

Conserving the Future

Proposals on Energy Policy

Policy Paper 58



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Summary

The overall aim of Liberal Democrat energy policy is to guarantee a secure supply of energy to UK households and businesses, at the lowest economic cost consistent with high environmental standards and social justice.

Liberal Democrats would reshape the UK and international framework by:

- Setting up a single Department of Environment, Energy and Transport, as part of our wider restructuring of Whitehall, which would include a Sustainable Energy Policy Unit to monitor and analyse energy policy developments, advise Ministers and co-ordinate the work of other Departments which affect energy.
- Merging the existing Carbon Trust and Energy Saving Trust into a single, statutory Sustainable Energy Agency responsible for implementing policy on energy efficiency.
- Remodelling the existing gas and electricity regulator as the Office For Sustainable Energy Markets (OFSEM), with a new primary duty to promote sustainable development.
- Continuing to argue for the target recommended by the G8 Renewables Task Force, of measures to bring renewable energy to a billion people by the end of the decade.
- Working with EU partners to press for Russian and US ratification of the Kyoto Protocol.

Liberal Democrats would use economic instruments to reduce carbon dioxide emissions from energy use at lowest economic cost, by:

- Making urgent preparations for participation by UK firms in the European Union Emissions Trading scheme which will become mandatory by 2008, particularly by drawing up a fair National Allocation Plan which will achieve real emission reductions, promote more efficient technologies and industries and maintain British industries' competitiveness.
- Reforming the Climate Change Levy into a Carbon Tax payable by all energy users not involved in the Emissions Trading Scheme, initially set at the same overall level as the CCL but with the level in future to be set on the advice of our proposed Green Tax Commission.
- Recycling any additional revenues from the Carbon Tax into offsetting tax cuts, including for example cutting VAT on energy saving materials to 5%.

Liberal Democrats would tackle the continuing scandal of fuel poverty and promote energy efficiency by:

- Reforming and strengthening government programmes such as Warm Front that support home energy improvements to ensure that they take every household out of the misery of fuel poverty.

- Tripling the energy savings target in the next round of the Energy Efficiency Commitment, which places obligations on energy suppliers to assist residential customers to make energy savings, and introducing an equivalent scheme for smaller businesses.
- Introducing an Energy Efficiency Improvement Initiative (EEII) to support energy savings by householders, landlords and business, to be managed by the Sustainable Energy Agency in co-operation with local authorities.
- As part of the EEII, offering all pensioner households a subsidised package of energy saving measures as an alternative to receiving the annual winter fuel bonus – the retail value of the package would be higher than the cash bonus, and provide long term savings in fuel bills.
- Using domestic and EU regulations progressively to improve the energy performance of power-consuming equipment and appliances.
- Requiring all public companies to report annually on their energy consumption and the intensity of their energy use.

Liberal Democrats would promote renewable energy and a low carbon economy by:

- Going beyond the existing government target of 10% of UK electricity to be generated from renewable sources by 2010 by setting targets of 20% for 2020 and 50% by 2050.
- Extending the existing Renewables Obligation on electricity suppliers so that 20% of electricity must be sourced from renewables by 2020.
- Placing requirements on electricity suppliers to provide two-way metering, to encourage small-scale renewable generation.
- Including targets for greenhouse gas reductions in spatial strategies and local development plans.
- Simplifying entrance into the wholesale market for smaller and intermittent sources, particularly renewable technologies, through reform of the electricity trading arrangements.
- Setting a target for 30% of electricity used in the public sector to be generated from Combined Heat and Power by 2015.
- Establishing a Sustainable Energy Innovation Unit to drive forward policy on research, development and implementation of renewable and efficiency technologies.
- Phasing out existing nuclear power stations at the end of their safe operating lives, and winding up the THORP and MOX plants as soon as it is practical to do so.

Introduction

1.1 Our Objectives

1.1.1 This paper sets out Liberal Democrat policies for the production, distribution and consumption of energy. As well as looking at issues connected with types of energy *sources* – fossil, renewable, nuclear – it considers the *use* of energy, or more accurately of energy services, the heat, light and power delivered when energy is consumed or transformed. We deal primarily with energy policy for the UK, but we recognise that the increasing internationalisation of markets – and the often global impacts of energy use – mean that the EU and wider international dimensions must also be considered.

1.1.2 Since the 1980s, both Labour and Conservative governments have let market forces increasingly decide which sources of energy should be used and in what quantities. In general, Liberal Democrats supported this shift. Policy Paper 50, *It's About Freedom*, sets out the Liberal Democrat belief in a market-driven economy. A properly regulated market framework gives everyone – producers, businesses, households and investors – the freedom to discover how best to meet their energy needs.

1.1.3 But markets also have major limitations. There is no such thing as a completely free market in energy; in most cases, natural monopolies, in distribution if not in production, mean that most customers cannot realistically choose between competing suppliers. The variable nature of demand – for example the peaks experienced in the midst of a harsh winter – mean that continuity of supply for all customers requires some installed capacity which is not normally used, an outcome the market itself is not likely to deliver. Externalities, such as the costs deriving from the environmental impacts of energy production and use, also justify government intervention and regulation. And innovation in energy sources may be discouraged because the market often does not adequately anticipate future developments. One of

the key roles of energy policy is therefore to seek to correct these failures.

1.1.4 The question, then, is what sort of intervention is required to meet our policy aims? A Liberal Democrat energy policy, we believe, should aim *to guarantee a secure supply of energy to United Kingdom households and businesses at the lowest economic cost consistent with high environmental standards and social justice*. What does this mean in practice?

- a) 'A *secure supply of energy*' means ensuring that paying customers are able to enjoy continuous, stable and reliable supplies of energy. The liberalised markets for electricity and gas initiated by the Conservatives have not always proved successful at guaranteeing this, as suppliers have avoided low-income high-risk customers and cut back on their maintenance and emergency repair budgets (as demonstrated in spectacular fashion during severe storms in winter months).

At one time, the objective of 'energy security' was used to justify (generally spurious) subsidies to favoured industry sectors to guarantee the strategic security of the nation as a whole. In reality political instability overseas is not likely to be a threat to UK energy supplies in the short or medium term, though in the long term there is still a case for ensuring that energy supplies stem from a geographically diverse range of sources, while both demand reduction and increased use of renewables would assist in reducing the need for imports. Increased renewables, being usually small scale, distributed and 'embedded' in local supply networks will also tend to improve reliability of supply.

- b) '*The lowest economic cost*' means ensuring that market failures that would push up costs to consumers are avoided. As with other industries involving natural monopolies

– particularly in distribution and supply – government intervention is justified to ensure an optimum level of market competition, maximising efficiency and minimising costs. The market liberalisation of the 1990s did largely succeed in this area, though sometimes at the cost of other objectives; it seems unlikely, however, that there is much scope for further significant market-driven efficiency gains. It should also be noted that many of our proposals set out in this paper to improve the efficiency of energy consumption will in fact raise the *unit price* of energy, while at the same time reducing total *consumption*, which in turn lowers the final bill for consumers

c) *'High environmental standards'* is self-explanatory. Energy production and consumption of all kinds, and particularly of fossil fuels and nuclear power, is accompanied by serious environmental externalities, including the emissions of greenhouse gases and pollutants which cause 'acid rain', and the production of hazardous wastes. Our objective is to minimise the environmental damage caused by energy production and use, through increasing the efficiency with which energy is used, and through switching to cleaner sources.

d) *'Social justice'* means ensuring that all households, especially the poorest, are able to enjoy access to energy services, a basic necessity. This overlaps with our first aim ('a secure supply of energy'), but focuses also on the condition of the fuel-poor, those unable to afford adequate supplies of energy to heat and light their homes to an acceptable level. Almost uniquely a British problem, the legacy of centuries of cheap coal and poor housing, fuel poverty is a scandal which it is our aim to abolish.

1.1.5 Some goals may of course be achieved at the expense of others: trade-offs must be made.

For example, measures to reduce the environmental impacts of energy use are likely to require a gradual rise in the price of energy, which will affect particularly the poorer members of society. However, higher prices per unit of energy do not have to mean higher overall bills to the consumer, if energy saving measures are taken which means people can meet their heating and other needs with less energy. Energy efficiency measures targeted on low-income households will therefore need additional government expenditure. This extra spending will also generate additional employment; the Association for the Conservation of Energy has projected 155,000 cost-effective jobs from upgrading UK buildings, mainly semi-skilled and geographically widely distributed. We would also explore the scope for including New Deal trainees in this work. And of course investment in energy demand reduction and in renewable energy sources will lead to environmental benefits in the form of lower levels of air pollution and greenhouse gas emissions.

1.1.6 It is clear from the discussion above that these aims of energy policy lead to conclusions about specific objectives, and the policies which we propose to meet them. Our objectives, in order of priority, are to:

a) *Reduce the environmental impact of energy use*, including greenhouse gas and other emissions from the burning of fossil fuels (coal, oil and gas) and their derivatives (including petrol) and the generation of hazardous – mainly nuclear – waste. This can be achieved by fuel switching, from coal and oil to gas, and from fossil to renewable sources, and by reducing energy demand through increasing the efficiency with which it is used.

b) *Guarantee access to minimum levels of energy services to every household*. The recent fall in levels of fuel poverty is almost entirely due to cheaper energy. But given our environmental objectives, the only sustainable way of ending

fuel poverty is to increase the level of efficiency with which it is used, through investing in home insulation, installing better heating systems, using more efficient appliances, and so on.

