

Liberal Democrats Policy Consultation

Transition to a Zero Carbon Britain

Consultation Paper 109



Background

This consultation paper is presented as the first stage in the development of new Party policy in relation to a transition to a zero carbon Britain. It does not represent agreed Party policy. It is designed to stimulate debate and discussion within the Party and outside; based on the response generated and on the deliberations of the working group a full policy paper will be drawn up and presented to Conference for debate.

The paper has been drawn up by a working group appointed by the Federal Policy Committee and chaired by Neil Stockley. Members of the group are prepared to speak on the paper to outside bodies and to discussion meetings organised within the Party.

Comments on the paper, and requests for speakers, should be addressed to: Andrew Johnson, Transition to a Zero Carbon Britain Working Group, Policy Unit, Liberal Democrats, 8-10 Great George Street, London, SW1P 3AE. Email: andrew.johnson@libdems.org.uk

Comments should reach us as soon as possible, and no later than 31 October 2012.

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Introduction

1.1 In 2007, Liberal Democrats committed to achieving a zero-carbon Britain by 2050, in which the UK will absorb as much carbon as it emits by that date. This commitment is the UK's domestic contribution to ensuring that international action on climate change has a chance of limiting increases in global temperatures to within 2 degrees Celsius above pre-industrial levels. This limit is regarded as the absolute minimum that is required to prevent catastrophic impacts of global climate change.

1.2 There have been a number of significant developments since Liberal Democrats last considered climate change strategies in detail. First, studies have provided further evidence of climate change, including the first evidence of rising Antarctic temperatures, rapid melting of the Arctic ice, changing rainfall patterns across the world, increased air humidity as warm air holds more moisture, and increased salinity of the oceans due to accelerated evaporation of seawater.

1.3 Second, the Climate Change Act 2008 (CCA) established a legally-binding target to reduce the UK's greenhouse gas (GHG) emissions by 34% from 1990 levels by 2020 and by at least 80% from 1990 levels by the year 2050. A system of carbon budgets sets legally binding interim targets to make progress towards the 2050 target. However, the independent Committee on Climate Change (CCC) has warned several times that the UK's underlying progress on GHG emissions (that is, aside from such factors as the impact of the recession and weather conditions in particular years) falls well short of what is required to meet future carbon budgets.

1.4 Third, a number of important laws and measures have been adopted at EU level. The 2007 climate and energy package set carbon reduction, renewable and energy efficiency targets for 2020. To achieve those objectives, the Renewable Energy Directive was adopted in 2009, followed by the Energy Efficiency Directive in 2012. A Low Carbon 2050 Roadmap has been published setting out long-term EU 2050 carbon reduction targets, as well as a specific Energy 2050 Roadmap spelling out different decarbonisation scenarios which could achieve those long-term targets. The current debate at EU level focuses on the desirability of accelerating the 2020 target, and on adopting 2030 milestones, similar to the climate and energy package for 2020, to provide industry with investor certainty and Member States with a framework in which to set national policy.

1.5 Fourth, since 2008, the global financial crisis and the economic recession have provided a very different context for energy and climate change policies. Public attention has focussed rather less on the threat of climate change than was the case in the mid-2000s. There is a mindset that instinctively sees 'looking after the environment' as an impediment to 'economic prosperity'. As chapter 2 makes clear, this is a false choice: well designed policies to support new technologies and services that help mitigate climate change are an investment and not a cost. In the long run, they will deliver new sustainable sources of jobs and prosperity and make the economy more secure and resilient.

1.6 However, tougher economic times have brought a new awareness that meeting the targets set out in the CCA will impose some short-term costs on consumers and businesses. Some overstated claims have been made about the impact of 'green taxes' on consumer energy bills. Moreover, the UK's fleet of power stations is ageing and electricity demand rising. The UK's dependence on fossil fuels is growing and gas prices are uncertain and volatile. It can be argued, therefore, that consumers would be worse off without policies to set the UK on a zero carbon path. Still, those policies should be as cost-effective as possible. Crucially, we need to consider the social element of the transition to a zero carbon Britain to ensure that its costs are borne fairly, and to protect those households that are in, or threatened with falling into fuel poverty, and businesses subject to competition from overseas competitors not operating under the same constraints.

1.7 Fifth, progress towards a new international agreement on climate change has not been as fast as hoped. The Copenhagen Climate Change Conference in 2009 failed to reach any legally binding

agreement on reducing carbon emissions, although nations signed up to national targets for emission reductions. The Cancun Conference of 2010 agreed that climate change was a major international challenge, and that actions need to be taken to limit increases in global temperatures to below 2 degrees Celsius.

1.8 The Durban Climate Change Conference of 2011 agreed that the participant countries would work towards a new legally binding agreement on reducing carbon emissions by 2015, to come into effect at the latest by 2020. There was also agreement to set up a Green Climate Fund to provide \$100bn a year to poorer countries to enable them to mitigate and adapt to the impacts of climate change. Although much work remains to be done to arrive at a new legally binding agreement, there is for the first time the global commitment to work towards this goal.

1.9 Finally, since 2010, Liberal Democrats in government have led on the delivery of a wide range of policies to meet the UK's existing obligations under the CCA and international agreements. The key policies that have been pursued or which are in the process of being introduced include:

- Setting, through the fourth carbon budget, a legally binding target of a 50 per cent reduction in emissions by the mid 2020s – the most ambitious of any industrialised country.
- Setting policies to meet the target, through the December 2011 Carbon Plan.
- Encouraging renewable technologies through direct investment and support, the maintenance and re-banding of Renewables Obligation Certificates (ROCs) and the introduction of the Renewable Heat Incentive.
- Moves to reform the electricity market to deliver the investment needed in low carbon technologies.
- Introducing the Green Deal, a world leading programme to revolutionise the energy efficiency of British properties, and ensuring improvements in the energy efficiency of new housing through regulations, working towards the 2016 target of zero carbon for new housing and 2019 for non-residential buildings.
- Creating the Green Investment Bank to provide finance for green infrastructure and technologies.
- Guaranteeing major investment in rail services, and introducing subsidies for the purchase of electric vehicles.
- Taking a leading role within the EU to argue for an increase in the 2020 target for emissions reductions from 20% to 30%.
- Playing a leading role in the outcome of negotiations at the Cancun and Durban Climate Change Conferences in 2010 and 2011.

1.10 The Federal Policy Committee has, therefore, commissioned new policy work on 'The Transition to a Zero-Carbon Britain'. The policy working group has the task of mapping out the specific policies that will be needed to deliver a zero-carbon Britain by 2050, building on existing party policies, and the achievements of Liberal Democrats in government. Rather than being confined to such areas as energy, transport and carbon pricing, the group's work will cover the full range of policy areas to effect the transition to a zero-carbon Britain by 2050. Policies for adapting to the impacts of climate change will, however, be considered separately.

The Liberal Democrat Approach

2.1 As the scientific evidence makes clear, the possibility of unchecked climatic change is the most serious problem now facing the world. The Liberal Democrat approach is based on three key principles:

- A clear understanding that environmental objectives are not an optional add-on but need to be incorporated in every economic transaction and decision.
- The need for bottom-up decentralist approaches to reducing emissions that allow individuals and communities to undertake activities themselves – alongside national action to set a stable, predictable policy framework in which long-term investments in low-carbon technology and infrastructure can be made with confidence.
- The need for international cooperation, through the EU and the wider global community, in tackling this global threat.

2.2 It is clear that current UK government policy needs to change. While Liberal Democrat ministers have succeeded in setting an ambitious agenda for UK climate policy, they have been undermined by constant in-fighting with Conservative ministers over, for example, subsidies for renewable energy, and by Tory Europhobia which could threaten the UK's relationship with the EU. The Chancellor's public comments on the "cost" of clean energy measures undermine the stable and predictable framework for low-carbon policy that industry needs. Little real power has been devolved to communities and local authorities.

2.3 A key element of the debate – quite rightly, given the state of the public finances and pressure on households and businesses – concerns the economic impact of climate policy. As the 2006 Stern Review of the economics of climate change argued, the annual costs of mitigation should amount to about 1–2 per cent of global GNP. The costs of not acting, and dealing with unchecked climatic change, could, by 2100 reach as high 5–20 per cent of global GNP per year, with the poorest suffering most.

