is needed. We support a robust certification scheme for all sources of biomass and biofuels used within the EU. In the longer-term, second generation biofuels, which do not have these concerns, may be able to play an even greater role and we would investigate the most appropriate future market mechanisms. A combination of agricultural reforms (supported by Liberal Democrats) and increased demand through biofuel production will inevitably raise world market prices for agricultural commodities. To minimise the risk of food shortages in developing countries it will be necessary to adopt policies such as prioritising the aid budget on stimulating indigenous food production and avoiding excessive incentives at home to convert food crops into biofuels.

4.5.4 At EU level, there has been a voluntary agreement with manufacturers to reduce average emissions for new cars. However, the target for 2008 of 140g/km will not be met and current proposals from the Commission set an overall mandatory target

of 130g CO<sub>2</sub>/km by 2012 with an additional 10g CO<sub>2</sub>/km to be delivered through a range of other measures, including biofuels. The Government announced in Budget 2007 its longer-term objective to reduce average new car emissions to 100g of CO<sub>2</sub>/km.

- 4.5.5 Liberal Democrats would press for the introduction of mandatory requirements to limit average emissions from all new cars placed on the EU single market to 120g CO<sub>2</sub>/km by 2015 and 95g CO<sub>2</sub>/km by 2020 through technical improvements alone. We also support a target of zero carbon for all new cars by 2040 and an effective system of penalties and incentives to ensure compliance. We will seek to achieve further emissions reductions by:
- Placing pre-approval restrictions on the power of vehicles, to curb the tendency towards building fuel-inefficient vehicles.
  - Promoting mandatory fuel economy labelling in all car advertising.
- 4.5.6 We would also extend targets to all other vehicles, to ensure that by 2050 all freight vehicles are running on electricity, biofuels or other renewable fuels. We would focus initially on policies to extend the use of zero-carbon urban delivery vehicles, such as those which have been trialled in central London.

## **4.6 Promoting Low Carbon Agricultural Technologies**

- 4.6.1 Farming is responsible for nearly 8 per cent of the UK's greenhouse gas emissions. Agricultural processes both release and absorb greenhouse gases - emissions mainly result from digestive processes in animals, animal wastes, fertiliser use and land use change.
- 4.6.2 Two thirds of the UK's nitrous oxide emissions, a greenhouse gas 310 times more potent than carbon dioxide, come from agriculture, partly from livestock manures but mainly from the use of artificial fertiliser. More than one third of the UK's methane emissions, a greenhouse gas 21 times more potent than carbon dioxide, come from livestock and livestock manures.
- 4.6.3 Some technological solutions are available but the Government has failed to make use of them. Bioenergy offers massive opportunities for saving carbon. UK biofuels offer clear emission savings relative to fossil fuels and accounting for current export surpluses of cereals and oil seed rape could cover the full 5 per cent target. Biomass can contribute towards crucial 'base-load' heat and electricity generation. However, the Labour Government is failing to focus the industry on emission savings and provide the support it needs to play its part.
- 4.6.4 Anaerobic digestion of slurries could capture methane to generate renewable energy, and produce soil-conditioning fertiliser with reduced odour, and lower bacterial load than un-processed waste. However, the UK has only thirty on farm digesters (compared to 2500 in Germany) and there is little financial or other support available.
- 4.6.5 Over four million tonnes of wood go unharvested every year in the UK's forests and the Government has set targets to reduce this to two million tonnes only by 2020. This is not ambitious enough, given that a vital resource is available immediately. If all of the four million tonnes were used this would be enough energy to power half a million households and cut carbon emissions by 0.8MtC.
- 4.6.6 Liberal Democrats would set up a new 'Agricultural Energy Saving Executive' (AESE) within DEFRA to encourage, advise and provide direct funding support for

rural energy saving initiatives. This would focus on research and advice into issues including: reducing fertiliser use and emissions; ploughing depth and other land use practices to minimise soil carbon loss and fix carbon; reducing emissions and costs of fuels and energy for farm vehicles and within farm buildings, including promotion of microgeneration, energy efficiency and greener vehicles.

- 4.6.7 We would develop a sustainable biogas industry by supporting increased country-wide use of anaerobic digestion for household, catering and farm waste, setting a strategy to maximise the numbers of digesters being used by 2015 and developing infrastructure to encourage use of digestate as fertiliser.
- 4.6.8 Liberal Democrats would develop a strategy to make full use of wasted agricultural and forestry resources such as straw and forestry offcuts.
- 4.6.9 Liberal Democrats would work to reduce methane emissions by funding and applying research in new diets for livestock.
- 4.6.10 We would promote the efficient use of inputs of fuel, feed and nitrogen in the agriculture sector by pursuing relevant R&D priorities and effective knowledge transfer. Agricultural soils form an important carbon store and the expansion of multi-annual biomass crops will result in additional sequestration. We will seek to increase the potential of soil as a carbon sink by promoting responsible soil management using Soil Management Plans.

## 5. Promoting Changes In Behaviour

5.0.1 The third element in our policy framework is measures to encourage long term changes in behaviour. In particular, we want to encourage people to use energy in more efficient ways. Our policies aim to overcome market failures that impede such changes in behaviour. Such measures must work in a cost-effective way, delivering results that cannot be achieved by carbon pricing.

5.0.2 The main elements of our policy response are:

- Market mechanisms – to give people and businesses incentives to change their behaviour. Examples include our proposals to: reform and strengthen the EU Emissions Trading Scheme; reform the Energy Efficiency Commitment/Carbon Emission Reduction Target; reform VED to encourage people to switch to lower emissions vehicles; and replace the Air Passenger Duty with a pollution charge covering both passenger and freight flights.
- Regulation – to stimulate investment by removing uncertainty and transaction costs for investors or increasing the commercial risks of inaction and create scale economies for strategically important technologies. Examples include: tougher performance standards the strengthening of buildings and land-use planning regulations and mandatory UK/EU average vehicle emissions targets for new cars.
- Information – to raise awareness of the full energy costs and climate impacts. Examples include performance labels, ‘smart’ energy meters, Energy Performance Certificates and dissemination of best practice.
- Financing – to accelerate the uptake of energy efficiency in the public and private sectors. Examples include energy service contracting and public procurement policies.
- Market information – to help business respond to market pressures with advice and information. Examples include improving public and company information, including establishing clear guidelines for companies reporting on greenhouse gas emissions.

### 5.1 Energy Efficiency

5.1.1 Energy efficiency is a vital area of our strategy to mitigate climate change. Study after study has shown investments in energy efficiency to be more cost-effective in terms of reducing carbon emissions than any form of low-carbon generation. The Energy Saving Trust has shown that since 1970, doubled energy efficiency from households reduced carbon emissions by 28MtC per annum and saved consumers £10 billion every year. This is three times the saving from the whole nuclear industry and almost as much as the total emissions from the UK’s coal-fired power stations. Efficient energy use also saves people and businesses money, creates jobs and helps to make industry more competitive. Energy efficiency measures can improve the quality of housing and provide older and vulnerable people with warm, comfortable homes.

5.1.2 The Carbon Trust has shown that the market barriers and failures that prevent people from taking action on energy efficiency may include investment costs, ‘hidden’ costs (research and information costs), lack of information about available options and inertia and lack of interest. Carbon pricing and measures to promote particular technologies will be important but not be sufficient to overcome these barriers.

