

Government Response to the Second Annual Progress Report of the Committee on Climate Change

October 2010

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Foreword by the Secretary of State



The Committee on Climate Change's second annual progress report is a welcome reminder of the challenges we face as we move to a low-carbon economy. I want to extend my thanks to everyone at the Committee on Climate

Change (CCC), particularly Lord Turner, for the meticulous work and objective advice that informs each chapter.

The Coalition Programme for Government¹ is clear: we believe climate change is one of the gravest threats we face, and that urgent action is required at home and abroad. We are determined to cut carbon emissions, decarbonise our economy, and enable green growth.

We build on a solid foundation. In July, I published the first Annual Energy Statement, which set out the long-term policy framework on energy and climate change. The 2050 Pathways Analysis, which accompanied it, described some of the routes we might take towards our ambitious emissions reduction target.

The CCC's annual reports will play an important role in deciding how we get there, by holding government to account on carbon budgets and progress on our reduction targets.

This year's report shows real progress: UK greenhouse gas emissions fell by 1.9% in 2008, and a further 8.6% in 2009. Yet there remains much to do. On energy efficiency, power generation, transport and technology, we have considerable ground to make up.

As the CCC's report makes plain, our emissions reductions have been mainly caused by the global recession. Lower demand and less activity in carbon-heavy sectors have masked the true environmental impact of our economy. As the recovery kicks in, there is likely to be a cyclical rebound in energy use and in carbon emissions.

In response, we must demonstrate policy ambition and clarity.

We will strive for an effective international agreement on climate change, pushing Europe toward a more ambitious 30% emissions reduction target, and backing up our words abroad with tougher carbon budgets at home.

We will clean the supply of energy in the UK, rebalancing our energy mix and securing a more sustainable legacy. The cheapest, most successful way of closing the gap between energy demand and supply is to save energy. Later this year, we will legislate for the Green Deal, a radical energy efficiency drive that will create jobs, save money and save carbon.

¹ <http://programmeforgovernment.hmg.gov.uk/files/2010/05/coalition-programme.pdf>

And we will forge ahead with our plans for a new kind of economy; one defined by green growth, and founded in a third industrial revolution – the green revolution.

Our promise to be the greenest government ever is not an option; it's an obligation. I look forward to working closely with the CCC to make it a reality.

A handwritten signature in black ink, appearing to read 'Chris Huhne', with a stylized flourish at the end.

Chris Huhne
Secretary of State for Energy and Climate Change

Executive Summary

1. This response addresses the points raised in the Committee on Climate Change (CCC) second annual report on UK progress towards meeting carbon budgets and the 2050 target, as required by the Climate Change Act 2008.

2. This response follows the first ever Annual Energy Statement (AES) to Parliament published in July 2010, alongside other publications including the 2050 Pathway Analysis.² The AES sets out 32 actions being taken to accelerate changes in the energy system and climate change policy to support the Coalition Government's determination to drive the transition to a low carbon economy.

3. This response comes ahead of the outcome of the spending review to be announced on 20 October 2010 and it is important to note that policy decisions on energy and climate change may be shaped by the outcome of this review.

Ensuring a low carbon recovery

4. We are fully committed to meeting the targets set out in the Climate Change Act and the transition to a low carbon economy in the UK is one of our top priorities. We therefore welcome the CCC's assessment that there has been progress across a number of areas that are key to achieving our carbon budgets. However, we also recognise that the recession has had a significant impact in reducing emissions and agree that a step change in the implementation of policies and

measures is still needed to ensure that emissions continue to fall as the economy recovers.

5. We are taking the following actions within the different sectors of the economy:

Low-carbon power

6. The Coalition Government agrees with the CCC on the fundamental role that the power sector plays in meeting carbon budgets and the need to decarbonise the electricity supply. We agree that the timely delivery of investments to improve connections to the transmission network is critical.

7. We propose to replace the Infrastructure Planning Commission (IPC) with a Major Infrastructure Planning Unit, which would retain the IPC's fast-track process for examining major infrastructure projects. Transitional arrangements would ensure that the examination of applications continue in the interim without interruption.

8. We continue to work on developing an enabling framework for the deployment of new nuclear capacity, through a Regulatory Justification, which is expected by the end of the year and Parliamentary approval of the National Policy Statement for nuclear by spring 2011.

9. We are committed to continuing public sector investment in four Carbon Capture and Storage (CCS) demonstration projects. We are currently

² Available from: www.decc.gov.uk/en/content/cms/news/pn10_85/pn10_85.aspx

supporting detailed Front End Engineering and Design work as a key element of the first CCS demonstration competition.

10. We welcome the CCC's analysis and advice on the future role of gas CCS and will consider carefully their recommendation that this should be part of the demonstration programme.

11. We are fully committed to pursuing the necessary institutional and market reforms to support and enhance investment in low carbon electricity generation. The Electricity Market Reform project will be consulting on a proposed set of changes to the market arrangements in the autumn, ahead of a White Paper in spring 2011.

Buildings and industry

12. The Coalition Government agrees that there is further potential for cost-effective emissions reductions from buildings and industry and will use a combination of policies to deliver this.

13. We intend to focus support where there remains a need to help householders, local communities, business, and the public sector to overcome barriers to investing in energy and carbon saving.

14. We agree that Energy Performance Certificates (EPCs) and Display Energy Certificates (DECs) are important tools for providing households and businesses with information on the energy performance of their homes and buildings. We are currently assessing the outcome of the consultation on improving EPCs and extending DECs to commercial buildings. We are also working to reduce the energy consumption of energy using appliances, using minimum energy performance standards.

15. We will be developing and consulting on a Green Deal financing mechanism to promote and deploy energy efficiency measures in all properties and we are committed to continually improving the energy efficiency of new housing.

16. We are also committed to cutting 10% from central Government carbon emissions in twelve months and all departments now have real time energy use data for their main headquarters available on their websites.

Transport

17. The Coalition Government agrees that the transport sector has an essential role to play in reducing greenhouse gas emissions across the UK economy. In the last year, new cars have seen substantial efficiency improvements, uptake of sustainable biofuels has continued to rise and we have confirmed support for the emerging market in ultra-low carbon vehicles through a consumer incentive.

18. We agree with the CCC that progressive electrification of passenger cars will be an important part of decarbonising transport, especially as we move into the 2020s. As well as confirming plans for a consumer incentive for ultra-low carbon vehicles, we are committed to mandating a national recharging network for electric and plug-in hybrid vehicles.

19. We agree that local initiatives to deliver reductions in car trips and increases in walking, cycling and bus trips can reduce carbon emissions while also addressing other important objectives in relation to air quality, health, and congestion. We announced on 22 September the creation of a Local Sustainable Transport Fund which will challenge local transport authorities outside London to develop packages of such measures. Details about the new Fund, including the resources available and how it will operate, will be announced later in the year.

20. We agree that land-use planning can potentially have significant impacts for transport emissions. Local authorities should ensure their land use and local transport plans are mutually consistent and deliver the most effective and sustainable development for their area.

21. We agree with the CCC that tackling greenhouse gas emissions from aviation and shipping will be an important element of addressing climate change and believe that a global sectoral approach is the most effective way to tackle emissions from these sectors. However, we support the use of regional measures until such time as a global solution is in place.

22. We are committed to cancelling runway expansions at the UK's three largest airports. The June Budget in 2010 included a commitment to explore changes to the aviation tax system.

Agriculture

23. The Coalition Government is determined that agriculture should play its part in reducing greenhouse gas emissions. Action is being driven forward by industry through a Greenhouse Gas Action Plan. We believe that this is the right approach, but will closely monitor the Plan's implementation and will be ready to intervene if sufficient progress is not made.

24. Agriculture is affected by a broad range of instruments which, though developed in response to diverse policy objectives, at the same time contribute to reductions in greenhouse gas emissions. We will continue to look for opportunities to make the most of these synergies.

25. We are committed to reducing the current uncertainty in the evidence base for agriculture. In the meantime, we will not allow this uncertainty to distract from the need for farmers to take action to cut emissions by introducing specific on-farm measures, many of which will also contribute to improved competitiveness and productivity.

CCC and Government indicators

26. In its report last year, the CCC set out its own indicator framework that would be used to assess the Government's progress towards meeting its carbon budgets. We are supportive of its overall approach to the framework and welcome the CCC's view that the indicators should not be seen as fixed targets but as an evolving framework in the light of new analysis.

27. We agree with the CCC's assessment that there has been progress across a number of the areas identified as key to achieving carbon budgets in the various sectors, as shown by the CCC indicators. We will be further developing our own indicator framework in order to fully account for Coalition Government priorities and the analysis of what needs to be delivered to meet future budgets.

Next steps

28. We are determined to drive the move to a low carbon economy and have set out our proposals for taking this work forward in the AES. This marked the beginning of a process to accelerate this transformation. The '2050 Pathways Analysis' published alongside the AES shows that meeting the 80% emission reduction target by 2050 is ambitious but achievable and compatible with maintaining the UK's security of energy supplies.

29. We are fully committed to making the vision set out in the AES a reality by implementing its policies and measures and by delivering the step change in emissions reductions needed to meet our carbon budgets. Over the coming months, we will be developing our policy framework for accelerating the transition to a low carbon economy and we look forward to working with the CCC in doing so. We will publish a government-wide carbon plan to set out, department by department, policies and deadlines to ensure real action on climate change.

30. We will also push for the EU to demonstrate leadership by tackling climate change, including supporting an increase in the EU emissions reduction target from 20% to 30% by 2020, compared to a 1990 baseline. Such a move by the EU would require us to tighten the level of the UK's second and third carbon budgets, in the light of further advice from the CCC.

Introduction and background

1. Under the Climate Change Act 2008, a system of legally binding carbon budgets has been established to set the trajectory towards our target to reduce UK greenhouse gas emissions by at least 80% compared to the 1990 baseline by 2050. Each carbon budget lasts five years and the first three, covering the period 2008-2022,³ were set in May 2009. The fourth budget, which runs from 2023-2027, must be set by 30 June 2011.

2. The Act also requires the independent Committee on Climate Change (CCC) to report by 30 June each year on progress towards meeting carbon budgets and the 2050 target. The Government must then lay a response to this report before Parliament by 15 October.

3. The CCC's second annual progress report, entitled *Meeting Carbon Budgets – ensuring a low-carbon recovery*, was published on 30 June 2010.⁴

4. The CCC's key messages are:

- indicators in its monitoring framework demonstrate that progress has been made;
- but the reductions in the last year are in some cases largely due to a reduction in economic activity caused by the recession and increased fossil fuel/energy prices;
- the CCC's indicator framework also builds in an increased pace of implementation moving towards the second carbon budget period;
- a step change in the pace of implementation of policies is therefore still required if the UK is to meet its legislated carbon budgets.

³ The first three carbon budgets require a 22% reduction in greenhouse gas emissions below the 1990 baseline in 2008-2012, a 28% reduction for 2013-2017, and a 34% reduction for 2018-2022.

⁴ Available from: <http://www.theccc.org.uk/reports/2nd-progress-report>

Chapter 1: Ensuring a low carbon recovery

1.1 In their overview chapter, the CCC look at overall progress towards meeting our carbon budgets, the impact of the recession, developments in the traded sector (those sectors of the economy covered by the EU Emissions Trading System) and an update on developments in climate science.

A step change is still required

1.2 We agree that a step change is still required in the pace of implementing policies and measures across all sectors of the UK economy to ensure that emissions continue to fall, especially as the economy recovers from recession.

1.3 We are determined to drive the transition to a secure, safe, low carbon, affordable energy system in the UK. The AES published in July 2010, sets out how we will do that.

1.4 Moving to a secure, low-carbon energy system is ambitious, but achievable. It requires major investment in new technologies to renovate buildings, progressive electrification of much of our heating, transport and industry, and decarbonisation of our power generation. It also requires major changes in the way energy is used by individuals, local communities, industry, and by the public sector. Such a transformation potentially offers economic opportunities for the UK as the country grows out of recession and the economy is rebuilt.

1.5 The AES sets out a clear, transparent, long-term policy framework, to act as a catalyst for private sector investment in new infrastructure and energy efficiency, in four key areas;

- saving energy in the home through the Green Deal and supporting vulnerable consumers;
- delivering secure energy on the way to a low carbon future;
- managing our energy legacy in a responsible and cost effective manner; and
- driving ambitious action on climate change at home, in the EU and globally.

1.6 Over the coming months, we will be developing our policy framework for accelerating the transition to a low carbon economy, which will serve to underpin our long term action on climate change mitigation. We will publish a government-wide carbon plan to set out, department by department, policies and deadlines to ensure real action on climate change.

Impact of the recession

1.7 Final emissions data for 2008 and provisional data for 2009 suggests that UK greenhouse gas emissions fell by 1.9% in 2008 and a further 8.6% in 2009. In their report, the CCC estimate that the impact of the recession and other factors in the non-traded sector will be 55 million tonnes of carbon dioxide equivalent (MtCO₂e) in the first carbon budget period (2008-12). We

agree with the CCC that a major cause for the significant reductions in emissions is due to the recession. However, both Government and the CCC indicators show progress on emissions reductions, across a range of policies that have been implemented to date.

EU ETS and carbon price

1.8 While the EU ETS is delivering significant emissions reductions across the UK and Europe, we agree with the CCC that the carbon price has not been sufficient in giving stable, long-term signals to generators, and as a result has failed to incentivise the required levels of new low carbon investment.⁵ The CCC calls for a UK carbon price floor – a regulated minimum below which the carbon price cannot fall, in addition to the EU ETS.

1.9 The Coalition Government is committed to introducing a floor price for carbon and to push for the EU to move towards full auctioning of ETS allowances. As announced in the June 2010 Budget, HM Treasury and HM Revenue and Customs will in the autumn publish proposals to reform the climate change levy to promote more certainty and support to the carbon price. This is part of a portfolio of reforms to the electricity market to encourage additional investment in low carbon electricity generation, particularly in the period before more fundamental reforms can be implemented. Subject to a public consultation, we will bring forward relevant legislation in the Finance Bill 2011.

CCC and Government indicators

1.10 In its 2009 report, the CCC set out its indicator framework to assess the Government's progress towards meeting its carbon budgets. The Coalition Government is supportive of the overall approach to the framework and welcomes the CCC's view that the indicators should not be seen as fixed targets but as an evolving framework in the light of new analysis.

1.11 The Coalition Government is developing its own indicator framework and monitoring tools in order to take account of the Government's priorities and the analysis of what is required to meet future budgets. The Government framework shares a similar approach to the CCC and focuses in particular on many of the same key policy milestones and indicators to aid its internal monitoring throughout the year. In addition, the indicators are intended to help inform our response to the CCC's assessment of how Government is delivering on its policy commitments and its overall contribution to achieving carbon budgets. They are used to inform assessments in the relevant sector chapters in this response. However, it is important to note that not every policy area mentioned in each sectoral chapter has its own indicator and milestone. We will consider how to strengthen the framework for measuring progress with clear success criteria and if appropriate, the use of trajectories for specific indicators, in response to the CCC's recommendations.

1.12 We agree with the CCC's assessment that there has been progress across a number of the areas that are identified as key to achieving carbon budgets in the various sectors, as reflected by its indicators. The CCC judge this progress against the indicative trajectories they set for their indicators. While the CCC acknowledge that, in general, indicators are in line with the trajectories and in some cases that there has been over performance, they also state that the framework envisaged little progress in 2009 due to modest ambitions and states that any outperformance is largely the result of the recession. We recognise that the recession has played a significant part and agree with the need for a step change in policy implementation, and we are committed to putting in place measures which will ensure this step change takes place.

⁵ The UK's EU ETS results for 2009 were published in July 2010 alongside the Annual Energy Statement. Please see: http://www.decc.gov.uk/en/content/cms/statistics/climate_change/gg_emissions/targets/targets.aspx

Climate change science and global negotiations

1.13 The Coalition Government agrees with the CCC that recent scientific controversies around leaked emails from the University of East Anglia's Climate Research Unit (UEACRU) have been overstated and note that three independent reviews of UEACRU's scientists have found no evidence of malpractice.

1.14 We also note that the discovery of a few factual errors in a part of the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report dealing with regional impacts of climate change has not materially affected its main conclusions. This has been confirmed by a Dutch Government review of the IPCC's Working Group II Report which found only a very small number of minor inaccuracies. The most recent Inter-Academy Council's Report on the IPCC recommends significant improvements

to IPCC management and stronger adherence to its review processes but does not criticise its overall conclusions or the science behind them. We therefore agree that the scientific case for urgent action to reduce greenhouse gas emissions remains strong. However, we also believe that the ongoing considerations of climate science should be conducted in an open and transparent way to command the widest confidence.

1.15 We remain committed to reaching an international agreement to limit greenhouse gas emissions. We agree with the CCC's conclusion that if we can achieve significant global emissions reductions both before and after 2020, it is still plausible that emissions will be on a path broadly consistent with the 2°C objective.