2.4 There are many benefits from policies that aim to improve energy efficiency and reduce fuel consumption through developing and commercialising new technologies in areas such as renewable energy, carbon capture and storage and low-carbon transport. Policies for climate change mitigation are not so much a cost as an investment, laying the foundations for new technologies, new industries, and new sources of jobs and prosperity.

2.5 The growth of the UK's low-carbon and environmental goods and services sector - the 'green economy' - in recent years has been a major success story. The sector accounted for almost a million jobs in total, last year and, even in the depths of recession, grew at a rate of almost 5 per cent, adding another 25,000 jobs and generating a trade surplus of £5 billion. Britain's real strengths in technologies such as offshore wind power or marine renewables leave it well placed to benefit from a rapidly expanding global market – currently growing at 3.7 per cent a year, significantly faster than the global average.

2.6 Furthermore, investment in low-carbon and environmental technologies will improve energy security and resilience, reduce dependence on imports of fossil fuels and protect businesses and consumers from oil and gas price shocks. In the short term, the investment needed to replace Britain's ageing power stations and to insulate its notoriously energy-inefficient homes and offices will help to stimulate an economy still struggling to recover from recession.

2.7 The real danger to Britain's environment and its economy, lie in the mistaken belief that 'environment' is a challenge that can wait until the economy is stronger – or, worse, in those (like the Chancellor) who like to pretend, in the face of all the evidence, that environmental regulations bring costs but few benefits. A failure to achieve the transition to a zero-carbon economy risks seeing green investment flow instead to countries like Germany, China or Korea, fixing the UK permanently in the economic slow lane – while at the same threatening the climate security of everyone.

Targets, Governance and Delivery

3.0.1 Moving the UK to a zero-carbon economy will be a significant political, economic and technical challenge. A clear, durable and long-term policy framework is therefore required to provide investors with confidence ensure that the necessary progress is made and maintained.

3.1 UK Emissions Targets

3.1.1 The Climate Change Act 2008 (CCA) established a legally binding target to reduce the UK's greenhouse gas emissions to 34% below 1990 levels by 2020 and to at least 80% below 1990 levels by the year 2050. To drive progress towards the 2050 target, the CCA introduced a system of carbon budgets which sets legally binding limits on the amount of emissions that may be produced in successive five-year periods. The first four budgets effectively require a reduction in greenhouse gas emissions to 50% of 1990 levels by the mid 2020s. Together, the budgets require average annual emissions reductions of 3%.

3.1.2 The Committee on Climate Change (CCC) was established under the CCA. The committee's role is to advise the government on the level of climate budgets and measures to achieve these budgets. The CCC's annual reports to Parliament have noted that emissions have fallen mainly due to such factors as the recession, weather conditions and rising energy prices, and that underlying progress resulting from policy measures would – if continued – be insufficient to meet future carbon budgets. The CCC has frequently called for a step change in the rate at which measures to achieve the carbon budgets are implemented.

3.1.3 There is also an issue about the extent to which the UK has effectively 'outsourced' greenhouse gas emissions. In April 2012, the Commons Energy and Climate Change Committee reported that the increase in carbon emissions from goods produced overseas and imported into Britain are now outstripping the gains made in cutting emissions here. This is an outcome of the way in which, under the UN Framework Convention on Climate Change (UNFCCC), emissions are attributed to the country of production, not the country of consumption. It is difficult to deal with this problem, however, without significantly rewriting global climate agreements.

3.1.4 The UK's existing targets, even if met in full, would not place Britain on a zero-carbon trajectory for 2050. It is clear from the UK's performance to date in reducing emissions and delivering policies to achieve the existing carbon budgets that a very significant step change will be required if such an ambitious goal is to be achieved.

Questions

1. *What should the UK's greenhouse gas emissions reduction target be for 2050?*
2. *Should targets be based solely on reductions in emissions or should they take into account the emissions of other countries that produce goods exported to the UK? How could such a target be set, measured and enforced?*
3. *Would sectoral targets assist in maintaining momentum for long-term targets and, if so, how should such targets be set?*
4. *How can future governments be held to account for the achievement of the targets?*
5. *How can we ensure that industry, electricity consumers and the public accept greenhouse gas emissions targets and are prepared to make the behaviour changes needed to achieve them?*

3.2 EU Emissions Targets

3.2.1 In 2007, the European Council committed to a target for 2020 of a 20% reduction in greenhouse gas emissions compared to 1990 levels, and also said this would be raised to 30% if other industrialised

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countries followed suit. This target is now legally binding on all member countries. The EU has an overall 2050 target of reducing emissions to 80 per cent or less than 1990 levels.

3.2.2 Liberal Democrats in Government are pressing for an EU target for 2020 of a 30% reduction in greenhouse gas emissions compared to 1990 levels. A European Commission analysis has shown that this approach is the most cost-effective way of cutting emissions en route to the 2050 target. A 30% target will help the EU to secure the investment in clean energy that it needs to stay competitive.

Question

6. *Should there be an EU emissions reduction target for 2030, together with 2030 milestones for renewables and energy efficiency, on the model of the 2020 targets?*

3.3 UK Governance for a Zero-Carbon Transition

3.3.1 Meeting the UK's emissions targets and making the transition to a zero carbon Britain will require action by different government departments and regulatory bodies. There is a need to ensure that there is a co-ordinated approach across government to ensure that all policies drive towards the target of reducing carbon emissions.

3.3.2 The creation of the Department of Energy and Climate Change (DECC) in October 2008, combining responsibility for energy policy with the delivery of the UK's principal climate change policies, was a step forward in ensuring the coordination of policy. However, DECC remains relatively weak within Whitehall and various other departments continue to be responsible for policies that are essential in delivering a zero-carbon Britain. These include the Department for Environment, Food and Rural Affairs, Department for Transport, Department for Communities and Local Government, Department for Business, Innovation and Skills and HM Treasury.

Question

7. *What mechanisms and structures should be put in place to ensure more effective delivery and co-ordination of policy across government to work towards a zero-carbon Britain?*

3.4 The Role of Local Authorities

3.4.1 Local authorities have a crucial role in contributing to emissions reductions and ensuring the UK meets its carbon targets. They have significant influence over key emitting sectors including residential and commercial buildings, surface transport and waste.

3.4.2 Local authorities can support emissions reductions by using energy efficiency programmes, promoting sustainable travel options, giving planning approval to renewable energy projects, developing decentralised energy plans and developing waste recycling programmes. Local authorities can also lead by example and reduce emissions in their own estates and operations. However, at the moment there is no requirement for councils to set targets and implement measures to reduce emissions within their area. This could put the transition to a zero-carbon Britain at risk.

Questions

8. *Should local authorities be given a statutory duty to develop and implement low carbon plans?*
9. *How should government empower, support and encourage local authorities to play their part in the transition to a zero-carbon Britain?*

Pricing Carbon

4.0.1 An effective system of pricing carbon is an essential (but not a sufficient) tool for achieving targets to reduce greenhouse gas (GHG) emissions. A carbon price is a cost applied to carbon pollution to increase the incentives to polluters to reduce the amount of greenhouse gas they emit into the atmosphere. Many economists contend that introducing a carbon price is the single most efficient way for countries to reduce their emissions. A single, consistent carbon price across different sources of carbon emissions (and ideally across countries as well) is a necessary condition for minimising the cost of emissions reduction.

4.0.2 Carbon pricing can be delivered in two main ways. The first is by applying carbon taxes to the distribution, sale or use of fossil fuels, based on their carbon content. The second way is through 'cap-and-trade' schemes, in which the total allowable emissions in a country or region are set in advance ('capped') and permits to pollute are created for the allowable emissions budget and either allocated or auctioned to companies. The companies can trade permits between one another, buying permits from other companies where this proves cheaper than reducing emissions themselves. Thus a market for emissions is created ensuring that carbon savings are made as cost-effectively as possible. The EU Emissions Trading System (EU ETS) is the best known example.

4.1 UK Carbon Pricing

4.1.1 The UK still does not have a consistent price for carbon. As the Institute for Fiscal Studies has noted, existing policies impose both explicit and implicit prices on carbon emissions, which vary greatly across energy sources and energy users.