5.1.3 The Government has promised a great deal on energy efficiency but delivered very little. The 2003 Energy White Paper included an objective of doubling the rate of energy efficiency improvements. This has not been achieved. Liberal Democrats would provide the decisive leadership, comprehensive package of fiscal and regulatory policy instruments and joined-up action that is needed.

### **Household Sector**

5.1.4 The household sector accounts for 27 per cent of the UK's greenhouse gas emissions. Energy efficiency measures offer people the prospect of greater warmth and lower heating costs but they are not taken up. For instance, five million houses with cavity walls still do not have wall insulation. Unfortunately, successive Labour and Conservative governments have not even tried to achieve international standards of home energy efficiency. As a result, ordinary consumers pay high prices for the same warmth that costs far less in other countries.

5.1.5 The state of our housing stock is a source of social unfairness. Among the poorest 10 per cent of households, the use of energy varies by a factor of six. This is caused by differences in the age and efficiency of hot water and heating systems. Another reason is that older buildings tend to be less energy efficient. Consequently, the price of energy – or using taxes to lift prices – cannot fairly be used to spur energy efficiency. Direct measures are required. Liberal Democrats would set national targets to reduce carbon dioxide emissions from the UK's housing by at least 60 per cent by 2050 by energy efficiency measures. Further savings would be achieved by other means, eg. microgeneration.

### **New homes**

5.1.6 New buildings in Britain still lag behind the energy efficiency standards applied on the continent. The Government has raised the energy efficiency standards in the building regulations in England but these efforts started from an extremely low base. Building regulations are still principally designed to ensure that new homes stand up, rather than to ensure energy efficiency. Their complexity and lack of transparency still make it hard for building control officers to assess if they are being met.

5.1.7 Liberal Democrats would cut carbon emissions from new buildings by 95 per cent compared with our existing housing stock by ensuring that all new homes have to be built to the GreenHouse standard no later than 2011. GreenHouse standards for new homes are modelled on Germany's tried and tested PassivHaus standards. They are the best known standard for building homes that require no fossil fuels for their space heating, and are thus zero carbon except for water heating and appliance use. These standards pay for themselves in energy savings, so that any extra cost in mortgage to pay for the extra capital element of the home would be more than recouped in lower energy bills. We also propose that the GreenHouse standard should be upgraded in line with best practice with the aim that new homes should have a zero-carbon space and water heating requirement from 2015. Liberal Democrats would:

- Improve the thermal efficiency standards in building regulations for new homes so that all new homes would have to be built to the GreenHouse standard no later than 2011.
- Use the Sustainable and Secure Buildings Act 2004 to upgrade the thermal efficiency requirements in Building Regulations, based on pilot schemes in selected volunteer local authority areas, beginning in 2007.

- Make the building regulations themselves easier to understand.
- Improve the enforcement regime to ensure new homes are built to the required standards.
- Allow local authorities to set higher standards where they believe them to be appropriate and feasible.

### ***Upgrading existing housing stock***

5.1.8 Three quarters of the housing stock that will be used in 2050 has already been built. The key to reducing household carbon emissions is to improve the existing housing stock. However, householders are not convinced that insulation packages can really work or that they can rely on real savings; there is a lack of available finance; and energy companies' incentives are based on selling more energy rather than saving it. Warm Front, the Government's current programme, will take 125 years at present rates to carry out the level of refurbishment that is needed.

5.1.9 Liberal Democrats would ensure that the housing stock is completely updated by the year 2050. We would bring in WarmHomes packs, to take a whole house approach with combinations of loft, roof and floor insulation, draught proofing plus window, heating, appliance and lighting renewal. We would aim to improve around one million homes by the year 2011. The other main features of WarmHomes are as follows:

- Different packages designed for different construction types such as cavity walled or solid walled properties.
- Enhanced consumer confidence, through specially designed packages that are initially based on the Energy Savings Trust Best Practice Standards and deliver real cuts in energy use.
- Better enforcement of building regulations, with random inspections and tough penalties on contractors who do not deliver.
- Householders could typically receive a £2000 subsidy paid through the energy companies to help meet the cost of installing WarmHome packs.
- There would be loans for WarmHomes in the form of 'energy mortgages', to enable people to use the savings from their lower energy use to pay back through their quarterly energy bill the cost of the package.
- A requirement on energy companies to install the packages at a commercial interest rate, upon request.

### ***Transforming energy companies into energy service companies (ESCOs)***

5.1.10 The Energy Efficiency Commitment (which the Government is renaming the Carbon Emission Reduction Target after 2008) imposes a statutory obligation upon electricity and gas suppliers to meet a target for the promotion of improvements in energy efficiency among household consumers. These can include the promotion of measures such as cavity wall and loft insulation, energy efficiency light bulbs, boilers and appliances. EEC has been moderately successful but the reality is that energy companies' main incentive is to make higher profits by selling more energy – and creating more carbon emissions.

5.1.11 Liberal Democrats would provide energy companies with incentives to make more money by selling less energy. We would reform the Energy Efficiency Commitment so that the amount of energy that energy companies could sell to residential housing gradually reduces from year to year. We would allocate each company a total quantity of energy sales to residential customers depending on past sales and

this would decline each year, allowing some flexibility in the event of major variations in climate conditions. If the energy company sold more than its allocation, it would have to buy that allocation from someone else. If it sold less, it could sell part of its own allocation for profit. This would ensure that energy companies sought the most efficient ways of reducing their carbon emissions. In order to encourage strong and continued competition among utilities, each company's allocation would be adjusted when it gained or lost customers.

### ***Tackling fuel poverty***

- 5.1.12 The Government's schemes to improve household energy efficiency have concentrated on reducing fuel poverty and failed fully to address efficiency. The main programme is Warm Front. Eligibility is mainly decided by access to benefits (though it was expanded in 2005). The National Audit Office (NAO) has found that around a third of those who are fuel poor (defined as spending more than 10 per cent of income on energy) may not be eligible as they are not on benefits, while between 40-70 percent of those who are eligible are not fuel poor. As a result, homes are not targeted either for their lack of energy efficiency or because their occupiers are fuel poor.
- 5.1.13 Liberal Democrats would ensure that measures to tackle fuel poverty give the highest priority to improving the energy efficiency of the homes of those on benefit and who are spending more than 10 per cent of their disposable income on energy. We would fully subsidise the cost to energy companies of packages to people suffering from fuel poverty.
- 5.1.14 Liberal Democrats would make available part of the allocation of grants under the WarmFront scheme to encourage non-network homes to install WarmHome packages, and also to connect to the gas mains.

### ***EU Action***

- 5.1.15 Regulation and other initiatives at the level of the European Single Market are essential to achieving a lower carbon economy. Under the terms of the 2005 Eco-Design and Energy-Using Products Directive, the EU is carrying out technical studies into the energy efficiency of boilers, water heaters, personal computers, imaging equipment, consumer electronics, battery chargers, office lighting, street lighting, air conditioning equipment, electric motors, refrigeration equipment, dishwashers and washing machines. First results are expected shortly. Liberal Democrats will press for minimum efficiency standards to be applied to all such products sold within the EU single market. We support the prohibition of standby and off-mode equipment and will work for the extension of energy-efficiency labelling to all electrical appliances.