1.16 We therefore agree with the CCC that the underpinning case for action on climate change remains strong.

Chapter 2: Low-carbon power

2.1 The Coalition Government recognises that it has a strategic role in reducing power sector emissions and ensuring investment in low-carbon generation to meet our emissions reduction targets. Greenhouse gas emissions from the power sector decreased to 219.7 MtCO₂e in 2008 representing a decrease of 2.9% relative to 2007 and 19.8% relative to the 1990 baseline. Provisional data for 2009 shows carbon dioxide emissions decreased by 11% to 186.2 MtCO₂e compared to 2008. Final electricity consumption⁶ decreased to 322.4TWh (from 341.9TWh in 2008); a reduction of almost 6% in 2009.

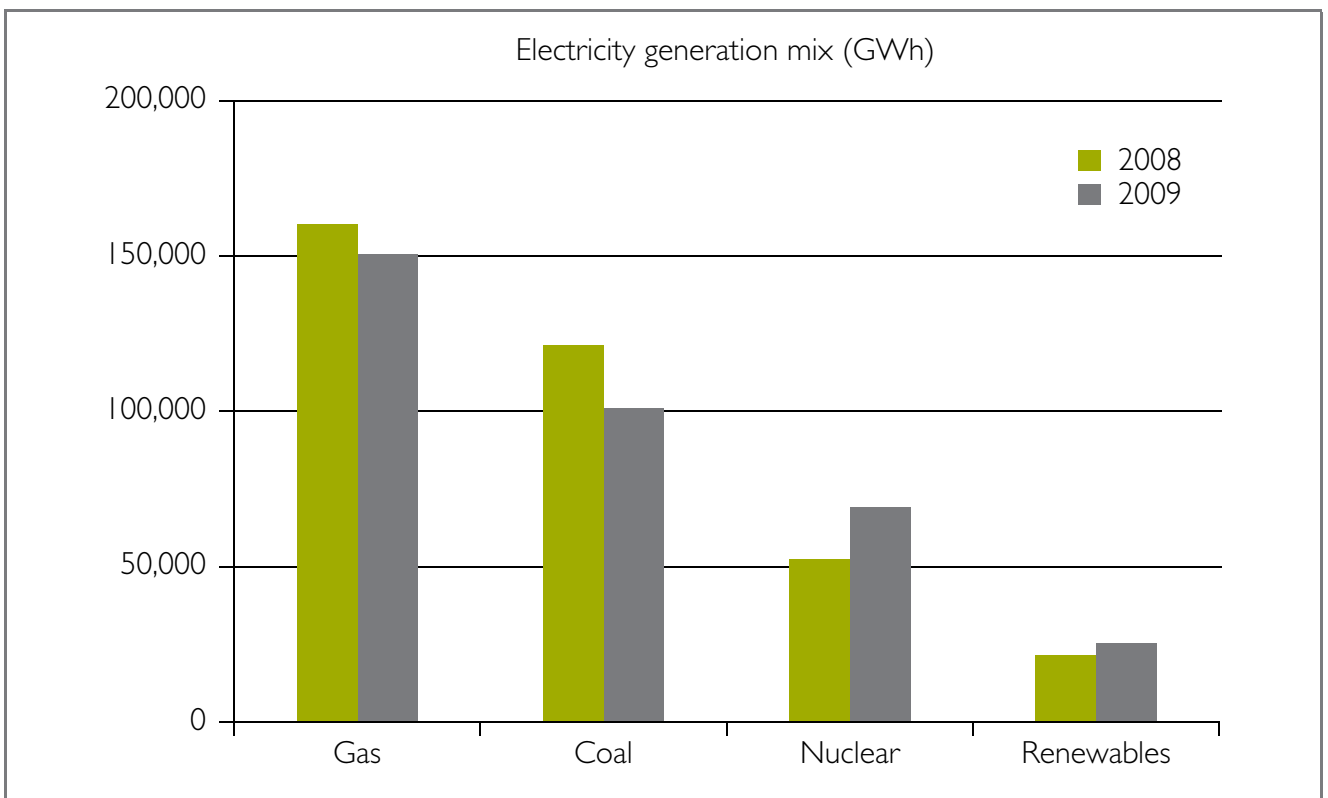
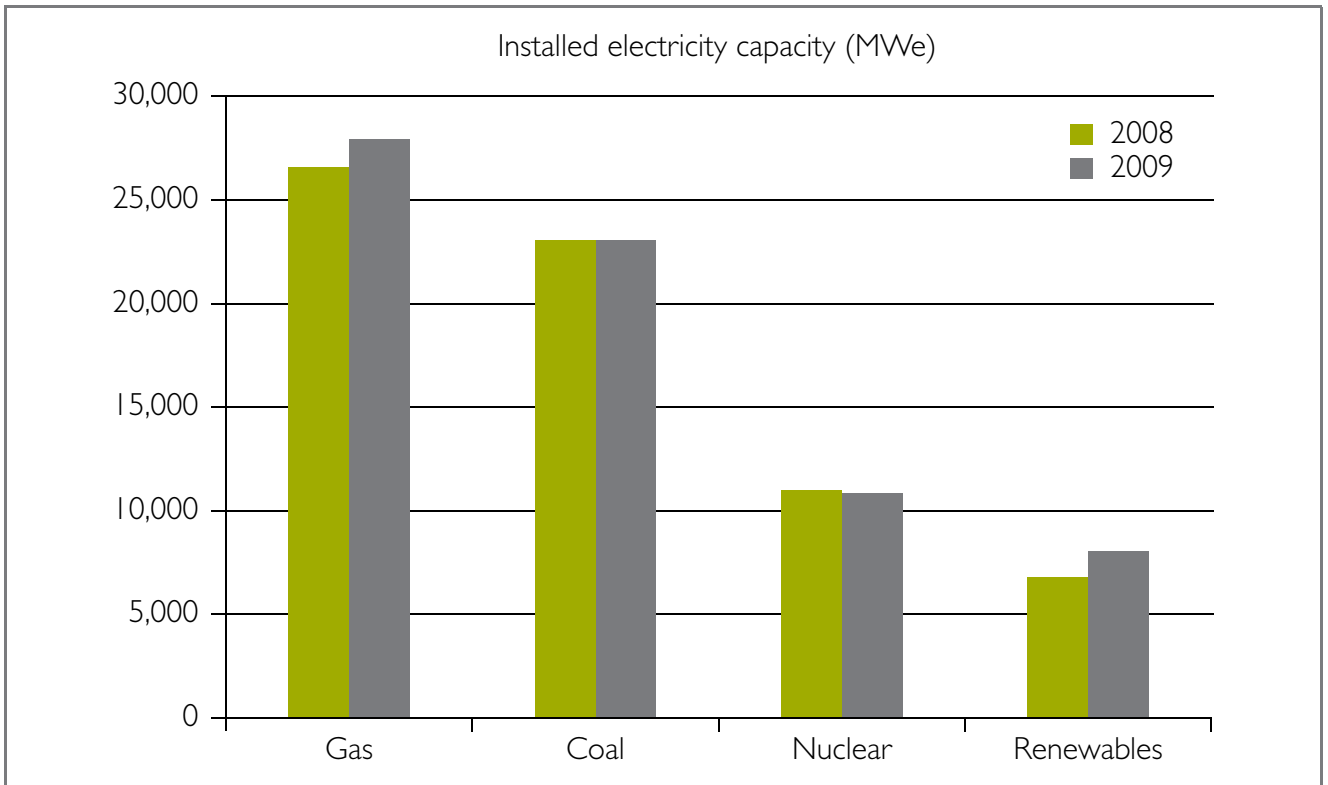
2.2 As with overall emission reductions over this period, Government agrees with the CCC that some of these reductions are due to the recession and changes in fuel prices. However, indicators for the power sector demonstrate progress, with an increase in installed capacity of, and generation from, renewable energy, which contributed to a decrease in the carbon intensity of electricity generation from 2008 to 2009. Progress in deploying renewable energy generating capacity is also demonstrated by the current number of applications at pre-consent stage and those already consented in 2010. Indicators on new nuclear and carbon capture and storage will show progress over a longer timescale.

2.3 In this chapter we analyse in further detail progress against Government's key indicators monitoring progress in achieving decarbonisation of UK electricity generation.

Carbon intensity of power generation

2.4 According to the latest figures published in the Digest of UK Energy Statistics, carbon intensity of electricity generation by major power producers fell to 442.2gCO₂/kWh in 2009 from 487.5gCO₂/kWh in 2008, a 9% reduction. Changes in installed electricity capacity and generation (measured in MWe and GWh) are also shown below, according to the major technology sources.

⁶ Final consumption differs from demand as it measures actual consumption only, without taking into account losses and electricity used by the energy industry.

Existing capacity and generation⁷

⁷ From Digest of UK Energy Statistics 2010..

Renewables

Indicator and milestone table 1

Milestones			
2009	Renewable energy to grow in line with EU targets		
2010	Publication of Renewable Energy National Action Plan		
Indicator	Level in current reporting year (2009)	% Change against previous year (2008)	Desired trend
Total installed capacity from renewables sources ⁸	8,030.6 MW	+18% compared to 2008	Upwards
Total generation from renewables sources	25,222 GWh	+17% compared to 2008	Upwards

2.5 Electricity generation from renewable sources increased by 17% between 2008 and 2009. The contribution of all renewables to UK electricity generation was 6.7% for 2009⁹, an increase of 1.1 percentage points during the year.

2.6 Progress has also been made against the UK's target, introduced in the 2008 EU Renewables Directive, for 15% of energy to come from renewable sources by 2020. Using the measurement methodology required by the Directive, 3% of energy consumption in 2009 came from renewable sources. This is an increase from 2.4% in 2008, which puts us on track to deliver the first milestone next year for 4% of all energy consumption to come from renewables. The Government will publish its Renewables Delivery Plan in Spring 2011, which will set out how we can deliver the legal commitment to supply 15% of our energy from renewables sources by 2020.

2.7 As the CCC notes, the Devolved Administrations have already set ambitious targets for renewable energy, higher than that required by the Renewables Directive. More detail on the Devolved Administrations can be found at Annex A.

2.8 The CCC has written to the Coalition Government with a preliminary response to our request for advice on the Government's proposal to consider an increase in ambition for energy from renewable sources.

Progress in renewables deployment

Adding Capacity

2.9 DECC currently collects data on projects in the planning pipeline, including those under construction. This data, in addition to that relating to projects awaiting construction, those at the pre-consent stage and those already operational, provides a comprehensive view of the renewable energy deployment pipeline. This data is collected on a monthly basis and can be found on our website.¹⁰

⁸ Excludes co-firing.

⁹ This is the figure for all renewables, including both major power producers and small scale renewables generation. Renewables from major power producers accounted for 4.1% of generation in 2009.

¹⁰ <https://restats.decc.gov.uk/app/reporting/decc/datasheet>

2.10 Progress is being made in the deployment of renewable energy. As of August 2010, there is 14,167MW of pre-consented applications for renewable projects, with the total potential generation in the planning system amounting to 25,491MW. This figure includes pre-consented and post-consented projects. A total of 4,585MW projects are currently under construction and 6,739MW are awaiting construction.

Planning

2.11 The Government wants a planning system for major infrastructure, including energy, which is rapid, predictable and accountable, while reasonably safeguarding wider interests.

2.12 As set out in the AES, the Government proposes that the IPC is replaced by a new Major Infrastructure Planning Unit (MIPU) as part of the Planning Inspectorate. The MIPU would retain the IPC's fast-track application and examination process for major infrastructure projects. Decisions would be made by Ministers in accordance with the clear policy framework provided in National Policy Statements (NPSs), and on the basis of recommendations by the new MIPU. We envisage most cases would take less than a year from application to decision.

2.13 The IPC will continue in its present role until new legislation is in place and it is abolished. Transitional arrangements will ensure that any project being considered by the IPC at the time of our changes does not have to start the planning process again.

2.14 We will re-consult on the draft NPSs in the autumn with a view to presenting the finalised statements to Parliament for ratification next spring. The re-consultation is due to changes which have been made to the Appraisal of Sustainability for the NPSs.

2.15 The revised statements will give investors the certainty they need to bring forward proposals to maintain security of supply. They will also ensure progress towards decarbonisation

and ensure plans for the first new nuclear power stations are on track to begin generating electricity by 2018.

2.16 For renewable energy projects below the Planning Act 2008 thresholds we have committed to a radical reform of the planning system to give neighbourhoods far more ability to influence decisions on the area in which they live. As part of this reform package, we stated in the Coalition Programme for Government that we will publish and present to Parliament a simple and consolidated national planning framework covering all forms of development. We are committed to removing the need for specific planning permission for small domestic wind turbines and air source heat pumps which meet certain criteria. We will bring forward legislation to do this as soon as possible.

2.17 We recognise the importance of strategic planning particularly to address infrastructure needs that require coordination beyond the level of a single local authority. This is particularly important in addressing the issues of climate change and energy generation. Strategic planning should not be a top down prescriptive process - it should enable local authorities and other partners to come together in a way that they choose to address issues which are important to them. In this context, we are considering the additional tools or mechanisms that can be added to the legislative framework to enable effective strategic planning. As part of this we are considering including a new 'duty to cooperate' in the Localism Bill, which we hope to bring forward in this session of Parliament. Such a duty would encourage joined-up working on plan-making and sharing information that is needed for effective plan-making, such as development and infrastructure plans.

2.18 Ensuring sufficient supply chain development for the deployment of renewables is also important. The CCC has stated the need for ensuring that the necessary investment is available for the development of a supply chain which can

deliver on our commitments. The Government recognises that the vision of a low carbon future provides opportunities for the UK that need to be maximised. We have a clear ambition to make the UK a leader in the development of renewable energy infrastructure.

2.19 We will also shortly publish a formal response to the Penfold Review of non-planning consents, which made a series of recommendations aimed at reducing duplication and unnecessary delay in the development consents associated with planning permission.

Transmission Access

2.20 The Government agrees with the CCC on the importance of an enduring access regime for onshore transmission. In the July AES we announced we would be using powers in the Energy Act 2008 to implement a 'Connect and Manage' access model, from 11 August 2010. Under this model, new generating capacity will be able to connect to the grid as soon as their 'enabling works' are built, without waiting for wider network reinforcement. 'Connect and Manage' has already been operating on an interim basis since its approval by Ofgem in May 2009, and has proved extremely successful. National Grid has carried out an analysis of costs and benefits associated with the earliest tranches of these projects to advance, and this is available from the National Grid website.¹¹

Onshore Transmission Network

2.21 The long term answer to capacity constraints for new renewable and other low carbon generation is to build new transmission networks. We agree that the timely delivery of necessary investments to connect generators is critical and that the priority investments identified by transmission companies in the Electricity Networks Strategy Group's 2020 Vision report are a valuable contribution to the work required.

2.22 Both the Coalition Government and Ofgem remain committed to ensuring that the regulatory process enables the timely and efficient delivery of investments in this area. In April 2010, Ofgem introduced licence changes to facilitate additional priority investments within the current transmission price control period (TPCR4). The April 2010 licence changes confirmed the funding framework for costs up to the end of 2011/12, comprising £78 million of pre-construction funding and £241 million of construction funding on projects planned to commence before 1 April 2011. On 17 March, Ofgem issued an open letter setting out its approach and timetable for future work on a potential £764 million of further investments planned by the Transmission Owners to the end of 2011/12, and is now considering further information submitted by the grid companies.

2.23 On 26 July, Ofgem published for consultation its recommendations from its RPI-X@20 project, which is a fundamental review of the regulatory regime for energy networks. Ofgem plans to take final decisions on the new regulatory framework in the autumn, having taken into account the responses to the summer consultation, with plans for the first stages of its implementation to occur within the next electricity and gas price control periods.¹²

Offshore Transmission Network

2.24 The Coalition Government considers that offshore wind has a significant role to play in meeting renewable energy targets and helping to ensure security of supply. An estimated £15 billion of investment is required in transmission assets to connect offshore wind farms to the onshore grid. It is therefore important that these connections can be delivered in a cost effective, timely and coordinated manner.

¹¹ <http://www.nationalgrid.com/uk/Electricity/Codes/gbsqsscode/DocLibrary/>

¹² <http://www.ofgem.gov.uk/pages/moreinformation.aspx?docid=81&refer=networks/rpix20/consultdocs>

2.25 In the July AES, it was announced that the new offshore transmission regime for transitional offshore generation projects would be fully implemented. This means that the tender process that Ofgem is currently running, to appoint new Offshore Transmission Owners for nine transitional projects with 2GW of capacity (worth £1.1 billion), can now move to a conclusion. In early August, Ofgem announced the preferred and reserve bidders for seven of the projects, with two to be decided at a later stage.

