

Press release yesterday from the Scottish parliament on Scotland's Energy Future extract

“Scotland does not need a new generation of nuclear power stations to be built but that there is a need to extend the life of existing nuclear power plants to give time to increase electricity generation from alternative sources”

Web link as follows www.scottish.parliament.uk/nmCentre/news/news-comm-09/ceet09-s3-006.htm

Scottish Parliament Report

Report sets out vision for Scotland's energy future

A political vision for the future of energy production and use in Scotland was set out yesterday in an extensive report from the Scottish Parliament's Economy, Energy and Tourism Committee.

[Determining and Delivering on Scotland's Energy Future](#) sets out a pathway for the Scottish Government to follow to meet the emissions targets in the [Climate Change \(Scotland\) Bill](#) passed last week by the Scottish Parliament.

The vision is laid out under four broad headings – efficiency, environmental sustainability, social justice, and maximising economic and employment benefits.

HOLYROOD COMMITTEE SETS OUT VISION

FOR SCOTLAND'S ENERGY FUTURE

30 June 2009

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[Determining and Delivering on Scotland's Energy Future](#) sets out a pathway for the Scottish Government to follow to meet the emissions targets set out in the [Climate Change \(Scotland\) Bill](#) passed last week by the Scottish Parliament.

The vision is laid out under four broad headings – efficiency, environmental sustainability, social justice, and maximising economic and employment benefits.

Recommendations include a multi-million-pound programme to reduce energy demand and an extension to the life of existing nuclear power plants, investment in renewable energy and cleaner coal-fired power stations, instead of developing any new nuclear power stations in Scotland.

The 126-page report was published following a [12-month committee inquiry](#) calling on 120 witnesses from Scotland's energy sector, together with 125 written submissions.

The findings of the report include recommendations that:

- the Scottish Government considers investing between £100 million and £170m annually over the next ten years to reduce energy demand and fuel poverty across Scotland
- a greater emphasis is placed on decentralising Scotland's electricity system, putting in place policies to increase individual, community and municipal-scale production, distribution and use of electricity and heat through schemes such as district heating
- Scotland does not need a new generation of nuclear power stations to be built but that there is a need to extend the life of existing nuclear power plants to give time to increase electricity generation from alternative sources
- the Scottish Government speeds up procedures to give consent to new, large-scale developments within Scotland's national electricity infrastructure, including the proposed Beauly-Denny line, so that Scotland can unlock its renewable energy potential and meet challenging climate-change targets

- the energy regulator Ofgem tackles fuel poverty issues by ensuring energy tariffs are transparent and that problems with energy pre-payment meters are addressed
- major companies in the oil and gas sector should be encouraged to diversify into marine-energy production, particularly offshore wind.

Committee Convener Iain Smith said: "This is our vision for Scotland's energy future. The provision of secure, affordable and environmentally-friendly energy supplies is fundamental to the wealth and national well-being of Scotland.

"Scotland is incredibly well positioned in terms of energy resources – rich oil and gas reserves, the largest wind, wave and tidal resources in Europe, and a well-supplied power generation market.

"However, there are immense challenges ahead in terms of the future of energy production and consumption. This report sets out our energy vision for Scotland and how best the Scottish Government can achieve it, striking the right balance between energy costs, security of supply and the environment."

Economy, Energy and Tourism Committee Report

SP Paper 313

EE/S3/09/R7

7th Report, 2009 (Session 3)

Determining and delivering on Scotland's energy future

VOLUME 1

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Further developing and deploying renewable energy technologies

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VOLUME 2

Remit and membership

Remit:

To consider and report on the Scottish economy, enterprise, energy, tourism and all other matters falling within the responsibility of the Cabinet Secretary for Finance and Sustainable Growth apart from those covered by the remits of the Transport, Infrastructure and Climate Change and the Local Government and Communities Committees.

Membership:

Ms Wendy Alexander
Gavin Brown
Rob Gibson (Deputy Convener)
Christopher Harvie
Marilyn Livingstone
Lewis Macdonald
Stuart McMillan
Iain Smith (Convener)

Committee Clerking Team:

Clerk to the Committee

Stephen Imrie

Senior Assistant Clerk

Katy Orr

Assistant Clerk

Gail Grant

Determining and delivering on Scotland's energy future

The Committee reports to the Parliament as follows—

Background

1. There are few issues as fundamental to Scotland's wealth and our nation's well-being as the provision of secure, affordable and environmentally-friendly energy supplies. As a country, Scotland is well positioned in terms of energy resources with the rich oil and gas reserves in the North Sea, the largest wind, wave and tidal resources in Europe and a well-supplied power generation market with its broad mix of generation technologies and fuel sources, currently producing a surplus of electricity for export.
2. Yet despite these advantages, there are immense challenges ahead in terms of Scotland's energy future. Firstly, geopolitical conflicts, especially in Russia and the Middle East, have raised concerns about the security of our energy supplies. Secondly, rising oil, gas and electricity prices have placed great strains on the consumer, whether they are a large, industrial user of energy or a householder. Thirdly, the pressure to substantially reduce Scotland's emissions of greenhouse gases as a contribution to tackling climate change is driving change in the energy sector. Finally, in relation to electricity in particular, many of Scotland's current power stations are ageing and need refurbishment or replacement in the coming years. For these reasons, the Parliament's Economy, Energy and Tourism Committee chose the issue of energy to form the basis of one of its main inquiries this parliamentary session.
3. There is already, of course, a wealth of research reports and studies setting out the technical and economic potential of a range of different technologies and a broad knowledge base covering the impact of energy on our environment. There is also a plethora of public policy initiatives from governments at all levels – Scottish, UK, European and global – aimed at tackling a wide variety of issues such as the development of new technologies, reducing fuel poverty, providing the energy industry with a skilled workforce, stimulating investment, reducing carbon emissions etc.
4. There is not, however, a clear and coherent expression of Scotland's energy future at the political level or an action plan on how this will be realised. These are the two aspects of this Committee's report that differentiate it from other research studies. This inquiry was an attempt to define what Scotland's energy future looks like and then to articulate how this will be achieved, pointing out the substantial investments that will be required and the trade-offs that will need to be made along the way. Central to these trade-offs is the delicate balance between price, security of supply and the environment.