4.1.2 Emissions from the different sectors are priced very differently. Emissions from electricity supplied by burning fossil fuels are subject to the EU ETS. Those created by larger business directly may come within the EU ETS and be priced at a low level through the climate change levy (CCL) or covered by Climate Change Agreements (CCAs). The CCL is a tax on high-carbon, non-renewable energy supplied to the industrial, commercial, agricultural, public and service sectors. Intensive users of energy, such as chemicals companies and some metals industries, are entitled to 65% discounts on CCL rates through to March 2013 (and 90% after that date), provided they sign up to and adhere to Climate Change Agreements (CCA's) which set targets for emissions reduction and energy efficiency.

4.1.3 Businesses and public sector organizations that are large energy users, but not large enough to be covered by the CCL, are covered by the Carbon Reduction Commitment (CRC), a mandatory cap-and-trade regime – currently under review by the government.

4.1.4 Emissions from electricity consumed by households are priced through the EU ETS but those from gas used principally in domestic heating are not priced at all. In effect, emissions from domestic gas and electricity use are subsidised because VAT is not charged at a full rate. But addressing these discrepancies would raise a number of complex issues. For instance, on average, poorer households devote a higher proportion of their spending to energy than richer households.

4.1.5 Other policies affect electricity prices. The Renewables Obligation (RO) requires electricity suppliers to source a certain proportion of their electricity from renewable generation. In addition, all users face lower implicit carbon prices on coal-fired electricity relative to gas-fired electricity because neither the CCL nor the Renewables Obligation discriminates between non-renewable fuels on the basis of their carbon content (coal is more carbon-intensive than gas).

4.1.6 Carbon pricing for transport is hardly more straightforward. Emissions from road transport are priced at high level through excise duties on fuel. Vehicle excise duty and company car tax, and many

residential parking schemes, are also now varied by the fuel-efficiency of the vehicle, creating additional incentives to purchase low-emissions vehicles such as hybrids.

4.2 EU Emissions Trading System / Carbon Floor Price

4.2.1 The EU Emissions Trading System (EU ETS) is the cornerstone of the policy framework to meet the European Union's emissions targets. The scheme covers electricity generation and the main energy-intensive industries – power stations, refineries and offshore, iron and steel, cement and lime, paper, food and drink, glass, ceramics, engineering and the manufacture of vehicles – and, from 2012, international aviation. Combined, these account for around half of UK greenhouse gas emissions. The UK has, then, a dual carbon pricing system, with around half of emissions are in the EU ETS and half out.

4.2.2 With a gradual tightening of the cap and a resulting carbon price, the system should provide incentives for reducing emissions volumes at least cost. However, because governments over-allocated allowances in the first place, compared to demand, the price of carbon has fallen substantially. The current low prices do not dissuade polluters from continuing to emit and do not provide sufficiently strong incentives for low carbon investors.

4.2.3 To address the low price of carbon under the EU ETS, the UK Government is pressing for all EU Emissions Trading System allowances to be auctioned and for a European emissions reduction target of 30% by 2020.

4.2.4 Within the UK, the Government is introducing the carbon floor price from 1 April 2013, to close the gap between the market price of carbon provided under the EU ETS and the level required to incentivise investment in low-carbon energy. The floor will start at around £16 per tonne of carbon dioxide (tCO₂) and follow a linear path to target £30/tCO₂ in 2020 (both in 2009 prices). The Treasury expects this to raise £740 million in 2013-14, rising to £1.4 billion in 2015-16. The carbon floor price should help ameliorate the dispersion of carbon prices because it depends explicitly on carbon content and applies to domestic and non-domestic sectors alike.

4.2.5 The carbon floor price and ETS will fall especially heavily on energy intensive industries, such as iron, steel, aluminium and paper, which employ around 620,000 people. As the carbon floor price is being introduced only in the UK, it may cause 'carbon leakage' of energy-efficient manufacturing to less-regulated economies. In November 2011, the Government announced that it will provide £250m to help energy intensive users with costs arising from the EU ETS and carbon floor price, and increase discounts under the CCA to 90% as from April 2013.

Questions

10. *How can we develop a UK carbon pricing regime that is effective, coherent and fair?*
11. *What further action is needed at EU level to improve the EU ETS, so that it can create a long-term and stable carbon price to facilitate a shift to a low-carbon economy?*
12. *Should the Liberal Democrats encourage low-carbon investment by ring-fencing receipts from the EU Emissions Trading System or the Carbon Floor Price?*
13. *As carbon pricing measures are developed, how can we help energy intensive industries to manage the transition to a zero-carbon economy?*
14. *In light of the CRC review, what carbon pricing measures should apply to non energy intensive companies and organisations?*

Sectors

5.0.1 As well as the targets under the Climate Change Act and the carbon budgets, the UK must meet EU targets on renewables and energy efficiency. This means supplying 15 per cent of final energy from renewable sources by 2020 and implementing measures contained in the recently agreed EU Energy Efficiency Directive.

5.1 Electricity

5.1.1 The power sector is the single largest source of UK emissions, accounting for 27% in 2010.

5.1.2 Current government projections indicate that, after electricity market reform, emissions from this sector are expected to fall by at least a quarter by 2030. By 2050, however, they need to be close to zero.

5.1.3 The Government expects that by 2050 the UK may need around double today's electricity capacity to meet peak demand, with improvements in energy efficiency being outweighed by the electrification of heating, transport and parts of industry and economic and population growth. But these views are strongly contested. How to make the transition to a decarbonised electricity system by 2050 is one of the major challenges in UK energy policy.

Questions

15. *Should we seek to reduce total electricity demand; if so, how? Should there be binding targets for reducing electricity demand?*
16. *How can future electricity policies allow for uncertainties around future demand and capacity, technological developments and the international context?*

Decarbonising the electricity sector

5.1.4 The Government believes that by 2050, electricity should come from three low-carbon sources: renewable energy, especially onshore and offshore wind, a new tranche of nuclear power stations, and gas and coal-fired power stations fitted with carbon capture and storage (CCS) technology. DECC's modelling suggests that a 'balanced mix' scenario carries the least cost, although this is, of course, open to argument.

5.1.5 The Government believes that over the next decade, the UK will need to invest in new generation capacity to replace the coal and nuclear power stations set to close by the early 2020s – representing a quarter of current capacity – in order to maintain energy security and deliver the legally binding carbon budgets. The Government's approach is to greatly increase the role of renewable sources in the electricity generation mix and to use more gas-fired generation alongside the increased penetration of renewables. The Government is also supporting the development of CCS technology at scale, enabling mature technologies such as nuclear to continue to play a role, and supporting the demonstration of less mature renewable technologies, such as marine. The Government intends that competition between the low carbon sources – renewables, nuclear and CCS - will drive innovation and lower costs.

5.1.6 The Committee on Climate Change (CCC) has recommended that the goal of decarbonisation of the power sector to 50g CO₂/kWh by 2030 should be placed in legislation, in order to provide certainty to investors in the UK's clean energy sector.

Questions

17. *How and when should we prepare for the decarbonisation of the electricity system?*
18. *Should there be a new UK target for renewable energy, for beyond 2020?*

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19. *Should a target for decarbonisation of the electricity sector be enshrined in legislation; if so, what should the target be?*

Electricity Market Reform

5.1.7 The Coalition Government's most important policy to deliver electricity decarbonisation is the package of market reforms. Ofgem has estimated that by 2020 the UK will need around £200bn investment in generation, electricity networks and gas infrastructure. Of this, at least £110bn would be needed in new generation and transmission assets in electricity—over double the rate of the last decade—in order to meet UK climate change, renewables and energy security targets, replace ageing plant and increase interconnection.

5.1.8 However, the Government has concluded that existing market arrangements would not deliver the level of low-carbon investment required. The Government therefore proposes four major reforms to the electricity market:

- (i) A carbon price floor to put a predictable and, over time, a rising price on carbon emissions, in order to make low carbon technologies more competitive (now provided for in legislation) [see chapter 4].
- (ii) A feed-in-tariff with Contract for Difference (FIT CfD) to provide long term contracts to low carbon electricity generators, providing guaranteed prices more cost-effectively (for renewables) than the current ROCs system.
- (iii) An emissions performance standard (EPS) to limit how much carbon coal (and eventually gas) power stations can emit; so that no new coal is built without demonstrating carbon capture and storage (CCS) technology or being 'CCS-ready' (not necessarily fitted).
- (iv) A capacity mechanism to ensure sufficient system flexibility to maintain reliable supplies, especially during peak periods, as the amount of variable and inflexible low-carbon generation increases.