2.26 New offshore transmission tender regulations have also been approved, which will enable Ofgem to run the next transitional tender round. Importantly, these new regulations include greater flexibility than the previous tender regulations, meaning that more projects will be eligible for inclusion in the transitional tender rounds. Ofgem plan to commence a second transitional tender round later this year for assets for around 2GW of capacity, with a potential asset value of approximately £1.8 billion.

2.27 The Coalition Government and Ofgem have been carefully considering recent issues that have been raised about the planned enduring regime for offshore transmission. Therefore, rather than implementing an enduring regime in July, the Government and Ofgem decided to consult further in order to consider ways of increasing flexibility, such as the possible inclusion of a 'generator build' option. A revised enduring regime will be put in place following the results of that consultation.

2.28 We are committed to the development of a smarter grid. More information about our work with industry on smart grid interoperability can be found on page 14 of the AES.

Feed-In Tariffs and Microgeneration

2.29 The Coalition Government has made clear its commitment to the full establishment of a feed-in tariffs scheme. The feed-in tariffs scheme was launched on 1 April 2010 and is intended to incentivise small scale low carbon electricity generation and encourage participation of individuals, householders, organisations, businesses and communities who have not traditionally engaged in the electricity market. The scheme supports new anaerobic digestion, hydro, solar photovoltaic and wind projects of up to 5MW and also supports, as a pilot programme, the first 30,000 micro combined heat and power installations with an electrical capacity of 2 kW or less.

2.30 We also launched a new Microgeneration consultation in July, a collaborative consultation process which will aim to tackle non-financial barriers to development of the microgeneration market. This was followed by a roundtable discussion with key stakeholders. Businesses, communities and householders wishing to invest in small scale onsite energy generation should benefit from this strategy.

Progress in new nuclear deployment

Indicator and milestone table 2

Milestones*	
Q4 2010	Decisions made on Regulatory Justification.
Spring 2011	Nuclear National Policy Statement presented to Parliament for ratification
2011	Generic Design Assessment for new nuclear reactors completed. First development consent and site licence applications. First funded decommissioning programmes approved.

* We will start to monitor progress and publish new nuclear indicator information when new nuclear capacity is deployed.

2.31 The CCC envisages a clear role for new nuclear power as a cost-effective technology within a low-carbon energy mix. The CCC's high-level trajectory for decarbonisation assumes development of up to three new nuclear plants by 2022.

2.32 The CCC suggests that the Government has a key role in creating certainty in the investment climate for new nuclear. In the AES we made clear that new nuclear power can proceed, provided it does not receive any public subsidy. We also committed to removing any unnecessary obstacles to investment in new nuclear power, including by taking the facilitative actions¹³ highlighted as key indicators by the CCC.

2.33 Our most recent indicative timeline for new nuclear shows that there has been some slippage on these facilitative actions. However, we are confident that the path to delivery of

the first new nuclear power station by 2018 is still achievable. According to the new timetable, we will:

- consult on a revised draft of the nuclear National Policy Statement in the autumn and put it before Parliament for ratification next spring;
- make a decision on Regulatory Justification of new nuclear reactor designs by Q4 2010;
- ensure that the regulators have the ability to maintain the level of resource needed to deliver a meaningful end to Generic Design Assessment of new nuclear reactor designs in June 2011; and
- finalise the arrangements to ensure that new nuclear operators set aside sufficient money from day one to pay for waste and decommissioning, with regulations coming into force in the first half of 2011.

¹³ See page 65 of the CCC's Report.

Progress in Carbon Capture and Storage (CCS) deployment

Indicator and milestone table 3

Milestones*	
2011	Legislative framework for CCS levy established.
2012	First decarbonisation report published.
2014	First UK demonstration operational

* We will start to monitor progress and publish CCS indicator information when CCS technology is deployed.

2.34 As we set out in the AES earlier this year, we recognise the important role CCS technology will play in our efforts to tackle climate change both in the UK and globally.

The framework for support of CCS

2.35 The CCC's progress report notes that the current framework for support of CCS demonstration provides a good basis for the development of CCS technology.

2.36 We agree with the CCC that a framework for the roll-out of CCS will help to strengthen investor confidence and facilitate the early roll-out of CCS. We announced in July that we are launching a CCS Development Forum, which will perform a vital function in holding Government to account on the delivery of its CCS commitments. A key focus of the Forum will be on delivering CCS in the UK as soon as possible. In this context, we intend to publish a CCS Roadmap in spring 2011, developed in consultation with industry and other stakeholders, which will articulate our proposed timescales and set out the key policy and commercial issues which need to be addressed, and by when. The Coalition Programme for Government also made several commitments in this area, including plans for an Emissions Performance Standard and to provide public funding for four CCS demonstration plant, which we are currently considering how to implement. We are considering what policy response might be appropriate in relation to any capacity of demonstration plants not fitted with CCS from the outset as we develop the detail of the CCS demonstration programme and more widely the reforms to the electricity market.

2.37 We aim to consult on our plans to introduce an Emissions Performance Standard as a key element of the Electricity Market Reform consultation in the autumn, and to include the outcome in the spring 2011 White Paper. This work will include consideration of the CCC's advice to expand the EPS to include gas-fired plant.

CCS demonstration projects

2.38 The Coalition Programme for Government committed to continue public sector investment in four CCS demonstration projects. We are currently supporting detailed Front End Engineering and Design (FEED) work as a key element of the first CCS demonstration competition. This work is on course to meet its scheduled conclusion in spring 2011. Further details regarding the next stages will be published after the Spending Review.

2.39 We are engaging with industry on the development of the selection process for future CCS demonstration projects with the intention of launching a formal call by the end of the year.

CCS infrastructure

2.40 The CCC has previously noted the potential for economies of scale in the provision of CCS infrastructure and recommended that bids for over-sized pipes should be allowed as part of the demonstration programme.

2.41 We recognise the potential for economies of scale from the clustering of capture sites and the sharing of transport and storage infrastructure. We are implementing the CCS Directive arrangements in order to facilitate

the construction of pipelines and storage sites that anticipate foreseeable future demand and to provide access to excess capacity by third parties. We expect to consult in more detail on draft regulations later this year. We also intend to require developers of CO₂ infrastructure to consider the opportunities for joint investment prior to seeking approval for construction. We will clarify how these requirements will interact with the competition for further demonstration projects at the time of issuing a call for proposals.

2.42 The CCC also noted progress in developing an infrastructure strategy as recommended by the CCC in their first annual progress report. The Office of Carbon Capture and Storage (OCCS) will be taking this work forward as part of the development of the CCS Roadmap.

Gas CCS demonstration

2.43 We welcome the CCC's analysis and advice on the future role of gas CCS. Gas CCS is likely to be part of the energy mix in the future and it is right that we take time to carefully consider the detail of the CCC's recommendation that gas CCS should be part of the demonstration programme.

2.44 We are also considering how gas demonstration projects fit within our climate change and energy security objectives, and, within the context of the UK's overall public expenditure, what additional benefits these projects can bring, such as their potential for UK business. We also need to consider how a gas CCS project would contribute to the global development of CCS technology.

2.45 Furthermore, we need to consider what type of CO₂ capture technology would be most advantageous to demonstrate on gas-fired power generation at this time, and the benefits of this process compared to demonstrating the same technology on coal.

CCS indicators in the Carbon Reduction Delivery Plan

2.46 The CCC recommended that we include two further CCS indicators in the DECC Carbon Reduction Delivery Plan, one tracking development of an infrastructure strategy and one tracking gas CCS demonstration. We will consider the need for such indicators alongside the development of the CCS Roadmap and as part of our consideration of the potential role for a gas project in the Government's CCS demonstration programme.

Green Investment Bank

2.47 We are currently considering a wide range of options for the scope and structure of the Green Investment Bank. Detailed proposals will be put forward following the outcome of the spending review in the autumn.

Chapter 3: Buildings and industry

3.1 The Coalition Government agrees with the CCC that there is further potential for cost-effective emissions reductions from buildings and industry and will use a combination of policies to deliver this objective. Going forwards, the Government intends to focus support where there remains a need to help householders, local communities, business and the public sector overcome barriers to investing in energy and carbon savings. Many of the necessary changes are already in hand, as explained below.

Residential Buildings

3.2 As the CCC notes, residential CO₂ emissions have seen a 5% decrease in the last year relative to 2008¹⁴ (provisional data estimates non-electricity emissions in this sector to be 76.7 MtCO₂ in 2009). Although this is a significant reduction, the Coalition Government acknowledges that this will have been, to some extent, due to the economic downturn as well as the impacts of policy measures.

3.3 The average energy efficiency of housing has continued to improve year on year¹⁵, as assessed

using the Government's Standard Assessment Procedure (SAP)¹⁶ – it is currently at 51.4 points in headline figures for the latest reporting year (2008) compared to 49.8 in 2007, and having risen each time it was assessed since monitoring started in 1996 when the average rating was 42.1. The specific energy consumption of households as measured by the Specific Energy Consumption Index has continued to decrease. These factors suggest that the UK is progressing toward low carbon living within the home. However, the use of renewable micro-generation remains marginal.¹⁷ Natural gas is the main fuel used for heating homes (used in 86% of dwellings). Those living off the gas network use fuels that are generally more carbon intense, such as oil and electricity. Those households could reduce their carbon footprint by switching to a lower carbon fuel, such as biomass and LPG (liquid petroleum gas). Alternatively, households could invest in technologies that are more energy efficient, such as combined heat and power and heat pumps. Renewable micro-generation technologies are another option, though the higher costs can inhibit their use as a viable alternative.¹⁸

¹⁴ Provisional 2009 greenhouse gas emissions estimates and final greenhouse gas estimates for 2008, DECC.

¹⁵ English Housing Survey, CLG.

¹⁶ The SAP rating is based on the energy costs associated with space heating, water heating, ventilation and lighting, less cost savings from energy generation technologies. It is adjusted for floor area so that it is essentially independent of dwelling size for a given built form. The SAP rating is expressed on a scale of 1 to 100 – the higher the number, the lower the running costs.

¹⁷ Sources: Specific energy consumption – Energy Consumption in the UK, DECC; Main Fuel types – English Housing Survey, CLG.

¹⁸ Sources: Specific energy consumption – Energy Consumption in the UK, DECC; Main Fuel types – English Housing Survey, CLG.

3.4 We agree that there is further potential for cost-effective emissions reductions from residential buildings, primarily through installation of loft, cavity wall and solid wall insulation along with other energy efficiency measures. We want to see demand for such measures to be maintained until the process of improving the UK's old housing stock is complete, and will use a combination of policies and the Green Deal (see section below on the Green Deal for details) to deliver this objective. Furthermore, we expect to agree measures in Europe setting minimum and/or labelling standards for a number of products e.g. boilers, water heaters, air conditioning, pumps and information and communication technologies (ICT), in the next 12-18 months.

3.5 In response to the CCC's concerns, we note the need for acceleration and detailed implementation plans, notably finance, to ensure energy efficiency measures are undertaken. The Government is already taking action on this in the following ways:

Accelerating the roll-out of Smart Meters

3.6 The Prospectus for Smart Meters (issued 27th July 2010) set out detailed plans, covering a wide range of proposals from consumer engagement and protection to technical issues such as the minimum requirements for the smart meter system. It made clear that Government wants to see a significant acceleration of smart meter roll-out compared to previously published targets. In order to bring forward the delivery of these proposals' early benefits, we are proposing a staged approach to implementation. We are also looking to the industry to examine all the opportunities for realising more ambitious, but achievable targets, for the rate at which suppliers must install smart meters.

Promoting Energy Efficient Products

3.7 Since agreement was reached on the Framework Directives, minimum energy performance and labelling standards have been agreed for 11 product categories in addition to the cross cutting measures on wasteful "stand-by". Taken together these measures are expected to generate net savings of around 7MtCO₂ per annum by 2020 and approximately £850 million annual net benefits in the UK. The current timetable envisages agreement being reached on a further 12 products (including boilers and water heaters, air conditioners, ICTs) in the next 12 to 18 months, which could potentially deliver up to a further 7MtCO₂ savings per annum by 2020. In addition, the Government has been working with product manufacturers and retailers to develop voluntary commitments to reduce their energy consumption, most recently on televisions. See table 4 for progress on indicators.

3.8 Through its public purchasing (Government Buying Standards), central Government plays a role in incentivising the market to improve the energy efficiency of its products. In ICT, for example, by purchasing desktop PCs with 30% greater energy efficiency than Energy Star (at no additional up-front cost than a PC with Energy Star) significant financial savings of £6.8 million can be realised over the lifetime of the product, while avoiding greenhouse gas emissions of 26,282t CO₂e.

Indicator and milestone table 4

Indicator	Projected cumulative emissions 2010-2020*	Change on 2007	Desired trend
Cumulative UK CO ₂ non-traded emissions savings expected from EU implementing Measures (minimum standards plus labelling), introduced to date (MtCO ₂)	-15.35	Zero baseline in 2007	Upwards
Cumulative UK CO ₂ traded emissions savings expected from EU implementing Measures (minimum standards plus labelling), introduced to date (MtCO ₂)	+72.75	Zero baseline in 2007	Upwards

* Negative figure indicates increased emissions

Source: Market Transformation Programme, DEFRA

Amendments to the Carbon Emissions Reduction Target (CERT)

3.9 The Carbon Emissions Reduction Target (CERT) requires all domestic energy suppliers with a customer base in excess of 50,000 customers to make savings in the amount of CO₂ emitted by householders. Suppliers meet this target by promoting the uptake of low carbon energy solutions to household energy consumers, thereby assisting them to reduce the carbon footprint of their homes. We have now extended the scheme to the end of 2012 and refocused it around insulation measures. The scheme's target savings have thereby been increased to over 100 million lifetime tonnes of CO₂, with

suppliers permitted to work towards the new target from 1 August 2010. New obligations on suppliers also require them to meet no less than two thirds of the increase in the target from professionally installed insulation measures, and require 15% of the target to be met in lower income pensioner, family and disabled households. In combination with the requirement to remove compact fluorescent lamps, there is expected to be a step change in the delivery of insulation, with over 3.5 million households set to benefit. This will ensure renewed certainty within the energy efficiency supply chain, allowing the industry to invest early and grow towards its capacity to enable it to meet future challenges. See table 5 for progress on indicators.

Indicator and milestone table 5

Indicator	Level in current reporting year (2009)	Change on baseline (2008 baseline)	Desired trend
Total lifetime MtCO ₂ savings achieved in the calendar years	63.7	14% (55.9 in 2008)	Upwards
Number of key measures installed	1,410,165	16% (1,216,410 in 2008)	Upwards

Source: Ofgem. Data relates to major insulation measures (cavity, loft and solid wall) professionally installed in approved schemes under CERT and excludes DIY loft insulation which was fairly substantial in this period.

A new obligation on energy companies

3.10 Powers for a new obligation on energy companies from 2013 to exceed the CERT will be included in the forthcoming Energy Security and Green Economy Bill. The new obligation will underpin the Green Deal, and focus particularly on those householders (e.g. the poorest and most vulnerable) and those types of property (e.g. the hard to treat) which cannot achieve financial savings without a measure of support. We will consult publicly on the detail of the new arrangements.

Boiler scrappage and energy efficiency schemes

3.11 As the CCC notes, there have been various energy efficiency schemes aimed at accelerating take-up among householders. Under the England Boiler Scrappage Scheme for example, which closed to applicants in March 2010 (but with vouchers under the scheme still being redeemed), it is estimated that approximately 119,000 households have been helped. We are evaluating these programmes to see the degree to which they helped accelerate the replacement rate for the most inefficient boilers (G-rated or worse) and intend to focus on measures where there remains a need to help householders overcome barriers to investing in energy and carbon saving. See table 6 for progress on indicators.

Indicator and milestone table 6

Indicator	Level in current reporting year (2009)	Change on 2007	Desired trend
Number of energy efficient fossil fuel boilers installations – broken down by rating	1,518,122 boiler sales (86% A rated, 13% B rated, 1% D rated)	6% decrease total boiler sales. Proportions: A rated – up 7% B rated – down 3% D rated – down 4%	Increase in % of A rated sales

Source: Heating and Hot Water Industry Council (HHIC) industry statistics

Zero Carbon Homes

Indicator and milestone table 7

Milestones			
2010	New standards in Building Regulations (Part L: fuel and power conservation) to be introduced from October 2010 (completed)		
2010	Revised Code for Sustainable Homes (on track)		
Indicator	Level in current reporting year	Change on 2008	Desired trend (where applicable)
Average energy efficiency (SAP rating) of new dwellings in England. Captures energy efficiency of new housing stock.	79.5 points in latest quarter (Q2 2010)	Up 0.5 points.	Upwards
Number of homes built to Code for Sustainable Homes level 3, level 4 and levels 5 & 6.	2,180 Code 3 (89% total of year); 148 Code 4 (6%); 13 Code 5 (1%) and 6 Code 6 (<1%) homes built in 2009. All additional to the homes built in 2008.	27 Code 3 (84% total of year); 2 Code 4 (6%); 2 Code 5 (6%) and 0 Code 6 homes built in 2008.	Increase in total number of Code homes at higher levels (4, 5 & 6)

Source: Environmental Performance of Buildings statistics, CLG.