- c) *Place requirements on suppliers to guarantee stable and reliable supplies to households and businesses*, including maintaining robust infrastructure and sufficient levels of emergency cover.
- d) *Maintain competition in the market*, including setting the appropriate framework for the growth of suppliers of energy services (not just of energy), and of distributed generation (e.g. buildings which supply their own energy needs, through solar power, wind turbines, fuel cells or combined heat and power).

The remainder of this paper sets out the policies which we propose to achieve these objectives.

1.2 The Liberal Democrat Strategy

1.2.1 Liberal Democrat energy policy aims to ensure that the market operates within a framework designed to deliver the objectives we set out above. We will use a mixture of direct regulation, market-based instruments, including taxation, and fiscal measures such as government grants. The key policies and institutions we believe will be necessary to deliver these objectives are described in Chapters 2 and 3.

1.2.2 As stated above, our key priority is to reduce the environmental impact of energy use. Our long-term target, adopting that of the Royal Commission on Environmental Pollution, is for the reduction in UK emissions of carbon dioxide – the key greenhouse gas, emitted when any fossil fuel or derivative is burnt – by 60% from 1997 levels by 2050. The UK's target under the Kyoto Protocol is a 12.5% reduction in all greenhouse gases from

1990 levels by the first commitment period (2008–12), a figure which it should be relatively easy to achieve (a 12.3% drop was already achieved between 1990 and 2001, although for CO₂ alone the drop was only 5.3 %). Liberal Democrats would set a firm interim CO₂ emissions reduction target of 20% by 2010.

1.2.3 Achieving carbon dioxide emissions reductions on this scale requires action in three main areas. First, a significant increase in the efficiency with which energy is produced and consumed in the UK, thereby reducing overall demand and associated emissions. There is currently very substantial scope for cutting the wastage of energy inherent in the way in which most buildings, industrial processes and electrical appliances are produced and operated. To realise this potential, however, requires energy markets which display much more powerful incentives to increase efficiency and reduce wastage. We believe that, even with projected economic growth, total electricity demand can be reduced to 70% of current (2003) consumption by 2050.

1.2.4 This requires a mix of policy measures, explained in more detail in chapters 3 and 4. We aim to adjust the price of energy to reflect its environmental impact at the point at which it enters the economy. Emissions trading schemes, currently operating in the UK and eventually to start in the rest of the EU, will help achieve this for the largest energy-consuming businesses. Emissions trading is not, however, suitable for the commercial sector, for smaller businesses and for households, and therefore price signals will have to be provided through a new carbon tax, replacing the current – and flawed – Climate Change Levy. The installation of Combined Heat and Power technology also offers opportunities greatly to increase the efficiency with which energy is used, and will be encouraged by the overall policy framework we propose.

1.2.5 In addition to energy efficiency policies aimed at the upstream end of the energy sector, we will apply a range of regulations and incentives at the downstream end. The current Energy Efficiency Commitment, which requires suppliers of gas and electricity to households to invest in energy saving measures, will be expanded both in its targets and in its scope. Government grants will be made available to businesses and householders investing in energy-saving measures, and financial assistance will be targeted in particular on low-income households, helping to end, once and for all, the scourge of fuel poverty. At the same time, new building and appliance regulations will steadily remove the worst performing units from the market altogether, a process accelerated by the use of government procurement policy and a reduction in VAT for all energy conservation materials to the same level as energy consumption.

1.2.6 The second main plank of our policy is reducing carbon dioxide emissions from power generation, which accounts for about a third of UK greenhouse gas emissions. This implies a major switch to renewable sources of electricity, including wind, biomass, wave, tidal and solar. Chapter 5 sets out our policies to achieve this switch, which includes steadily increasing requirements on generators to source from renewables, reform of the electricity trading arrangements, and government support for research, demonstration and near-market initiatives. Despite the current slow pace of expansion, we believe it possible for renewables to account for 10% of electricity output by 2010, 20% by 2020, and 50% by 2050 (as noted above, total electricity output by then should only be about 70% of current output). We recognise that these are tough targets to achieve, but believe that given commitment they are realistically attainable. We are encouraged by the positive approach of the recent renewable energy strategy announced by the Scottish Executive, which aims to achieve 40% renewable electricity generation in Scotland by 2020.

1.2.7 Renewables also need to expand to replace the electricity generated by the nuclear stations, which will gradually fall (to zero by about 2030) as the stations reach the end of their safe operating lives. As we explain in chapter 5, although nuclear power does not generate greenhouse gas emissions, it is an unacceptably expensive means of achieving this aim, particularly when the full costs of decommissioning and waste disposal are taken into account. We believe – and demonstrate in this paper – that renewables and energy efficiency together can reduce carbon dioxide emissions at a lower economic and environmental cost.

1.2.8 Our third key area for action lies in reducing emissions from transport, which currently accounts for about 22% of UK greenhouse gas emissions. Liberal Democrat policies in this sector are set out in more detail in *Transport for People* (2001) but in summary utilise a similar mix of measures as above: the use of regulation and price incentives, including Vehicle Excise Duty (VED) levels graduated by energy efficiency, tax advantages for low-emission fuels, encouragement for congestion charging, and so on. Action will be required to tackle the rapid growth in emissions from air transport, and the party is soon to establish a policy working group on aviation which will develop policy in this area.

1.2.9 We recognise that one effect of these policies will be gradually to increase the unit price of fossil fuel-generated energy, for both businesses and households. Indeed, this is the point of proposals such as the carbon tax – to introduce the price signals that are currently missing, to steer consumers towards saving energy and to lower-carbon alternatives. And once these opportunities are taken up, of course, consumers should find their overall energy bills going down, as consumption falls. At the same time, we will provide significant levels of financial assistance – e.g. with home insulation – to accelerate these

moves and mitigate the impact on low-income households. And it should also be remembered that there would be offsetting benefits - from the extra employment in the energy efficiency and renewables sectors, from higher air quality and from lower costs of climatic change.

1.2.10 Many of the policies which we advocate in this paper, such as emissions trading, strengthened regulation on energy efficiency of buildings and appliances, reforms to the regulatory system for energy markets, and extension of the Renewables Obligation on energy suppliers, will not require additional government expenditure. However, there remain some important elements of our overall policy package which will require public spending - in particular strengthening existing home insulation programmes targeted on those most at risk of fuel poverty (the 'Warm Front'

programme) and our proposed Energy Efficiency Improvement Initiative. A detailed costed programme will be set out at the time of our next general election manifesto. But because of the vital importance we attach to achieving greenhouse gas emissions reductions, it is clearly a high priority to transfer funding from other budget headings to make significant resources available for the policies in this paper. Simply by redirecting the £150 million per year which the current government is using to bail out the nuclear power operator British Energy, we would be able to, for example, double the existing funding for Warm Front. And in the context of overall DTI and DEFRA budgets (excluding CAP spending) of over £8 billion, it will be possible to find savings of a few percentage points to fund the Energy Efficiency Improvement Initiative.

Governance

2.0.1 A flexible, coherent policy-making framework and the right regulatory system for the energy markets are obviously vital to achieving our objectives. Because there are a wide range of policy levers (including economic instruments, regulation and public investment) which need to be used in balance, a joined-up approach to policy which can respond to experience of what works, and alter the emphasis between the different levers over time if necessary, is vital. A strong regulatory system will be particularly important in achieving our goal of guaranteeing consumers secure access to those energy services which are a basic necessity.

2.1 Making Energy Policy

2.1.1 Liberal Democrat energy policy is designed to deliver the objectives of environmental sustainability, security of supply, social justice and economic growth and efficiency. Our energy programme provides greater coherence and clarity of purpose than the ad hoc, piecemeal and, in many respects, backward-looking approach of previous Conservative and Labour governments. We use policy targets where they are needed to signal clear, long-term commitments and to provide a focus for attention and expectations, (which is especially important in providing assurance to the industry). Crucially, targets must be underpinned by a combination of policy tools. The main forms are economic instruments where they will deliver change at least cost; regulation where competition is not available or where flexibility and cost-effective solutions can be delivered; and fiscal incentives to effect changes in market behaviour. At all times, we seek the most cost-effective and fairest means of delivering our policy objectives.

2.1.2 However, we do not suggest that our policies are the final answer. The private and

liberalised energy market will continue to change and become more complex over the next few decades. Indeed, one of the main lessons of the last thirty years is that in an ever changing market robust institutional arrangements are needed to drive energy policy forward. Building carbon reduction and related environmental demands into all government policies will be a major challenge. To do the job, the institutions need to have the focus and the capacity. Their work must be well co-ordinated.

2.1.3 At the moment, the governance of UK energy policy is divided and confused and its ability to deliver has been eroded by the twists and turns of successive governments' policy agendas. Main responsibility for policy is split between the Department of the Environment, Food and Rural Affairs (DEFRA) and the Department of Trade and Industry (DTI), but the devolved administrations and local government have important roles, as have many other key departments of state including the Treasury and Ministry of Defence. Too often, the main output has been low quality or a lack of progress in key policy areas. Examples are the battles between the DTI and the old DETR (now the Office of the Deputy Prime Minister) over planning and between DTI and DEFRA over energy from waste.