5.1.9 In May 2012, the Government published for pre-legislative scrutiny a Draft Energy Bill, to provide a framework for, *inter alia*: FIT CfDs; Final Investment Decisions (FIDs) to enable some of the new investment to come forward before the CfD regime comes into force; a capacity market; and the EPS.

5.1.10 The proposals are controversial. Some commentators, including the Commons Energy and Climate Select Committee, contend that demand-side measures need to be given a much higher priority, not least because they are likely to deliver much more cost-effective solutions than building ever greater levels of generating capacity.

5.1.11 The reform of the wholesale electricity market is also relevant. In its April 2011 report on electricity market reform, the Select Committee called for "wholesale electricity market reform ... to break the dominance of the 'Big Six' energy companies in order to allow new entrants to invest in the UK's low-carbon future". In February 2012, Ofgem proposed to require the Big Six groups to sell 25% of their generated power in a range of different products in the spot and forward financial markets.

Questions

20. *How can the electricity market be reformed so as to provide robust incentive mechanisms to reduce total energy demand?*
21. *How should the above reforms be designed to ensure they do not interfere or undermine the existing EU framework the UK is part of, such as the EU Emissions Trading Scheme?*
22. *What further measures might be needed to allow new market entrants and community energy projects to invest in the UK's low carbon future?*

Renewable Electricity

5.1.12 In practical terms, the UK's obligation under the EU Renewable Energy Directive, that 15% of UK's

final energy consumption should come from renewable sources, translates into a commitment that electricity from renewable sources should account for at least 20% of electricity by 2020. The CCC has concluded that renewable sources could provide over 40% of UK electricity by 2030. This will, however, require their costs to be significantly reduced. An increased penetration of renewable electricity would need some combination of balancing capacity and flexible back-up generation.

5.1.13 Better interconnection to other European countries would enable the UK to trade electricity and make use of balancing capacity. The government is talking to countries including Norway, Denmark Iceland and Ireland about developing new subsea interconnectors to enable the UK to export and import renewable electricity to ensure a reliable energy supply and to balance variable power generation such as wind. Interconnection to Norway offers a particular advantage to the UK because it opens access to the significant electricity storage capabilities of Norwegian hydro.

5.1.14 Current government policy is based on the assumption that by 2020 most of the renewable electricity target will be met by onshore wind, offshore wind and biomass electricity, with offshore wind being the most expensive (marginal) technology needed to meet the 2020 target. Recent reductions in the price of solar PV have led some to say that solar PV can replace offshore wind at a lower cost, and that the focus of policy should be moved away from wind and towards solar PV. In 2011, the government substantially reduced the value of the Feed-in-Tariff on solar due to large cost reductions, and has set out plans to reduce subsidies as costs reduce. However the government still pays a large premium on solar generated from small roof-top sites on homes and businesses, on the basis that there is a benefit from decentralised electricity in terms of public awareness and balancing of the electricity network.

5.1.15 Other government policies to promote renewable electricity include: committing £50m over the next four years to support innovation in offshore and marine technologies; planning reforms to facilitate the development of renewable energy infrastructure; establishing an improved licensing and regulatory system for marine energy; making offshore wind and energy from waste a priority for investment by the Green Investment Bank; committing £60m to encourage the development of port and manufacturing facilities for offshore wind and marine energy parks; reforming electricity grid access; and establishing a new offshore grid framework.

Questions

23. *What policies are needed to deliver a higher level of renewables penetration?*
24. *Should the UK meet its 2020 renewables target solely from electricity generated in the UK?*
25. *Should the UK support overseas renewable electricity projects and interconnectors as a cheaper way of meeting renewable targets; if so, how?*
26. *To what extent do we want to see the UK develop biomass electricity, which, for larger plants, requires imports of wood chips or pellets? Is this a sustainable way in which to generate electricity?*

Nuclear

5.1.16 Existing nuclear power plants provide 16% of UK electricity supply but they are ageing. Under the Coalition Agreement, the Government supports the construction of replacement nuclear power plants, provided they are subject to the normal planning process for major projects (under a new National Planning Statement, implemented in 2011) and receive no public subsidy.

5.1.17 The government contends that new nuclear power is a proven technology able to provide continuous low carbon generation and to reduce the UK's dependence on fossil fuel imports. In order to facilitate the construction of new nuclear plant, the government has acted to reduce regulatory and planning risks, ensure there is an appropriately skilled workforce, and rebuild the nuclear supply chain.

5.1.18 In our 2010 general election manifesto, Liberal Democrats rejected a new generation of nuclear power stations; on the basis that nuclear is a far more expensive way of reducing carbon emissions than

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promoting energy conservation and renewable energy.

5.1.19 Critics of the government's nuclear power strategy contend that it will not be possible to undertake a new build programme without large, ongoing public subsidy. There is debate over the meaning of 'public subsidy', with some commentators arguing that the electricity market reform proposals favour the nuclear sector. There are also concerns as to the safety and cost of nuclear waste disposal and of the decommissioning of old plant.

5.1.20 The first new nuclear power station will not be available until 2019 at the earliest. The economic viability of nuclear projects is an increasing concern, though current government plans would ensure the full risk of construction cost overruns would lie with the developer not the public sector. Three consortia had plans to invest in new nuclear capacity but the one led by RWE and E.ON withdrew earlier this year.

5.1.21 Existing nuclear generators, as well as existing renewable generators, will receive a profit from the effects of the higher electricity price that will be a consequence of the carbon price floor, but will not have to pay the price floor as a 'tax' because nuclear generation does not emit carbon. Liberal Democrats have called for a windfall tax to be applied to these profits, with the proceeds earmarked to help reduce electricity costs for vulnerable consumers.

Questions

27. *What role should nuclear power have in the UK's electricity generation mix between now and 2050?*
28. *Where safe to do so, should the life of existing nuclear power stations be extended?*
29. *How should 'public subsidies' for new nuclear plant be defined?*

Carbon Capture and Storage

5.1.22 Carbon capture and storage (CCS) could become an important low carbon technology over the next 40 years. CCS will allow fossil fuels to provide flexible electricity generating capacity, helping to balance other low carbon sources. Whilst there are no full-chain commercial-scale CCS power projects in the world so far, studies show that in the 2020s fossil fuel generation with CCS, at least for coal, is expected to be cost-competitive with some other low carbon electricity generation sources. CCS can be applied to coal, gas and biomass thermal generation and could also be used to capture the CO₂ emissions from industrial processes such as oil refining, aluminium smelting and cement production.

5.1.23 In 2005, the Labour Government announced it would support a BP demonstration project near Peterhead. This project failed in 2007 after policy delays and disagreements over the appropriate level of subsidy. A subsequent CCS competition launched the same year eventually failed in 2011 when the only surviving consortium (Longannet) also withdrew in a dispute over the level of subsidy.

5.1.24 To date only four small pilot plants have been delivered in the UK, although six larger projects are proposed. The coalition government has set aside £1 billion to support projects aimed at the commercialisation of CCS, as well as providing ongoing revenue support through electricity market reform; additional support may be available from the EU.

Questions

30. *What other measures, if any, are needed to encourage the development and commercialisation of CCS technology?*
31. *Should any support for CCS be spread across fuel types or focussed on coal, gas or biomass?*
32. *Should CCS for industrial processes be supported; if so, how?*

Unabated Gas

5.1.25 The government believes that gas generation will continue to play an important role in the UK electricity system, with new gas plant required over the next decade to provide peak capacity following coal and nuclear plant closures and unabated gas playing a significant role in electricity generation through the 2020s and even in 2050, as a back-up for renewables.

5.1.26 In order to provide investors in new gas plant with certainty, the government announced in March 2012 that the emissions performance standard (EPS) governing new fossil fuel fired power stations would be set at a carbon intensity level of 450g/kWh through to 2045. This effectively bans coal-fired power stations without CCS, but allows gas-fired power plants to operate unabated.

5.1.27 In the context of its recommendation that power sector emissions should be reduced to 50 gCO₂ / kWh by 2030, the CCC has seen a potentially important role for gas CCS, if this can be shown to be viable. But the committee has been clear that the role for unabated gas fired power generation should be limited to balancing the system in 2030, by which time the share of unabated gas generation in the total should be no more than 10%, compared to 40% today. The CCC has concluded that “a second dash for gas, resulting in a higher share of unabated gas in 2030, would neither be economically sensible nor compatible with our legislated carbon budgets.”