5. This inquiry report is the culmination of over 12 months of work. During this period, the Committee heard from 120 witnesses who came and gave evidence to us and our consideration of the over 125 written submissions. Committee members also visited a range of energy projects right across Scotland, including power stations and energy sites in Fife, East Dumbarton, East Lothian and Aberdeen, wind farms in central Scotland and marine energy research establishments in Orkney and Caithness. Members of the Committee also made visits to Brussels to learn more about European Union (EU) policies and to Germany, Sweden and Denmark to look at the development of their energy sectors.

6. The Committee is grateful to all of the organisations and individuals who engaged with us and gave us their time and thoughts. The submissions received have been influential in shaping this report. The Committee is also grateful to the Scottish Council for Development & Industry whose energy conference in September 2008 provided much of the context for our inquiry when it was first launched.

Structure of the report

7. This report has been kept as concise as possible in order to focus on the core issues, namely what is Scotland's energy future and what decisions need to be taken at a political level, by whom and by when. Separate volumes, however, contain links of the *Official Reports* of our meetings and the written evidence submissions received by the Committee.

8. The structure of the remaining sections of this inquiry report is as follows—

- A brief overview of energy in Scotland and key facts and figures;
- A short recap of the political and public policy landscape, setting out the various targets and commitments that have been made;
- The Committee's vision for Scotland's energy future;
- Conclusions, recommendations and the Committee's political action plan;
- A more in-depth look at the evidence-taken during the course of the Committee's inquiry.

9. A separate Volume 2 of our report is available in electronic copy only on the Committee's website¹. This will contain links to the oral and written evidence received during the course of this inquiry, including the *Official Reports* of the relevant meetings.

10. To re-emphasise however, this report is neither an exhaustive economic or technical appraisal of Scotland's energy scenarios. Many such research studies already exist, such as the recent work by the Royal Society of Edinburgh², the Scottish Council for Development and Industry³, the Stern report⁴ and the Scottish Government itself.⁵ **Rather, this report provides the context for the**

political action plan for Scotland, focusing on the decisions that must be taken and the timetable for these.

11. In short, our inquiry report is a response to the challenges made by many in their evidence to the Committee to take clear decisions and provide a climate of greater certainty for the substantial investments that are required in the energy sector in the decades to come. Billions of pounds of investment are required in the coming years in the energy sector to provide a new generation of power plant, for improved transmission and grid infrastructure, to enable us to continue to benefit from the fossil fuel resources off Scotland's shores, to eliminate fuel poverty and to meet emission reductions.

12. As such, the structure of this inquiry report is different from the norm for committee inquiries. After a short introduction to the subject matter of energy and an outline of the political and public policy landscape, the Committee sets out its preferred vision for Scotland's energy future and our political action plan on how it should be realised. The remainder of the report that follows is the more traditional analysis of the evidence received and the issues that emerged that, of course, have underpinned the rest of the report.

13. We have chosen to place our vision and our action plan at the forefront of the report. Underpinning the conclusions and recommendations we make, however, is our analysis of the evidence received both during formal sessions and during our external visits.

Remit of our inquiry

14. Given the imperative of cutting the emissions of greenhouse gases and other pollutants, the remit for the inquiry was to determine, within the devolved context and the Parliament's competences, what type of future we want in Scotland in terms of the production, distribution and more efficient use of energy, and how and when it can be delivered to meet the Scottish Government's objectives of increasing renewable energy generation and reducing emissions. The inquiry would also consider how energy supplies can be secured at an affordable price and how economic benefits from the energy industries can be maximised.

15. As part of this inquiry, the Committee sought evidence on the following three key issues—

- What type of future is needed in Scotland in terms of the production, distribution and more efficient use of energy, given the issues of price, security of supply and sustainable development?
- How can this future be delivered in Scotland and how will we meet all the various targets and obligations?
- What decisions need to be taken, by when and by whom to deliver on Scotland's energy future?

16. Linked to these three key issues were the following—

- Which energy sectors offer the best prospects for economic growth and reduced carbon emissions, and how should these be secured?
- What are the hindrances to determining and developing Scotland's energy future?
- What is needed in the short and medium-term, particularly from the Scottish Parliament and the Scottish, UK and other governments (such as the EU), to deliver Scotland's energy future?
- How can demand for energy be reduced in Scotland?
- How can the energy sector deliver the kind of reductions in greenhouse gas emissions that the Scottish Government wants to see?
- How can energy supplies be secured at a price which is affordable?
- How can economic benefits from Scotland's energy industries and the development of clean technologies be maximised?
- What are examples of best practice in Scotland and elsewhere, particularly focussing on low-carbon solutions and covering electricity, heat and transport?