2.1.4 Liberal Democrats would set up a Sustainable Energy Policy Unit within Whitehall with a clear remit to:

- Monitor and analyse developments in the energy markets.
- Provide strategic policy advice to Ministers on energy security and environmental implications of energy policy; and
- Co-ordinate the work of departments whose work impacts on energy policy.

2.1.5 As part of our wider restructuring of Whitehall, we would set up a single Department of Environment, Energy and Transport, which would be the sponsoring department for the Sustainable Energy Policy Unit.

2.1.6 In the context of our commitment to a devolved settlement within the United Kingdom, we would pass responsibility for planning permission for power stations of over 50 Mw in Wales, currently retained in Whitehall, to the National Assembly in Cardiff.

2.2 Delivering Energy Policy Objectives

2.2.1 Responsibility for delivering energy policies is also diffused. There are several non-statutory bodies including the Carbon Trust (CT), and the Energy Saving Trust (EST), which play similar roles in promoting energy efficiency, but in the business and residential sectors respectively. These bodies are relatively weak. Their funding is only discretionary, which exposes them to political control. In the areas of research, development and innovation, there is a plethora of government committees, with some 20 grant-giving bodies. There is no governmental organisation charged with co-ordinating research into new energy technologies, easing successful ideas into the market and investigating the technical implications of new forms of generation.

2.2.2 Liberal Democrats would merge the Carbon Trust and Energy Saving Trust into a single statutory Sustainable Energy Agency responsible for:

- Promoting energy efficiency.
- Commissioning research into new energy technologies (see also section 5.5)

- Providing advice on best practice in energy efficiency and environmentally friendly technologies.
- Allocating capital to new energy technology businesses, including funding specialist investment funds.

2.3 Regulating the Gas and Electricity Markets

2.3.1 When the gas and electricity industries were privatised, the Conservative Government established independent regulatory offices to licence and monitor the gas and electricity companies and to take action where necessary to ensure compliance. Labour passed the Utilities Act 2000, with the stated aims of strengthening regulation, improving accountability and *“achieving the right balance of interests between consumers and shareholders.”* The main changes included: merging the gas and electricity regulators into a new body, the Office of Gas and Electricity Markets (OFGEM); giving OFGEM a new primary duty to protect consumer interests, wherever appropriate through promoting effective competition; and obliging the regulator to have regard to Ministerial guidance on social and environmental objectives. Liberal Democrats supported the key reforms.

2.3.2 Both the Conservatives and Labour have sought to replace regulation with competition wherever possible. Whilst we agree in principle with the drive for competition, Liberal Democrats believe that an independent regulator for the gas and electricity markets has a continuing role to play in regulating those parts of the industry where competition is not viable. A specialist regulator is also needed to protect consumers in the liberalised markets, help to secure gas and electricity supplies and to assist in achieving our goals in environmental and social policy.

2.3.3 But Labour has not delivered a regulatory framework that will promote environmental objectives in the gas and electricity markets. For example, OFGEM failed to consider adequately the impact the reforms to electricity trading would have on CHP and renewable energy. Some progress has been apparent more recently. But we remain concerned that environmental considerations do not feature sufficiently highly in OFGEM's priorities.

2.3.4 At the same time, Liberal Democrats are reluctant to propose major changes in the regulatory regime. We do not want to undermine the independence of the regulator from excessive political interference and therefore endanger investors' confidence. There will always be tensions between economic regulation (designed to lower prices) and environmental policy goals. The role of government is to make energy policy and this should not be confused with economic regulation, or vice versa. This means that energy policy objectives should be pursued through legislation where necessary. And the work of both Ministers and regulators should be as transparent as possible.

2.3.5 Liberal Democrats would promote our environmental objectives in the gas and electricity markets by:

- Giving the gas and electricity regulator a primary duty to promote sustainable development.
- Remodelling the regulator as an Office For Sustainable Energy Markets (OFSEM).
- Providing the regulator with new statutory social and environmental guidance based on this paper, to provide a clear framework of the government's expectations and the timetable for delivery of key policies.

2.3.6 The last proposal is particularly important. We are clear that the most effective solution to

complaints about the existing regulator's work is to deliver greater clarity and certainty in energy policy, so that the regulator, energy companies and investors can all understand what the government is trying to achieve and what is expected of them.

2.3.7 As part of the social guidance advocated in 2.3.5, we would insist that OFSEM uses its regulatory powers to ensure secure supplies of necessary energy services to households. We are also very disturbed at continuing reports of obstructiveness by supply companies towards existing consumers who wish to switch to more competitive suppliers. OFSEM must protect domestic consumers from this kind of sharp practice by supply companies, and ensure that any large falls in wholesale prices are passed on appropriately to consumers.

2.4 Towards a Global Sustainable Energy Policy

2.4.1 While most of this paper focuses on what Liberal Democrats would do in terms of UK domestic energy policy, we recognise that energy and environmental policies must be set in the European and international context. Not only are energy markets increasingly globalised, so too is environmental policy, particularly on the crucial issue of climate change.

2.4.2 Action at the European level is being and will continue to be essential in working towards our energy policy objectives. The European Emissions Trading System which is likely to be formally agreed later this year is a major step forward which we welcome (see chapter 3). The EU has taken effective actions to raise the energy performance of goods sold within the single market, (although we have further proposals to strengthen these in chapter 4), has raised standards for buildings through the Energy Performance of Buildings Directive, and has also

set targets for the share of electricity to be generated by Combined Heat and Power within the Sixth EU Environmental Action Programme. We welcome the Commission's decision to produce a new Energy Services Directive to ensure that the liberalisation of the EU energy market (which we support) is balanced with environmental responsibilities. We believe the UK should argue for a strong Directive, and will press for its effective implementation in due course.

2.4.3 In the long term, it is vital that the developing world is enabled to embrace a sustainable energy policy. World-wide, some 2 billion people lack access to electricity and rely on traditional energy sources, such as fuel wood, biomass or kerosene, for their cooking, heating and lighting. We regret the failure of the World Summit on Sustainable Development to agree a global target for increasing the use of clean energy, and will continue to argue for the recommendation made by the G8 Renewables Task Force in 2002, for measures that will bring renewable energy to a billion people by the end of the decade.

2.4.4 In the meantime, we will press ahead with the implementation of the voluntary initiative announced at the World Summit – the Renewable Energy and Energy Efficiency Partnership (REEEP) – to accelerate and expand the global market for renewable energy and energy efficiency technologies. In addition, sustainable energy considerations should be made a key criterion in UK aid and export promotion policies, so that subsidies for exports of high-carbon energy technologies are ended and sustainable energy projects and technology transfer are supported.

2.4.5 The Kyoto Protocol sets the global framework for controlling greenhouse gas emissions. Our first priority is to see the Protocol enter into force as quickly as possible – which will happen as soon as Russia ratifies. UK and EU diplomatic efforts should therefore be focused on

accelerating Russian ratification. Once that is secured, it will be important to see the Protocol develop its new mechanisms, including a global system of emissions trading, as fast as possible; in this respect the EU and UK experience of developing their own emissions trading systems will be immensely valuable.

2.4.6 Preparations also need to be made for the longer-term development of the Protocol, beyond the first commitment period of 2008–12. Liberal Democrats argue for:

- Further and more ambitious emissions reductions targets should be agreed for the second and subsequent commitment periods, based on the principle of 'contraction and convergence' with the long-term goal of equalising per capita emissions across the world.
- Generous assistance with finance and technology transfer must be made available to developing countries to assist them in meeting their targets.
- It should be a major aim of UK and EU diplomacy to encourage the US to ratify the Protocol.

2.4.7 Britain itself accounts for only about 2% of world greenhouse gas emissions (although with less than 1% of world population), and its direct impact on controlling climate change is therefore limited. Nevertheless, both by itself and as part of the EU, the UK can play an important role in demonstrating to the rest of the world that it is possible to meet and exceed Kyoto targets in a cost-effective manner. The Liberal Democrat aim of reducing carbon dioxide emissions by 20% by 2010 and 60% by 2050 is therefore highly important in encouraging worldwide action to control climate change.

Carbon Tax and Emissions Trading

3.0.1 The economic instruments described in this chapter have a key role in simultaneously achieving two of our goals, between which there is potentially a tension: delivering energy services at the lowest economic cost, while meeting high environmental standards .

3.0.2 The Liberal Democrats support the use of market-based mechanisms, in particular:

- Mandatory emissions reduction targets, with the flexibility to trade for large energy users as part of the EU Emissions Trading Directive expected to be agreed later in 2003.
- A carbon tax for domestic and small to medium sized business energy use.

3.1 The Case for Market Approaches

3.1.1 Major changes to the way the economy is run will be needed to make the transition to the low carbon economy that is the goal of the Liberal Democrats. Although the economic costs can be held to manageable levels (the International Panel on Climate Change has estimated the costs of stabilising atmospheric carbon dioxide levels at 550 parts per million by volume would lead to a loss of around 1% of projected GDP across the developed countries), if the wrong policy instruments are used economic costs involved could be unnecessarily high and could lead to a public backlash against the necessary actions. Different industries, and even different firms within the same industry, will have widely varying costs for achieving the same reduction in emissions. The environmental and economics benefits of emissions trading have been exemplified through the sulphur dioxide (SO₂) trading programme in the US.