Questions

33. *What role should gas-fired generation play in the GB electricity system (i) before 2030 and (ii) between 2030 and 2050?*
34. *How can we balance any role for peaking gas plants in providing energy security with the need to ensure that the GB electricity system is on a path to decarbonisation by 2050?*

Reducing electricity demand and balancing the electricity system

5.1.28 With a decarbonised electricity supply, we will need a grid that is able to reflect the changed quantity and nature of power generation, and a more flexible electricity system that can cope with fluctuations in demand and supply. A ‘smarter’ electricity system will entail a combination more efficient transmission and distribution networks, flexible back-up capacity, bulk storage of electricity greater interconnection, and new ways of managing energy demand. [See also section 5.1.3 and the discussion of smart meters in section 5.2.3].

5.1.29 There is increasing interest in the concept of a ‘smart grid’, defined by the Electricity Networks Strategy Group as ‘an electricity power system that can intelligently manage the actions of all users connected to it – generators, consumers and those that do both – in order to efficiently deliver sustainable, economic and secure energy systems’.

5.1.30 The issues to be addressed include: cost (likely to be billions of pounds); timing and sequencing; the changing nature of the low carbon energy mix to 2050; investment risks for distribution network operators; how to ensure consumer engagement; the need for a smart grid supply chain; and investment in skills.

5.1.31 The government and Ofgem have set up a Smart Grid Forum to provide network companies with a common focus in addressing future challenges. Ofgem’s Low Carbon Networks Fund is making £500m available to network operators to introduce new innovation and smart technology.

Questions

35. *How can we ensure that the electricity transmission and distribution networks can adapt to a low carbon future?*

36. *What policies are needed to ensure that the components of a smart electricity system are in place when they are needed?*

5.2 Buildings

5.2.1 Domestic buildings account for 29% of UK emissions and non-domestic buildings account for 14% of emissions. The UK's national policy on buildings should therefore primarily focus on reducing inefficient use of energy in the existing building stock.

5.2.2 By 2050, emissions from buildings can be substantially eliminated through greatly improved energy efficiency of the buildings themselves, the appliances used within them, and decarbonising the energy used within the buildings.

5.2.3 At EU level, the recently (June 2012) agreed Energy Efficiency Directive (EED) contains binding measures to improve the energy efficiency of buildings. The EED requires the UK to set by 2014 a long-term strategy for the renovation of its entire building stock in order to achieve substantial energy and emissions savings by 2050. It will also require the government to renovate 3% of its buildings annually by 2020, in order to stimulate the market and develop the skills and expertise in the construction industry which will be necessary for the large scale renovation needed to 2050.

Improving heat efficiency in buildings

5.2.4 The Green Deal is the government's innovative programme to finance a mass programme of energy efficiency works on our domestic homes, business premises and public buildings. The work will be undertaken at no upfront cost, with the costs plus a financing cost being recovered in instalments through future energy bills. It is envisaged that the regular energy savings achieved through the efficiency works would exceed the costs recovered through future energy bills. The programme will be accompanied by the Energy Company Obligation (ECO) that will provide direct financial support to vulnerable households and hard to treat homes, funded by energy companies but with the costs passed on to their customers.

5.2.5 There are some concerns as to the likely level of take up of the Green Deal as consumers will need to be persuaded that savings on future energy bills will at the least meet the additional costs that will be added by repaying the costs of the works.

5.2.6 The Government is also committed to successive improvements in new-build standards through changes the Building Regulations in England and the devolved administrations. In October 2010, the new regulations in England and Wales introduced a 25% improvement on 2006 carbon emissions standards for new buildings.

5.2.7 In December 2010, the Government committed that all new non-domestic buildings in England would be zero-carbon from 2019. In the Plan for Growth, published alongside Budget 2011, the Government committed that all new homes from 2016 would be zero carbon. Liberal Democrats support upgrading building efficiency regulations to improve dramatically the energy performance of existing homes and public buildings by 2019.

5.2.8 Policies for a zero carbon transition and spatial planning should be mutually reinforcing in contributing to sustainable prosperity. However, planning authorities do not have a particularly good record on actions to tackle climate change. The planning processes themselves are somewhat fragmented, with little strategic oversight to ensure that the multitude of individual planning decisions combine to create neighbourhoods which encourage and enable low carbon living. Recent planning changes proposed by the government promote a default presumption in favour of 'sustainable development'. This approach uses a limited definition of sustainability and has caused concern that the strategic deficit will get worse and not better.

Questions

37. *What new regulatory and fiscal incentives are needed to encourage take-up of energy efficiency in buildings?*
38. *Should the UK set a separate target for building renovation to 2050? How should this target be expressed?*
39. *How can planning authorities (a) enhance the environmental performance of new and existing buildings while respecting local views and (b) be encouraged to set higher energy efficiency standards, even compared to building regulations (until zero-carbon building regulations apply)? What legislative changes, if any, are needed?*

Promoting changes in behaviours to reduce energy demand

5.2.9 The Government intends that all households, businesses and public buildings should have smart energy meters between 2014 and 2019. Smart meters will provide consumers with real time information on their energy usage and the opportunity to save money on their energy bills. But the rollout of smart meters, in itself, does not guarantee energy savings or lower energy bills; consumers need to be educated and provided with advice on how to engage with the technology. Smart meters are merely the first step: the development of a smart grid is the 'big prize' in better managing supply and demand for energy.

Question

40. *What other policies (for example the use of regulations) are needed to promote changes in consumers' energy consumption behaviours?*

EU action for energy efficiency

5.2.10 The EU has a target for 2020 of cutting energy use by 20% compared to 2009 levels. The 2012 Energy Efficiency Directive (EED) quantifies a 2020 Europe-wide energy consumption limit of 1474Mtoe (mega tonnes of oil equivalent) and introduces numerous measures on the energy supply and demand side to achieve this.

5.2.11 Central to these measures is a requirement on Member State governments to introduce national energy efficiency obligation schemes and take a lead in their own countries in terms of renovating government buildings, planning for the renovation of the building stock (see 5.2 above) and procuring energy efficient products and services. The EED also brings in energy audits for large companies and requires Member States to ensure improved efficiency of their energy generation, transmission and distribution systems.

5.2.12 Liberal Democrats support an ambitious implementation of the EU Energy Efficiency Directive to ensure that the EU energy saving target of 20 per cent by 2020 is met, and preferably exceeded.

Question

41. *What specific actions to promote energy efficiency in various sectors such as industry and buildings should the Liberal Democrats push for at EU level? Should they include setting energy efficiency targets for post-2020?*

5.3 Transport

5.3.1 The transport sector currently contributes around one fifth of total UK greenhouse gas emissions. Emissions from the sector rose between 1990 and 2007, but have since fallen back to around 1990 levels, a trend which has been driven predominantly by improvements in car fuel efficiency.

Cars and Vans

5.3.2 The Government expects that by 2020, emissions from cars and vans are expected to fall by around one third, as a result of more fuel efficient engines and a greater proportion of biofuels being included in road fuels. EU fuel efficiency standards play a crucial role here; although successive revisions of the standard have always been opposed by manufacturers, in practice they have tended to over-achieve fuel efficiency gains.

5.3.3 The CCC believes that ultra low emissions vehicles (e.g. battery electric, plug-in hybrid and hydrogen fuel cell) will play an important role in meeting the 2050 emissions reduction target. To support market development in electric vehicles, the government is currently providing a Plug-in Car Grant, with subsidies of £5,000 for cars and £8,000 for vans and the development of an electric vehicle charging infrastructure. However, the take up of electric vehicles remains very low, reflecting the fact that a limited number of models have come to market and that battery range is still very limited.

Questions

42. *Are new measures needed to reduce car and van emissions?*
43. *To what extent would lowering speed limits and encouraging greater eco-driving behaviour assist in cutting greenhouse gas emissions?*
44. *How can we address barriers to the uptake of electric cars and vans?*

Rail

5.3.4 As a low carbon mode of transport, rail has significant potential to reduce overall total emissions from the sector by helping to address the over reliance on car journeys, HGV traffic and domestic air travel. The government plans to significantly increase the electrification of rail where there are clear economic benefits in doing so.

5.3.5 The Government has approved the initial route for HS2, to the north of England. Considerable technical and political obstacles remain before the construction of the line is complete, but there is clear potential for HS2 to create additional capacity on the existing rail network and take passengers away from the roads and air travel.