3.12 The CCC notes that progress has been made during the last year towards meeting the commitment that all new homes in England will be zero carbon from 2016. In July 2010 the Minister for Housing and Local Government made a statement to Parliament on the future direction of zero carbon homes policy¹⁹. This statement reaffirmed the commitment to enabling all new homes to be zero carbon from 2016, and laid out key elements of the policy trajectory through which this will be enabled, including:

- confirming introduction of a minimum energy efficiency standard for all new homes;
- commissioning further work from the Zero Carbon Hub on a national benchmark carbon compliance standard in building regulations; and

- exploring the feasibility of enabling developers to make payments to fund local renewable energy projects to meet part of their carbon reduction requirements.

3.13 An amendment to the energy efficiency provisions in Part L of the Building Regulations was introduced on 1 October 2010 strengthening standards for new buildings by 25% and also tightening the standards when work is carried out to existing buildings. The Part L 2010 changes represent the next step towards zero carbon buildings and will deliver 2 million tonnes of carbon savings a year by 2020, while reducing home energy bills by an average of £115 per annum.²⁰ See table 7 for progress on indicators and milestones.

¹⁹ <http://www.communities.gov.uk/newsstories/newsroom/16527871>

²⁰ Implementation Stage Impact Assessment of the Revisions to Parts F and L of the Building Regulations from 2010, CLG March 2010.

Non-domestic Buildings and Industry

3.14 As the CCC notes, CO₂ emissions from non-domestic buildings have seen a 3% decrease in the last year relative to 2008.²¹ Greenhouse gas emissions from the workplaces sector decreased to 96.6 MtCO₂e in 2009; a decrease of 14% relative to 2008 and 41% relative to 1990. Although this is a significant decrease, the Government acknowledges that this will have been, to some extent, due to the economic downturn as well as the impacts of policy measures.

3.15 Going forward, we believe that we have policies in place which will deliver significant emissions savings as the economy grows. The Carbon Reduction Commitment should for example begin to make a significant impact now it has begun to be rolled out, while the new Green Deal for the non-domestic sector will lever in billions of pounds of new investment to improve the energy efficiency of our building stock.

3.16 A means to measure the energy efficiency of the existing non-domestic stock more effectively continues to be explored, with an associated indicator in this area under development.

3.17 The Prime Minister's commitment to cutting emissions by 10% over 12 months from the Government estate will also set a clear lead for industry to follow.

The CRC Energy Efficiency Scheme

3.18 The CRC Energy Efficiency Scheme helps secure improved energy efficiency in our workplaces and public buildings. The CCC published its advice to Government on the second phase of the scheme on 24 September and recommended that the CRC be re-designed prior to the start of the second phase (2013-2017), in order to reduce its complexity. DECC is currently considering this advice. In the meantime there is no data to report until October 2011.

Promoting Energy Efficiency in the non-domestic sector

3.19 The Government has continued to explore and gather data on sectors of the economy not currently covered by existing policies such as the CRC energy efficiency scheme, Climate Change Agreements (CCAs) and the EU ETS.

3.20 The Government is aware of the shortcomings of the recent ENUISM²² update and will report further on a programme to update its models for industrial emissions, as well as non-domestic buildings-related emissions, next year. The Government will continue to work with the CCC to improve the evidence base for reducing industry emissions, while looking at the future of CCAs in order to ensure significant improvements in energy efficiency with minimal complexity and policy overlap are delivered.

EU ETS: heavy emitters in industry

3.21 As referenced in Chapter 1 of this response, Government is committed to improve the efficient functioning of the EU Emissions Trading System (EU ETS). The UK is working closely with the European Commission, other Member States and stakeholders to agree fair, efficient and environmentally ambitious rules that reward early action taken to reduce emissions by installations.

3.22 We recognise that for a small number of sectors the costs of implementing the EU ETS may lead to a risk of carbon leakage and the relocation of investment or production to countries without carbon constraints, resulting in an overall increase in global emissions. The best way of addressing carbon leakage is through an international climate agreement. In the interim, the EU ETS Directive provides adequate measures to mitigate the risk through free allocation.

3.23 The Energy Intensive Industries project currently being taken forward by DECC and BIS will look at greenhouse gas abatement potential in key energy intensive sectors ("EIS"), in light of the move to a low carbon economy. It will consider

²¹ Provisional 2009 Greenhouse Gas emissions estimates and final Greenhouse Gas estimates for 2008, DECC.

²² The Industrial Energy End Use Simulation Model.

both incremental and radical decarbonisation of these sectors in the short, medium and long term, looking at improvements to conventional processes as well as substitutes and alternatives. It will also support the evidence base for an EU move to a 30% target and broader international climate change negotiations, and will consider policy options for helping UK energy intensive industry to make the transition to a low carbon economy while ensuring future competitiveness.

Incentives for Small and Medium-size Enterprises (SMEs)

3.24 We agree with the CCC that opportunities exist for smaller organisations to save energy and carbon in a cost-effective manner. As such we reviewed the evidence for action from smaller organisations, the barriers constraining these organisations from taking action and the effectiveness of existing tools already targeting these organisations. Findings from the review indicate that:

- The unconstrained sector (organisations outside of CRC, CCAs and EU ETS) accounts for 49 MtCO₂, of which 34 MtCO₂ is from non-domestic buildings and 15 MtCO₂ is from industry. The cost effective potential of this

sector is 7.8 MtCO₂ per year by 2020 (7.2 MtCO₂ from buildings and 0.6 MtCO₂ from industry). Of this, 4.5MtCO₂ is expected to be delivered by existing policies;

- The most significant barrier to action is the availability of finance; closely followed by a lack of knowledge about what could be done. Furthermore, only 20% of all businesses interviewed had sought external energy efficiency advice;
- The lack of data about the sector, and about the effect of policy currently in place, hampers understanding.

3.25 We agree with the CCC that the provision of financial assistance is an important part of encouraging the sector to take up energy efficiency measures. The Green Deal will take this work forward and provide a mechanism for promoting and financing energy efficiency measures for businesses (and all non-domestic buildings). As set out later in this chapter, the Green Deal will apply equally to homes and businesses. We will work with business representatives to ensure that our policy is appropriate for SMEs and addresses the particular barriers they face. See table 8 for progress on indicators and milestones.

Indicator and milestone table 8

Milestones			
2009	Annual Review in April		
2010	Annual Review in April		
Indicator	Level in current reporting year (2009/10)	% Change between 2008/09 and 2009/10 (increase)	Desired trend
Carbon Trust Loans (NB data is in financial years)	0.15 tCO ₂ in 2009/10	148% (2008/09: 0.06 tCO ₂)	Positive contribution to savings in the workplaces sector.
Number and value of Carbon Trust Loans	2,161 loans to UK-wide customers, saving £34m/year on energy bills in 2009/10	202% (2008/09: 714 loans)	N/A as levels subject to annual budgets and dependent on size of individual loans

Zero carbon new non-domestic buildings

3.26 The consultation was completed in February 2010, with a wide range of perspectives within industry received. We are now reviewing the proposals in light of this information. Data for the indicator on the energy efficiency of new non-domestic buildings is not yet available.

Indicator and milestone table 9

Milestone	
2010	Consultation on policy proposals for zero carbon new non-domestic buildings completed (completed).

Public sector buildings

3.27 Public sector carbon dioxide emissions appear to have stabilised between 2008 and 2009, with provisional data showing emissions of 10.2 MtCO₂ in 2009.

Indicator and milestone table 10

Milestones			
2009	Reduce carbon emissions from central Government by 12.5% by 2010-11, relative to 1999/2000 levels		
2010	Reduce carbon emissions from central Government by 12.5% by 2010-11, relative to 1999/2000 levels		
2011	Reduce carbon emissions from central Government by 10% in the twelve months to May 2011		
Indicator	Level in current reporting year (2008/09)	% Change on years 1999/00 and 2007/08	Desired trend (where applicable)
12.5% reduction in CO ₂ from central government buildings by 2010-11 relative to 1999/00.	2.6 MtCO ₂ in 2008/09	10% relative to 2.9 MtCO ₂ in 1999/00 by 2008/09; and 6.3% in 2007/08 relative to 1999/00.	Downwards

3.28 The public sector spent £2.6 billion on electricity and gas in 2008/09 and is responsible for around 3% of the UK's emissions. Since 1990 emissions have been steadily falling across the sector, which includes central government as well as schools and the NHS in the wider public sector. Between 1990 to 2008 end-user emissions from the public sector have reduced by almost a third.

3.29 We share the CCC's view that it is important for the Government and wider public sector to lead by example in reducing their own emissions, and to save money through improved energy efficiency. That is why the Prime Minister made a commitment to cut carbon emissions from the central Government office and administrative estate by 10% (in the twelve months to 14 May 2011) and that all departments make real time energy use data for their main headquarters available on their websites. See table 10 for progress on indicators and milestones.

3.30 However, the Coalition Government also notes that forthcoming research (which will be published on the Defra website) into central Government's carbon footprint shows that in 2008, indirect supply chain emissions were responsible for 77% of the total carbon footprint. Thus, the Government is keen through its procurement activities to engage with its suppliers to help them reduce the emissions associated with the goods and services provided to Government.

3.31 We are currently considering the scale and scope for potential emissions reductions across the whole of the public sector, and how the public sector can use innovative financial models to drive energy efficiency investment.

Energy Performance Certificates and Display Energy Certificates

3.32 The Coalition Government agrees with the CCC on the potential of Energy Performance Certificates (EPCs) and Display Energy Certificates (DECs) in providing more transparency on emissions reductions opportunities in buildings. The Government is aware of concern surrounding the apparent low level of compliance with regulatory requirements for EPCs, particularly in relation to non-domestic buildings. That is why, for example, the recent consultation on EPCs and DECs sought views from business partners about whether to amend the Energy Performance of Buildings Regulations 2007 to make them clearer as to when an EPC is required. We are assessing responses on this issue.

3.33 Proposals to roll out DECs will be considered as part of CLG's implementation of the EU Energy Performance of Buildings Directive. CLG hope to complete this by the end of 2012.

3.34 It is also important to recognise that the current regulations specify that enforcement is a matter for local authorities. However, there are a number of steps Government has taken to provide the enforcement authorities with support and guidance aimed at helping them identify cases of non-compliance and take the appropriate action.

Generic Support Measures

Combined Heat and Power

3.35 The Government agrees with the CCC that there is need to explore further the potential of Combined Heat and Power (CHP). We agree that there are a number of key factors for considering the potential role for CHP and district heating, such as the timetable for the decarbonisation of heat and electricity; the relationship between heat loads and power stations; the availability of biomass; and the cost and effectiveness of alternate means of providing heat and power. Government is analysing this in the context of meeting carbon emissions reduction and renewable energy targets. We understand that the CCC will be providing a fuller assessment in the context of its advice on the fourth carbon budget to be published at the end of 2010, and look forward to considering their analysis. See table 11 on progress on indicators and milestones.

Indicator and milestone table 11

Milestones			
2009	Annual indicators based on DUKES annual report		
2010	Annual indicators based on DUKES annual report		
Indicator	Level in current reporting year (2009)	% Change on 2008	Desired trend
CHP Capacity (GWe)	5.569	+1% (5.494 in 2008)	Upwards
Of which renewable (GWe)	0.213	+5% (0.203 in 2008)	Upwards

The Renewable Heat Incentive (RHI)

3.36 The Coalition Government's proposals will encourage deployment of more renewable heat technologies, raising consumer awareness, and setting the right levels of support for specific technologies, while linking these initiatives to the need for high levels of consumer awareness and energy efficiency. The CCC has identified a number of important factors which the Government agrees need to be addressed. We are fully committed to taking action on renewable heat and are carefully considering responses to the RHI consultation. We will set out detailed proposals on how to take forward action on renewable heat after the spending review, and will develop policy indicators in this area in due course.

The Green Deal

3.37 The aim of this initiative is for every participating householder and business to save money on their energy bills by installing bespoke packages of measures in their property. Green Deal providers (e.g. energy companies, high street retailers, and other commercial and third sector organisations) would help guide customers through straightforward advice and assessment processes and provide the upfront capital for the work. Owners and occupiers would then repay the costs through any savings they make on their energy bills. We will develop policy indicators in due course.

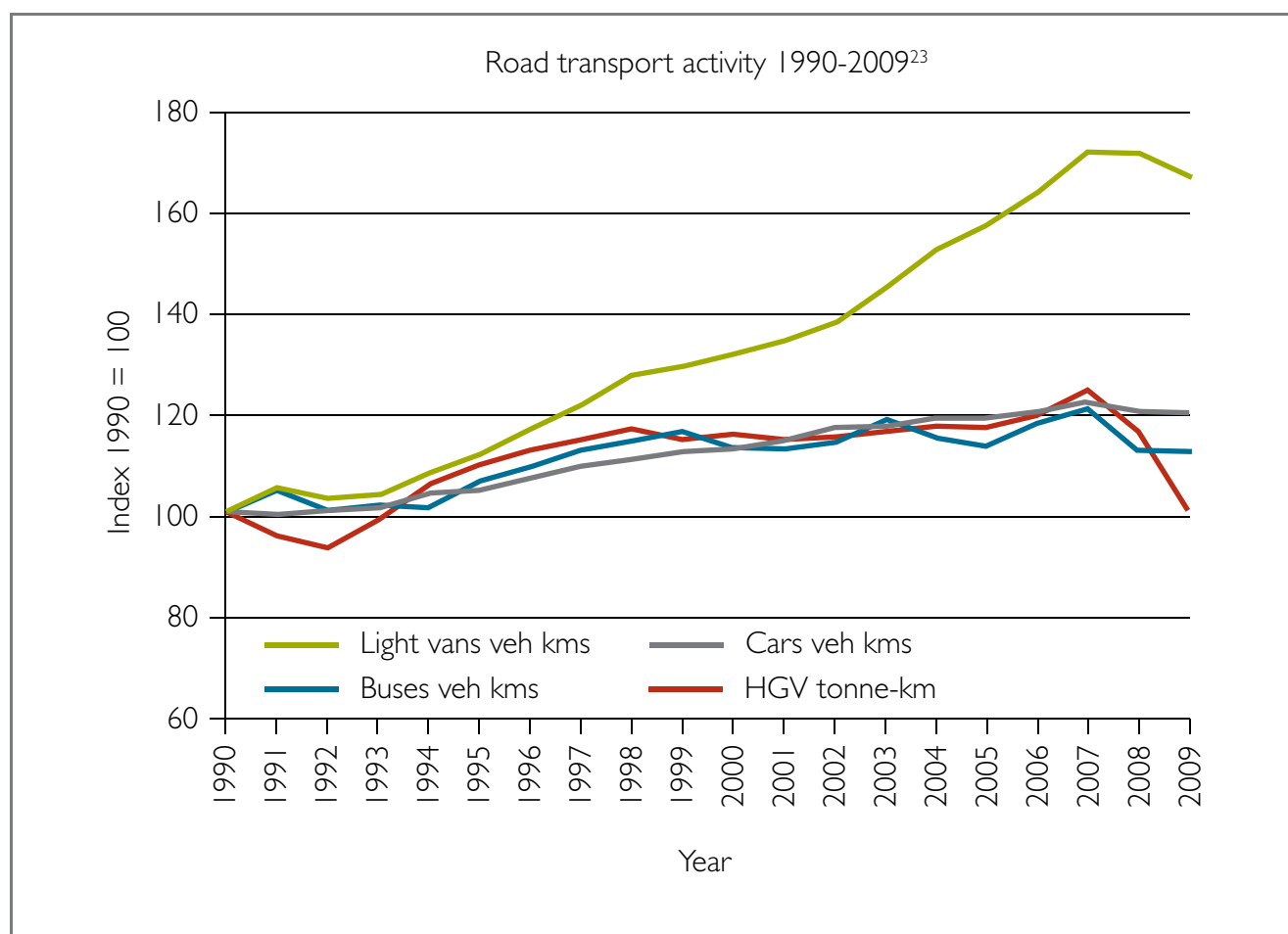
3.38 The Green Deal initiative is expected to drive demand by reducing or removing upfront costs for the consumer. Importantly, repayments for the Green Deal installations will be attached to the energy meter at the property rather than to the occupier so that upon change of occupancy the new householder or business will take over responsibility for repayments. Repayments should be less than any energy bill savings. We are committed to making Green Deal finance available to all sectors of society and are looking at how to make a success of the initiative for tenants in private and social rented housing as well as owner-occupiers and commercial premises.