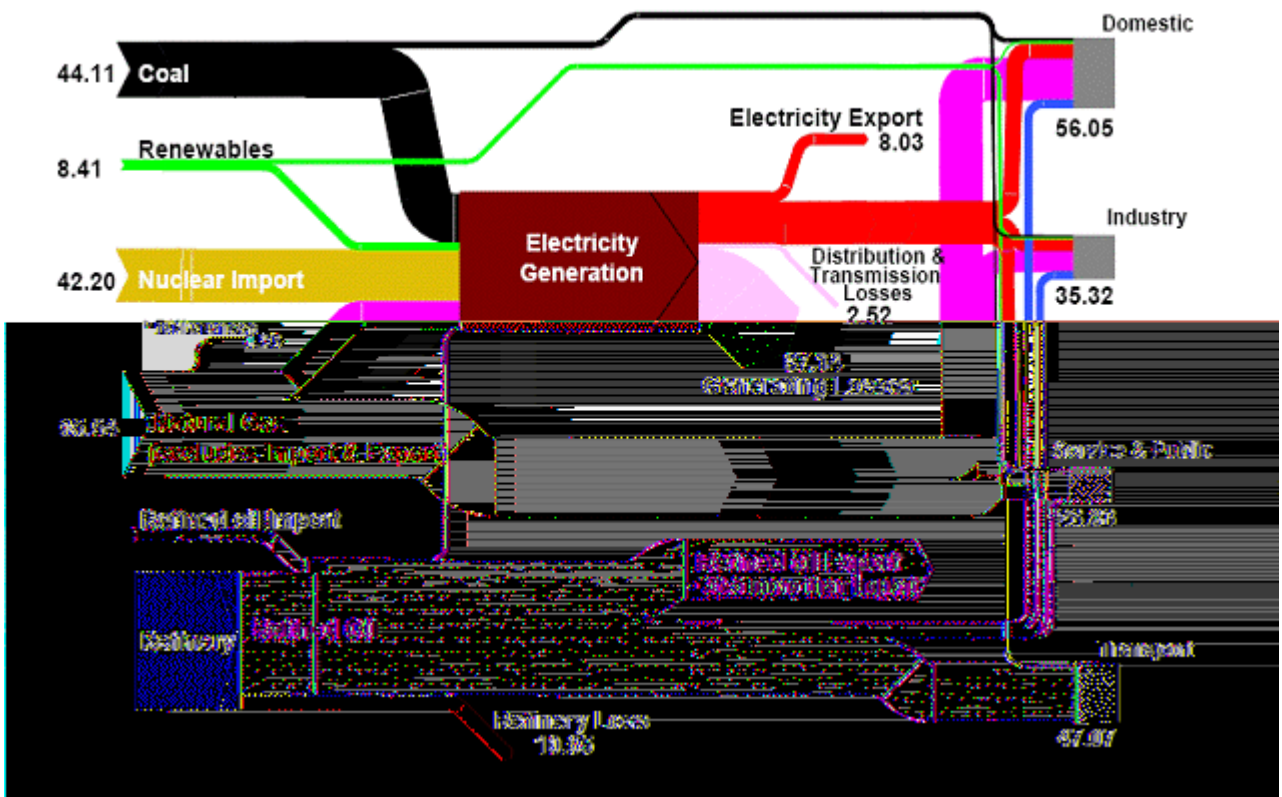
ENERGY – AN OVERVIEW

Key facts and figures

Energy supply and consumption

17. The overall picture of energy flows in Scotland is outlined in Figure 1 below, produced for the Scottish Government as part of its Scottish Energy Study series.

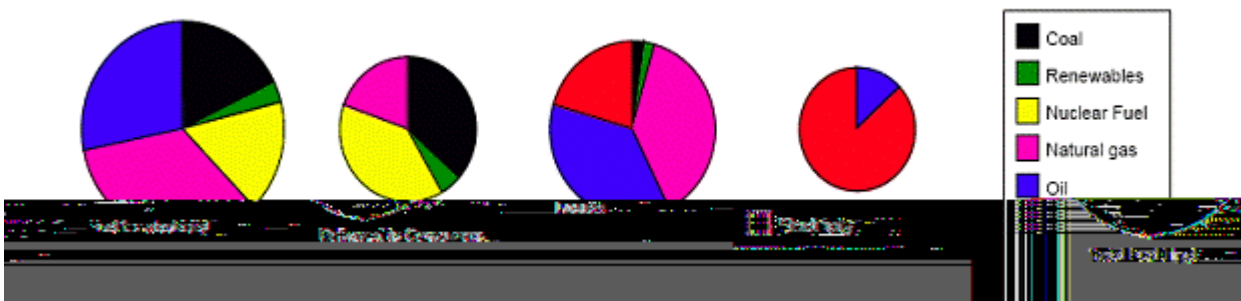
Figure 1: Energy flows in Scotland (in TWh. NB. 1TWh = 1 million billion watt-hours)



Source: Scottish Government, Scottish Energy Study, 2008

18. Figure 2 below, sets out the relative input contributions of fuels, firstly to overall primary energy supply, then as electricity generated and energy delivered, and finally showing losses associated with electricity generation and transmission, and from energy use in refineries. The areas of the pie charts below are scaled to the relative amounts of fuel use in each sector.