5.3.6 Liberal Democrat policy is to continue to extend electrification of the rail network as far and as fast as possible to accelerate the achievement of a carbon-free railway and to manage the operation and detailed specification of HS2 with energy efficiency, as well as sheer speed, in mind.

Questions

45. *In addition to electrification and HS2, what further investment in rail is likely to make the greatest contribution to reducing emissions from the transport sector?*
46. *What efforts should be made to improve operational and energy efficiency of the existing rail network?*

Public transport, walking and cycling

5.3.7 In February 2011, the government committed £560 million funding to support sustainable travel through the Local Sustainable Transport Fund. A high-level assessment suggests that this could support the roll-out of Smarter Choices across 25% of the UK. Smarter Choices are techniques for influencing people's travel behaviour towards more sustainable options such as encouraging school, workplace and individualised travel planning. They also seek to improve public transport and marketing services such as travel awareness campaigns, setting up websites for car share schemes, supporting car clubs and encouraging teleworking.

5.3.8 The Government is also providing various packages of funding to assist local authorities and bus companies to replace existing buses with electric vehicles.

Question

47. *Should we develop plans for a full roll-out of Smarter Choices over the next decade?*

Road freight traffic

5.3.9 Improvements in fuel efficiency will help reduce emissions from road freight but on the basis that the volume of freight is unlikely to reduce significantly in the period to 2050, a greater modal shift from road to rail is required. Such a shift will require some considerable improvements in infrastructure, and improved technology for rolling stock. There are opportunities for reducing carbon emissions through more efficient combustion and fuels, but the opportunities for electric road freight appear limited because of a lack of necessary power and range.

Question

48. *What longer term steps should be taken to reduce carbon emissions from road freight traffic?*

Aviation and Shipping

5.3.10 Emissions from aviation are forecast to contribute an increasing proportion of the UK's total emissions. Whilst emissions from other sectors are expected to decrease up to 2050, it is generally accepted that the predicted growth in aviation will result in increased emissions.

5.3.11 Domestic aviation and shipping are already included in UK carbon budgets (although they contribute a very small proportion of total emissions) and so will need to contribute to meeting the 2050 target.

5.3.12 International aviation and shipping emissions are not currently included in the UK's 2050 target and carbon budget system. The Government must decide whether to include them by the end of 2012, or explain to Parliament why it has not done so. This decision will need to be considered alongside development of the UK's sustainable aviation policy framework through 2012/13.

5.3.13 The aviation sector has been included in the EU Emissions Trading Scheme, as from 1 January 2012. The scheme covers all airlines flying to and from the EU. However, most ETS allowances for aviation are being allocated to airlines rather than auctioned.

5.3.14 Aviation is taxed relatively lightly compared to other forms of travel, with international agreements requiring that aviation fuel is not subject to national duties, and with no VAT charged on airline tickets. The UK charges APD on domestic and international flights starting from the UK, and has significantly increased the level of duty in recent years, and extended the scope to private jets.

5.3.15 Liberal Democrat policy is to incorporate emissions from both (international) sectors in UK carbon targets and budgets, promote international taxation of bunker fuels and reform UK taxation of air travel.

5.3.16 Greenhouse gas emissions from international shipping are significant and increasing. Before international shipping emissions can be addressed, there is an urgent requirement to calculate the level of the UK's emissions from the sector and the potential impacts of carbon pricing policies.

Questions

49. *What steps should be taken to manage the anticipated growth in emissions from domestic and international air travel?*
50. *What further steps should the Government take at the UK and EU levels to promote less carbon intensive shipping?*

Biofuels

5.3.17 In order to meet its commitment under the EU Renewable Energy Directive to have 10% of all energy for transport coming from renewable sources by 2020, the UK will need to make greater use of sustainable biofuels. To ensure biofuels are sustainable, the EU Renewable Energy Directive set sustainability criteria to take account of the direct effects of land use change. Indirect land use change – such as clearance of virgin forests to grow food crops displaced by biofuel crops such as oil palm – is also a key factor in determining sustainability and accounting for emissions, and EU-wide sustainability criteria for ILUC are currently being finalised.

5.3.18 In line with the sustainability criteria of the Renewable Energy Directive, the government has made changes to the Renewable Transport Fuels Obligation (RTFO), which requires fuel suppliers for road transport to include a set percentage that is sourced from biofuels. Minimum sustainability standards must be met by such fuels in order to be classed as renewable, and therefore count towards meeting the suppliers' targets for biofuels under the obligation.

5.3.19 Liberal Democrat policy is to increase the use of biofuels from environmentally sustainable sources, including waste, thereby avoiding negative impacts on forests.

Questions

51. *What new mechanisms are needed to ensure that such fuels are sustainably sourced?*
52. *To what extent will bio-fuels make a meaningful contribution to meeting the 2050 emissions reductions targets?*

5.4 Industry

5.4.1 Industry accounts for 23% of UK GHG emissions. Of the total emissions from industry, over 80% arises from the heat generated for industrial processes. If carbon emissions from industry were to remain steady, they would exceed 50% of total UK emissions by 2050. This would place an unsustainable burden on other sectors of the UK economy to deliver the reductions in carbon emissions necessary if the UK is to meet its 2050 targets. The policy challenge is to substantially decarbonise industry, whilst not undermining its competitive position.

5.4.2 The Government's strategy is to encourage industry to focus on improving energy, process and material efficiency, using the EU Emissions Trading System (EU ETS) and Climate Change Levy (CCL) / Climate Change Agreements (CCAs) to provide incentives [see chapter 4.1]; promote fuel switching – from using fossil fuels for industrial processes to lower carbon fuels such as sustainable; and promote the large-scale deployment of effective carbon capture and storage (CCS) technology, for example by supporting CCS technology research projects.

5.4.3 In its June 2012 progress report, the Committee on Climate Change (CCC), argued that bioenergy could meet around 25% of industry heat demand by 2030 within sustainability limits. The committee added that CCS is a promising application in a range of energy-intensive industries (e.g. steel), and could result in around a 20% emissions reduction from current levels in industry over the longer term.

Questions

53. *Should we encourage the use of biomass by industry; if so, how?*
 54. *What new policies, if any, are needed to incentivise the use of CCS in industry?*

5.5 Agriculture, Forestry and Land Use

5.5.1 Agriculture, forestry and land use account for 9% of UK GHG emissions. Since 1990 there has been a reduction of around 30% in emissions from the agricultural sector as a result of fewer livestock, and more efficient use of fertilisers and decoupling subsidies from production.

5.5.2 The Government intends to make further progress through efficiency in crop management, more sustainable methods of livestock rearing, and the greater use of on farm generated energy. The UK will also argue for the CAP to be reformed to ensure that the environmental impacts of agriculture and land use are addressed. There will also be a focus on woodlands creation, which can act as a carbon sink, and moves to end the use of peat in horticulture.

5.5.3 If we are to achieve our target of a zero-carbon Britain, it is inevitable that forestry will have to be significantly expanded, with its negative impact on emissions offsetting the sources remaining even after the most radical policies are implemented for energy, transport and industry.

Question

55. *The production of energy crops diverts agricultural resources away from food production. How much arable land should be dedicated to energy crops?*
 56. *What can we do to increase forestry significantly?*

5.6 Waste Management

5.6.1 All waste management activities result in the emission of some greenhouse gases (mainly carbon dioxide and methane). Waste accounts for around 3.5% of the UK total emissions, most of which occurs in the form of methane, a particularly powerful greenhouse gas. This figure does not take into account the 'hidden' carbon costs of poor resource efficiency and the carbon costs occurring in other countries from where our raw materials and our products arise or any other environmental damage that occurs.

5.6.2 The *Waste Strategy for England 2007*, delivered by the Labour government, set out the concept of the waste hierarchy, which starts from the position of preventing waste arising in the first instance, through re-use of materials, recycling, and the use of waste to produce energy and soil improvers.

5.6.3 The Waste Strategy Review, undertaken in 2011, contained an aspiration to move towards zero waste. However, clear implementation plans await the development of a national waste management plan and associated policy.

5.6.4 Liberal Democrats seek faster progress towards a zero-waste economy. Current party policy is to ban, by 2015, the disposal of biodegradable waste to landfill, and to promote a huge increase in energy from waste, in line with the waste hierarchy, through anaerobic digestion and other environmentally sustainable technologies.