3.39 Green Deal providers may choose to form partnerships with local authorities, registered social landlords and social enterprises, to offer local solutions to both homes and businesses. We are currently in discussion with a range of organisations ahead of legislation being introduced in the forthcoming Energy Security and Green Economy Bill.

Chapter 4: Transport

4.1 Our most recent emissions data shows that domestic transport greenhouse gas emissions fell by 3% between 2007 and 2008. This pattern is evident across all road transport modes,

which collectively showed a 3.6% reduction in emissions between 2007 and 2008. Provisional CO₂ emissions data for 2009 show a further 6.5% reduction in overall domestic transport emissions.



²³ Source: Light vans, Cars & taxis and Buses & coaches: National Road Traffic Survey, DfT
 HGVS: Continuing Survey of Road Goods Transport (based on HGVs carrying freight), DfT

4.2 The main drivers of greenhouse gas emissions in the transport sector are:

- Levels of transport activity
- Vehicle efficiency, particularly car fuel efficiency
- Take-up of alternative fuels, particularly biofuels.

4.3 Largely driven by growth in the economy and population, transport activity has steadily grown since 1990, but reduced somewhat in 2008 and 2009 partly as a result of the recession (see chart above). Transport policies to reduce emissions from new cars and to increase the use of biofuels have contributed to the emissions reductions seen in this sector. New car fuel efficiency has improved, moving the fleet average efficiency upward, and the uptake of biofuels has increased in line with regulatory targets. The net result is that emissions have declined in the last two years, a trend which is projected to continue, chiefly as a result of further increases in car fuel efficiency and biofuel uptake.

Car and van efficiency

Indicator and milestone table 12

Milestone			
2009	New car CO ₂ regulation passed		
Indicator	Level in current reporting year (2009)	% Change on year 2005/2008	Desired trend
Estimated average <i>new</i> car emissions	149.8gCO ₂ /km	-12%/-5%	Downward
Estimated average car emissions (all cars)	167.6gCO ₂ /km	-3%/-1%	Downward

4.4 CO₂ emissions per km for new cars in Great Britain are shown in the table above, together with estimated CO₂ emissions per km for the car fleet in Great Britain first registered after 2001. The recent trend is encouraging, and the Government will monitor future developments closely and consider what further action may be necessary to ensure continued progress.

4.5 The Government recently reached a position on the EU's proposed new van CO₂ regulations. Its overall aim is to see legislation which sets ambitious but realistic targets, while reflecting the diversity of the sector and avoiding competitive distortions.

Biofuels

Indicator and milestone table 13

Milestone			
2010	National Action Plan submitted to European Commission		
Indicator	Level in current reporting year	% Change	Desired trend
% by volume of road transport fuel from biofuels	2008/09: 1,250,615,174 litres or 2.7% of total road fuel supplied	Only one year of <i>verified</i> data available at present. Next set of verified data, 2009-10, due to be published in January 2011	Up

4.6 In 2008/09 road transport used a total of 1.25bn litres of biofuel, equating to 2.7% of UK transport fuel. Unverified data for the 2009/10 reporting year shows that 3.33% of fossil road fuels were biofuel, over the 3.25% obligation set for the year.

4.7 The Department for Transport is currently reviewing options for implementing the Renewable Energy Directive (RED) which sets a target for 10% renewable energy in transport by 2020.

Electric Vehicles

Indicator and milestone table 14

Milestones			
2010	Consumer incentive for ultra-low carbon vehicles announced First round of Plugged In Places commence delivery Winners of TSB R&D competition announced		
Indicator	Level in current reporting year	% Change on year 2008*	Desired trend (where applicable)
Number of licensed electric cars	2009 = 1,453	+ 10%	Up

* Earliest data are from 1994 when there were 93 electric cars registered.

4.8 We agree with the CCC that progressive electrification of passenger cars will be an important part of decarbonising transport, especially as we move into the 2020s. On 28 July 2010 the Government announced that a consumer incentive will be available from 1 January 2011 to reduce the up-front purchase price of electric and plug-in electric cars by 25%, up to a maximum of £5,000. This level of incentive is set until the end of March 2012. The level of incentive beyond this date will be set following a review in early 2012. The Government is convinced of the need to support early market adoption of ultra-low carbon vehicles, and will monitor uptake in the coming years.

4.9 The Coalition Programme for Government commits to mandating a national recharging network for electric and plug-in hybrid vehicles. To inform these decisions we are funding the Plugged-In Places programme, which is supporting the roll-out of a critical mass of charging infrastructure in a limited number of places across the UK. London, the North East and Milton Keynes secured £8.8m of funding for 2010/11 in the first funding competition. A second competition is scheduled to take place in the autumn for funding in 2011/12 and 2012/13. The amount of funding available for these years will be set as part of the spending review.

Smarter Choices

Indicator and milestone table 15

Milestones*	
2010	Evaluation of sustainable travel towns. ²⁴
	Dissemination of evaluation results.

* We have not included indicator data for smarter choices, as there is insufficient information to report at this stage.

4.10 The Government agrees that local initiatives to deliver reductions in car trips and increases in walking, cycling and bus trips can reduce carbon emissions while also addressing other important objectives in relation to air quality, health, and congestion. We announced on 22 September 2010 the creation of a Local Sustainable Transport Fund. The Fund will challenge local transport authorities outside London to develop packages of measures that support economic growth and reduce carbon in their communities as well as delivering cleaner environments, improved safety and increased levels of physical activity. Measures could include encouraging walking and cycling, initiatives to improve integration between travel modes and end-to-end journey experiences, better public transport and improved traffic management schemes. Details about the new Fund, including the resources available and how it will operate, will be announced later in the year.

4.11 The Government is also looking at the potential for promoting alternatives to travel such as flexible working and video-conferencing. These measures have the potential to deliver greenhouse gas savings and further proposals in this area will be made in due course.

Eco-driving

Indicator and milestone table 16

Milestones*	
2010	Publication of response to consultation on increasing the uptake of eco-driving training for HGV and bus drivers.

*There is currently no comprehensive annual data on eco-driving and so no indicator has been used, though wider training requirements for car, bus and HGV drivers include elements of eco-driving (see below).

²⁴ <http://www.dft.gov.uk/pgr/sustainable/tp3planning/travelguide/sttresults/>

4.12 We note the CCC's views on the potential carbon benefits of training car drivers in eco-driving techniques. Elements of eco-safe driving techniques are integral to the driving test, which some 700,000 drivers pass every year. The Government will consider what further steps may be necessary to encourage the wider uptake of eco-driving training.

4.13 Eco-driving training for bus, coach and lorry drivers is encouraged through the Driver Certificate of Professional Competence (CPC) periodic training. About 8% of the periodic training delivered since the introduction of Driver CPC in September 2008 for bus and coach drivers and September 2009 for lorry drivers has been eco-safe training. The Government recently consulted on increasing the uptake of eco-driving training for this group of drivers. The responses to this consultation have been considered and the Government will shortly announce its plans to work with industry to encourage greater uptake of eco-driver training for this group of drivers.

Planning

4.14 In the Coalition Programme for Government we said that we would publish and present to Parliament a simple and consolidated national planning framework covering all forms of development. The Government will make an announcement on taking forward the national planning framework and implications for specific areas of planning policy later this year.

4.15 We agree that land-use planning can have potentially significant impacts for transport emissions. Transport consequences of new development are considered as part of the planning process. Local authorities should ensure

their land use and local transport plans are mutually consistent, and deliver the most effective and sustainable development for their area. Local authorities should work with each other and with businesses and communities to consider strategic transport priorities and cross boundary issues. We are considering including a new 'duty to cooperate' on local authorities and other public authorities in the Localism Bill, which we hope to bring forward in this session of Parliament. Such a duty would encourage joined-up working and sharing information that is needed for effective plan-making, such as development and infrastructure plans.

Aviation and shipping

4.16 The Government agrees with the CCC that tackling greenhouse gas emissions from aviation and shipping will be an important element of addressing climate change. The Government believes that a global sectoral approach is the most effective way to tackle emissions from these sectors but supports the use of regional measures until such time as a global solution is in place. The Coalition Programme for Government includes commitments to cancel runway expansions at the UK's three largest airports, and Budget 2010 in June included a commitment to explore changes to the aviation tax system.

4.17 We note the methodological issues in relation to allocating international shipping emissions to countries, and look forward to the CCC's 2011 report on this subject. We will reply to the CCC's report on aviation emissions²⁵ in due course.

²⁵ Meeting the UK aviation target – options for reducing emissions to 2050

Chapter 5: Agriculture

5.1 The CCC's latest report is its most comprehensive analysis of the agriculture sector to date and in response we comment on this sector in some detail. We agree with the CCC that reductions in emissions from agriculture will play an important role in the overall strategy for greenhouse gas reduction across all sectors of the UK economy. As the CCC has itself noted, emissions from agriculture are estimated to have fallen²⁶ since 1990 for a number of reasons, including a reduced use of nitrogen fertilisers (linked to better use of manures, mainly on grassland), changing farm practices and a decline in overall livestock numbers as a result of reforms to the Common Agricultural Policy.

5.2 The CCC has also acknowledged that it is important to consider the context in which policy on emission reductions in the agricultural sector must be developed. Feeding a growing global population while at the same time addressing the impacts of climate change and guarding against natural resource degradation will be a big challenge. We have stated our intention to promote increased agricultural productivity by enhancing the competitiveness and resilience

of the whole food chain to ensure a secure, environmentally sustainable and healthy supply of food, with improved standards of animal welfare²⁷. The Coalition Government and the agricultural sector accept that this will require agriculture to play its part in climate change mitigation, not least because the sector is itself under threat from the effects of climate change and will need to adapt to its impacts.

5.3 Although only about 1% of total UK CO₂ emissions can be attributed to agricultural sources, agriculture is estimated to be responsible for about 8%²⁸ of the UK's greenhouse gas emissions, the overwhelming majority of which are from non-CO₂ gases emitted from nitrogen fertiliser, manures and ruminant livestock; these gases – nitrous oxide and methane – are respectively 298 and 25 times more powerful than CO₂.²⁹ Moreover, as emissions from other sectors reduce over time, agriculture will have to play an increasingly active role in helping to meet the UK's 2050 greenhouse gas reduction target.

²⁶ The Committee referred to a reduction of 21% in the introduction to Chapter 5 of its 2nd Annual Progress Report. However, as explained in later sections, agricultural emissions estimates are subject to a high degree of scientific uncertainty. As a result, the overall decline will be over a large range and one priority for future evidence work is to make uncertainty estimates more robust.

²⁷ This approach is described in Defra's Structural Reform Plan, published in July 2010 – see <http://www.defra.gov.uk/corporate/about/what/documents/defra-srp-100716.pdf>

²⁸ Applying uncertainty figures from the National Inventory Report 2010, the true contribution could be in the range of 2% to 13%

²⁹ As described in table 2.14 of the 4th assessment report of the International Panel on Climate Change (IPCC). For inventory reporting purposes, earlier figures (310 and 21) from the IPCC's 2nd assessment report (2006) are used.

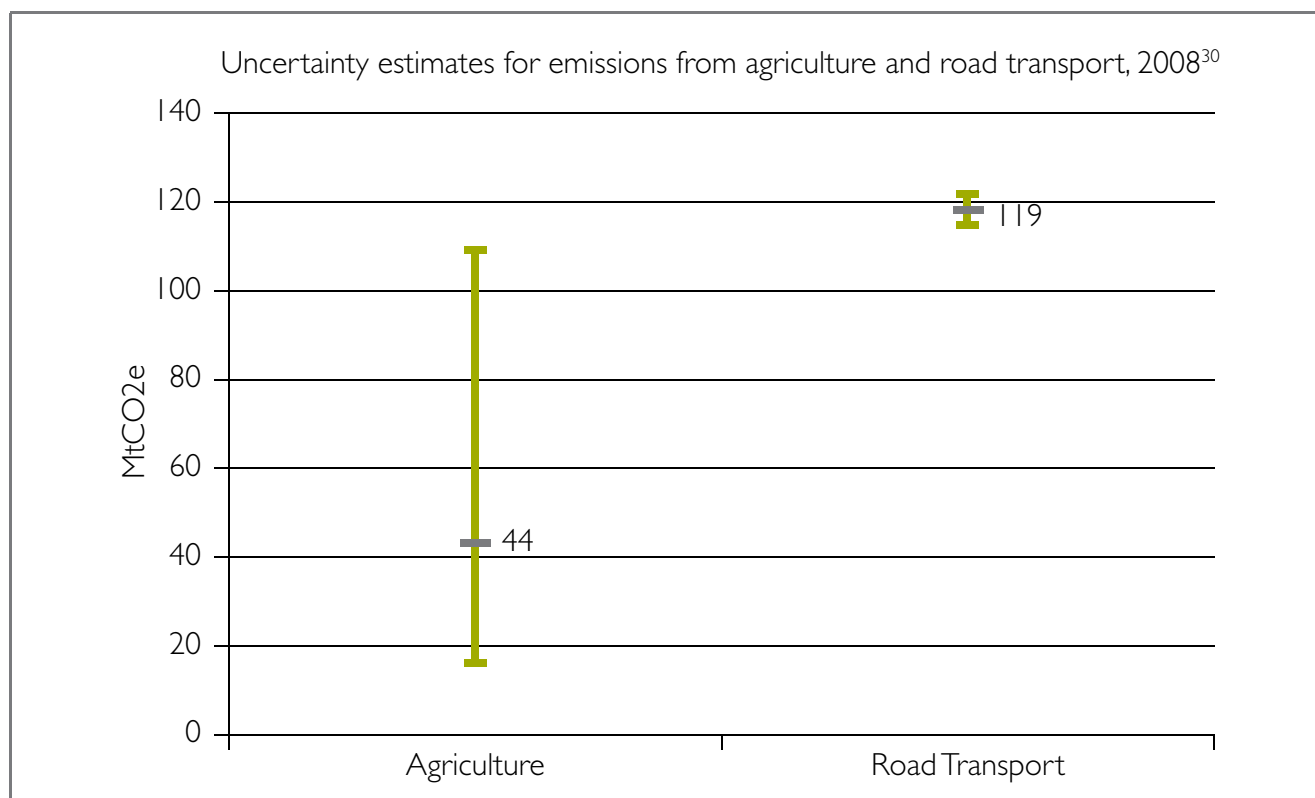
5.4 This chapter describes the policy approach being taken to tackle this problem within England (work underway in the Devolved Administrations is described in Annex A). However, it is also essential to bear in mind that food supply and climate change are global problems. A United Nations Framework Convention on Climate Change workshop in April 2009 estimated that agriculture is responsible for about 14% of greenhouse gas emissions worldwide – and can only be solved by making agriculture more sustainable across the world. Regardless of the level of agricultural activity in England, it would not make sense to reduce agriculture-related greenhouse gas emissions in the UK simply to export the environmental consequences of food production elsewhere.

The evidence on agricultural emissions

5.5 There is no doubt that greenhouse gas emissions from agriculture contribute to climate change. However, as the CCC has noted, there is a great deal of uncertainty in the evidence base for agriculture. We are committed to reducing

that uncertainty and agree with the CCC that it is essential to develop a more robust evidence base to underpin and strengthen our approach to reducing emissions in this sector.

5.6 Because the agricultural sector covers a diverse range of practices that are part of complex biological systems, emissions from agriculture are heavily affected by variable, uncontrolled elements such as climate, weather and soil conditions, as well as controlled activities such as livestock diet. So one element of uncertainty arises from the fact that there are considerable variations in the level of emissions created, even where farmers are adopting the same practices. For example, different soil types and moisture conditions will lead to different levels of emissions from the same degree and method of fertiliser application. The chart below illustrates the difference in the size of the uncertainty around estimates for emissions from agriculture and road transport.



³⁰ Figures taken from 2010 NIR, Annex 7.

5.7 There is also a high degree of uncertainty about the extent to which abatement measures have already been taken up within the agricultural sector. This makes it difficult to determine the potential of the sector to adopt new behaviour that could reduce emissions in a cost effective way. Abatement potential is currently assessed using highly theoretical approaches, so any estimates will inevitably include a high level of uncertainty.

5.8 However, there is now a good understanding of the issues that need to be investigated further and of the research methods required to address these uncertainties in the future. We are confident that further work will provide the answers we need to inform policy development. We intend to take this research forward as a matter of priority.

5.9 Scientific uncertainties in the agriculture sector are not confined to the UK. We are working with many partners to help address these uncertainties and develop a better understanding of the science, for example, through the Global Research Alliance and the European Joint Working Programme on Food Security, Agriculture and Climate Change.