Figure 2: A summary of energy supply and demand in Scotland

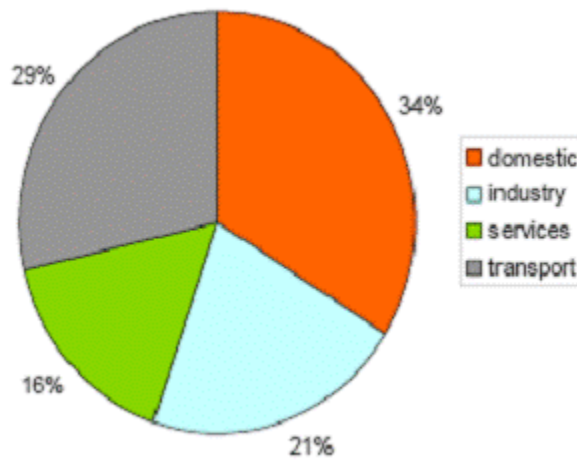


Source: Scottish Government, Scottish Energy Study, 2008

19. As the above diagrams show, natural gas, oil (especially for transport) and electricity are the predominant forms of energy supplied/delivered to end-users in Scotland. However, coal and nuclear fuel also make significant contributions via electricity generation.

20. In terms of energy demand, the main end-use sectors in Scotland are, in decreasing order of energy consumption: domestic, transport, industry and services, as set out below in Figure 3a. Figure 3b, breaks down fuel use by end-user sector.

Figure 3a: Energy demand in Scotland by sector



Source: Scottish Government, Scottish Energy Study, 2008

Figure 3b: Fuel use by end-demand sector



Source: Scottish Government, Scottish Energy Study, 2008

The Scottish electricity sector

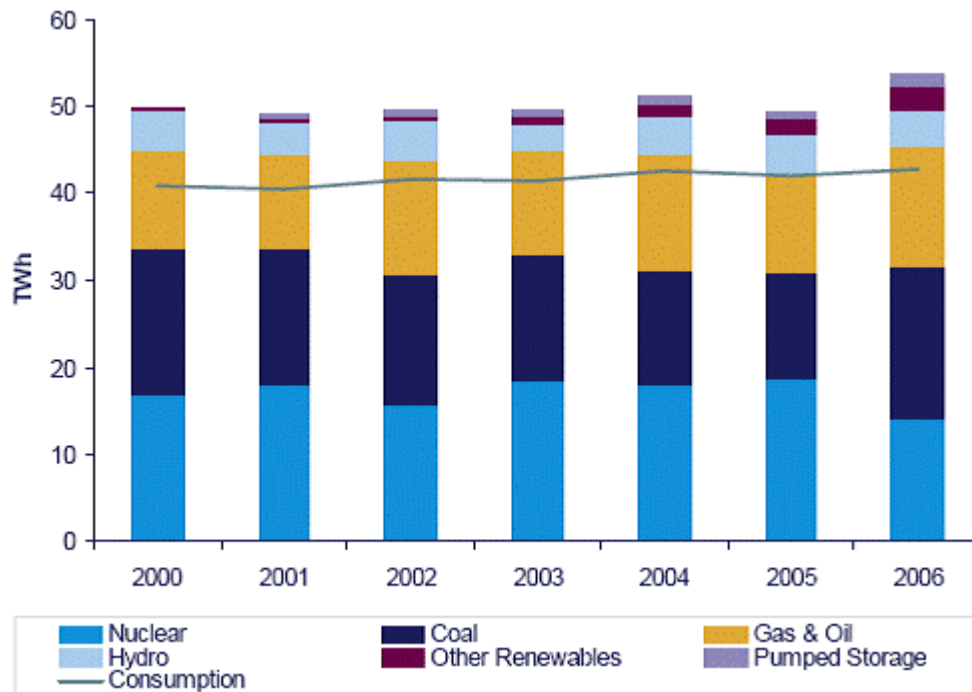
21. Looking specifically at the electricity sector, Scotland's installed generation base consists of a broad mix of generation technologies and fuel types. Power is

supplied by a combination of large base-load plants, including nuclear, coal and gas-fired units, hydro generation, both conventional hydro and pumped storage, and a number of other renewable sources.

22. Scotland’s electricity industries typically produce a surplus of generation output and this is exported into wider electricity markets in England and Wales, and, via a separate interconnector, to Northern Ireland. The interaction of the Scottish and other networks therefore plays an important role in system balancing and supply security north of the border. Although power flows are predominantly north to south, flows in the opposite direction are not uncommon.

23. Figure 4 provides historical data on the composition of the Scottish electricity sector disaggregated by the different forms of generating technology. Figure 5 provides figures on electricity generation in recent years.