## **5.2 Commercial and Public Sectors**

- 5.2.1 The business and public sectors account for around one-third of UK greenhouse gas emissions. According to the Carbon Trust, existing technological and energy efficiency measures can be used to deliver carbon abatement on a cost effective basis, to reduce emissions by 2020 by at least 12 per cent across manufacturing processes in the large energy-intensive users and 20 per cent in non-domestic buildings-related energy use.
- 5.2.2 Businesses are now taking more action to improve their energy efficiency and contribute to emissions reductions. However, there are a number of barriers that public policy needs to address. These include: financial cost/benefit considerations that define rates of return on a carbon abatement investment; 'hidden' costs, for

example, perceived risks of poor performance; market failures, for example, primary metering, where utilities have insufficient incentives to encourage consumers to monitor their energy usage; and organisational factors, such as inertia and a tendency to disregard small opportunities.

5.2.3 These barriers are not being addressed by existing government policy. For example, the cost/benefit considerations could be addressed by the EU Emissions Trading Scheme. However, the EU ETS is focused on large, energy-intensive industrial facilities and not on other manufacturing emissions. The Climate Change Levy may not alter the behaviour of non-energy intensive organisations and does not address market failures or organisational and behavioural barriers. The definitions used in the Energy Performance of Buildings Directive are unduly restrictive and the enforcement of building regulations has been uneven. The Carbon Trust currently does not work with businesses with an energy bill of under £50,000 per year which leaves a significant gap. Liberal Democrats would:

- Promote revisions to the EU ETS, including expanding its coverage to cover a wider range of sectors and greenhouse gases.
- Extend the coverage of the Carbon Reduction Commitment (CRC), the proposed new UK mandatory trading scheme, by applying it to organisations whose mandatory half hourly metered electricity consumption is greater than 3000 MWh a year (as opposed to 6000 MWh a year as the Government proposes) and bring in a full auctioning of allowances.
- Introduce a version of Energy Efficiency Commitment/Carbon Emission Reduction Target for those businesses paying the Climate Change Levy at 100 per cent (or in future our proposed carbon tax).
- Improve the information available to commercial users about their energy use by rolling out the development of smart metering.
- Extend energy efficiency labelling requirements across business and public sector-related products.
- Merge the Energy Savings Trust and the Carbon Trust into a single Sustainable Energy Agency responsible for promoting energy efficiency, providing advice on best practice in energy efficiency and environmentally friendly technologies and allocating capital to new energy technology businesses, including funding specialist investment funds.
- Require all public companies to report annually on their energy consumption and set public targets for improvements.

### ***Small Businesses***

5.2.4 Small and medium sized enterprises (SMEs) account for around 7 per cent of total UK emissions. According to the Federation of Small Business, about 40 per cent of SMEs have yet to take any action to increase their energy efficiency.

Liberal Democrats would:

- Reduce the minimum level for interest free energy efficiency loans to £1,000.
- Develop a single access point for advice to improve SMEs' resource efficiency, covering energy, waste, water and sustainable transport. Recent HM Treasury research shows that larger businesses are more likely to seek separate specialist advice for the various resource streams - waste, energy, water and material use.

- Work for the swift roll out of smart metering, in order to increase individual business' awareness of usage and potential energy savings. SMEs are not energy-intensive and the cost of energy is thought to be less important than other business pressures. Many do not know how much they spend on energy as they have estimated bills and in many cases the utility bills are dealt with by their landlord or by another office.

### ***Public sector***

5.2.5 Most public sector emissions are buildings related. The public sector accounts for more than one third of non-domestic building construction. The total floor area of public sector buildings is growing at nearly 2 per cent per year and can, therefore, lead carbon emissions reduction. Liberal Democrats would:

- Improve governance, compliance and reporting with energy efficiency standards in the public sector.
- Reform public sector procurement guidelines to bring in a Code for Sustainable Buildings, with standards higher than the 2005 Building Regulations.
- Require all public bodies only to build, purchase or lease new buildings meeting the highest BREEAM efficiency standards and use central government funding to ensure that local government buildings meet these standards.

## **5.3 Planning**

5.3.1 Liberal Democrats would:

- Strengthen building regulations, by fully implementing the Energy Performance of Buildings Directive and ensure better enforcement of building regulations.
- Encourage local authorities to adopt policies that insist on a high energy performance score, using the BREEAM assessment system, (unless the developer can prove that achieving such a standard would make construction not viable).
- Encourage local authorities to also have related policies to maximise the on-site capture of renewable energy and heat, where the developer can show that this does not invalidate the lifetime viability of the building.
- Empower local authorities to attach conditions to require multi-tenanted commercial buildings to provide individual fuel bills entirely based upon actual rather than averaged consumption.

## **5.4 Transport**

### ***Promoting a Shift from Road and Air to Rail***

5.4.1 Rail is responsible for just 1 per cent of total UK carbon emissions. Emissions per passenger kilometre from rail produce much lower emissions, on average, than journeys by car or air. Moreover, tonne for tonne, rail freight produces 90 per cent less carbon dioxide than road transport.

5.4.2 Rail therefore has a great opportunity to reduce carbon emissions. A major barrier, however, is the capacity of the existing network. Demand for rail travel is growing each year. Britain has seen a 40 per cent increase in passenger kilometres travelled by rail since 1996, rail freight has grown by 66 per cent in the last decade and the Government's own figures forecast a 30 per cent growth in rail passenger

miles by 2016. The network will reach 'capacity' by 2015. Another is that the costs of travelling by rail are still too high compared to other modes of transport.

- 5.4.3 Liberal Democrats would promote a shift from road and air transport to rail. We would introduce a presumption against the building of new roads where there is no overall environmental and social benefit and shift the balance of spending from roads to rail and other public transport within the existing budgets for transport. We would set up a Future Transport Fund to be a catalyst for additional investment in key rail and light rail improvements and extensions and, in the short run, to reduce the cost of fares. To provide the endowment for the Future Transport Fund, we would charge road freight on a pay per mile basis, varying according to emissions, similar to schemes that currently operate in Germany, Austria, Switzerland and the Czech Republic. Distance charges on road freight would provide an incentive for freight to shift to rail and short sea and canal trips. We would also use a climate change charge on air flights within the UK, exempting 'lifeline' flights (see paragraph 3.2.12). This would make available an estimated £12 billion by securitising the receipts over 30 years.
- 5.4.4 The Future Transport Fund will operate in a similar way to the former Rail Passenger Partnership, used as a lever for matching and/or additional public investment from local authorities and private investors.
- 5.4.5 The Fund's board would have complete flexibility about the best ways to catalyse speedy investment. This could take the form of guarantees of borrowing by Network Rail or specific consortia, of low interest and deferred interest loan stock, of equity stakes or of subsidy or any mix of this or other financial instruments.
- 5.4.6 The Future Transport Fund would be required to support schemes which deliver best value carbon reductions, on the basis of full cost and environmental assessment. Subject to assessment, these could include removing bottlenecks, building road-rail freight transfer depots, funding light rail systems, reopening closed lines, extending electrification and building a high-speed north-south rail link. In considering any extension to High Speed Rail Services, it would be best to start incrementally from the London end of the Channel Tunnel High Speed Link. This would make fast journeys possible to and from Paris, Brussels and the rest of Great Britain.
- 5.4.7 In the longer term, high-speed rail would be extended to an east-west corridor while a dedicated freight line – along the lines of the 'Central Railway' and 'Direct Link North' proposals could further increase the capacity to shift freight by rail rather than road.
- 5.4.8 Given the increase in rail use, much of what is proposed may be commercially viable and financeable. Our proposals would ensure that the investment is undertaken as a matter of urgency, with some subsidy if required.