Knowledge and uncertainty in agricultural emissions

The challenge of quantifying greenhouse gas emissions from agriculture and the reductions that can be made is considerably greater than for other sectors. We know that there are considerable variations in emissions even when the same farming practices are adopted by farmers. For example, different soil types and moisture conditions will lead to different emissions from the same level of fertiliser application. By contrast, the greenhouse gas emissions associated with combusting a litre of diesel are likely to be relatively similar regardless of where the fuel was sourced or where it is burned. As a consequence of the scientific uncertainty in agriculture (uncertainty in the emissions factors), uncertainty in agricultural emissions – shown below – is relatively high. For comparison, at the 95% confidence interval uncertainty for road transport emissions is +/- 2%³¹.

Uncertainty estimates for agricultural emissions inventory

Gas	Source	95% Confidence Interval	Reference
Nitrous Oxide	Soils	+249, -93	NIR(2010)
Nitrous Oxide and Methane	Manure Management	+/- 25	NIR(2010)
Methane	Enteric Fermentation	+/-16	NIR(2010)

In addition to the scientific uncertainties associated with agricultural greenhouse gas emissions and abatement measures, there is also uncertainty about the existing level of adoption of abatement measures by the sector because insufficient survey data and information is available. In the absence of robust data, studies to assess the abatement potential available in the sector have made assumptions based on expert opinion/ elicitation about the existing coverage of abatement options. This is a reasonable approach in the absence of better evidence, but it may not always lead to an accurate estimate of abatement potential.

We agree with the CCC that a focus on the delivery of mitigation measures is a sensible approach for this sector. However it is important to ensure that the right mitigation measures are encouraged. Several of the mitigation measures proposed in both the optimistic and the pessimistic cost curves are based on studies that are limited either in duration or physical extent. Independent analysis³² has challenged whether some of the measures achieve abatement at all. The current evidence base is not sufficiently robust to provide the Government or the farming sector with the confidence to act on all the mitigation measures identified and further work is required. However, it has identified areas where farmers can reduce emissions (although the precise extent is not certain) and save money. We believe that current action should focus on these and on measures that achieve multiple benefits, such as those that also improve habitats and air, water or soil quality. It is also important to ensure that novel mitigation measures do not have unacceptable consequences for the environment or animal welfare and we are encouraged that the CCC has recognised the importance of these factors in the text of its report, if not in its estimates of abatement potential.

³¹ UK NIR 2010, Annex 7.

³² For example: Review of the Marginal Abatement Cost Curves for Agriculture produced for the Committee on Climate Change. AEA (2009) Defra Project AC0216, see <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=16758&FromSearch=Y&Publisher=1&SearchText=ac0216&SortString=>

[ProjectCode&SortOrder=Asc&Paging=10#Description and Harris et al. \(2009\) Analysis of Policy Instruments for Reducing Greenhouse Gas Emissions from Agriculture. Forestry and Land Management, see http://www.defra.gov.uk/foodfarm/landmanage/climate/documents/climate-ag-instruments.pdf](http://www.defra.gov.uk/foodfarm/landmanage/climate/documents/climate-ag-instruments.pdf)

A combination of these factors present a great challenge in ensuring an accurate estimate of the abatement potential for the sector. Uncertainties associated with abatement potential become particularly important when considering the cost-effectiveness of practices to reduce greenhouse gas emissions. The table below shows the range of cost-effectiveness estimates that might be attributed to some of the different methods proposed in the latest Marginal Abatement Cost Curves (MACCs) for agriculture when scientific uncertainty in greenhouse gas emissions is accounted for.

Range of cost effectiveness (£/tonne CO₂e) given agricultural uncertainty³³

Measure	Pessimistic			Optimistic		
	central	lower	upper	central	upper	lower
Beef Manure, Covering Lagoons	9	7	12	9	7	12
Large on farm AD (Pigs)	17	14	23	17	14	23
Beef Manure, Covering Slurry Tanks	24	19	32	24	19	32
Dairy Manure, Covering Lagoons	25	20	33	25	20	33
Medium On Farm AD (Pigs)	33	26	44	33	26	44
Crops Soils, Nitrification Inhibitors	–	–	–	59	17	843
Crops Soils, Species Introduction	52	15	743	70	20	1,000
Dairy Manure, Covering Slurry Tanks	70	56	93	70	56	93

It is important for the economy as a whole that the cheapest emissions reductions are achieved first and Marginal Abatement Cost Curves provide a helpful way of achieving apportionment between sectors in a way that achieves this objective. However, in the case of agriculture the uncertainties around emission factors mean that for any cost positive measure we cannot be sure how cost effective it may be relative to other measures either within agriculture or in other sectors of the economy. Further work is therefore needed to ensure abatement potential can be quantified more accurately so that agriculture can contribute cost-effectively to emissions reductions. This does not mean that we should not act now or that none of the measures which are, on average, cost positive should not be promoted by the sector if the technology is safe or has other benefits. The costs of employing the same mitigation measure will vary between farms; a voluntary approach therefore allows farmers to adopt the measures that will be the most beneficial for them.

³³ Central cost effectiveness estimates are taken from Scottish Agricultural College, 2010, 'Review and update of UK marginal abatement cost curves for agriculture' page 33 (http://downloads.theccc.org.uk/s3.amazonaws.com/0610/pr_supporting_research_SAC_agriculture.pdf). Upper and lower estimates have been derived applying emission uncertainty estimates detailed in table above.

Measures to reduce emissions from agriculture

5.10 We agree with the CCC that, in view of the current uncertainties in the evidence base, it is important to focus on the measures that can be employed to deliver reductions in greenhouse gas emissions. It is essential that differences of view about the suitability of particular targets do not distract attention away from practical action that can be taken at farm level now. We are committed to encouraging the introduction of measures that will also contribute to other policy objectives: we want to ensure the wider adoption of resource-efficient farming and land management that can reduce emissions and improve farmers' competitiveness, while delivering enhanced levels of productivity in an environmentally sensitive manner.

5.11 Whatever the uncertainties in our knowledge about the current level of greenhouse gas emissions from agriculture, it is already clear that there are many actions that could be taken to deliver reductions. The CCC's report refers to a number of measures, but the practical, environmental, economic and legal implications of some of these will need to be thoroughly evaluated before they can be recommended to farmers. We shall also be working closely with industry to consider other potential measures. In the meantime, we can identify a number of actions which would involve relatively simple changes in farming practice and could generally be introduced without imposing additional costs on farmers. Some examples are described in the box below.

Potential measures to reduce greenhouse gas emissions from farming

The CCC's analysis promoted a number of measures to reduce GHG emissions from agriculture. The text below explains what these measures are, identifies measures that can be applied now and highlights where further investigation is required before some measures can be implemented.

Potential cost-saving measures:

Use of improved crop nutrient management practices: Planning the quantity, timing and type of organic and inorganic fertiliser applications to match the needs of the crop, ensures the best economic return and also helps to reduce impacts on water and air quality. Recognised nutrient management planning tools, when used with Defra's recently updated Fertiliser Manual (RB209), encourage the use of best practice and ensure farmers have access to up to date information about managing crop nutrients and achieving balanced soil fertility and pH conditions.

Use of improved breeding practices in the beef, sheep and dairy industries: This may be achieved through increased use of Profitable Lifetime Index and Estimated Breeding Value in breeding decisions. Breeding takes time and the genetic potential of animals can only be realised, and the welfare of the animals ensured, if this is coupled with appropriate management practices. It should also be noted that a substantial proportion of UK beef production is currently derived from cattle bred from the dairy herd, so it is important to guard against adopting breeding solutions that maximise productivity and minimise emissions for one sector but might result in reduced productivity and increased emissions in the other.

Use of improved feeding practices: The increased use of maize rather than grass silage is suggested in the MACC analysis. This has limited applicability and it is important that maize is cultivated in a manner that protects soil and water quality. However, in their report “Change is in the Air”³⁴ EBLEX recognise that alternative feeding practices such as increased use of clover-rich pastures and high-sugar grasses may also increase feed conversion ratios and consequently reduce GHG emissions per kilo of meat. There are already measures that farmers can take in planning the feeding regime for their livestock such as using a ration formulation programme or seeking advice from an expert on animal nutrition. Research has been commissioned by Defra to examine the impact of feeding practices on GHG emissions (AC0209)³⁵, though further work is needed to establish the extent to which these improvements in emissions intensity could affect overall emissions.

The following options are, on average, cost-positive but will be encouraged among farmers who can employ these measures profitably or for other benefits:

Covering Slurry Stores: This measure will, on average, cost farmers money. However in some cases covering slurry stores can reduce dilution of slurry with rainwater and the measure also helps to reduce emissions of ammonia which lead to secondary particulate formation and acidification of soils in addition to nitrous oxide emissions. Agriculture is the main source of ammonia emissions in the UK and it is important that farmers take action to tackle this pollutant which has both environmental and public health impacts.

Anaerobic Digestion (AD)³⁶: The latest MACC analysis³⁷ identifies centralised plants for poultry manure and on-farm digesters for large and medium sized pig enterprises as cost-effective ways of achieving emissions reductions. Use of manure as a feedstock for AD can help to reduce emissions from manure storage and also helps to generate biogas which can be used in place of fossil fuels. Defra has commissioned work to carry out a full life-cycle analysis of AD which will examine the use of various waste stream feedstocks, including manure. The study will consider the costs and benefits of energy crops required for co-digestion, the storage and transport of manure and digestate and the use of digestate on land. This analysis is required to improve our understanding of the costs and benefits of employing this technology and how it might be implemented in an optimal way.

³⁴ “Change is in the Air” EBLEX, 2010 see <http://www.eblex.org.uk/news/-Livestock-and-climate-change.aspx>

³⁵ Information on all Defra projects referred to in this section by Code can be found through the Defra research and development website at <http://randd.defra.gov.uk>

³⁶ The Government is committed to “introduce measures to promote a huge increase in energy from waste through anaerobic digestion (AD)”. Defra and DECC Ministers jointly chaired an AD Round Table on 6 July to discuss how this can be achieved in a cost-effective way. The issues arising from the discussion will be explored in the development of a joint DECC/Defra AD Action Plan, to be worked up in association with relevant organisations, including local authorities and representatives from the retail, finance, energy and agricultural sectors.

³⁷ Scottish Agricultural College, 2010, Review and update of UK marginal abatement cost curves for agriculture. See <http://www.theccc.org.uk/reports/2nd-progress-report/supporting-research>

Species Introduction: To meet the requirements of profitable, local or specialist markets, some farmers, if well placed (e.g. have the right soil and climatic conditions and on-farm machinery), may be able to switch in a cost-effective manner from a crop with a high nitrogen requirement, such as wheat or oilseed rape, to one with a lower nitrogen requirement. There is a risk, however, that this could result in an overall increase in emissions if main crop production is exported. It may nonetheless be possible to make greater use of existing crop varieties which favour nitrogen utilisation efficiency and yield by screening existing varieties to identify their nitrogen efficiency, and offering the information as an additional factor to be taken into account when making variety choices. In the medium to long term (10-12 years), the breeding of new varieties is likely to include these criteria.

Further research is required on the following technologies before they can be recommended for the purposes of reducing greenhouse gas emissions from agriculture:

Dietary Additives: Use of dietary additives to reduce emissions is being explored in Defra-commissioned research. The use of propionate precursors³⁸ for beef and dairy cattle is proposed in the most recent MACCs. However, the studies to date are short-term and showed possible implications for animal health. Longer term studies would be needed before this technology could be recommended. Use of ionophores³⁹ in beef and dairy cattle are currently illegal within the EU.

Draining Soils: Draining some agricultural systems can both increase productivity and reduce nitrous oxide emissions in some cases. The benefits nonetheless vary according to the type of soil and the location of the drains, while there may also be trade-offs with biodiversity objectives as well as synergies or trade-offs with water quality objectives. Draining organic soils may actually lead to an increase in emissions. Further work is being carried out to understand the extent of existing soil drainage networks and to understand where environmental outcomes can be enhanced through the use of land drains.

Nitrification Inhibitors: Nitrification inhibitors are known to reduce emissions of nitrous oxide from agricultural soils and are used widely in New Zealand. However, research to assess the extent to which this technology is likely to be effective in reducing emissions and its environmental impacts under UK conditions must however be completed before it can be recommended.

Reduced Tillage: Reduced tillage is helpful for reducing run-off and soil erosion, and it is widely practiced in the UK where agronomic conditions (such as weeds and soil type) allow. It is clear that the method reduces fuel consumption during soil cultivation relative to mould-board ploughing. The sampling methods used in studies claiming that this improves soil carbon are nonetheless flawed and it is possible that nitrous oxide emissions may be increased where this technique is used.

³⁸ The addition of propionate precursors to animal feed reduces methane production in ruminant digestion.

³⁹ Some ionophores (lipid soluble molecules) have been previously used as antibiotics and as growth enhancing feed additives for livestock to increase feed conversion efficiency. Their use has now been phased out under EU law because of concerns about their use contributing to increasing anti-microbial resistance in pathogenic bacteria.

Action by industry

5.12 We accept that we have a role to play in helping farmers to understand and seize these opportunities. For example, the Farming Futures joint Government and industry communications project has already generated greater awareness of climate change in the farming sector through an interactive website, fact sheets, case studies and a series of focused regional workshops. Many in the industry have recognised the potential for action and the Climate Change Task Force (which comprises a number of organisations including the National Farmers Union, the Agricultural Industries Confederation, the Country Land and Business Association and, more recently, the Agriculture and Horticulture Development Board) has begun to drive activity. In association with a wider industry Partnership, the Task Force published its Greenhouse Gas Action Plan in February 2010. The Action Plan focuses on using resources more efficiently through:

- better use of nitrogen in animal and crop nutrition;
- better management systems for livestock; and
- better use of on-farm energy and fuel.

5.13 The Industry Partnership intends to explain how these actions will be taken forward in a Delivery Plan to be published later in 2010. Given the uncertainty about agricultural emissions explained above, it is difficult to be precise about the level of reductions the Greenhouse Gas Action Plan will generate. However, current industry estimates suggest that it will deliver in the region of 3 MtCO₂e, annually by 2020, and until better evidence is available, we will continue to use this as an indicative figure.

The role of Government

5.14 We firmly believe that it is right for industry to lead the process of change and so welcome the effort that has gone into developing the Greenhouse Gas Action Plan and the ongoing work on its delivery. We will continue to work

in partnership with the farming sector to ensure that it has access to relevant information and advice and will support the industry in taking the Greenhouse Gas Action Plan forward. The Greenhouse Gas Action Plan provides a clear focus for the agricultural sector; a starting point for future action and an impetus for ongoing change.

5.15 We welcome the fact that the CCC has acknowledged the value of an industry-led approach. We also note its suggestion that a wider range of policies, going beyond the provision of information and encouragement, is needed. In that context, it is important to bear in mind the complex policy framework currently surrounding agriculture.

5.16 Many of the policy interventions in play in the agriculture sector have greenhouse gas mitigation benefits, alongside their other environmental objectives. Regulations on nutrient management to enhance water quality, or the reform of the Common Agriculture Policy to de-couple payment of subsidies from production, will continue to develop and to have longer-term benefits. We agree that the Government has a role to play in ensuring that this policy framework will continue to exploit synergies for climate change mitigation and to consider future opportunities for policy interventions to deliver reductions in greenhouse gas emissions.

5.17 Non-Government actors such as food retailers, manufacturers, and others in the food chain are also playing an active role by spreading best practice in greenhouse gas emission reduction through their supply chains.

5.18 We will continue to work in partnership with the industry to ensure that synergies between the general policy framework for agriculture and the food-chain on the one hand, and the Greenhouse Gas Action Plan on the other, are understood and exploited.

Monitoring progress

5.19 Our primary objective is to ensure that reductions in greenhouse gas emissions can be delivered in the long-term. To that end, we will review the progress made under the Greenhouse Gas Action Plan in 2012. In the meantime, we will continue actively to develop policies, including potential options for Government intervention, so that we are ready to act should it prove necessary to intervene to supplement industry-led action.

5.20 We agree with the CCC that we need to develop a set of indicators to enable us to measure progress. These will need to monitor both:

- specific actions at the farm level - the extent to which changes have been taken up in practice; and
- outcomes at the national level – such as the resource efficiency of production.

5.21 However, even more than in any other sector, we need to be very careful to develop indicators that give a measure of real progress, in view of the uncertainties about agricultural emissions figures and the difficulty of using emissions statistics to capture the real effect of improvements in farm practice.

5.22 We welcome the CCC's suggestions as a valuable contribution to our ongoing efforts to develop reliable indicators and we will continue to work with the sector and the CCC to agree as far as possible a single set of indicators to be used as a common mechanism for continual monitoring. However, we do not consider that it is productive to provide trajectories for indicators at this stage, given the current levels of uncertainty in the evidence base. Our intention is to hold further discussions with key partners in order to reach agreement on the most constructive way forward in this area.