Question

57. *In which sectors are specific strategies needed for reducing the amount of waste sent to landfill?*

Boosting Low-Carbon Investment

6.1 Financing the Zero-Carbon Transition

6.1.1 In 2010, a study by Ernst & Young found that, in order to meet its emissions target, the UK needs to fund an estimated £450bn of low carbon investments by 2025, but only £50bn - £80bn of funds will be available from traditional sources of capital - such as utility companies, project finance and infrastructure funds. Ernst & Young concluded that a dedicated investment vehicle was needed to reduce risks and mobilise finance at scale from institutional investors and plug the estimated £370bn – £400bn shortfall.

6.1.2 The Green Investment Bank (GIB), launched in 2012, is intended to accelerate investment in green technologies and infrastructure. By being a focal point for green finance, the GIB can help to facilitate private sector investment flow to green projects. The GIB has critical mass and a government mandate, which the bank may harness to provide long term funding for green infrastructure.

6.1.3 The GIB will be capitalised by government with £3bn of funding during the period to 2014/15. However, it will have no powers to borrow further capital from the financial markets as a direct obligation of the government until April 2015 and will only gain such powers if public sector debt is falling as a percentage of GDP at that time.

6.1.4 The investment priorities for the GIB for the period to 2015/16 are to include support for the Green Deal and non-domestic energy efficiency, energy from waste generation, commercial and industrial waste processing and recycling, and offshore wind power.

6.1.5 Current Liberal Democrat policy is to enable the GIB to have full borrowing powers, in order to provide greater investment resources, should they be needed.

6.1.6 If the GIB can access billions of long-term funds from the global capital markets, and if other countries' green investment banks are able to do the same, there will be liquid financial markets for green infrastructure bonds of various maturities. National Savings and Investments (NS&I) and possibly high street banks may want to market funds that invest in green infrastructure bonds. This may also establish another source of funding for the government. Such funds could also be attractive to the public.

6.1.7 The Coalition Agreement contained a commitment to create green financial products to enable individuals to invest in infrastructure needed for a green economy. However, no progress has been made.

Questions

58. *How can we ensure that the GIB can access greater investment resources?*

59. *How can we provide individuals with more opportunities to invest in low carbon infrastructure?*

6.2 Innovation for a Zero Carbon Britain

6.2.1 Government support for innovation in low carbon technologies is currently provided by a number of organisations. These bodies include Research Councils UK, the Technology Strategy Board (TSB), DECC, Energy Technologies Institute (ETI) and the Carbon Trust. DECC works with other bodies to carry out Technology Innovation Needs Assessments for low carbon technologies. These assessments will provide information on the innovation needs of those technologies most likely to be important in achieving climate and energy targets.

6.2.2 Public support for R&D into low carbon technology is key to the zero carbon transition. In its 2010 report, Building A Low Carbon Economy, the CCC concluded that the current level of public expenditure on R&D should be regarded as a minimum. It added that certain areas, such as CCS and electric cars,

should attract increased funding. No cuts to R&D funding were announced in the 2011 Budget. But some commentators expressed concern that the impact of the grant reduction for the Carbon Trust (40% for 2011/12) will constrain its ability to support low carbon technology development and R&D.

6.2.3 Taxation policy also has a potential role to play in promoting innovation. R&D tax credits and enhanced capital allowances can facilitate greater expenditure on R&D into low carbon technologies.

Question

60. *How should the government encourage greater innovation in the development and adoption of low carbon technologies and services?*

6.3 Public Sector Leadership

6.3.1 The public sector accounts for around a tenth of all purchasing power in the UK. Public bodies bought goods and services worth £251 billion in 2009-10, of which central government spending comprised £158 billion and the wider public sector (including local public bodies such as NHS trusts, schools, hospitals and local authorities) £93 billion.

6.3.2 The size of public expenditure presents central and local government, and their agencies, with the capacity to drive sustainability through their procurement programmes.

6.3.3 Sustainability already plays an important role in the Government Buying Standards. These were introduced to help public sector buyers follow green purchasing principles to reduce emissions. Buying decisions are not without their complexity and whilst the standards provide a framework for guidance, given the scale of the challenge presented by the emissions reductions target, central government has to be seen to be leveraging all opportunities to reduce emissions.

Question

61. *What further action can government take to ensure it leads by example in the procurement of low carbon goods and services?*

Consumers and the Zero-Carbon Transition

7.1 Paying for Climate Change Policies

7.1.1 Liberal Democrats are determined that the costs of the transition to a zero carbon Britain will be borne fairly.

7.1.2 In many cases, the cost of funding government energy policy objectives is borne by the consumer through higher power bills. Examples of factors increasing energy bills include the Renewables Obligation (RO), Feed-in Tariff (FiT) and European Union Emissions Trading System (ETS).

7.1.3 The basis on which energy suppliers pass on these costs to consumers varies. The costs of the RO, FiT and EU ETS fall upon suppliers according to the amount of energy consumed by their customers. By contrast, the costs of the Warm Home Discount Scheme and the various schemes requiring energy companies to make energy efficiency investments (CERT and CESP and the new ECO scheme) are attributed to suppliers according to their market share. The energy companies pass on costs of these policies at a fixed rate per customer, regardless of the level of a customer's energy consumption.

7.1.4 If the costs of energy and climate change policies are going to be recovered through energy bills, it may be more equitable if they were to be recovered on the basis of the amount of energy consumed rather than as a flat rate per household. Recovering the costs on a consumption, or 'per unit' basis, rather than a flat rate per gas and electricity consumer, is more progressive because people on higher incomes tend to use more energy than those on lower incomes, especially if more costs were recovered through gas consumers rather than electricity. Some 85% of low-income households would benefit from such a consumption-based approach.

7.1.5 However, a small percentage of low-income, high-energy users would be adversely affected. To redress this, the Fuel Poverty Action Group has proposed that policies, such as ECO, should encourage suppliers to target support at vulnerable consumers with high levels of energy consumption. The Warm Home Discount Scheme could also be re-designed so that help is directed towards households most affected by a move to consumption-based ECO cost recovery.

Question

62. *Should the costs of environmental and climate change policies be recovered on a consumption, or 'per unit' basis, rather than a flat rate per gas and electricity consumer, with support provided to low income households through the Warm Home Discount and ECO?*

7.2 Fuel Poverty

7.2.1 The zero-carbon economy should be inclusive, but one in five UK households live in fuel poverty, that is, they need to spend more than 10% of income to heat a home to an adequate standard of warmth. The Warm Homes & Energy Conservation Act 2000 requires the elimination of fuel poverty in all English households by 2016. But earlier this year, the independent Hills review confirmed that fuel poverty is a serious national problem that is set to rise rapidly. Nearly 8 million people in England, within 2.7 million households, both had low incomes and faced high energy costs in 2009 (the most recent year with available data).

7.2.2 The table below illustrates the difficulties faced by fuel-poor households. Not only are they economically disadvantaged, they also generally need to spend more on fuel, in absolute terms, to achieve a warm and healthy living environment, i.e. those who need to spend most on fuel are least able to do so and most likely to live in the most thermally inefficient properties.

Expenditure as % of income	% of housing stock	Number households	Average income	Average fuel costs (£)	Average efficiency (SAP) rating (up to 100)
Up to 5%	43.9%	9,454,000	£41,849	£1,246	58
5% to 10%	37.7%	8,118,000	£19,894	£1,344	53
10% to 15%	11.8%	2,553,000	£12,242	£1,460	47
15% to 20%	3.5%	745,000	£9,630	£1,641	41
Over 20%	3.1%	666,000	£6,388	£1,894	37
Total	100.0%	21,535,000	£27,852	£1,342	53

Source: Detailed Tables published by DECC in 2011

7.2.3 The Government's key policies to address fuel poverty are briefly summarised below:

- The Warm Home Discount Scheme, providing £1.1bn from energy suppliers over the next four years to help around 2 million low-income and vulnerable households with energy costs.
- The Green Deal - the government's plan to upgrade the nation's hardest to heat homes at no upfront cost.
- Targeting at least £540 million under the Energy Company Obligation (ECO) on funding energy saving improvements in the poorest homes.
- Agreement with energy suppliers on clear and transparent communications to make sure consumers know about the potential savings from checking on their energy deal, switching tariff and/or supplier, and insulating – and how they can take up these opportunities to save money.
- Action to make it easier and quicker for consumers to switch energy suppliers.
- Promoting collective purchasing and switching.