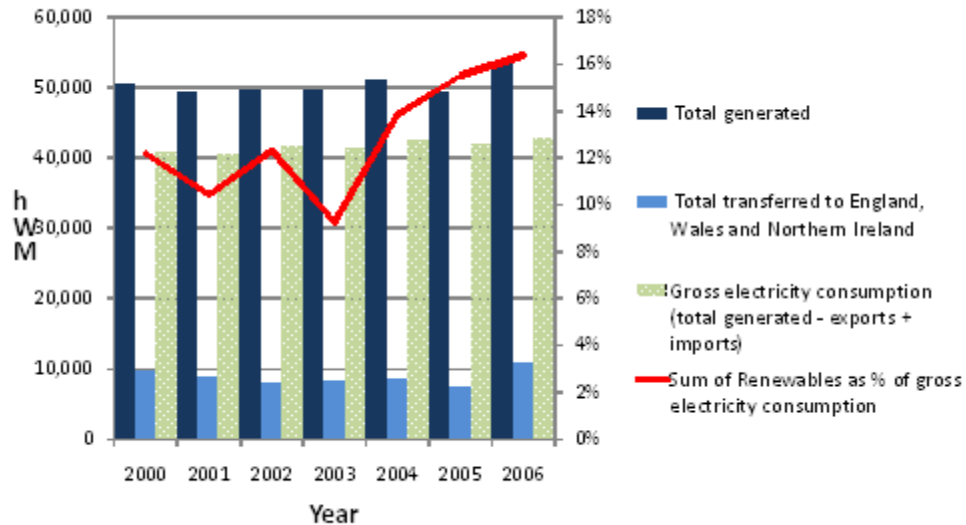
Figure 4: Scottish electricity generation by source



Source: Scottish Government and UK Department for Business, Enterprise and Regulatory Reform (as cited by Wood Mackenzie for the Scottish Council for Development & Industry)

24. For 2007, the Scottish Government’s figures for electricity generated by fuel type are 12.3 TWh for nuclear, 13.9 TWh for coal, 11.1 TWh for gas, 1.4 TWh for oil, 1.2 TWh for hydro pumped storage, 4.7 TWh for hydro and 3.5 TWh for other renewables⁶.

Figure 5: Electricity generation in Scotland



Source: UK Department for Business, Enterprise and Regulatory Reform (as cited in evidence from the Association of Electricity Producers)

25. What the above figures show is the relatively stable pattern of generation mix in Scotland in recent years. The drop in electricity generated by nuclear in 2006 was compensated for by an increased use of coal-fired power plant. The figures also show the marked increase, in relative terms, in the use of renewable energy sources for electricity generation. This growth has been driven in the main by a rapid increase in on-shore wind as table 1 below shows.

Table 1: Development of renewable energy in Scotland

MW	2000	2001	2002	2003	2004	2005	2006	2008
Hydro	1320	1340	1354	1299	1307	1311	1330	1347
Wind	39	44	186	308	412	765	946	1208
Biomass and others	32	39	55	69	91	101	120	181
Total	1391	1423	1595	1676	1810	2177	2396	2736

Source: Scottish Government (as cited by Wood Mackenzie for the Scottish Council for Development & Industry)

26. According to the Scottish Government, by October 2008, the amount of installed capacity in Scotland from renewables had reached just over 3,000 MW, with a further 5,500 MW of plant consented (albeit not necessarily constructed).⁷

In his most recent evidence to the Committee, the Minister quoted a figure nearer 6GW.⁸

27. Finally, one of the most contentious issues that emerged during the Committee’s inquiry is the so-called “energy gap”, that is whether there is the potential for significant energy (and electricity in particular) shortages in the decades to come if investments are not made in newer forms of energy supply. Table 2 below sets out the profile of the major power plants in Scotland and the year of commissioning, and Figure 6 shows the cumulative effect of their decommissioning.

Table 2: Asset profile (operational at the end May 2008)

Company Name	Station Name	Fuel	Installed capacity (MW)	Year of commissioning or year generation began
British Energy	Hunterston B	nuclear	820	1976
British Energy	Torness	nuclear	1,230	1988
Scottish and Southern Energy plc	Peterhead	Gas/oil	1,540 (1)	1980
Scottish and Southern Energy plc	Fife power station	CCGT	123	2000
Scottish Power	Cruachan	Pumped storage	440	1966
Scottish Power	Cockenzie	coal	1,152	1967
Scottish Power	Longannet	coal	2,304	1970
Various	Various	hydro	1,588	Various (2)
Various	Various	wind	1,177	Various (3)

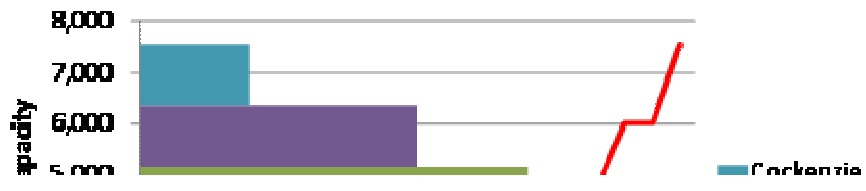
(1) Station capacity is 2,370 MW but transmission constraints limit use to only 1,540 MW at one time

(2) A mix of older stations mostly commissioned in the 1950s and 1960s and newer, smaller stations from 2000s

(3) Mostly commissioned in late 1990s and 2000s.