### ***Promoting Sustainable Local Transport, Walking and Cycling***

- 5.4.9 The Tyndall Centre has concluded that a third of the reduction in carbon emissions from transport by 2050 could come from a switch to public transport, walking and cycling, as well as measures to reduce the need to travel by car. Since 1997 the time spent walking and cycling has decreased by nearly 10 per cent, bus use has declined while the amount of time people spend travelling by car has increased. Liberal Democrats would reverse this trend by:

- Including the promotion of safer cycling and walking in all local transport plans.

- Promoting ‘Liveable Cities’ with requirements for decentralised public services like schools and hospitals and safe walking and cycling routes in new developments.
- Requiring train and coach operators to accommodate bicycles on all new vehicles, and improving cycle storage and parking at stations.
- Providing personal travel advice and promotional activities on walking, cycling and bus alternatives.
- Giving local areas more power over the licensing, regulation and funding of bus services, which will allow them to invest in developing bus routes and community transport services.

## **5.5 Encouraging Action by Individuals**

5.5.1 Individuals, households and communities all have a crucial role in tackling climate change. Liberal Democrats recognise that government should establish a framework that encourages people to take action to reduce their personal carbon footprints. Proposals in this paper that will provide such support include our proposals to encourage household energy savings, raise building standards so that more homes are zero carbon, ensure that energy generating householders (through microgeneration) are fairly rewarded, make cars more fuel-efficient, invest in high speed rail and improve rail and light rail networks.

### ***Carbon Offsetting***

5.5.2 One role for government is to ensure that market solutions can provide genuine ways to mitigate climate change. Carbon offsetting, for example, involves calculating emissions and then purchasing equivalent credits from emission reduction projects that have prevented or removed the emission of an equivalent amount of carbon dioxide somewhere else. This is a useful way of compensating for emissions produced with an equivalent carbon saving, lessening the impact of a consumer’s actions.

5.5.3 Consumers should have an assurance that when they offset their emissions, the money is spent on projects that effect real carbon dioxide emission reductions. Liberal Democrats support moves to introduce a voluntary standard and code of practice and, if those prove to be ineffective, will investigate other options.

### ***Personal Carbon Allowances***

5.5.4 Proposals for personal carbon allowances involve using a national emissions cap and allocating emissions rights, as carbon credits, across the population as a whole. People would give up their credits when they bought electricity, gas or transport fuel. The allowances would be tradable: people who wanted to emit more could buy credits from those who emit less.

5.5.5 Such a proposal has a number of advantages. In conjunction with other measures they could guarantee a certain reduction in carbon emissions. At the same time, some important issues need to be resolved. For instance, such a scheme could exacerbate fuel poverty, at least until our proposals for energy efficiency had taken effect.

5.5.6 Liberal Democrats would examine the potential benefits of introducing a system of tradable personal carbon allowances, including the implications for carbon savings, fuel poverty, civil liberties and the public finances.

## 6. UK Adaptation To Climate Change

6.0.1 It is clear that the world's climate is already changing and some further change cannot be avoided. The Earth has already warmed by 0.7° C since around 1900. Even if all emissions stopped tomorrow, the Earth would warm by a further 0.5 – 1° C in coming decades. These changes are having profound effects on the environment. Water supply has been affected. In the summer of 2006, hosepipe bans affected 13 million people in the south-east of England. Flood risk is increasing. In 2000 the UK experienced its wettest autumn for almost 300 years with costs over £1.3bn, and in 2007 its wettest ever July with costs estimated at over £3bn. There is every indication that these and other effects will become more serious in future.

### 6.1 Future Impacts of Climate Change

- 6.1.1 The likely future effects of climate change in the UK include an acceleration of coastal and inland flooding risk. The Association of British Insurers (ABI) estimates that a sea level rise of 0.4 metres is likely by the end of this century and could happen as early as 2040. Such a rise would leave more than 400,000 houses in eastern England at risk of flooding. The total number of properties in the UK at risk from flooding is expected to increase from 2m today to 3.5 million by 2080. In 2004, a government commissioned report estimated that annual average damage from flooding could increase from around £1 billion to up to £21 billion by the end of the century if no action is taken to tackle climate change and its impacts.
- 6.1.2 As events this summer clearly showed, it is not just coastal areas that are at risk. Dramatic changes in rainfall patterns are likely to occur so that rain will have a greater tendency to fall in concentrated bursts over fewer days of the year as it did this June. This also means more days without rain leading to droughts. When the rain does come, there will be more rain than current drainage systems can cope with, leading to even more floods.
- 6.1.3 Pressure on water resources is growing. With more houses being built, particularly in the South East, and the fact that we are all using more water, demand for water is increasing. Climate change will only add to these pressures. Longer, drier summers will lead to increased pressure on our water resources. This could mean a combination of new efficiency measures and new water resources, such as new or enlarged reservoirs or pipeline transfers, which in themselves increase carbon emissions, need to be developed.
- 6.1.4 Ecological systems will come under strain from lower river flows, saline intrusion, and reduced groundwater surface water interactions in the summer will all have an impact on ecology, though it is still difficult to define and predict the impacts.
- 6.1.5 There will be significant impacts on agriculture, with farmers needing to adapt their planting activities to the new climate. There are also significant human health risks, demonstrated by the 35,000 excess heat-related deaths in Europe during the heat wave in summer 2003.
- 6.1.6 All of the above effects are likely to vary a great deal between regions, with the South East likely to be particularly badly affected due to high pressure on resources and exposure to flood risk.

## **6.2 Government Failures**

- 6.2.1 Labour have not taken enough action to adapt to these threats. Flood risk management budgets for 2006-7 were cut from previous plans by £14.9 million half way through the financial year. An NAO report in June 2007 showed that just under half of high risk flood management systems have been maintained to their target condition.
- 6.2.2 According to the Association of British Insurers' (ABI) calculations, about one third – 108,000 – of the additional homes planned for the South East are located on the flood plain. The large number of homes planned across the UK also puts greater strain on limited water resources, for which Labour has failed to produce a joined-up and sustainable strategy. This is simply not sustainable.
- 6.2.3 The UK has led research into climate change impacts through the government funded UK Climate Impacts Programme (UKCIP). The Government has failed to adequately integrate this information into planning and other regulations. There has not been enough emphasis on making this information widely available, so that business takes full account of the possible impact of climate change in its long term planning.

## **6.3 Liberal Democrat Solutions**

- 6.3.1 There is a wide range of ways in which government can support people in adapting to climate change. One is make high quality climate information widely available, so that individuals and businesses are better placed to make decisions about climate proofing and are made aware of the need to plan for long term climate change.
- 6.3.2 Planning regulations that take into account likely future risk are also vital to establish a built environment that will be able to cope with the changed climate. Building standards will need to be changed to allow for better cooling during hot weather, and, in relevant areas, greater resilience to flooding and other extreme weather events.
- 6.3.3 Transport infrastructure and other public assets will similarly need to be climate proofed. Around one percent of the UK's total physical public assets are replaced every year. Therefore, if climate proofing is started immediately, we could have largely completed a climate-resilient public infrastructure by the time some of the worst effects of climate change are felt. In addition we will need more investment in public assets which support adaptation, such as water resource and coastal management systems.
- 6.3.4 An awareness of climate change impacts is needed across government departments to make sure it is included in long-term planning for areas such as health and agriculture.
- 6.3.5 Liberal Democrats would:
- Develop a UK national adaptation plan, building on the work of the UKCIP to educate individuals and businesses about what adaptations are necessary in response to climate change, and embracing both new standards in the public sector and appropriate regulations (ie. revising building standards) where necessary in the private sector.
  - Ensure that government departments are given a clear responsibility for planning for the effects of climate change, particularly in areas such as health,

transport, housing and agriculture, so that they can put in place appropriate regulations.