3.1.2 There are thus great economic advantages to a sensitive policy that encourages emissions cuts which can be made at relatively low cost, without imposing excessively costly adjustments on those firms and sectors where the costs of adjustment are very high.

3.1.3 Market mechanisms are more likely to achieve least cost-adjustment than simple regulation because they have the following advantages:

- Dynamic incentives for innovation. The ongoing costs of the cap on emissions or tax will drive innovation and give an incentive to long- term research into less polluting technologies.
- Less vulnerability to regulatory failure.
- Revenue. Both taxes and auctioned tradable permits raise revenue, which can be used to offset other taxes and/or re-invested to further reduce greenhouse gas emissions, e.g. incentives for domestic energy conservation.

3.1.4 The main difference between the two forms of economic instrument – tradable allowances or permits and a tax - is that with the former a certain level of emissions can be guaranteed to be reached while the costs of doing so may vary, but with the latter the costs imposed can be predicted but the emissions level cannot. Because demand for some kinds of goods and services is relatively price inelastic, a tax may not achieve the desired behavioural changes without being raised to politically difficult levels. Although a permit system need not raise revenue if there is free allocation, auctioning of permits will raise revenue.

3.2 Emissions Trading

3.2.1 Given that the need to achieve Greenhouse Gas (GHG) emissions targets is imperative, the balance of advantage would seem to lie with tradable permits for those sectors where they are feasible. In any case, electricity generators and large industrial energy users will be part of the mandatory EU Emission Trading Scheme, which Liberal Democrats support. The directive introducing this scheme is expected to receive final approval by the end of 2003. Features of the scheme include:

- A mandatory absolute emissions cap for participating firms, together with an allocation of tradable allowances equal to the cap.
- Firms can then either buy or sell allowances depending on how they manage their emissions related to their cap.
- Targets and allowances to be set by Member State Governments.
- A pilot phase 2005-2007, followed by full implementation in 2008-2012.
- The UK has an opt out until 2007, conditional on equivalence of effort.
- Fines for exceeding caps without having bought allowances will be €40 per tonne in 2005-7, and €100 per tonne of carbon thereafter.

3.2.2 Of course, we are not starting in a vacuum. The UK already has its own Emissions Trading Scheme (UKETS). The UKETS will need to effect a transition to the EUETS by 2008, at the latest. Because there are wide differences between the existing UK schemes and the new EUETS, a lot of work needs to be done to ensure a smooth transition, and the Government's recent (2003) White Paper seems somewhat complacent on the

matter. The most important issue is how allowances will be allocated.

3.2.3 Liberal Democrats therefore advocate a fair National Allocation Plan for the EUETS which will achieve real emission reduction, promote more efficient technologies and industries and maintain British industries' competitiveness, including:

- Ensuring no "hot air" is allowed into the system, e.g. allowances for closing down uneconomic plant.
- Benchmarking allowance allocation for new industries against "best in class", e.g. new electricity generation capacity would be given allowances for CHP equivalent efficiency of generation.

3.2.4 Although in the initial phase of the EU emission trading scheme, the proposed Directive provides that there will be free allocation of permits, as the scheme progresses we should aim to move towards auctioning an increasing proportion of permits (up to the allowed level of 10%). This is primarily because we believe this will lead to the most efficient, market-driven allocation. Auctioning will also raise some revenue, but that is a secondary consideration.

3.2.5 We would allow other parts of UK industry that are not part of EUETS to accept an emissions reduction target and be able to trade in the EUETS in exchange for carbon tax rebates.

3.2.6 If the EUETS does not deliver the emission reductions intended, e.g. due to "hot air" entering the system which will not deliver the emissions cuts required, we will give priority to international political negotiations to ensure co-operation to achieve GHG reductions.

3.3 Carbon Taxation and Use of Revenues

3.3.1 The 1998 Marshall report argued that small and medium sized businesses – including practically all the commercial sector – account for 60% of business carbon emissions, yet will never be able to participate in emissions trading because the economies of scale are not sufficient and the cost of managing the system would be too great for both government and energy user. The same would apply with even more force to domestic energy use. The only economic instrument therefore available for these sectors will be a carbon tax.

3.3.2 To avoid ‘double taxing’ of industries involved in emissions trading, the appropriate policy mix is a carbon tax applied only on fuels used directly to generate heat or other energy services (e.g. domestic gas and coal). Electricity prices to consumers will already reflect the extra costs imposed by the permit system and will not therefore be subject to the carbon tax in addition. In administrative terms, it will probably be most practical to levy the carbon tax on all carbon fuels at the point where they enter the economy, but then give full rebates to those firms in the EUETS based on their permitted carbon allowances.

3.3.3 Liberal Democrats have criticised the existing Climate Change Levy (CCL) for its complexity, its range of exemptions, and its confusion of objectives. Liberal Democrats would therefore replace the existing CCL with a uniform carbon tax applying to all use of energy not covered by the EUETS.

3.3.4 We would initially introduce the Carbon Tax at a level to replace directly the existing Climate Change Levy. Future changes to the levels of the Carbon Tax would be set on the advice of our proposed Green Taxation Commission, and pre-announced with the longest possible advance notice. This would give time for investment decisions to adjust, and thereby limit any possible adverse economic impact.

3.3.5 In the long term, the Carbon Tax has the potential to generate significant amounts of revenue. In accordance with the Liberal Democrat environmental principle of ‘*taxing differently, not taxing more*’, we would recycle these revenues into cutting other forms of taxation so that the net effect on the overall tax burden was neutral. The Green Taxation Commission would advise how best to do this, but one tax cut advocated in this paper which could be funded from the Carbon Tax is the reduction in VAT on all energy saving materials to 5%.

Conserving Energy

4.0.1 There is no inevitable growth in the amount of energy we use. It is perfectly possible to enjoy substantial growth in prosperity which is sufficiently resource-efficient to ensure decreasing fuel usage. It is Liberal Democrat policy to ensure that this trend is accelerated dramatically.

4.0.2 The Government has declared that it wishes to double the average rate of improvement over the past 30 years in energy intensity of 1.8% p.a. Most of these gains occurred during the 1970s and early 1980s; during the 1990s progress slowed, and in some years completely reversed. We endorse the Government's targets. But we are convinced that these can never be achieved without radical improvements to existing policies. All forms of energy generation have both ecological impacts and significant capital costs – it is therefore in the UK's overall economic interest to minimise energy wastage.

4.0.3 The measures outlined in this chapter include strengthening energy-efficiency regulation at domestic and EU levels, enhancing the obligations on energy suppliers, and the two main public expenditure proposals in the paper: significantly increased funding for the Warm Front programme, and an Energy Efficiency Improvement Initiative to support energy savings by householders, landlords and business, to be managed by the Sustainable Energy Agency in co-operation with local authorities. These policies will make a major contribution in delivering all the key objectives identified in the Introduction, simultaneously reducing the environmental impact of energy production and use, while enhancing energy security by reducing the need for energy imports and allowing businesses and households to meet energy service needs with a lower basic energy input. In terms of our social justice goals

and tackling fuel poverty, it is this set of proposals which will be crucial.

4.1 Fuel Poverty

4.1.1 Around four million households – one in six – in the UK suffer from fuel poverty. That means they need to spend 10 per cent or more of their income on all fuel use and heating their home to an adequate standard of warmth. These households – who are more likely to be elderly people – have to choose between keeping warm and eating. Fuel poverty is the prime cause of some 35,000 winter deaths in England every year and imposes large costs on the NHS. This is a shocking indictment of past governments of all parties – a scandal which Liberal Democrats have been in the forefront of highlighting.

4.1.2 The main drivers of fuel poverty are the size and energy efficiency rating of a home, low incomes and high fuel prices. But these work in very complex ways. Consequently, the blight of fuel poverty needs multi-faceted solutions. There are no quick fixes or simple answers. For example, increasing income-related benefits would not necessarily provide a solution because the fuel poor would not necessarily receive them. Similarly, while policies to help electricity prepayment meter customers would primarily benefit people on low incomes, such meters are also used in holiday homes. And policies targeted entirely on the rented sector would ignore the fact that the fuel poor tend to be owner-occupiers.

4.1.3 In 2001, Labour promised to take all vulnerable households in the UK out of fuel poverty by 2010. In February 2003, the Energy White Paper set out an additional aim: that as far as reasonably practicable no household in Britain should be living in fuel poverty by 2016-18 (the targets are November 2016 for England and Scotland and 2018

for Wales). These targets were mandated under the Warm Homes and Energy Conservation Act 2000, a Private Member's Bill which had Liberal Democrat support. However, we believe that the Government's existing policies will not deliver them; and the 22% cut in reduction in government funding for fuel poverty measures over the last three years does not suggest a strong commitment.

The role of competition and lower energy prices

4.1.4 Market competition is an essential part of the solution to fuel poverty. Following the liberalization of the markets, domestic gas and electricity prices are now at lower levels, in real terms than they have been for a generation. This, and changes in incomes, were the overwhelming reasons for the reduction between 1996 and 2001 in the numbers of households suffering from fuel poverty. However, relying on lower prices may not be a sustainable policy in the long term, given the current pressures on the generation market and the likely implications of policies required to promote environmental objectives. Policies to improve energy efficiency will need to be strengthened substantially.