Source: UK Department for Business, Enterprise and Regulatory Reform

Figure 6: Major Scottish generation capacity



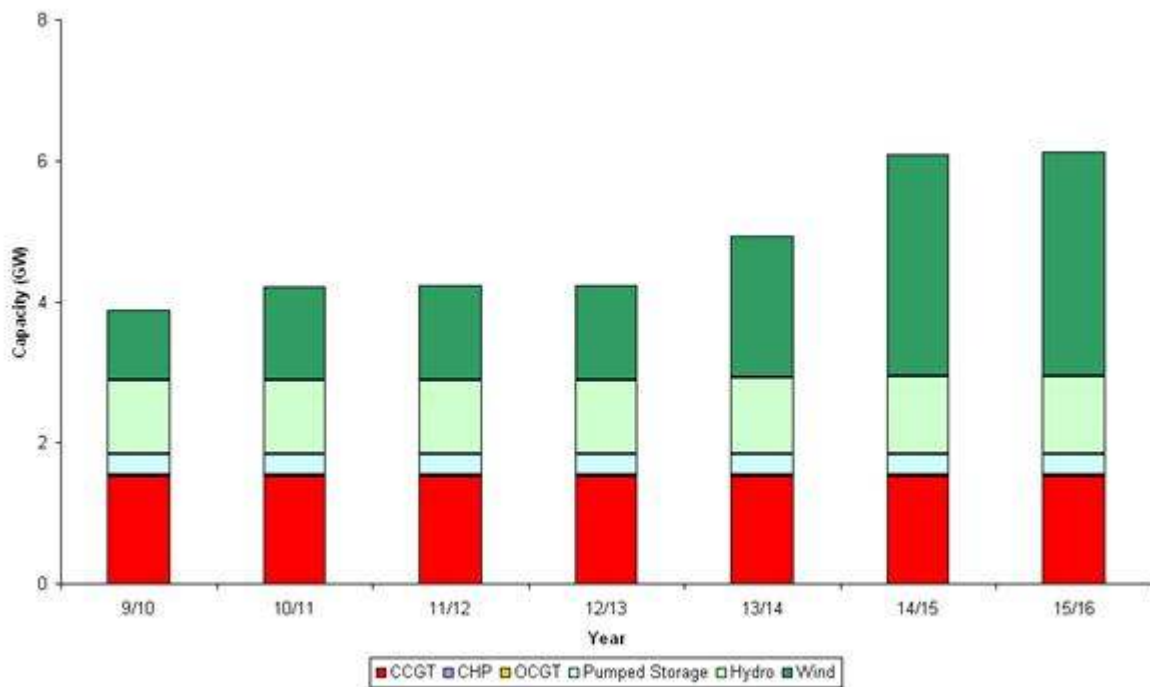
Torness site have talked publicly about the scope for a phased extension as far as 2040.¹²

32. What this means is that, unless the lives of the current stock of coal-fired and nuclear power plant are extended, the Scottish electricity system will see a loss of 1,152 MW in 2015, a further reduction of 820 MW of capacity in 2016 and possibly an additional loss of 1,230 MW in 2023.

33. It should be noted that there is an issue in relation to the CCGT plant at Peterhead, which has a station capacity of 2,370 MW but current transmission constraints limit use to only 1,540 MW at any one time. It is not clear if, and by when, such constraints could be removed.

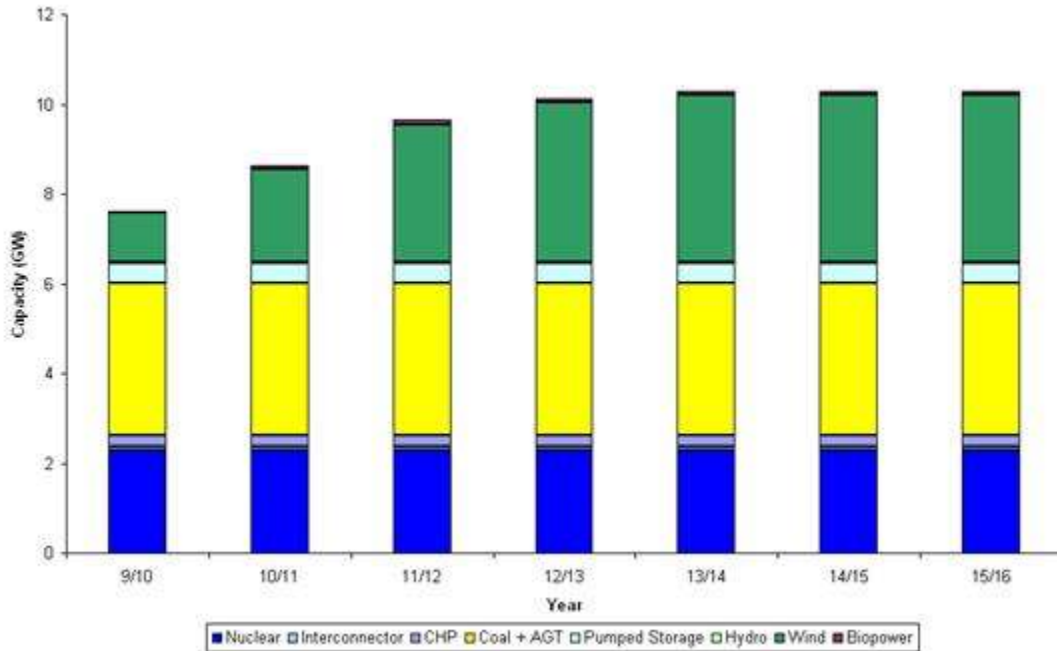
34. Figures 7 and 8 set out the expected generating mix for both the north of Scotland area (SHETL) and in the south of Scotland (SPT) based on National Grid's most recent seven year statement. This takes into account current plant mix, expected closures, new plant under construction etc.