- Develop good early warning systems for extreme weather events so that measures can be put in place to minimise their risk, in particular with respect to human health and safety.
- Give the Environment Agency strategic responsibility for flood defence management and planning, working with local authorities and water companies to deliver an accountable strategic, long-term approach to flood defence and an early warning system for all types of flooding.
- Establish English national task forces to create integrated flood management plans.
- Introduce a rolling 50-year planning horizon for climate change adaptation.
- Invest in flood management systems while taking a realistic view of growing flood risk and recognising that the protection of some coastal areas is unsustainable and a policy of managed coastal realignment will need to be adopted.
- Promote good water resource management by: reforming the water regulatory regime to include sustainable development in Ofwat's remit; including good water resource management in building and planning regulations; and extending compulsory water metering in areas of water scarcity.
- Map drainage systems at risk of being overwhelmed by intense rainfall and encouraging Ofwat to prioritise storm water improvements.

## 7. Climate Change and Developing Countries

- 7.0.1 Climate change will have many harsh impacts on developing countries. These include lower rainfall requiring change in crops and agricultural practices, water shortages, flooding, and mass migration. The conflict in Darfur, largely triggered by climatic change, according to a UNEP study, is a grim portent of what may be to come.
- 7.0.2 According to the Stern review, deforestation accounts for approximately 18 per cent of world annual greenhouse gas emissions and is the largest source of emissions in the developing world. If current rates of deforestation in Brazil and Indonesia alone continue until 2012, that will wipe out nearly 80 per cent of the total emissions savings agreed under Kyoto.
- 7.0.3 The wealthier countries have an obligation to prevent these apocalyptic scenarios by helping the developing countries to develop low cost renewable energy technologies and sustainable forestry in these countries and ensuring that climate change is a priority in international development programmes.
- 7.0.4 Liberal Democrat policy proposals on adaptation, combating deforestation achieving low carbon growth, and climate proofing development policies are set out below.

### 7.1 Helping Developing Countries to Adapt to Climate Change

- 7.1.1 There is already clear knowledge of where the major impacts of climate change will occur. More than forty of the least developed countries (LDCs) have already adopted National Adaptation Plans of Action (NAPAs). These can be used in each country to prioritise necessary actions.
- 7.1.2 The rich countries are responsible for 70 per cent of the greenhouses gases currently in the atmosphere. Applying the principle of 'polluter pays', they have an obligation to help the poor and vulnerable countries to adapt to climate change. Therefore, additional funding for adaptation should not be part of existing commitments to development under the UN 0.7% GNP target.
- 7.1.3 The resources that are needed have not yet been fully estimated. But some LDCs who have adopted NAPAs have identified the most urgent and immediate needs which vary between 100 to 200 million dollars per country. The range of global estimates is very wide - assessments by the World Bank estimated \$10 to \$40 billion dollars a year for all developing countries, and Oxfam have suggested a figure of over \$50 billion.
- 7.1.4 The UN has created several new funds (e.g. the Special Climate Change Fund and the LDC Fund) which are based on voluntary contributions from rich countries. These have raised several hundred million dollars so far to support adaptation activities in developing countries. An 'Adaptation Fund' has also been created which is not based on donations but on a levy of 2 per cent on transactions carried out under the clean development mechanism (CDM), which could also generate a few hundred millions a year. It therefore seems likely that by themselves these funding streams will be seriously inadequate. A number of other possible sources of revenue for adaptation have been suggested, including an international air travel levy, the use of proceeds from auctions of carbon permits, and the use of a proportion of revenue from carbon taxes.

7.1.5 Liberal Democrats would work for the creation of a new UN Adaptation Fund, to which developed countries will be required to subscribe funds based on their GDP and their past contribution to carbon emissions, and into which the proceeds of the Adaptation Levy and any other internationally-agreed funding streams will be paid in future. As with all international grant systems, there are concerns that funds may be misappropriated through corruption. We would require careful auditing of all expenditure under the fund, which will have to be clearly based on each country's NAPA.

## **7.2 Tackling Deforestation**

7.2.1 Deforestation accounts for approximately 18 per cent of world annual greenhouse gas emissions and is the largest source of emissions in the developing world. If current rates of deforestation in Brazil and Indonesia alone continue until 2012, that will wipe out nearly 80 per cent of the total emissions savings agreed under Kyoto. Urgent action is required.

7.2.2 Deforestation is primarily driven by the high economic rewards that are available from industrial logging, and turning forest land over to beef, palm or soya production.

7.2.3 Currently, avoiding deforestation is not eligible for credits through existing carbon markets, largely because of concerns over additionality, permanence and leakage. While carbon markets could play an important role in providing such incentives in the longer term, the Stern review concluded there are short-term risks of destabilising carbon markets if deforestation is integrated without agreements that strongly increase demand for emissions reductions.

7.2.4 Nevertheless, as Stern concluded, curbing deforestation is a highly cost-effective way of reducing greenhouse gas emissions and has the potential to offer significant reductions fairly quickly. Liberal Democrats would encourage urgent action after the conclusion of the UNFCCC's consultation period on 'Reducing Emissions from Deforestation and Forest Degradation' (REDD), which ends this December.

7.2.5 At a national level, establishing and enforcing clear property rights to forestland, and determining the rights and responsibilities of landowners, communities and loggers, is the key to effective forest management. This should involve local communities, and take account of their interests and social structures, work with development goals and reinforce the process of protecting the forests. Unfortunately, most forest-rich developing countries are a long way away from this ideal, being unable to police their forests effectively because of a lack of enforcement capacity, inadequate laws and corruption.

7.2.6 The immediate priority, therefore, is to improve standards of governance, thereby enabling forests to be managed sustainably and to guarantee long-term carbon reductions. Eventually integration of avoided deforestation into carbon markets may be possible, but in the short term this means acceleration of the EU's Forest Law Enforcement, Governance and Trade (FLEGT) initiative, which aims to improve governance while excluding illegal timber from EU markets. Liberal Democrats advocate the following measures:

- Speeding up the process of agreeing FLEGT partnership agreements with the major timber-producing countries, and spreading the system to other consumer countries, such as Japan; in the long run, we see this evolving into a global system to promote trade in sustainable timber.

- Encouraging all consumer countries to adapt their government procurement policies to incorporate legality and sustainability criteria for timber and timber products – on the UK model.
- Adopting similar procurement policies at local government level (Liberal Democrat councillors could take a lead in this).
- Incorporating requirements for the use of legal and sustainable timber in building standards, for example for housing or schools (see Chapter 5).
- Making illegal the import and sale of all illegally harvested timber and conflict timber into the EU.
- Encouraging companies to take action to control their own supply chains for timber and timber products, including introducing a requirement to include in their annual reports information on the legality and sustainability of the products consumed.