4.1.5 Further, lower prices have not benefited those most likely to suffer from fuel poverty. Consumers who pay by quarterly credit and, in particular those who pay by prepayment meters have seen lower reductions in their bills than those who pay by direct debit. This trend has been particularly pronounced in the gas market. And many low-income prepayment meter consumers do not enjoy the same choice of tariffs as direct debit customers. Because of debt blocking or security deposits, they cannot change their supplier so easily.

4.1.6 Through revised social and environmental guidance (see para 2.3.5), Liberal Democrats would actively encourage the energy regulator to tackle discrimination in the gas and electricity markets against low-income consumers. We would

also support measures to reduce the cost of prepayment meters to consumers.

Energy efficiency programmes for fuel poverty households

4.1.7 The main programmes in this field are:

- Warm Front in England (and similar schemes in Scotland, Wales and Northern Ireland) providing grants for insulation and heating improvement packages to those in privately owned housing who receive certain benefits.
- Local authority capital programmes for public sector housing.
- The Energy Efficiency Commitment (EEC), which places obligations on energy supply companies to assist consumers to take up energy efficiency measures (the target energy saving for 2002-2005 is 62 TWh) and requires at least 50% of the programme to be for priority social groups. Specific measures can include cavity wall insulation, loft insulation, energy saving light bulbs, CHP. The basic concept of the EEC is based on policies developed by the Liberal Democrats in the 1990s.
- The Decent Home Standard (a government set of housing quality standards to which councils must bring a third of all council housing by 2004, and which all social housing must reach by 2010)
- The Government has developed in some areas "Warm Zones" to co-ordinate at local level efforts by energy companies, local authorities and voluntary groups to tackle fuel poverty.

4.1.8 While these programmes undoubtedly do some good, as presently run they suffer from a number of shortcomings. Most importantly, they are targeted on households receiving means-tested benefits and tax credits. Consequently,

around half those benefiting are not in fuel poverty. At the same time, nearly one-third of those in fuel poverty are not eligible for either EEC or Warm Front. The reasons include a low take up of benefits and the fact that some benefit recipients are not in one of the vulnerable categories. And there is mounting evidence that fuel bills may be driven more by poor insulation and inefficient heating than by low incomes.

4.1.9 Because of the relatively low level of grants provided, it is unclear to what extent those households who receive Warm Front (or equivalent) grants are lifted out of fuel poverty. The scheme, as currently designed, will make little impact on difficult to heat properties – properties with solid wall construction and those not currently connected to the mains gas network, which are more likely to be in rural areas. And the part Warm Front plays in improving household energy efficiency will now be undermined by the Government's cuts to its funding.

4.1.10 The various measures, many of which have been put in place in a piecemeal fashion over several years, are not sufficiently integrated into a coherent strategy. There is a lack of co-ordination in formulating and delivering fuel poverty policies, at a national, regional and local level. Liberal Democrats would:

- Review the targetting and effectiveness of existing government schemes to improve energy efficiency. Our priority would be to ensure that such schemes take people out of fuel poverty. We would introduce flexibility to ensure that people suffering from fuel poverty, but who do not meet the existing income (benefits) criteria, receive assistance. If necessary, we would target schemes on properties rather than income.
- Subject to the results of the review, seek to allocate significantly increased funds for the Warm Front and equivalent programmes.

- Triple the target savings under future rounds of the Energy Efficiency Commitment.
- Bring the various government programmes and measures within an integrated strategy to tackle fuel poverty.
- Expand partnerships and initiatives to tackle fuel poverty at local level.
- Require the Decent Home Standard for thermal insulation to equate to Building Regulations wherever practicable. At present, these standards are woefully inadequate in energy performance terms.
- Encourage the development of local heat networks powered by renewables and/or small-scale CHP, to improve the circumstances of fuel-poor households.
- Consider facilitating extensions to the gas network where they can be demonstrated to be the best environmental and economic option.

4.2 At Home

4.2.1 Around 30% of energy is consumed in our homes. Particularly with the growth in the number of households, and the areas occupied per head, the absolute amount of fuel used is due to keep increasing under existing policies. UK homes are notorious for wasting fuel; there are enormous ranges of cost effective energy saving items around, which are not being installed. Similarly, few electrical devices are promoted on the basis of their relative energy performance.

4.2.2 Liberal Democrats are committed to reversing the current trends regarding profligate energy usage in our homes. We shall achieve this by seeking to convince householders of the urgency of accepting their own responsibilities to do their bit to combat the threat of climate

change, as well as save on household bills, through a major public information campaign. But we cannot rely upon exhortation alone. We shall need to introduce both positive incentives and financial penalties to encourage this change of approach across society.

4.2.3 We endorse the Government's decision to expedite improvements to the standards of new homes, through tightening the energy performance of the Building Regulations. However, we are concerned from past experience that government will water down proposed improvements following pressure from house builders. To overcome this, we will introduce an incremental system whereby the energy performance of the Building Regulations will be upgraded automatically every three years to the level being achieved by the top-performing 25 per cent of new buildings. We are also aware of concerns that the Building Regulation standards may not be being achieved in practice and will therefore introduce random testing of new buildings; if a test reveals that a building does not comply, every building constructed by that developer and contractor during the next two years will have to be tested at their expense. The Liberal Democrat controlled London Borough of Sutton with its BedZed initiative has regenerated a brownfield site with a commercial/mixed residential development on a zero-carbon basis. Following this example, every local authority should have at least one major exemplar zero-carbon development; to facilitate this, we will provide planning powers, and also pump-priming through the Energy Efficiency Improvement Initiative.

4.2.4 But the key issue is to deal with energy usage in existing properties. The official method of measurement for energy efficiency is the Standard Assessment Procedure (SAP). This is not a perfect measure: it tends to measure comfort, rather than efficiency. However the present Building Regulations require all new homes to achieve a SAP

rating of at least 75. In the English House Condition Survey conducted for the DETR in 2000, 84% of homes in England were found to be at or below SAP 60, with an overall average of only 43.8. 3.3 million homes were at or below SAP 30, 1.6 million below 20 and 900,000 below 10. This demonstrates how massive are the opportunities for improvement which remain undelivered.

4.2.5 Whole-hearted implementation of the new European Directive on the Energy Performance of Buildings is vital. This will offer valuable information to anyone moving home regarding the energy efficiency of their building, and provide a means of comparing relative performance. But to ensure that advice is put into practice requires positive political action.

4.2.6 To improve the efficiency of appliances and power-consuming equipment, we will:

- Require the relative energy efficiency/running costs of every appliance to be prominently displayed at the point of sale.
- Work within the EU to ensure continuous upgrading of minimum energy standards required for all intensive energy-using appliances, with the level of key fast-developing technologies to be raised to that of the top performing 10% every three years. An example would be minimising energy demands from stand-by settings.
- Set tough efficiency standards for power-consuming equipment outside the competence of EU legislation.
- Introduce a regulatory requirement that all new domestic heating boilers shall have a full-load rated efficiency not less than 75%, or shall be capable of generating electricity for domestic use.

- Require all new and replacement electricity meters to be capable of two-way operation, to facilitate the economic installation of embedded generation capacity.

4.2.7 As part of our proposed Energy Efficiency Improvement Initiative, our priorities will be to:

- Offer targeted grants for householders to achieve substantial energy rating improvements, channeled through the new Sustainable Energy Agency in co-operation with local authorities.
- Provide grants to householders installing certain innovative products like micro CHP and heat pumps.
- Offer all pensioner households a subsidised package of energy saving measures as an alternative to receiving the annual winter fuel bonus – the retail value of the package would be higher than the cash bonus, and provide long-term savings on fuel bills.
- Introduce a targeted grant towards the cost of energy saving materials for private landlords. In exchange, landlords will be required to ensure any home available for letting meets a minimum standard of energy efficiency.

4.2.8 Other Liberal Democrat measures to improve energy efficiency in homes will include:

- Requiring Local Authorities to achieve the energy saving targets as per the 1995 Home Energy Conservation Act, introduced by the Liberal Democrats.
- Requiring all homes let by Housing Associations to achieve at least SAP75 rating within 10 years, and setting a minimum energy efficiency standard as part of the licensing conditions for Homes in Multiple Occupation (HMOs).

- Tripling the present requirements for those holding electricity and gas licences to deliver assistance to customers to save energy, under their Energy Efficiency Commitment. This could involve more imaginative specific measures than currently used, for example provision of upgrade kits to expand the existing solar heating period in the summer where people do not need to use heating systems.
- Cutting VAT on all energy conservation materials from 17.5% to 5%, the same rate as for energy consumption. Contrary to the Government's propaganda, this is perfectly possible under existing European law.
- Pressing within the European Union for zero rating VAT on all energy conservation materials.
- Allowing energy service companies in the residential sector access to the Enhanced Capital Allowance Scheme.
- To encourage landlords to install boilers to the highest standard, classifying them as replacements not betterment, in line with recent rulings on the upgrading of windows.

4.3 In Industry

4.3.1 The best way of driving change is by the introduction of market-based incentives to improve energy performance. Liberal Democrats welcome the creation of a Europe-wide greenhouse gas emissions trading system from 2005. By concentrating heavily upon energy suppliers, it should strongly motivate increased efficiency in production and transmission, as well as switching to less climate damaging sources in the case of electricity. But it is unlikely initially to provide extra incentives for better efficiency at the point of use.