Figure 7: Plant type in the SHETL area (2009/10 to 2015/16)



Source: National Grid, GB Seven Year Statement, 2009

Figure 8: Plant type in the SPT area (2009/10 to 2015/16)

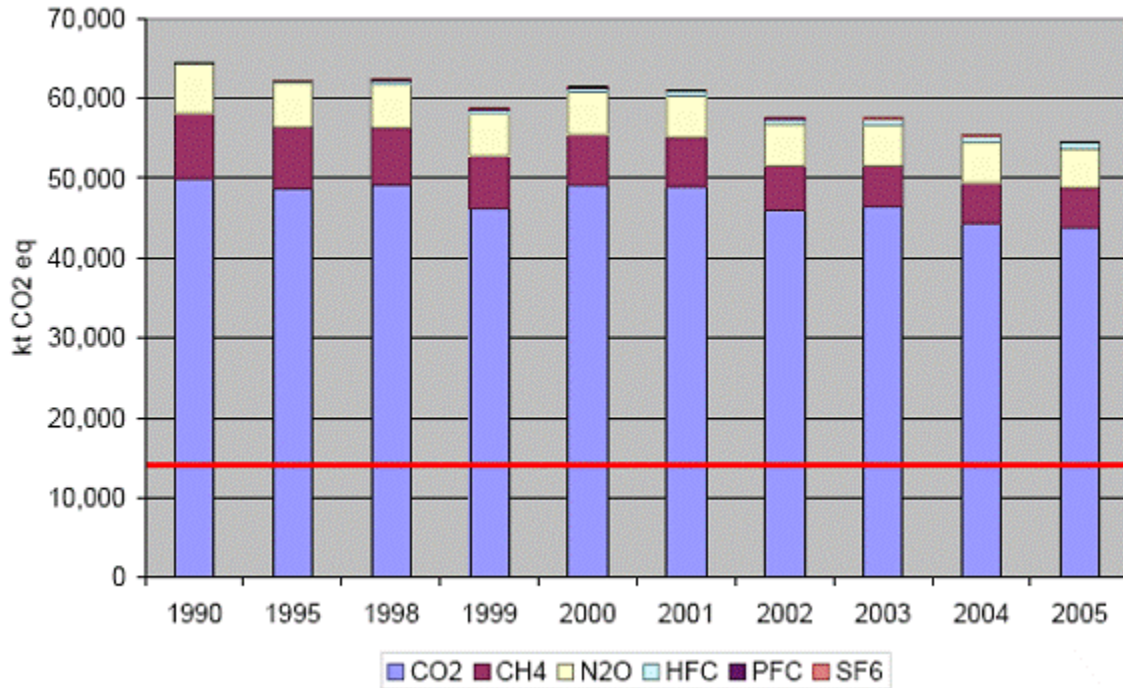


Source: National Grid, GB Seven Year Statement, 2009

Climate change and greenhouse gas emissions in Scotland

35. Until relatively recently, emissions of greenhouse gases, such as carbon dioxide (CO₂), were decreasing in Scotland. The average decrease in CO₂ emissions in Scotland since 1990 has been 1.23% though the latest figures showed a 5.4% increase between 2005 and 2006¹³. Figure 9 below shows the observed trends in Scottish greenhouse gas emissions from 1990 to 2005. The red line in Figure 9 shows the effect of an 80% reduction in Scottish greenhouse gas emissions (relative to 1990 emission levels).

Figure 9: Net Scottish greenhouse gas emissions¹⁴



Key: CO2 (carbon dioxide) CH4 (methane), N2O (nitrous oxide), HFC (hydrofluorocarbons), PFC (Perfluorocarbons) and SF6 (Sulphur hexafluoride)

Source: Scottish Government

36. In terms of CO2 emissions only, of the approximately 45 Mt of the gas emitted each year in Scotland (based on 2005 figures), around 14 Mt of CO2 (slightly below one-third) are from the Scottish electricity system.¹⁵ Other significant emitters are industry, residential, agriculture and transport.

Employment and economic benefits

37. The final set of core statistics presented here relate to the employment and economic contributions of the energy sector. According to Scottish Enterprise, between energy production and generation, some 100,000 highly skilled people are employed in approximately 2,000 businesses ranging from multinationals, large Scottish global companies, and a highly regarded small to medium enterprise base.¹⁶ More recent statistics from the Scottish Government put the employment figure at around 160,000 workers in the energy sector in Scotland (approximately 6-7% of the workforce in Scotland), with some 145,000 of these in the oil and gas sector (around 30,000 of which are offshore) spread between around 2,000 firms and upwards of 12,000 employees in the major power generation companies in Scotland.¹⁷

38. In the most recent statistics provided, the Scottish Government cites a figure of 40,700 people employed in the energy sector.¹⁸ Clearly, therefore, there is

great disparity between all of these figures, perhaps accounted for by different definitions of “numbers employed”.