### **7.3 Accelerating Technology Transfer to Developing Countries**

7.3.1 As set out in chapter two, *International Action*, developing countries must be assisted to access low carbon technology. Key Liberal Democrat policies are:

- Establishment of an ‘International Leapfrog Fund’, funded by international contributions and managed by UNEP, to provide funds to facilitate the development of low carbon technologies, energy efficiency and renewable energy technologies in developing countries.
- Modifications of WTO rules to ensure that trade rules, including those governing intellectual property and technical barriers to trade, do not undermine environmental objectives.
- Development of new, innovative regional investment frameworks to remove tariff barriers and intellectual property barriers that prevent or slow the dissemination of low carbon technologies.
- Negotiation of an international ‘Climate Agreement for Africa’ to encourage developed countries to eliminate or reduce intellectual property rights protection on a range of low carbon technologies to facilitate take-up in African countries of these technologies.

### **7.4 Making Development Environmentally Sustainable**

7.4.1 This year sees the twentieth anniversary of the Brundtland Report, which marked, at least in theory, international acceptance of the concept of sustainable development, ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. Despite the rhetoric, despite the Earth Summit in 1992 and despite the World Summit on Sustainable Development ten years later, little more than lip service is paid to the principle of sustainable development. Liberal Democrat policies on sustainable development are set out in policy paper 64 *A World Free from Poverty* (on development) and policy paper 65 *Wealth for the World* (on international trade).

7.4.2 In general, climate change is not given a high enough priority in development programmes. All too often projects are supported which involve, to cite only two areas of concern, non-renewable energy or forest reduction. In 2006, the Environmental Audit Committee, for example, concluded that “DFID’s climate change policy lacks coherence ... it is directly and indirectly responsible for very significant emissions of carbon into the atmosphere through the projects it funds”. Liberal Democrats would work for universal climate-proofing of development

assistance and export credit to ensure that climate change is mainstreamed into development programmes and initiatives. This would require coordinated action through the EU, OECD Development Assistance Committee, World Bank, and the OECD Group of Export Credit Agencies to ensure that development objectives fully support climate mitigation.

- 7.4.3 Currently the world population is estimated at 6.5 billion. There are a range of forecasts for population in the middle of the current century. The UN's medium projection is 9 billion and still rising and some high estimates indicate that global population may eventually reach 12 billion. The most rapid growth is in the poorest countries - the world's highest birth-rate is currently Niger with 50.16 births per thousand of the population.
- 7.4.4 Rapidly increasing populations carry risks including pressure on land, water resources, public services and infrastructure and higher pollution emissions. Aside from the obvious effect of more people leading to more carbon emissions, attempts to move to more sustainable technologies can be more difficult when there is population pressure. In the long term, it will be much more difficult to maintain carbon concentrations in the atmosphere at acceptable levels if there is continuing rapid world population growth. Our policy proposals to reduce carbon emissions in developed countries are set out in chapter two.
- 7.4.5 In general population rates fall as countries grow in prosperity, so the successful achievement of sustainable development is vital for curbing population growth. In particular, the key factor in reducing the birth rate is the status and education of women. Liberal Democrats therefore believe development assistance should target improvements in these areas as a high priority, in particular by improving access to primary education and reproductive health services for women and girl children.

## 8. Governance and Institutions

8.0.1 Effective governance and institutions are essential if a long-term climate change strategy is to have credibility and be capable of being delivered.

### 8.1 Making Climate Change Policy

8.1.1 At the moment, a number of Whitehall departments are responsible for developing and implementing climate change policy. Defra is the lead department and its own responsibilities cover energy efficiency measures and emissions trading schemes. Other relevant departments include the Department for Business, Enterprise and Regulatory Reform (energy policy), Department for Communities and Local Government (building regulations, housing, planning), HM Treasury (taxation), Department for Transport (airport, aviation policy), Foreign and Commonwealth Office (climate change negotiations) and Department for International Development. Defra has not been an effective 'champion' and, of course, Treasury has been hugely influential over policies on carbon pricing, energy, energy efficiency and planning. There is no single focus within government on climate change and too little expertise is being applied to the complex policy issues involved.

8.1.2 The Labour Government has provided plenty of high-sounding rhetoric on climate change but the policies delivered have made the problems worse and not better. The Treasury, for example, reduced green taxes as a share of GDP from 3.6 per cent in 1999 to 2.9 per cent in 2005. The Department for Transport has come up with policies for airport expansion that will only produce more greenhouse gas emissions. The DCLG plans more than 100,000 new homes on flood plains. In 2006, Defra cut the Environment Agency's flood defence budget. The MoD has cut the Met Office's Hadley Centre budget for climate change research.

8.1.3 Liberal Democrats would:

- Make climate change policy more joined up, by setting up a dedicated Cabinet committee on climate change and publishing an annual action plan that would help to deliver real policies, not just rhetoric.
- Improve the formulation and delivery of climate change policy, by creating a new Department of Environment, Energy and Transport, taking in all of Defra's current environmental responsibilities, energy from the Department for Business, Enterprise and Regulatory Reform and all the roles of the Department for Transport.
- Make future governments more accountable for delivering our climate change policies by placing a legal duty on ministers to achieve our goal of a carbon neutral UK by the year 2050 and producing annual carbon budgets.
- Increase the expertise available to government, by setting up a Climate Change Policy Unit to provide strategic policy advice to ministers on climate change issues and co-ordinate the work of departments where it affects climate change and chase progress on departmental targets.
- Ensure that environmental priorities are at the heart of government spending plans, by publishing a full 'Green Budget' assessment of every budget and writing climate change policies and targets into all cross-departmental initiatives where appropriate (eg. PFI contracts, Public Service Agreements).

## 8.2 Implementing Climate Change Policy

8.2.1 Responsibility for delivering policies is also diffused. In the key field of energy, there are several non-statutory bodies, including the Carbon Trust and the Energy Saving Trust, which play similar roles in promoting energy efficiency, but in the business and residential sectors respectively. There is a gap between the remits of the two bodies affecting small businesses, as the Carbon Trust only covers businesses with energy bills of £50,000 and over. The trust's funding is only discretionary, which could expose it to political control. Liberal Democrats would merge the Carbon Trust and Energy Saving Trust into a single statutory Sustainable Energy Agency (see section 5.2.3).

## 8.3 Regulating the Markets

8.3.1 The activities of regulated utility companies, in particular gas and electricity suppliers, have a major impact on climate change. Existing regulators pay too little attention to climate change and sustainability because their primary role is to keep down prices to the consumer. We would therefore reform these bodies and their remits. Liberal Democrats would:

- Reform Ofgem into a new Office for Sustainable Energy Markets, with a primary duty to ensure that the UK targets for reducing emissions of greenhouse gases, especially carbon dioxide, are met.
- Change OFWAT's remit to give equal weight to sustainable development (on which the government would provide formal guidance) and protecting the interests of consumers.

## 8.4 Role of the European Union

8.4.1 The European Union has always taken a strong lead in pushing for global action to tackle climate change: the EU negotiates as a bloc, which gives it a powerful voice in the UN discussions, and the Commission and Member States work together to promote effective international action. Member states have agreed that European-level policies and measures are essential to support efforts to reduce emissions. Some measures can be delivered most effectively at EU level. In some sectors, there is a strong, single market case for European action. Other measures could have little impact if taken at a national level or could harm the competitiveness of the industry in the member state concerned.