4.3.2 So in the short term we would build on the agreements for energy intensity improvements already negotiated with 44 industrial sectors, covering 5,000 companies and 12,000 individual sites, in return for 80% reductions on the Climate Change Levy. The Government has restricted eligibility to sites covered by IPPC. Liberal Democrats believe this is absurdly restrictive. We would enter into similar agreements with any sectors wishing to participate.

4.3.3 Initial agreements are due for assessment during 2003/4. Some of those concluded are unjustifiably generous; on average only 60% of even energy efficiency measures identified as showing a payback within 24 months have been required. We would seek to strengthen the effectiveness of such agreements progressively, whilst recognising that many will eventually be subsumed within the emissions trading scheme.

4.3.4 All public companies should be required to report on their annual energy consumption: many already do so voluntarily. These figures should show absolute reductions achieved, as well as energy use per unit of output (energy intensity). In the case of buildings use, this should detail fuel consumption per square metre, and per employee. Companies should declare their targets, as well as past achievements, in energy reduction over a 5, 10 and 20 year period. This should cover individual process plant sites, and any building over 1000 sq metres. Every building above this size to which the public has access must display its current energy rating in a prominent position.

4.4 In the Service Sector and in Commerce

4.4.1 For the vast majority of companies, particularly in the service sector, energy bills form a negligible part of their costs. The impact of any price signals, even when paying the Climate Change Levy at 100%, has been limited. Part of the reason for this has been that most commercial properties are not owned by the companies that occupy them. This is of increasing concern: this sector is the fastest growing of all in energy consumption terms

4.4.2 Under the new Energy Performance of Buildings directive, whenever any property changes occupancy, a contemporary energy survey must be provided, giving advice both on likely running costs and necessary improvements. We would place a duty upon all landlords at the time to arrange for immediate upgrading to a progressively increasing level of efficiency, based upon the nationally agreed rating scheme.

4.4.3 Far too many tenants receive fuel bills based upon floor space occupied, rather than what they themselves use. To encourage individual responsibility, we would legislate to require that all businesses should receive fuel bills based upon actual consumption, with a duty upon landlords to provide all tenants with individual gas and electricity meters.

4.4.4 Tenants wishing to improve energy usage in the premises they occupy can only do so now with landlords' permission. This can often be withheld by default. We would allow tenants to undertake energy efficiency works at their own volition: a landlord would be required to object in writing and with reasons within four weeks of application to halt the work. This should be subject to appeal to the Local Planning Authority. Common heating services are frequently archaic and ill maintained. We would place a duty on landlords to carry out an

annual efficiency survey, made available to all tenants. If efficiency were more than 15% worse than the sector average we would place a duty on the landlord to upgrade the system.

4.4.5 The Energy Efficiency Commitment has proved extremely effective in the residential sector in helping to turn traditional energy supply companies towards becoming genuine providers of energy services. Unlike schemes funded from general taxation, it also has the substantial merit of following the Polluter Pays principle. We would therefore introduce an equivalent scheme to cover those businesses currently paying the Climate Change Levy at 100% (or in future our proposed carbon tax).

4.4.6 We would also expand the Zero Interest loan scheme for energy efficiency for SMEs, introduced by the Liberal Democrats in the Scottish Executive. We believe this scheme has enormous potential for replication; we welcome the Carbon Trust's decision to begin offering similar facilities throughout the UK. As part of the Energy Efficiency Improvement Initiative, we would greatly expand the overall loan capital available, and extend the period for repayment of capital beyond the present five years to encourage investment in a wider range of technologies.

4.5 In the Public Sector

4.5.1 Energy use in public buildings accounts for 6% of UK carbon dioxide emissions, but the public sector is much more politically significant than this figure might suggest. It has long been accepted that the public sector has a key role to set a good example of energy performance, and to act as a demonstrator of good practice. Targets set for improvement in energy efficiency across Whitehall were not met during the 1990s: subsequently no new targets have been adopted. Liberal Democrats deplore this failure as an abrogation of good government. We would immediately set a target of at least 3.6% annual improvement in each

Ministry, in line with the national energy intensity target. In its White Paper, the Government considered targets for CHP investment, but has committed itself to nothing.

4.5.2 Public buildings tend to be poor in energy efficiency terms. Savings of 25-40% could be made. In addition, there are economic benefits for around two thirds of hospitals and university sites to be supplied from CHP. Renewables-fired heat networks, and solar hot water and solar photovoltaic panels all have a role.

4.5.3 The main barrier to energy efficiency investment is lack of capital. Where appropriate analysis takes into account future benefits, including cost savings and environmental benefits, the benefits are often shown to be greater than the costs. The Government has outlined an investment appraisal technique for public sector investment (the so-called Green Book guidance). It recommends investments are analysed to deliver a given service over a 25 year lifetime at 3.5% discount rate and recommends the lowest whole life cost option is implemented. However, government rarely applies its own rules. Liberal Democrats would implement the Green Book in full for investments in energy efficiency, renewables and CHP for the public sector, taking into account the notional income that would have been received by way of grant had the project been in the private sector.

4.5.4 Government is also a major purchaser and should use its buying power to strengthen the market for energy efficiency products. We will set specific targets regarding the minimum energy ratings of buildings occupied by personnel funded by the taxpayer, whether national or local. We will also set strict mandatory requirements for the energy performance required from all providers of public services, whether directly employed in the public sector, or from the commercial or not-for-profit sectors. We will also insist on high standards in the energy performance of office equipment and

other goods purchased by the government, and seek to improve procurement practice in the EU.

4.6 Moving Around

4.6.1 The transport sector is responsible for 32% of UK energy use. Although this is not now growing as fast as before, failure to cut back on this sector would place extra pressure on other sectors. Road vehicles are the largest contributor by far, responsible for 80% of transport energy usage. In order to meet our environmental goals, there is a clear need for policies which will both reduce the demand for travel overall and cut the level of environmental damage caused by each journey.

4.6.2 Our most recent transport policy paper *Transport for People* advocated that the overall tax take on road fuel be increased by no more than the rate of inflation, while VED should be set on a graduated scale based on CO₂ emissions, with big increases for gas guzzlers, and local authorities should be allowed to introduce both congestion charging and work place parking charges. Lower fuel duty rates and concessions on congestion charging would be used to promote high efficiency and alternate fuelled vehicles. Enhanced investment in public transport was proposed.

4.6.3 We will set tough targets for improvements in car energy performance. We will also encourage

through fiscal incentives the introduction of low or zero emission vehicles, for example by basing the level of road fuel duty more on the carbon content of the fuel in an overall revenue neutral manner. The carbon tax advocated elsewhere in this paper would however not apply to transport fuels on top of the existing levels of taxation.

4.6.4 Emissions from UK aviation are set to rise by 30% this decade, according to government predictions. Combined with the fact that emissions of greenhouse gases high in the atmosphere have a much worse greenhouse effect than the equivalent emission at ground level, this rise in emissions from aviation is a major cause for concern. The Government's current policy is based on the discredited predict and provide approach rather than one of managing demand, and implies that all further growth in air traffic is beneficial to the UK economy. Taxation is an instrument that can be used effectively to discourage pollution and unnecessary waste, by taxing differently not more, to ensure air transport carries the full burden of its environmental costs in line with the polluter-pays principle. It is existing Liberal Democrat policy to work towards the introduction of an aviation tax at the European level as a tax change that would enable cuts elsewhere. The party's forthcoming aviation policy working group will be charged with further developing policy on this issue.

Towards a Low Carbon Future

5.0.1 The two keys to reducing climate change emissions are the reduction of energy use through improved efficiency and conservation discussed in chapter 4 and switching from fossil fuels to renewable energy sources that produce no net greenhouse gas emissions. Liberal Democrats are committed to the rapid development of renewable sources of energy, and this chapter sets out the policies to bring this about. The development of renewable sources will also contribute to our energy security objective, as renewables generation tends to take place closer to the point of use than fossil fuel generation, reducing reliance on imports and the need for long-distance transmission.

5.0.2 The scope for expansion of Combined Heat and Power (CHP) technology, which can involve renewable or fossil fuel generation, is also discussed here, together with our policy on another major non fossil fuel energy source, nuclear power.

5.1 Renewables

5.1.1 The UK's record on renewable energy is lamentable. The House of Commons Environmental Audit Committee has pointed out that renewable energy currently accounts for just 3% of UK electricity production, *'a tiny proportion which compares very unfavourably with almost all other European countries'*. The committee forecasts that the UK will fail to meet its interim target of 5% of renewable production by 2003 and is unlikely to achieve more than half of the full target of 10% for 2010. The Government has failed to commit itself to a firm medium term target for renewable generation, merely aspiring to double renewable generation between 2010 and 2020. Liberal Democrats would set a formal target of at least 20% of electricity generation to be renewable by 2020, increasing at an average rate of 1% a year

thereafter so that there would be 50% renewable by 2050.

5.1.2 The cost of electricity from renewable sources should not be a barrier: The Performance and Innovation Unit forecast in February 2002 that, with the right supporting policies, energy from crops, offshore wind, and onshore wind would all come down to within the range 2p-4p per kilowatt hour by 2020. Offshore wave energy would cost around 5p. This compares with 2.3p for Combined Cycle Gas Turbine and 3-4p for new build nuclear stations. Solar water heating has been viable for years and electricity-generating solar roofs are likely to be viable within the next two decades.