7.2.4 Existing policies could be adapted to help ameliorate fuel poverty. The Carbon Floor Price [see Chapter 4] will fall more heavily on vulnerable consumers and those suffering from fuel poverty. Research by the energy efficiency experts Camco suggests that if the Government's annual £4bn revenue available through the EU Emissions Trading System and the Carbon Floor Price from 2013 was recycled to households to spend on energy efficiency measures, it would be enough to bring nine out of ten households out of fuel poverty.

7.2.5 Another option is to use smart metering technologies [see section 5.2.3] more imaginatively. For example, the first 700 units (kWh) per quarter could be unencumbered of any levy on consumers to fund climate change or social policy objectives. The follow on units would be more expensive, but poorer people generally use less energy, and a higher follow on price would provide a real incentive for all consumers to use less energy.

Questions

63. *What new policies should be introduced to deliver the requirements of the Warm Homes & Energy Conservation Act 2000?*
64. *What further action should be taken to empower consumers through collective purchasing and switching?*

Skills for a Zero Carbon Economy

- 8.1 The development and retention of a skilled UK workforce, equipped to maximise the opportunities presented by the green economy, will be critically important to a successful transition to a zero carbon Britain.
- 8.2 The Government assessed the skills required by a low carbon economy in the 2011 report, *Skills for a Green Economy*. These include: skills which support low carbon industry focusing on energy generation; skills to protect and manage natural assets including an understanding of environmental impact assessments, of ecosystems and land use planning; skills to support resource efficiency including project management skills with an understanding of resource management and reducing waste in production; and skills supporting climate resilience including scientific and technical skills allowing for the modelling and interpreting of climate change projections and resource efficiency technologies in households and businesses.
- 8.3 An area of particular importance is skills in rapidly growing environmental markets (in science, technology, engineering and maths—'STEM'). But skills gaps in these areas act as a barrier to a low carbon economy, especially in the wind, wave and tidal energy sectors.
- 8.4 The Coalition Government is also taking a demand led approach to meeting these needs, based on a partnership between government, business, trade unions, colleges, training providers and their national agencies. The Skills for a Green Economy report found that many employers continued to be unable to "clearly articulate their skills needs and that there had been few attempts to look at the skills implications of the transition right across the economy."
- 8.5 The Government's policies designed to address the barriers in the market include:
- Bringing together a new 'skills for a green economy' grouping of Sector Skills Councils to focus specifically on green economy skills to help businesses articulate their skills requirements and to develop cross sector standards on training and qualifications.
 - Improving the quality of information, advice and guidance available on careers in a green economy through the new National Careers Service.
 - Creating a STEMNET system sending 'STEM ambassadors' into schools, and a 'See Inside Manufacturing' programme aimed at changing students' views on manufacturing careers.
 - Setting up a renewables training network, with 2,000 places on training courses specifically tailored to those wanting to make the move into the renewable energy sector.
- 8.6 The Government is committed to improving the quality of teaching skills in the Further Education sector with a focus on sustainable construction, renewable energy and other low carbon priority areas and raising awareness and understanding of the green economy with employers.

Questions

65. What additional action is needed to ensure that there are adequate skills to support a green economy?
66. What are the correct roles of government and business?

International Action

9.1 As a developed industrial country, historically responsible for more than an average global share of greenhouse gas emissions, the UK has a responsibility to show international leadership, both in reducing its own emissions and in providing assistance to poor countries to mitigate and adapt to climate change. At the same time, as argued above, early action by the UK and EU can demonstrate that investment in low-carbon technologies can be a successful development path.

9.2 In all its efforts, the UK will be more effective in operating through the European Union. The collective economic and political strength of the EU bears much greater weight in international diplomacy than does the UK operating alone, and EU regulations – for example on energy or fuel efficiency – set the parameters for far bigger markets than the UK can influence by itself. The Prime Minister's attempts to marginalise the UK within the EU undermine his own professed objective of making the current government the 'greenest ever'.

9.3 EU policies are discussed throughout this paper, but the overall framework it sets is crucial. Liberal Democrats believe that the EU should move immediately to a more ambitious greenhouse gas reduction target – 30 per cent by 2020 rather than the existing 20 per cent – reflected in the EU's target for the second commitment period of the Kyoto Protocol (which must be agreed this year) and with an accompanying tightening of the Emissions Trading Scheme cap.

9.4 The EU budget should be used more ambitiously to steer investment into low-carbon solutions and to provide assistance in particular to poorer Eastern European states with many cost-effective opportunities to reduce emissions – for example through energy efficiency investments – but a shortage of investment capital. Low-carbon objectives should be built into all other relevant EU policies, such as the Common Agricultural Policy.

9.5 The global framework for controlling climate change, through the UN Framework Convention on Climate Change (UNFCCC), is proving dangerously slow to emerge. Thanks partly to Liberal Democrat ministers, and to effective joint action through the EU, the Cancun and Durban climate conferences in 2010 and 2011 succeeded in getting the process back on track after the disappointment of Copenhagen in 2009. British foreign policy should now aim at accelerating the implementation of the 'Durban platform', seeing a new global climate treaty agreed by 2015 at the latest, with entry into force no later than 2020. Until then, UK diplomatic efforts and development assistance should be deployed to encourage as many countries as possible to adopt ambitious emissions reductions targets for the remainder of this decade, and to support adaptation strategies in poor countries. But we need at least to consider the options for an alternative approach should the international negotiations for a new climate treaty fail.

9.6 We applaud the Coalition Government's decision to reach the UN target of 0.7 per cent in official development assistance by 2013. An increasing proportion of the total should be devoted to explicitly low-carbon development objectives, building on the current International Climate Fund, and the remainder of the aid budget scrutinised carefully to ensure it does not conflict with this aim. The UK should contribute generously to the new Green Climate Fund being established under the UNFCCC. The UN Sustainable Development Goals, now being developed to run alongside the Millennium Development Goals, should highlight low-carbon development targets. The government should without further delay fulfil its commitment (in the Coalition Agreement) to end support for fossil fuel industries from UK Trade & Investment and UK Export Finance (formerly ECGD); the two agencies should have their remits modified so that priority is given to low-carbon exports.

9.7 The UNFCCC process tends to be focused on controlling emissions of carbon dioxide – which is not only the most important greenhouse gas but also, because of its source in a huge range of energy uses, industrial processes and agriculture, the most intractable. Yet there are many additional options for

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action outside the UNFCCC process, but complementary to it, which can effectively buy time for the more complex and longer-term policies to be put in place to reduce CO₂.

9.8 The UK has just joined the Climate and Clean Air Coalition, set up by the US, Sweden and other countries to coordinate action against 'short-lived climate forcers' such as methane, black carbon and hydrofluorocarbons (HFCs), together responsible for a third of current global warming. Development assistance should be used to tackle these problems in developing countries, for example by replacing inefficient cook-stoves. HFCs (artificial greenhouse gases used in air conditioning, refrigeration, etc., whose use is expanding at 10–15 per cent a year) should be introduced to the Montreal Protocol, the ozone treaty, whose production and consumption phase-out model is better suited than the emissions controls of the Kyoto Protocol; the EU should use the current revision of the F-Gas Regulation to ensure it phases out HFC use as quickly as possible.

9.9 Finally, changes in forest cover and land use account for about 17 per cent of greenhouse gas emissions. Although the pre-Copenhagen hopes for the emergence of a global market for forest carbon credits through a REDD+ (reducing emissions from deforestation and forest degradation, plus conservation) mechanism have not been realised, there is much that can be done. Timber-producing and -consuming countries should take joint action to tackle the root causes of deforestation, primarily clearance for agriculture, for example by using public procurement policy to source zero-deforestation products such as palm oil, soy or beef. Investments should also be made in improving law enforcement and governance in developing countries, often the most cost-effective way of achieving sustainable forest management and reducing emissions.

Questions

67. *Should the UK aim to take an international lead in climate policy? Would it be more sensible, given the weakness of the economy, to aim not to cut emissions faster than Britain's main economic competitors?*
68. *What other steps should the UK/EU take alongside the climate negotiations to maximise the chance of them succeeding, and to promote cuts in emissions?*
69. *Should we begin to draw up options for an alternative approach should the international negotiations for a new climate treaty fail?*