8.4.2 It was the EU that set an objective of limiting average global temperature increase to no more than 2 degrees Celsius above pre-industrial levels. The European Climate Change Programme (ECCP), launched in 2000, has delivered the directive setting up the EU emissions trading scheme, as well as directives on the promotion of electricity from renewable energy sources, the energy performance of buildings, and the promotion of biofuels. Recent and current work to consider further measures to contribute towards the EU's Kyoto Protocol target and covers geological carbon capture and storage, passenger road transport, aviation, and non-carbon dioxide emissions. In March 2007, the European Council committed the EU to a unilateral target to reduce greenhouse gas emissions by 20 per cent by 2020, which will increase to a collective target of 30 per cent for developed countries, if other non-EU industrialised countries are also willing to come on board.

8.4.3 EU climate change policies are determined with the full involvement, and frequently the leadership, of British ministers and MEPs. Once the targets have been agreed and major policy instruments put into place at EU level, it is then up to member

states to determine how to use the policy tools at their disposal to deliver them. Under Labour, the UK has played a key role in shaping EU policy on climate change but, too often, it has been slow to deliver the changes that are needed. Given their antipathy and divisions over the EU, it is hard to see how the Conservatives could ever be credible on climate change issues. Liberal Democrats are committed to ensuring that the UK provides leadership in Europe on climate change and that we deliver in this country on what has been agreed. This includes our proposals to: ensure that EU policies play a greater role in building a low-carbon economy (see section 2.3); strengthen the EU emissions trading scheme (see section 3.1); take action at EU level to reduce aviation emissions (see section 3.2), promote innovation (see section 4.1) and carbon capture and storage (see section 4.3); and reduce emissions from vehicles (see section 4.5) and energy-using products (see section 5.1).

### **8.5 Role of Local Government**

8.5.1 Local government has a vital role to play in delivering climate change objectives. Local councils are well placed to identify and implement local solutions such as zero carbon building development and sustainable transport. They can also work effectively in partnership with the voluntary or third sector. Many local authorities have been in the forefront of tackling climate change, and over 200 have signed the Nottingham Declaration on Climate Change (2000), pledging themselves to actively tackle climate change in your area and work with others to reduce emissions country-wide. However, still more could be done at local level. Liberal Democrats will facilitate effective action at local level by:

- Including carbon reduction targets in regional spatial strategies and local development plans.
- Placing carbon reporting requirements on local authorities.

## Conclusion

With this policy paper, Liberal Democrats become the first party to aim for a carbon neutral Britain by 2050 and the first to set out practical, commonsense policies to achieve that goal. The Annex to this paper shows current levels of carbon emissions by sector and describes the main policy proposals for reducing those levels and their impacts by 2050.

After ten years, Labour has failed on climate change. Carbon dioxide emissions are rising, Labour's policies for sustainable energy are not working and their policies on transport are only making the problems worse. David Cameron may talk green, but under his leadership the Conservatives have yet to propose any credible solutions for cutting greenhouse gas emissions.

We are the only party to commit to 100 per cent carbon free, non-nuclear electricity by 2050. We would provide new incentives for renewables and micro-generation through appropriate guaranteed prices.

We would introduce green mortgages to fund the upgrading of Britain's housing stock. On present progress, the Government would take 125 years to meet modern energy efficiency standards. The Conservatives have no plans.

We would reverse the decline in green taxation under Labour, and use the revenue raised to cut income tax.

We are the only party with a credible party on rail investment because we identify a way of paying for it.

We would boost flood defences and other changes to respond to climate change. New threats need to be met with new responses in a UK national adaptation plan.

We would take action at the international level, setting up a leapfrog fund to back clean energy in developing countries. There will be no solution to climate change if the developing world has to choose between prosperity and the future of the planet.

We would back a global treaty, with fair carbon shares for all.

We would reform Whitehall and make sure that the goal of a carbon neutral Britain is at the heart of all government policies.

Labour has failed on climate change. The Conservatives offer no solutions. Liberal Democrats will meet the challenge.

**Annex - Domestic Carbon Emission Cuts (Source Emissions)**

| Sector  | 2005 Carbon Emissions | Key Policy Proposals  |   | Carbon Emissions 2050 |
|---|-----------------------|---|---|-----------------------|
|   |                       | Short Term  | Longer Term   |                       |
| Energy Supplies                                     | 61.6MtC               | <p><b>30 per cent of the UK's electricity to come from clean, non-carbon emitting sources by 2020</b></p> <ul style="list-style-type: none"> <li>• Fixed minimum prices for electricity generation - new incentives for renewables and micro-generation</li> <li>• Emissions Trading Scheme strengthened (more auctioning and tighter limits)</li> </ul>  | <p><b>100 per cent carbon free electricity without nuclear power by 2050 and all 'heat' supplied from generators to be from renewable sources</b></p> <ul style="list-style-type: none"> <li>• Tighter Emissions Trading / Carbon tax</li> <li>• All post 2020 generators to have capture and storage</li> </ul>  | Net Carbon Saving     |
| Business, Industrial and Public Sector (inc. Waste) | 42.2MtC               | <p><b>Improve energy efficiency, more renewable energy (electric and heat) micro-generation</b></p> <ul style="list-style-type: none"> <li>• Emissions Trading / Carbon Tax (as above)</li> <li>• Extension of domestic emissions trading to wider number of businesses</li> <li>• Tighten building and planning standards</li> </ul>   | <p><b>100 per cent carbon free 'heat' generation (Geothermal / Renewable fuels / Solar etc)</b></p> <ul style="list-style-type: none"> <li>• Tighter Emissions Trading / Carbon Tax</li> <li>• Extension of domestic emissions trading again to even wider number of businesses</li> <li>• Continue to tighten building and planning standards</li> </ul> | Residual Carbon       |
| Road Transport                                      | 34.9 MtC              | <p><b>Reverse trend of increasing emissions from transport – greener vehicles and encouraging modal shift</b></p> <ul style="list-style-type: none"> <li>• Green tax switch for cars and planes: more graduated car tax up to £2000, and an emissions charge per plane rather than passenger duty</li> <li>• Lorry road pricing on motorways by distance &amp; emissions</li> <li>• 'Future Transport Fund' to build a high speed rail line and back rail improvements</li> </ul> | <p><b>Zero Carbon Road Transport by 2050</b></p> <ul style="list-style-type: none"> <li>• All new cars must be zero carbon from 2040</li> <li>• All freight vehicles in 2050 running on electricity, biofuels or other renewable fuels</li> </ul>   | Zero Carbon           |
| Households  | 24.0MtC               | <p><b>Begin reducing energy use in households</b></p> <ul style="list-style-type: none"> <li>• Bring forward date from which all new homes should be zero emissions to 2011</li> <li>• Introduce green mortgages to fund the upgrading of our housing stock (75% will still be used in 2050)</li> </ul>   | <p><b>Carbon free 'heat' generation for households</b></p> <ul style="list-style-type: none"> <li>• Energy efficiency cuts emissions by a minimum of 60% by 2050 on existing housing</li> <li>• Biomass microgeneration / geothermal / 'renewable gas' to provide remainder</li> </ul>  | Residual Carbon       |
| Agriculture & Land Use                              | 13.0MtC               | <p><b>Cut carbon emissions by making use of 'waste' products</b></p> <ul style="list-style-type: none"> <li>• Cut half of emissions through use of waste products for energy generation</li> </ul>  | <p><b>Deliver carbon neutral agriculture</b></p> <ul style="list-style-type: none"> <li>• Technological measures to reduce emissions from animals (feedstuffs)</li> <li>• Some emissions from animals will remain – but offset by 'sinks' from land use practices</li> </ul>  | Offset Carbon         |
| Other Transport                                     | 2.6MtC                | <p><b>Reverse trend in domestic aviation emissions</b></p> <ul style="list-style-type: none"> <li>• Climate Change Levy on domestic flights</li> <li>• VAT on tickets for flights</li> <li>• Limit runway capacity to current level</li> <li>• High speed rail and freight alternatives (see above)</li> </ul>  | <p><b>Eliminate, as far as possible, all other emissions from transport</b></p> <ul style="list-style-type: none"> <li>• Aviation in Emissions Trading and International Fuel Duty</li> </ul>   | Residual Carbon       |
| <b>TOTAL</b>  | <b>178.3MtC</b>       |   |   | <b>Zero</b>           |

# Glossary

## **Anaerobic digestion –**

The naturally occurring decomposition of organic matter by bacteria, which when harnessed by an industrial process can be used to treat waste, produce biogas that can be used to power electricity generators, provide heat and produce soil improving material.