5.1.3 The PIU also suggested that the investment risk was low for renewables because capacity can be added incrementally and that costs would reduce rapidly as technologies mature. So what are the barriers? The Carbon Trust has identified market failures limiting the rate of investment in renewables including:

- Long time scales for return on capital investment coupled with significant political and technical risks.
- Limited incentives both in scale and scope relative to other countries.
- Institutional barriers related to planning, grid connection and the provision of common infrastructure.
- Limited management capacity to drive change.
- Low consumer awareness.

5.1.4 Our intention is to remove the barriers that are hindering the development of renewables and, where necessary, provide incentives to ensure that

the switch from fossil fuels to renewables is fast enough to achieve the target of reducing greenhouse gas emissions by 60% by 2050.

Promoting Renewables

5.1.5 We believe that the role of government should be to encourage the market for renewables in general rather than picking which specific renewable technologies should be installed. Once a clear framework has been established that guarantees a market for renewable energy, market competition should ensure that the most viable technologies are developed and installed. We therefore favour the extension of the current policy of imposing an obligation on energy suppliers to source an increasing percentage from renewables. Liberal Democrats would set the Renewables Obligation to increase progressively to 20% by the year 2020. We have considered whether the obligation should be used to give additional encouragement to particular categories of renewable energy, but have concluded that such detailed intervention in what should be market decisions is not justifiable.

5.1.6 Another form of obligation should be a requirement on the supply companies to agree to provide bi-directional metering for households and small businesses on request, with an export price guarantee at least equivalent to the input price. This is necessary to encourage small-scale renewable electricity generation, for example through solar panels on houses, which could make a useful net contribution to overall supply, but where a draw on the national grid will still be required at certain times of day. In the short term, this could be achieved on the basis of profiling to reduce costs. All new and replacement meters should have two-way capacity.

5.1.7 Direct financial support is, however, necessary in three areas:

- Support to kickstart the domestic/small commercial market for new technologies.
- Near-market development costs: for example, the Eggborough debacle has shown the need for more development work before high-tech biomass plants are reliable enough to be commercial (Eggborough is the first wood-fuelled power station in the UK, it opened last year and shut within days after the sand used in the fluidised bed reacted with the resin in the wood chips and jammed up).
- Research into new renewable technologies that hold promise in the medium-term.

Planning for Renewables

5.1.8 For biomass and wind, the land use planning system has proved a major obstacle: in recent years, three-quarters of the applied-for wind-driven capacity in England and Wales has been refused planning permission, almost always on the grounds that it will damage the landscape. There is, of course, an irony here, for there is growing evidence to suggest that climate change - especially if it is unabated by substantial switching from fossil fuels to renewables - will dramatically alter the biodiversity and landscapes that are supposedly being protected.

5.1.9 Liberal Democrats want to ensure that sustainability - which must include switching from fossil fuels to renewables - is placed at the core of the planning system. We will therefore include targets for greenhouse gas reductions in spatial strategies and local development plans. This is not intended to force planning authorities to accept wind turbines or any other specific solution but to require them to introduce a range of policies that will ensure that the necessary climate change emissions targets are achieved. To facilitate this, we propose maximizing 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.
- Giving planning authorities the power to set a minimum renewable energy percentage for the total power consumption for new commercial buildings and requiring new homes to be built with the capacity to generate a minimum set percentage of their energy needs. These levels might be set fairly low to begin with - for example, for commercial buildings sufficient to meet any air-conditioning load and for homes a level that could be met from solar water heating - and then increased incrementally as developers gain experience.
- Enabling planning authorities to set maximum carbon emissions levels (which could be zero) for complete developments: the developer could then use a combination of energy efficiency and on-site renewables to meet the limit.

5.1.10 We would also investigate the part that renewable energy generated in Scotland - which has up to 40% of Europe's renewables resources - can play in meeting energy needs in the rest of the UK. If this is to be part of the solution, the problems that need to be overcome include how the urgently necessary strengthening of the grid links from the Highlands and Islands of Scotland into the UK distribution system is to be funded (clearly costs must be shared with UK consumers and producers) and how the planning issues can be dealt with.

Transforming the Networks

5.1.11 Most renewable and environmentally friendly energy technologies are small-scale and tend to be embedded within the distribution networks. Therefore, a greater use of such

technologies will require more power plants of different sizes in different locations: in other words, a more decentralised network. But the electricity transmission grid and distribution networks were designed for a different era. Based upon large coal and nuclear stations, they are highly centralised. Changing the operation and design of the network infrastructure will involve considerable re-engineering and require substantial investment. Distribution network operators therefore need incentives to provide additional infrastructure, connect and carry more locally produced, sustainable power and to become more active managers of their systems. Liberal Democrats welcome the existing energy regulator's moves to start developing such incentives. We would continually monitor the progress towards network reform and, if necessary, would require the regulator to develop more powerful incentives. And we also believe that the scale of network change also demands a strategic plan, led by government, working with OFSEM and grid operators.

5.1.12 In the medium-term, a second distribution issue will have to be resolved, as it seems likely that the mix of renewable technologies will include a substantial proportion that deliver an intermittent supply; solar energy is not generated in the dark and diminishes considerably in midwinter, while wind energy is, obviously, weather dependent. It would be prudent therefore to find ways to increase the storage of electricity by building more pumped storage hydro schemes and/or developing large batteries and using hydrogen. This last clearly has considerable potential and is probably the key to any major breakthrough in reducing climate change emissions from transport.

Energy from Waste

5.1.13 A mix of renewable technologies will also assist in maintaining supply security: biomass, for example, has the attraction that it can provide a

base load. Within the context of an overall Zero Waste approach to waste management, we therefore support local enclosed gasification plants for organic waste where appropriate, as these are little different from other biomass plants and overcome the problem of methane emissions that can occur in large-scale composting. We totally reject mass burn incineration. We endorse the waste management hierarchy which places energy from waste after waste reduction, recycling and reuse. However, there are specific non-incineration technologies such as pyrolysis and anaerobic digestion which could be considered, but only if they offer the least environmentally damaging solution over the full life cycle of the material, and do not undermine the waste hierarchy.

Transport

5.1.14 Transport is, of course, a major source of climate change emissions, and is addressed in chapter 4. Alternative and lower carbon fuels offering benefits compared with petrol and diesel are now available, ranging from biodiesel to LPG. We believe that the policies advocated earlier, including cuts in fuel duty and VED for less environmentally damaging vehicles and fuels, would encourage the development of a UK biofuels industry and speed the development of fuel cell cars using hydrogen generated from renewable energy.

5.2 Electricity Trading

5.2.1 Electricity trading arrangements will have a major influence on the development of renewable electricity. The wholesale market for electricity in England and Wales is regulated by the New Electricity Trading Arrangements (NETA), soon to be replaced by the British Electricity Transmission and Trading Arrangements (BETTA) which will also extend to Scotland. Currently, Ofgem takes regulatory responsibility for the construction and monitoring of these systems.

5.2.2 NETA's working is highly technical, but its outcomes have been very visible, producing a significant fall in wholesale electricity prices (although a lesser fall in retail prices). One consequence has been that there is now a serious disincentive to new investment in the industry. Another has been to undermine the economic viability of CHP, which has been squeezed by the large fall in the output price of electricity, coupled to an unrelated rise in the input price of gas. In general smaller, and particularly intermittent, sources are at a severe disadvantage under NETA, and this has made it harder for some renewable technologies to flourish.

5.2.3 Despite Government hopes and various tweaks by Ofgem, NETA still poses significant barriers to a rapid expansion of renewables, and it is not clear that BETTA will improve this. Indeed it could simply export the same problems to Scotland.

5.2.4 Liberal Democrats want a new approach that will simplify entrance into the wholesale market for smaller and intermittent sources, particularly renewable technologies, and provide them with a sufficiently predictable market to justify investment in them. This requires changes in the duties, powers, and obligations placed on our proposed OFSEM, giving them a specific remit to examine and overcome non-market barriers to renewables. Within the current framework that could include a longer settlement period, and there also needs to be additional regulatory measures to encourage embedded generators, and micro-CHP.

5.3 Improving the Efficiency of Combustion Technologies

5.3.1 In addition to switching from fossil fuels to alternative fuels, an equally important objective is improving the efficiency with which fuel is burnt.

This imperative ranges from engine technology, right through to power generation technology.

5.3.2 There is much government can do to foster the development of lean burn engines and fuel cells in vehicles and this would be included in the role of the Sustainable Energy Innovation Unit (see below).

5.3.3 Most fossil fuel power plant achieves efficiencies of only 35-50%, though most combustion-based renewables plant is only 20-30% efficient (delivered to the site). New technologies such as fuel cells, can increase this efficiency to over 50%. The best way to improve efficiency of any combustion based power generation is to use the heat generated in the process of producing power. This applies at every scale from micro-CHP in individual homes to major power stations, and includes renewables and fuel cells.