Land Use, Land Use Change, and Forestry

5.23 Although there are some uncertainties associated with the future dynamics of the forest carbon sink (where forests absorb carbon emissions), the emissions reduction potential of an enhanced woodland creation programme is perhaps better understood and we look forward to the CCC's recommendations in its fourth carbon budget report in December.

5.24 We share the CCC's concern over the scientific and analytical uncertainties in the potential for soil carbon sequestration, and in this context look forward to its forthcoming advice. We continue to focus on strengthening the underlying evidence base on soil carbon, including work to establish trends in levels of carbon in all soils, to understand the opportunities to protect or increase levels of carbon in UK soils through land management, and to improve the evidence on carbon fluxes from degraded and restored peat lands.

Chapter 6: Conclusions and Next Steps

6.1 We are fully committed to implementing the policies and measures necessary to deliver the step change in delivery that the CCC has called for. We need to continue our progressive implementation of these policies in order to achieve the required short-term and long-term emission reductions in the power, buildings, transport and agriculture sectors.

6.2 Over the coming months, and in line with the 32 actions set out in the July Annual Energy Statement, the accompanying '2050 Pathways Analysis', and actions of other Government departments, we will continue to develop the detail of our policy framework for making the transition to a low carbon economy and meeting our 2020 and 2050 emission reduction targets. We will also publish a government-wide carbon

plan to set out, department by department, policies and deadlines to ensure real action on climate change.

6.3 The CCC must provide their advice on the level of the fourth carbon budget by 31 December 2010. The Government must then set the level of the fourth carbon budget, which runs from 2023-2027, by 30 June 2011, taking into account this advice and must also publish a report on proposals and policies for meeting it, as soon as reasonably practicable thereafter.

6.4 We welcome the CCC's ongoing advice and guidance on tackling climate change. We look forward to working closely with them over the coming year and to receiving their third progress report in June 2011.

Date of forthcoming publications

Date/deadline	Report
Autumn 2010	Publication of the revised 2050 Pathways Calculator; following the Call for Evidence
31 December 2010	CCC advice on level of fourth Carbon Budget 2023-27
Spring 2011	Carbon Capture Storage Roadmap
30 June 2011	Government to set fourth carbon budget 2023-27
30 June 2011	CCC to publish third annual progress report on meeting carbon budgets
Oct 2011	Report on policies and proposals to meet the fourth carbon budget Government response to CCC's third annual progress report

Annex A: Recent policy developments in the Devolved Administrations

Scotland

1. The Climate Change (Scotland) Act was passed unanimously by the Scottish Parliament in June 2009. The Act includes world-leading targets and has received strong support from Scottish civic society and business. The Climate Change Delivery Plan⁴⁰ was also published in June 2009 outlining the transformational changes required to meet the targets in the Act.

2. The statutory Report on Proposals and Policies that Scottish Ministers are required to lay in draft before Parliament will build on the Delivery Plan by detailing the specific measures that the Scottish Government is undertaking to meet the emissions reduction targets set under the Act. The draft report is subject to Parliamentary consideration, and work on it is being aligned with preparatory work on the draft Budget, which is due after the UK Government concludes its Comprehensive Spending Review.

3. The Climate Change (Annual Targets) (Scotland) Order 2010, laid in draft before the Parliament on 22 September 2010, is to set the first batch of annual targets for the period 2010-2022, as required by section 4(2) of the Act.

4. A great deal of progress has been made since the publication of the Delivery Plan. The Scottish Government's Renewables Action Plan⁴¹ was published in July 2009 and sets out route maps for technologies and covers cross-cutting issues such as skills, infrastructure and research and development, all focussed on helping to achieve Scotland's renewables targets. An update on progress was published in February 2010.⁴² Scottish Ministers recently announced an increase in the 2020 target for renewable electricity from 50% of consumption to 80%.

5. The Scottish Government published its Renewable Heat Action Plan⁴³ in November 2009. The Action Plan outlines measures designed to help Scotland meet its target of 11% of heat coming from renewable sources by 2020, against current production of just 1.4%.

6. In his Budget Bill speech of 3 February 2010, the Cabinet Secretary for Finance and Sustainable Growth, announced that funding for area-based home insulation schemes will be increased from £15 million to £25 million, including £10 million for a new universal access scheme offering free insulation measures to around 90,000 homes. It also committed £2 million for 2010-11 for a Scottish boiler scrappage scheme. This will support the forthcoming Energy Efficiency Action Plan for Scotland.

⁴⁰ <http://www.scotland.gov.uk/Publications/2009/06/18103720/0>

⁴¹ <http://www.scotland.gov.uk/Publications/2009/07/06095830/0>

⁴² <http://www.scotland.gov.uk/Publications/2010/01/28112033/5>

⁴³ <http://www.scotland.gov.uk/Publications/2009/11/04154534/0>

7. The Energy Saving Scotland boiler scrappage scheme was launched on 24 May 2010, offering up to 5,000 homeowners a £400 grant towards replacing a G-rated boiler with a highly energy efficient model.

8. In March 2010, the Scottish Government, together with Scottish Enterprise, published a Carbon Capture and Storage Roadmap. This sets out a vision of CCS becoming a mainstay of Scotland's future energy supply and a vital economic sector.

9. On 22 March 2010 the Scottish Government's published 'Towards a Low Carbon Economy for Scotland', a discussion paper setting out plans to move towards a low carbon economy in Scotland, as part of the Scottish Government's overarching Economic Strategy. It identifies the key dimensions of a transition strategy towards a low carbon economy, describes the Scottish Government's approach to develop the strategy and seeks to engage key stakeholders in the strategy process.

Hydro power

10. January 2010 saw the publication of a study reporting that Scotland's potential for new hydro electric generation is nearly double the amount previously estimated⁴⁴.

11. Scottish Ministers responded by recognising the valuable contribution that hydropower generation makes to achieving Scotland's renewables targets, while at the same time setting out the need to balance the benefits of renewables generation and protection of the water environment⁴⁵.

Marine Renewables

12. In December 2008, the Scottish Government announced the £10 million Saltire Prize. The Prize, the largest Government innovation prize in the world, will go to a commercially viable wave or tidal energy technology that generates

the most renewable electricity over 100 Giga Watt hours (GWh) over a two year period using only the power of the sea, enough to power 10,000 homes.

13. Scotland's seas have now been further opened up for wave and tidal energy development to support the Saltire Prize. The Crown Estate is running a new leasing round for projects up to 30 Megawatts (MW) capacity to support developers hoping to win the Saltire Prize.

14. Marine Scotland has also published guidance on the areas of Scotland's seas most suited to development. The guidance highlights the areas considered as most appropriate for wave and tidal energy, reflecting potential power output, limited environmental and technical constraints and development possible within the Saltire Prize timescales.

15. In March 2010, the Scottish Government announced a new £12 million fund to support the deployment of wave and tidal energy devices. The Wave and Tidal Energy: Research, Development and Demonstration Support (WATERS) fund will support the testing of new wave and tidal prototypes in the seas around Scotland. The fund will also assist in the development of new technologies, up to the prototype stage, particularly those which increase the effectiveness of installation, operation and maintenance of marine energy devices.

Sustainable Transport

16. On 14 April 2010, the Scottish Government announced that an additional £10 million would go to support a range of sustainable transport initiatives.

17. The Cycling Action Plan for Scotland (CAPS) published in May 2010 will also benefit from increased capital funding for cycling infrastructure. In addition, CAPS will outline actions that will help to maximise the modal share for cycling. This will

⁴⁴ <http://www.scotland.gov.uk/Publications/2010/01/19141527/0>

⁴⁵ <http://www.scotland.gov.uk/Topics/Business-Industry/Energy/Energy-sources/19185/17851-1/HydroPolicy>

include projects which raise awareness of all road users' needs, provide incentives to switch mode and increase the numbers of children receiving cycle training.

18. Increased cycling and walking, and public transport use, is also a key component of the current Smarter Choices, Smarter Places partnership project⁴⁶ with the Convention of Scottish Local Authorities. Since its launch in May 2009, £10 million from Scottish Government and a further £5 million in local match funds have been allocated to seven projects involving local infrastructure improvements and behaviour change campaigns including widespread personal travel planning. Smarter Choices Smarter Places is due to complete in March 2011, when the results will inform the development of future sustainable transport projects and policies.

Agriculture, related land use and forestry

19. The Scottish Government is working in collaboration with the agricultural sector to reduce greenhouse gas emissions through the voluntary *Farming for a Better Climate* initiative. This initiative has identified five key action areas to help Scottish farmers reduce:

- Improving efficiency in the use of energy and fuels;
- Developing renewable energy;
- Locking carbon into the soil and vegetation;
- Optimising fertiliser and manure application;
- Optimising livestock management and storage of waste.

20. The *Farming for a Better Climate*⁴⁷ website was launched in June 2009. A series of *Farming for a Better Climate* workshops for advisors, consultants, farmers and land managers were held throughout Scotland in 2009 and 2010.

21. In partnership with the Scottish Agricultural College, a three year Climate Change Focus Farm programme was launched in June 2010.

The Farms will be used to host open days, events and meetings to communicate the *Farming for a Better Climate* initiative to the Scottish farming community, land managers and the public.

22. An Agriculture and Climate Change Stakeholder Group was established in September 2009. The remit of the group is to consider practical measures that can be taken within the agricultural industry to contribute to the Scottish Government's climate change objectives, and to make recommendations on the ways of facilitating the adoption of these measures.

23. The Scottish Government Rural and Environment Research and Analysis Directorate manages around £70 million of funding each year towards a scientific research programme to support policy needs. Research is carried out into a wide range of environmental, biological and agricultural subjects. The current programme, runs until 2010 and the results of this research will be integrated into future policy developments and knowledge transfer to the industry.

24. The Scottish Government has funded the Planning Land Application of Nutrients for Efficiency and the Environment (PLANET) project. This project has developed user friendly software that will allow farmers to use field level information to generate fertiliser recommendations and to set up a nutrient management plan.

25. A project was funded by the Scottish Government to review existing greenhouse gas accounting tools and to recommend improvements in emissions accounting and reporting. The findings of this project will be published in autumn 2010.

26. The Scottish Government hopes to encourage farmers to undertake farm based greenhouse gas audits, as a means of helping them to identify which of the relevant measures in *Farming for a Better Climate* are likely to have the greatest impact on reducing their emissions.

⁴⁶ <http://www.scotland.gov.uk/Topics/Transport/sustainable-transport/Places>

⁴⁷ <http://www.sac.ac.uk/climatechange/farmingforabetterclimate/>

27. Scotland Rural Development Programme (SRDP) is a £1.5 billion programme of economic, environmental and social measures designed to develop rural Scotland. It commenced in 2007 and will operate until 2013.

28. Under SRDP, grants are available for activities focusing on reducing emissions of greenhouse gases, improving efficiency of practices and better management of current climate change actions. Funding is also available under the Skills Development Scheme for industry-led initiatives to transfer knowledge and improve farmers' land and business management skills.

29. In November 2009, the UK Forestry Commission published the report 'Combating Climate Change – a role for UK forests'.⁴⁸ This examined the potential of the UK's trees and woodlands to mitigate and adapt to our changing climate and it highlights the important potential contribution of Scotland's forests. The Forestry Commission Scotland is developing subsequent action detailed in the Scottish Forestry Strategy Implementation Plan (2010-13), published in May 2010.

30. In September 2009 the Scottish Government launched the Central Scotland Green Network⁴⁹ initiative, key elements of which include the expansion of woodland cover in and around the towns and cities of the Central Belt to help absorb CO₂, and the development of strategic routes for active travel.

31. The Scottish Soil Framework,⁵⁰ published in May 2009, assessed the role that soils can play within Scotland's climate change framework. Taking this forward, the Scottish Government organised an expert workshop in November 2009 to establish current knowledge of carbon stocks in Scottish peatlands⁵¹ and to produce a list of priorities for future work.

32. On 23 September 2010 the Scottish Government launched a consultation on a draft Land Use Strategy,⁵² which closes on 17 December 2010. Section 57 of the Climate Change (Scotland) Act 2009 requires that a land use strategy be laid by Scottish Ministers before the Scottish Parliament by 31 March 2011. The strategy must set out the Government's objectives in relation to sustainable land use, as well as proposals, policies and their associated timescales for meeting those. The objectives, proposals and policies must contribute to obligations under the Act on emissions reduction targets, to climate change adaptation objectives and to sustainable development.

Waste reduction and management

33. The Scottish Government launched Scotland's first Zero Waste Plan⁵³ on 9 June 2010. The Plan sets out a vision for a zero waste society. Driving this ambition are the Scottish Government's targets to recycle or compost a minimum of 50% of municipal waste by 2013; a minimum of 60% by 2020; and a minimum of 70% by 2025. These are supported by another target: that only 5% of the remaining waste should end up in landfill by 2025.

Planning

34. The Scottish Government has extended the scope of permitted development rights planning legislation for domestic microgeneration as required by Section 70 of the Climate Change (Scotland) Act. The Town and Country Planning (General Permitted Development) (Domestic Microgeneration) (Scotland) Amendment Order 2010 provides for free-standing micro-wind turbines and air source heat pumps, which will benefit mainly rural householders.

⁴⁸ <http://www.forestry.gov.uk/forestry/infd-7y4gn9>

⁴⁹ <http://www.centralscotlandgreennetwork.org/>

⁵⁰ <http://www.scotland.gov.uk/Publications/2009/05/20145602/0>

⁵¹ <http://www.scotland.gov.uk/Publications/2010/02/19145611/0>

⁵² <http://www.scotland.gov.uk/Topics/Environment/Countryside/Landusestrategy>

⁵³ <http://www.scotland.gov.uk/Publications/2010/06/08092645/0>

35. In fulfilment of the timescale required in the Climate Change (Scotland) Act, the Town and Country Planning (General Permitted Development) (Domestic Microgeneration) (Scotland) Amendment Order 2010 was made on 5 February 2010 and came into force on 8 March 2010.

36. Amendments to the building regulations under the Building (Scotland) Amendment Regulations 2010⁵⁴ came into force on 1 October 2010. These regulations require that new build homes and non-domestic buildings must be more energy efficient, have greater sound insulation and better levels of home security. For new buildings, the enhanced energy standards will mean a reduction in CO₂ emissions from new buildings of 30% on 2007 standards and of around 70% compared to 1990 levels.

37. The 2010 regulations also continue to improve the energy performance of existing buildings where alteration, extension or conversion is proposed or where carrying out common replacement work, such as to boilers, windows and doors. New for 2010 is the introduction of certain provisions to improve the energy performance of existing buildings where other building work is proposed. The new 2010 Technical Handbook⁵⁵ provides guidance on meeting the new regulations.

Funding for community projects

38. The Climate Challenge Fund⁵⁶ gives communities, through individual community groups and community planning partners, the ability to implement actions to reduce their carbon emissions. The Fund has a total available resource of £27.4 million over the three years 2008-11. Funding has now been offered to 232 communities across Scotland, with over £23 million already being allocated to projects across the seven rounds. Over the three years of Climate Challenge Fund grants, 970 applications were received from community groups.

Carbon assessment of the Scottish Budget

39. Section 94 of the Climate Change (Scotland) Act requires an annual carbon assessment of the Budget, with the Scottish Government producing a report describing the direct and indirect impact on greenhouse gas emissions of its expenditure plans. The first such carbon assessment was published alongside the Draft Budget in September 2009.

Adaptation to the effects of climate change

40. The First Minister launched Scotland's first Climate Change Adaptation Framework in December 2009. The core aim of the Framework is to make Scotland more resilient to climate change. In releasing the Framework, the Scottish Government is taking a coordinated, strategic lead and is challenging all sectors to take action to capitalise on the opportunities and adapt to the negative consequences from climate change.

Wales

41. The Welsh Assembly Government published its Climate Change Strategy and associated Emission Reduction and Adaptation Delivery Plans in October 2010. The Strategy confirms the Assembly Government's commitments and the areas where it will act to reduce greenhouse gas emissions and enable effective adaptation in Wales.

Agriculture

42. The Assembly Government has significant levers in this sector, although many of these operate within an EU framework, for example payments to farmers under the Common Agricultural Policy (CAP) and the wider Rural Development Plan and regulatory requirements.

43. The Assembly Government established a Land Use and Climate Change Group to provide specific advice on emissions reduction in agriculture. Early in 2010, the Land Use and Climate Change Group produced its report

⁵⁴ http://www.opsi.gov.uk/legislation/scotland/ssi2010/ssi_20100032_en_1

⁵⁵ <http://www.scotland.gov.uk/Topics/Built-Environment/Building/Building-standards/publications/pubtech>

⁵⁶ <http://www.scotland.gov.uk/Topics/Environment/climatechange/ClimateChallengeFund>

which assessed the science relating to emissions from the agriculture, land use and food sectors in Wales. The report also outlined a way forward for these sectors to achieve significant reductions in greenhouse gas emissions by 2040.