## **Bioenergy / Biofuels –**

A fuel or energy produced from dry organic matter or combustible oils produced by plants. First-generation fuels refer to biofuels made from sugar, starch, vegetable oil, or animal fats using conventional technology – for example vegetable oil, ethanol, methanol. Second-generation fuels are made from biomass feedstock using advanced technical processes.

## **Biomass-**

Biological material which can be used as fuel or for industrial production. Most commonly, biomass refers to plant matter grown for use as biofuels, but it also includes plant or animal matter used for production of fibres, chemicals or heat. Biomass may also include biodegradable wastes that can be burnt as fuel.

## **BREEAM –**

The Building Research Establishment Environmental Assessment Method. A tool that allows the owners, users and designers of buildings to review and improve environmental performance throughout the building's life.

## **Climate Change Levy (CCL) –**

A tax, introduced in April 2001, on energy delivered to non-domestic users in the United Kingdom. It aims to provide an incentive to increase energy efficiency and to reduce carbon emissions.

## **Clean Development Mechanism (CDM) –**

An arrangement under the Kyoto Protocol allowing industrialised countries with a greenhouse gas reduction commitment to invest in emission reducing projects in developing countries as an alternative to what is generally considered more costly emission reductions in their own countries.

## **Combined Heat and Power (CHP) -**

CHP is the use of a heat engine or power generator to simultaneously generate electricity and useful heat. Non-CHP power stations waste the heat created in the generation process. CHP captures this heat for domestic or industrial heating purposes, either very close to the plant, or for distribution through pipes to heat local housing.

## **Energy Service Companies (ESCOs) –**

A business that provides energy management services to an energy user. It will identify and evaluate energy-saving opportunities and then recommend a package of improvements to be paid for through savings.

## Zero Carbon Britain – Taking a Global Lead

### **EU Emissions Trading Scheme (EU ETS) –**

The largest multi-national greenhouse gas emissions trading scheme in the world. A main pillar of EU climate policy.

### **FLEGT –**

Forest Law Enforcement, Governance and Trade Action Plan. Adopted by the European Commission in May 2003 as part of the EU's response to the call for action at the World Summit on Sustainable Development. Sets out new and innovative approaches to tackling illegal logging, linking good governance in developing countries with the legal trade instruments and leverage offered by the EU's internal market.

### **Global Environment Facility –**

An independent financial organisation that provides grants to developing countries for projects that benefit the global environment and promote sustainable livelihoods in local communities.

### **IMF –**

The International Monetary Fund

### **International Energy Agency –**

An intergovernmental organisation founded by the Organisation for Economic Co-operation and Development (OECD) in 1974 in the wake of the oil crisis. Primarily dedicated to preventing disruptions in the supply of oil, as well as acting as an information source on statistics about the international oil market and other energy sectors.

### **IPCC –**

Intergovernmental Panel on Climate Change. Established in 1988 by two UN organisations, the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP), to evaluate the risk of climate change brought on by humans, based mainly on peer reviewed and published scientific/technical literature.

### **Kyoto Protocol –**

An international agreement standing on its own, and requiring separate ratification by governments, but linked to the UNFCCC. The Kyoto Protocol, among other things, sets binding targets for the reduction of greenhouse-gas emissions by industrialised countries.

### **The Lisbon Agenda –**

Also known as the Lisbon Strategy or Lisbon Process. It is an action and development plan for the European Union set out in March 2000 with the objective making Europe, by 2010, "the most competitive and the most dynamic knowledge-based economy in the world".

### **Millennium Development Goals –**

Eight goals that the 192 United Nation member states have agreed to try and achieve by 2015, one of which is ensure environmental sustainability.

**National Adaptation Plans of Action (NAPAs) –**

Documents prepared by least developed countries (LDCs) identifying urgent and immediate needs for adapting to climate change. The NAPAs are then presented to the international donor community for support.

**Ofgem –**

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

**OFWAT –**

The Water Services Regulation Authority. The body responsible for economic regulation of the privatised water and sewerage industry in England and Wales.

**Radiative forcing –**

Broadly, the difference between the incoming radiation energy and the outgoing radiation energy in a given climate system. In relation to aviation emissions, it is used to quantify the total climate change effect of aviation including Nox, water vapour etc relative to simple carbon emissions – the effect of the carbon emissions of an aircraft is multiplied by a factor of approximately 2.7.

**RTFO –**

Renewable Transport Fuel Obligation. A requirement on transport fuel suppliers to ensure that, by 2010, 5% of all road vehicle fuel is supplied is from sustainable renewable sources.

**The Stern Review –**

A report to the Prime Minister and Chancellor of the Exchequer on the Economics of Climate Change by Sir Nicholas Stern, Head of the Government Economic Service.

**UNEP –**

United Nations Environment Programme. Established in 1972, it coordinates United Nations environmental activities, assisting developing countries in implementing environmentally sound policies and encourages sustainable development through sound environmental practices

**UNFCCC –**

United Nations Framework Convention on Climate Change. An international environmental treaty produced at the United Nations Conference on Environment and Development (UNCED) in 1992 to consider what can be done to reduce global warming and cope with temperature change.

**WTO –**

World Trade Organisation. Came into being on 1 January 1995 and is designed to supervise and liberalise international trade.

## Zero Carbon Britain – Taking a Global Lead

*This paper has been approved for debate by the Federal Conference by the Federal Policy Committee under the terms of Article 5.4 of the Federal Constitution. Within the policy-making procedure of the Liberal Democrats, the Federal Party determines the policy of the Party in those areas which might reasonably be expected to fall within the remit of the federal institutions in the context of a federal United Kingdom. The Party in England, the Scottish Liberal Democrats, the Welsh Liberal Democrats and the Northern Ireland Local Party determine the policy of the Party on all other issues, except that any or all of them may confer this power upon the Federal Party in any specified area or areas. The Party in England has chosen to pass up policy-making to the Federal level. If approved by Conference, this paper will therefore form the policy of the Federal Party on federal issues and the Party in England on English issues. In appropriate policy areas, Scottish, Welsh and Northern Ireland party policy would take precedence.*

*Many of the policy papers published by the Liberal Democrats imply modifications to existing government public expenditure priorities. We recognise that it may not be possible to achieve all these proposals in the lifetime of one Parliament. We intend to publish a costings programme, setting out our priorities across all policy areas, closer to the next general election.*

### **Working Group on Climate Change**

*Note: Membership of the Working Group should not be taken to indicate that every member necessarily agrees with every statement or every proposal in this Paper.*

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