5.3.4 The UK already generates 6% of its electricity in this way, and the Government has a target for generating 10,000 MWe by 2010 (equivalent to 15% of UK electricity). We believe that it is achievable for CHP to supply 30% of UK electricity generation by 2020, and to demonstrate government commitment, would set a target for 30% of electricity used in the public sector to be generated from CHP by 2015. By 2020, a significant proportion of this could be using renewable fuels, for example biomass, so that the same project could be contributing to the 20% renewables by 2020 target as well as helping to meet our ambitions for CHP. We therefore see CHP and renewables as complementary; however we would always place the higher priority upon promoting renewables, because they are a guaranteed non fossil fuel energy source.

5.3.5 The measures outlined earlier in the paper, including reform of BETTA, emissions trading and carbon taxes will aid this transition. But an important additional element would be to bolster

the Government's existing planning framework. Already, large industrial sites that plan to use over 50 MW of heat have to consider whether the heat can be gained from the waste heat from power generation rather than from large heat-only boilers. We would reduce this threshold to 1 MW of heat. Power station developers would also have to demonstrate that they have examined opportunities for using heat from power generation, before being given consent. We would argue that government needs to abandon its rather haphazard case-by-case approach laying out a clear, consistent, and transparent framework. At present few companies are interested in building new power plant, because the market has a surplus of generation over supply. But in future years, as new generation is needed, it should be given the go-ahead by government only if it is based either on renewables, or it supplies heat generated in the process of generating power. In doing this, the Government would provide a much-needed clear and long-term signal for industry.

5.4 Nuclear

5.4.1 Current Liberal Democrat policy calls for nuclear power to be phased out as the current stations come to the end of their safe working lives. Five of the 11 older Magnox plants have already been closed, the AGRs will close between 2010 and 2023, and the newest plant, Sizewell B, is due to shut down by 2035.

5.4.2 Nuclear power currently accounts for over 20% of UK electricity generation, and is a zero-carbon source. Proponents of nuclear power argue that given the uncertainties over the scope for energy conservation measures and the expansion of renewable energy sources in the medium term, the UK should at least keep its options open in respect of another generation of nuclear plants (as the Government has in its recent White Paper). They would argue that the cost of power from a new generation of nuclear plant would be around 3-4p per kWh which though significantly higher than

gas, is currently no more expensive than onshore wind and less than most other renewable sources. The policies advocated earlier in chapter 3 of a carbon emissions trading system would also tend to close the economic gap with fossil fuels.

5.4.3 However, there remain powerful arguments against nuclear which we find conclusive. Nuclear energy creates a lasting legacy of hazardous nuclear waste. Nuclear fuel and waste both present security risks in the event of an accident or terrorist attack. The costs of decommissioning nuclear stations at the end of their working lives are large and unpredictable. The private sector will not fund new nuclear build because they cannot make a profit, so large public subsidy would be required. Lastly, nuclear fission is a relatively mature technology which is less likely than newer technologies to make rapid technical and economic advances.

5.4.4 We therefore reassert the existing policy of phasing out existing nuclear stations. In doing so we recognise this makes our strategy for a low carbon economy more dependent on attaining significant advances in energy conservation in the short to medium term, and on renewable energy sources delivering at acceptable economic cost in the medium to long term. However, we are confident that both of these can be achieved.

5.4.5 The work carried out by BNFL at Sellafield in its Thermal Oxide Reprocessing Plant (THORP) involves separation of reusable uranium and plutonium from fission products. The process is expensive and gives rise to complicated waste streams, and the slow build up in the stock of plutonium is a major concern. The Sellafield MOX plant (SMP) is designed to make use of the plutonium by converting it to the oxide form and mixing it with uranium oxide so the mixed oxide (MOX) can fuel more reactors. Again it is an expensive process and there are very limited markets for the fuel. Only Sizewell B could use it in small quantities in the UK. Given our proposal to

phase out nuclear power and given the difficulty of finding outlets for the plutonium, we believe both the THORP and SMP plants should be closed as soon as practicable. We recognise that this will have serious employment consequences for West Cumbria and that the people employed in this industry have a wide variety of skills which could be used in other industries. Well-planned and resourced regional development and additional training will ensure the re-use of valuable skills and offer West Cumbria a more secure post-nuclear future.

5.4.6 The secure long-term disposal of nuclear waste is not so much a technical problem as a major challenge of obtaining public acceptability. Many issues are entwined, but it is clear that our present generation has to take responsibility for disposing of all such waste securely and in a way that absolutely minimises the risk of contamination of the environment for future generations. Nuclear waste can remain radioactive for thousands of years and such is the nature of the radioactivity that treatment and disposal options must be not only robust in themselves, but also capable of retaining their integrity for thousands of years. There is now an international and scientific consensus that geological disposal should provide a long-term solution to this problem. Conditioned waste would be stored in a purpose designed repository some 500 metres below ground. It would be monitored carefully for many years and then eventually closed. We support this option. We recognise that the most vital requirements for the success of this solution are creating a political consensus and seeking public support and legitimacy. It is our policy to actively seek such all-party and public support.

5.5 Innovation

5.5.1 Current government energy policy shows a woeful lack of urgency in two areas: seeking answers to critical questions, and in actually using

the completed research and experience to move forward. For example, it is clear that wind energy is the most important renewable source which can contribute significant electricity within the next 20 years, but it is not yet known whether wind farms should be located all round the UK (to take advantage of different wind patterns) rather than concentrated along the west coast of the UK; nor what the best means of storing energy and so balancing out the peaks and troughs of wind energy might be.

5.5.2 Similarly, hydrogen is already being used in fuel cells to power vehicles, but it is not clear how the potentially huge volumes required if petrol and diesel are phased out will be produced; what safety protocols will be needed when the handling of hydrogen moves beyond trained specialists to the public at large; what strategy will be employed to develop a garage network across the country (manufacturers won't make cars if they can't be re-fuelled, and garage owners won't sell hydrogen if there are too few cars); and what the likely costs of vehicles and fuel will be, and hence what taxes and subsidies are likely to be needed in the early years.

5.5.3 In short, while much research has been done it is not being properly used, whilst other research which is clearly needed, has not yet started. One problem is that though a great deal of technical research can be carried out by individual companies with or without government subsidy (for example the work on photo voltaic cells by BP and other oil companies; the Stingray device which aims to generate electricity from tidal streams; the wave power installations at Islay and so on), there is an almost total lack of co-ordination. Strategies to ease the successful ideas onto the market remain to be agreed.

5.5.4 We see a clear need therefore to establish a Sustainable Energy Innovation Unit (SEIU) alongside our proposed Sustainable Energy Agency to put some urgency into the drive towards a lower carbon economy. The SEIU would have a similar

role to the Medical Research Council. The MRC has responsibility to continuously review medical research across the world; to carry out or commission research including trials which are not being done by other bodies; to provide an authoritative voice on best practice; and, where necessary, to present clear, costed, recommendations for *implementation* by government.

5.5.5 While Liberal Democrats in government would never seek to pick winners at a political level, we expect that areas to which the SEIU might give priority could include:

- a) Energy storage systems.
- b) Ways to improve the efficient production, retention and use of energy within buildings.
- c) Technologies to increase the efficiency and lifetime of photo voltaic cells; reduce the costs through improved materials, manufacturing and installation techniques; and minimising the toxicity risks during manufacture and disposal. (The potential prize of being able to plug into the sun cheaply is immense because solar power is virtually infinite).
- d) The development of biofuels in heat and power production and transport.
- e) The development of cleaner engine options, including lean burn engines and fuel cells.

5.5.6 We would anticipate that research into wave, tidal stream, biomass, cleaner ways to generate energy from waste, and other potential renewable technologies *and* innovative ways of using them, would also be supported. This support should continue to the point that they can enter commercial production, if the various steps in development prove successful.

5.5.7 Looking further ahead, it is important to recognise that energy demands might be met in a different way than at present. For example, if hydrogen were to replace gas, it could be used as a conventional heating fuel, in a fuel cell to produce electricity, and even to power the car. No mains electricity would then be needed.

5.5.8 It would be wrong to suggest that there are not formidable technical problems to be solved, and we do not yet have the luxury of knowing precisely how to achieve a 60% carbon dioxide emissions reduction by 2050. Thus it seems right for now to pursue every avenue. We will continue to support international nuclear fusion research at no more than the current levels of up to about £20m per year, though we continue to take the view expressed in *Conserving Tomorrow* (1996) that nuclear fusion is such a distant prospect that it hardly deserves the priority it has enjoyed as against renewable energy sources and energy efficiency strategies. We will also investigate ways

to mitigate the impact of fossil fuel use, for example through gasification of coal and capturing or sequestering carbon dioxide. Carbon sequestration should however be seen as a medium term expedient rather than a long term solution; and levels of government support for such R & D should reflect the fact that there is considerable private sector research being undertaken in this field.

5.5.9 One cannot necessarily accelerate progress by spending more money, but in this vital field it seems to us crucial that the pace of research and development is not threatened by lack of money or administrative delay.

5.5.10 The failure to prioritise research is emblematic of the failure by both Conservative and Labour Governments to deliver on their promises. Only Liberal Democrats can be relied upon to ensure that the best-intentioned policies are turned to practical effect.

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 and the Welsh Liberal Democrats 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. If approved by Conference, this paper will form the policy of the Federal Party, except in appropriate areas where any national 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.

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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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ISBN: 1 85187 701 0

© June 2003

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Printed by Contract Printing, Units 9-10 Joseph House, Eismann Way, Phoenix Park Industrial Estate, Corby, NN17 5ZB. Cover design by Helen Belcher

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