44. The Assembly Government has welcomed the Group's report and, in relation to those recommendations that have been accepted, many are already being progressed through Assembly Government programmes and policies. These include the forthcoming *Glastir* scheme, Wales' new sustainable land management scheme and the knowledge that the Assembly Government is already proactive in liaising with research funders and research bodies on issues covered by other recommendations. This is particularly in relation to research or mechanisms to gather data on emissions (for the greenhouse gas inventory).

45. The Assembly Government's Internal Working Group will be producing its Implementation Plan at the end of 2010 for taking forward the accepted recommendations.

Transport

46. The Wales Transport Strategy "*One Wales: Connecting the Nation*" was published in May 2008. The Strategy recognises the need to develop a balanced approach so that transport plays its full part in tackling climate change while it continues to support economic development and social cohesion. One of the priorities identified in the Strategy is the need to reduce greenhouse gas emissions.

47. The Wales Transport Strategy provided the framework for the development of the National Transport Plan, which was published in March 2010. The National Transport Plan sets out, for the first time, the full range of measures that will be undertaken to develop a better integrated and sustainable transport network in Wales. It brings together plans for the road and rail networks, adding and integrating public and community transport, walking and cycling. The Plan also seeks to ensure that people are able to make better and more sustainable transport choices, by supporting the provision of the information that they need to change their behaviour and to plan their journeys.

The overall aim is to ensure that the transport network works efficiently and effectively, whilst minimising its impact on the environment.

48. Our strong focus on encouraging behavioural change in transport also includes support for eco driving (that is driving in a safe and fuel-efficient way) and encouraging smarter purchasing choices so that people buy more fuel-efficient vehicles.

49. The enhanced arrangements for transport planning will strengthen the vital links between transport functions and other local government services, such as education, planning, health, leisure and environmental services.

Buildings and Industry

50. The Assembly Government's main levers to influence emissions from business relate to direct business support and actions enable the right environment in which businesses can grow and develop, actions to support behaviour change and the role of land use, spatial and marine spatial planning. The Assembly Government and wider public sector can also influence emissions reduction in business through the purchasing power of public sector procurement.

51. '*Economic Renewal: a new direction*' has established a renewed approach to economic development in Wales and ensures that we are:

- better able to meet the needs of businesses;
- encourage a stronger and more sustainable economy;
- increase the prosperity and long-term well-being of the people of Wales.

52. Sustainable development is the key principle underpinning this work and tackling climate change will be one of the key objectives.

53. The Green Jobs Strategy forms part of a much broader range of measures designed to create a sustainable economy built on the firm foundations of sustainable businesses, sustainable technologies and sustainable employment. These will make an important contribution to the way in which Wales deals with the current situation and places itself in a robust position to take advantage

of future opportunities. The Green Jobs Strategy will play a key part in shaping and driving the business opportunities associated with a move to a low carbon, low waste economy.

54. Energy generation, consumption and efficiency are also critical to reducing business sector emissions. *A Low Carbon Revolution: The Welsh Assembly Government Energy Policy Statement and the National Energy Efficiency and Saving Plan*⁵⁷, both *One Wales* commitments set out how the Assembly Government intends to support low carbon energy generation and increased efficiency.

Power

55. The Assembly Government's 'One Wales' programme includes a commitment to the production of an energy strategy, and to 3% annual reductions in greenhouse gas emissions in areas of devolved competence from 2011. To achieve this ambitious agenda, the Assembly Government recognises that Wales will need to reduce by 80-90% its use of carbon based energy, resulting in a similar reduction in greenhouse gas emissions in Wales.

56. The Assembly Government's energy policy statement, "*A Low Carbon Revolution*", published in March 2010, illustrates that Wales has the potential to produce more than twice as much renewable electricity as Wales consumes as a nation by 2025: about a half of this from marine, a third from wind and the rest mainly from sustainable biomass power or smaller local (including micro) heat and electricity generation projects using wind, solar, hydro or indigenous biomass.

57. The *Low Carbon Revolution* represents an overarching commitment to sustainable energy development and will be delivered through a number of Assembly Government Frameworks such as the National Efficiency Savings Plan and the Green Jobs Strategy.

58. The Assembly Government is determined to make the most of Wales' unique landscape and coast to maximise the renewable energy potential sustainably. It is estimated that the total investment potential in Wales is £50 billion or more in large renewables and other low-carbon electricity projects over the next 10 to 15 years. The exploitation of marine energy resources in particular presents a very significant investment opportunity. The potential for an estimated 40 gigawatts of wave and tidal stream energy exists in waters off Wales and the Policy Statement on Marine Energy in Wales, outlines the high level support for marine energy development, whilst setting the strategic framework for the development of a strong marine-energy sector in Wales.

59. The Welsh Assembly Government is committed to delivering a low carbon agenda in Wales and is driving it forward in all the areas for which it is responsible, including transport, economic development, skills and education, housing, regeneration and local government. This commitment has cross party support within the National Assembly for Wales.

Northern Ireland

Strategic Context

60. A revised Sustainable Development Strategy was approved by the Northern Ireland Executive for publication on 28 May 2010. A public consultation on a Sustainable Development Implementation Plan closes on 29 October 2010. Both the Strategy and the Implementation Plan identify greenhouse gas emission reductions as an important objective of the Executive.

⁵⁷ <http://wales.gov.uk/docs/desh/policy/100331energystatementen.pdf>

Energy

61. The Northern Ireland Executive recently approved a new Strategic Energy Framework (SEF 2010) which was published on 27 September. The Framework sets out Northern Ireland's energy priorities over the next ten years and identifies key energy goals in terms of building competitive markets, ensuring security of supply, enhancing sustainability and developing Northern Ireland's energy infrastructure.

62. The SEF, sets a very challenging target to increase the amount of electricity and heat from renewable sources to 40% and 10% respectively by 2020. In addition to addressing energy diversity and security of supply, higher levels of renewables will play a very positive role in climate change mitigation. Primarily as a result of large scale onshore wind projects, Northern Ireland is expected to meet its current renewable electricity target of 12% by 2012. In order to achieve future ambitious targets however it must also harness the contribution that other renewables technologies can make, for example, bioenergy and offshore renewables. The SEF also includes proposals to consider the roll out of SMART meters and to investigate a supplier obligation to further stimulate energy efficiency measures.

63. Progress continues on the development of the first cross-departmental Bioenergy Action Plan, 2010-2015. This plan aims to increase awareness of bioenergy, create an enabling environment, facilitate targeted investment in the supply chain and continue focussed research & development. It is intended that the plan will be finalised in the autumn, taking account of consultation responses.

64. The finalisation of an Offshore Renewable Energy Strategic Action Plan 2010-2020, will assist the commercial development of at least 600MW of offshore wind and 300MW of tidal energy by 2020. The Department of Energy, Trade and Investment is working with The Crown Estate on a Leasing Round for NI waters to be launched later in 2010-2011. Not only can offshore renewable energy contribute to the region's challenging renewable electricity targets, but it also offers business opportunities for Northern Ireland companies within this growing national and international market.

65. In conjunction with our neighbours in Scotland and the Republic of Ireland, two major projects continue to progress under the EU Interreg IV Programme; the Biomara research project into the use of local marine seaweeds and algae for bio-fuel production and the Irish-Scottish Links on Energy Study (ISLES) is a feasibility study for an offshore electricity grid to encourage commercial use of offshore wind, wave and tidal technologies.

66. Ensuring that increasing amounts of renewable electricity can be moved to where they are needed will require significant upgrading of the electrical transmission systems entailing a substantial investment programme in Northern Ireland, comparable in scale to the £3.6 billion investment already announced by EirGrid in the Republic of Ireland.

67. Importantly, and as a first step in the development of a wider strategy for renewable heat deployment in Northern Ireland, a major piece of work has recently completed considering the relatively untapped renewable heat market. This work has collated reliable data on heat and renewable heat usage in Northern Ireland, assessed the future sustainable growth potential for the renewable heat sector in the region and considered the appropriateness of incentivising the uptake of renewable heat technologies. As a result the Strategic Energy Framework has adopted a target of 10% renewable heat by 2020 and work will soon begin on a full economic appraisal of a Northern Ireland specific Renewable Heat Incentive.

68. The Northern Ireland Renewables Obligation (NIRO) continues to be the main form of incentivising renewable electricity generation. On 1 April 2010, enhanced Renewables Obligation Certificates (ROCs) were introduced for new generating stations using wind, hydro and photovoltaic technologies and a consultation is currently underway which proposes enhancing ROC levels for Anaerobic Digestion. This will be subject to State Aid approval.

Transport

69. To meet the climate change challenge, Northern Ireland is currently reviewing its Regional Development Strategy (RDS) and Regional Transportation Strategy (RTS). The revised RDS has a specific strategic objective and guidance that consider ways to help reduce energy consumption and encourage more sustainable methods of production. To inform the review of the RTS the Northern Ireland Executive has initiated a programme of work to:

- develop a baseline and establish the current level of greenhouse gas emissions from road transport; and
- identify a framework of policies and actions to reduce emissions whilst facilitating economic growth and social progress.

70. A revised RTS is expected to issue for consultation before the end of the year.

71. Alongside the RTS review the Northern Ireland Executive also established an Active Travel Forum drawing together key stakeholders to consider the wider social, economic and health benefits of active travel, the key barriers, best practice and opportunities for alignment with existing policies and programmes. The Forum is expected to produce a high-level strategy before the end of the year setting out recommendations.

Construction

72. Reduced emissions from new buildings will be achieved through a progressive tightening of thermal standards required under building regulations. This will begin with an initial amendment in 2011 with a further amendment planned for 2013.

73. Central Procurement Directorate has adopted a Low Carbon Design policy for construction procurement and intends that all new public sector buildings will be zero carbon from 2018. This will include adoption of best practice in new builds through the Building Research Establishment Environmental Assessment Method and the Civil Engineering Environmental Quality Assessment & Award Scheme (BREEAM & CEEQUAL).

74. The Low Carbon Homes Scheme is a new rate relief scheme which came into effect on 1 April 2010. It aims to encourage the building of low and zero carbon homes in Northern Ireland by offering full rates relief for first occupiers of low and zero carbon homes for two and five years respectively. The Energy Efficiency Homes Scheme is a rate relief which came into effect on 1 April 2010. It is managed by the Energy Saving Trust and provides a one-off reduction in rates to home owners who install cavity wall insulation and/or loft installation in their home to the required standards.

The Government Estate

75. The Central Energy Efficiency Fund makes available £1 million annually to projects in the public sector that aim to deliver energy efficiencies and reduce carbon emissions. The fund currently offers grants covering a maximum of 50% of the projects' capital costs. Generally the energy efficiency projects supported have an average payback of less than three years.

Housing

76. As part of the New Housing Agenda, all new build Social Housing must comply with a minimum rating of level three in the Code for Sustainable Homes. In effect this means new social houses built today are 25% more energy efficient than before. These homes are not just energy efficient in occupation as the code for sustainable homes places specific standards during construction to make them more sustainable and environmentally friendly in occupation and construction.

77. From November 2009, Housing Associations have been incentivised to go even further than level three by increasing the level of subsidy to those Housing Associations who can build to level four standards.

78. The Northern Ireland Executive is also working with the Housing Executive, the Home Energy Conservation Authority for Northern Ireland, on a pilot site in South Belfast that will allow for up to 70 mixed tenure social homes built to level five standard. This is the largest and most ambitious level five development across the UK and the use of renewable technologies in this

scheme will be essential to meet the strict level five ratings. This will provide important learning for the industry as we seek to achieve our carbon neutral housing targets by 2016.

79. The Heating Replacement Scheme and the Warm Homes Scheme assist householders with energy efficiency improvements. These energy efficiency improvements also help reduce carbon emissions contributing to carbon reduction targets.

Agriculture

80. The Department for Agriculture and Rural Development (DARD) established an internal Steering Group during 2009 to develop a range of primary production focused mitigation measures based on a review of available scientific evidence. Five key themes have emerged; better livestock management, better nutrient and fertilizer management, locking in carbon in soils, peatlands and grass, locking in carbon in new and existing woodlands and optimising renewable energy and fuel efficiency on farms. These themes are currently subject to consultation processes across all segments of the Northern Ireland agri-food industry. Greater efficiency and cost effectiveness are key to the approach with the DARD issuing a Renewable Energy Action Plan in June 2010. A DARD led Stakeholder Group has been established to help further develop mitigation themes/measures. Additionally, DARD is planning to contribute to DEFRA led research aimed at addressing the research gaps identified.

Employment and Learning

81. The Northern Ireland Minister for Employment and Learning is seeking to contribute to the mitigation of the effects of climate change through a direction to target 5% of quality-related research (QR) funding towards research in areas that encompass the theme of sustainability, in particular, alternative/renewable energy sources or green technology. QR funding is used to support the research infrastructure necessary for the two Northern Ireland universities to conduct research. It also contributes to the costs of postgraduate research training.

82. The universities are using the funding, which amounts to a total of some £4million over the 2009/10 and 2010/11 academic years, to support single projects, one entitled "Clean Energies" and the other, "Sustainability Measurement and System Evaluation".

83. The Department of Employment and Learning is also supporting relevant research projects through other programmes such as "Strengthening the All-Island Research Base", which seeks to contribute to the development of the All-Island research infrastructure. Projects are being undertaken in areas of strategic interest to both Governments, including Future Energy Systems. Funding of £1.54m has been provided to the University of Ulster; between 2008 and 2011. To support an "Energy Storage" project being undertaken in collaboration with University College Dublin, the National University of Ireland (Maynooth) and Dublin Institute of Technology. The project is concerned with demonstrating how energy storage can be incorporated within the built environment to reduce the use of fossil fuels. Under another research programme, the "US-Ireland R&D Partnership", the Department is contributing some £350,000 towards a total investment of approximately £1 million in another project concerned with the Development of a Greenhouse Gas Ocean-Atmosphere Flux Sensor with Membrane-Based Photoacoustic Technology. The project is being taken forward in conjunction with Woods Hole Oceanographic Institution (Massachusetts) and the National University of Ireland (Galway).

Glossary

AES	Annual Energy Statement	EIB	European Investment Bank
ASHPs	Air Source Heat Pumps	EIS	Energy Intensive Sectors
CAP	Common Agricultural Policy	ENSG	Electricity Networks Strategy Group
CCC	Committee on Climate Change	EPC	Energy Performance Certificate
CCS	Carbon Capture and Storage	EST	Energy Saving Trust
CE	Cambridge Econometrics	EU	European Union
CERT	Carbon Emissions Reductions Target	EU ETS	EU Emissions Trading System
CESP	Community Energy Saving Programme	FEED	Front End Engineering and Design
CfIT	Commission for Integrated Transport	FITs	Feed-in Tariffs
CHP	Combined Heat and Power	GWh	Gigawatt hour
CLG	Department for Communities and Local Government	IPC	Infrastructure Planning Commission
CO ₂	Carbon Dioxide	IPCC	Intergovernmental Panel on Climate Change
CPC	Certificate of Professional Competence	KW	Kilowatt
CRC	Carbon Reduction Commitment Energy Efficiency Scheme	KWh	Kilowatt hour
DARD	Department for Agriculture and Rural Development, Northern Ireland	LPG	Liquid Petroleum Gas
DECC	Department of Energy and Climate Change	MACC	Marginal Abatement Cost Curves
DEC	Display Energy Certificate	MtCO ₂ e	Million tonnes of carbon dioxide equivalent
DEFRA	Department for Environment, Food and Rural Affairs	MW	Megawatt
DSA	Driving Standards Agency	MWTs	Micro Wind Turbines
DfT	Department for Transport	MWe	Megawatt electrical output
DUKES	Digest of United Kingdom energy statistics	NEESP	National Energy Efficiency and Saving Plan
		NGET	National Grid Electricity Transmission
		NIRO	Northern Ireland Renewables Obligation

NPSs	National Policy Statements
Ofgem	Office of the Gas and Electricity Markets
OFTO	Offshore Transmission Owner
OND	Office for Nuclear Development
ORED	Office for Renewable Energy Deployment
PAYS	Pay As You Save
PDR	Permitted Development Rights
PPS	Planning Policy Statement
RDS	Regional Development Strategy
RED	Renewable Energy Directive
RES	Renewable Energy Strategy
RHI	Renewable Heat Incentive
RO	Renewables Obligation
SAP	Standard Assessment Procedure
SEF	Strategic Energy Framework
SMEs	Small and medium sized enterprises
SSA	Strategic Siting Assessment
STT	Sustainable Travel Demonstration Towns
SWI	Solid Wall Insulation
TPCR4	Transmission Price Control Period
TWh	TeraWatt Hours
UEACRU	University of East Anglia's Climate Research Unit
UNFCCC	United Nations Framework Convention on Climate Change

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