39. In terms of renewable energy technologies, the current members of the industry’s main trade association employ around 2,600 people in Scotland.¹⁹ Of this total, nearly 1,100 are employed in wind energy, 620 in hydro, 190 in wave and tidal and 150 in micro-generation.²⁰

40. According to the previous Scottish Executive, the energy industries in Scotland account for around 12% of our national production gross domestic product (GDP).²¹ The new Scottish Government puts this figure at 5% (without oil and gas extraction included) or 23.2% (with oil and gas extraction included) in 2006.²² At a UK level, the oil and gas sector contributed around 2.4% of GDP in 2007, the electricity industry contributed around 1%, the gas industry around 0.3%, coal just under 0.1% and the nuclear industry around 0.1%.²³

41. Investment levels (provisional) for 2007 were, at a UK level, £4.5 billion (at 2003 prices) in the oil and gas industry, just over £3 billion in the electricity industry, nearly £15 billion in the gas industry²⁴, £0.11 billion in the coal sector and no investment from the nuclear industry (due to the disposal of assets being recorded as negative according to the conventions in national accounting).²⁵

42. It is important to recognise that these investment figures are a yearly snapshot. In terms of trend data²⁶—

- In 2007, investment by the oil and gas industry was 12% lower than in 1995, at constant 2003 prices.
- In 2007, investment by the electricity industry was more than twice the level than in 1995, at constant 2003 prices.
- In 2007, at constant 2003 prices, investment by the gas industry was 84% higher than in 1995 and was nearly three times higher than in 2005.
- Investment in the coal industry fell in the late 1990s. It rose again in 2000 and 2001, reaching its highest level since 1996 at £161 million. It has generally fallen since.
- Investment by the nuclear sector has generally turned negative in the last three years, falling from a high of £0.6 billion (in 2003 prices) in 1999.

In summary

43. As indicated previously, there are other more detailed analyses of energy statistics in Scotland than that provided in the brief overview above. However, the key messages that should be taken from the facts and figures presented above are as follows—

- The oil and gas sector dominates the energy sector in terms of primary energy production, followed to a lesser extent by nuclear, coal and

- furthermore by renewable energy. Even after all targets for renewables are met in 2020, around 70% of primary energy needs in Scotland will come from oil and gas;
- In terms of consumption, the key sectors in descending levels of energy use are the domestic, transport and industrial sectors. In terms of the former, energy for space and water heating is a major use of our resources (particularly using gas, oil and electricity);
 - In relation to electricity, nuclear and conventional coal-fired power plants currently dominate the provision of 'base-load' generation.²⁷ Load-following²⁸ and peak supply²⁹ is provided mainly by gas- and oil-fired power plant and renewables;
 - The demand for energy use in Scotland continues to grow, with year-on-year increases in the domestic and transport (particularly for road and aviation) sectors, and in some parts of industry;
 - The growth in the penetration of renewable energy technologies has been marked in recent years although this has been dominated by on-shore wind. In terms of future potential, however, offshore wind, wave and tidal power could be more dominant a few years hence if the power can be harnessed and distributed;
 - The age profile of the current generation of power plants in Scotland means that, unless the lives are extended for a further period, the Scottish electricity system will see a loss of 1,152 MW of capacity in 2011, a further 820 MW in 2016 and an additional 1,230 MW as early as 2023;
 - In terms of new plant, the Scottish Government suggests that some 5.5-6.0GW of new renewables is expected to be in place by 2011 and that carbon capture and storage plant would, according to ScottishPower, be operational no earlier than 2014-15. In its recent climate change delivery plan, the Scottish Government suggest that 2013-2015 is the expected timescale for carbon capture and storage plant.³⁰
 - Scottish emissions of greenhouse gases, primarily carbon dioxide, methane and nitrous oxide, have, until recently, been falling although they are now increasing. The electricity system in Scotland accounts for a little under one-third of emissions, with energy use in transport also a major component;
 - Scotland's energy industries are major employers and provide a substantial contribution to the UK's economy and a disproportionate contribution to the Scottish economy.

44. The above statements have been influential in shaping the key issues that the Committee has concentrated on during our inquiry. In short, by providing a focus for where the greatest effort is needed and where the main challenges and policy choices lie.

THE POLITICAL AND POLICY LANDSCAPE

Background

45. The political and public policy landscape for energy is a complicated one. In addition to the devolved competences of the Scottish Parliament, Scotland's energy policy is influenced by developments at both the UK and European Union levels. Additionally, in respect to climate change, energy supply and use in Scotland is shaped by inter-governmental agreements such as the United Nations Framework Convention on Climate Change whose members next meet in Copenhagen in December 2009 to consider a successor to the Kyoto Protocol.

European Union energy and climate policy

46. The energy sector in Scotland cannot be seen in isolation and its workings are shaped to a significant degree by EU legislation and policies. The EU is also a source of much of the investment and resources available for research, development and deployment of new energy technologies as well as the finance provided for energy projects through bodies such as the European Investment Bank (EIB).

47. At the EU level, there are three main drivers of energy policy, namely³¹—

- *Market Competition:* The EU has set the goal of creating a single, integrated EU market in gas and power with the intention of improving competition and driving down prices for energy consumers. A series of directives over the last decade have sought to progress this goal, leading to the full opening of gas and power markets in most jurisdictions and the gradual separation of monopoly transmission networks from competitive production and supply activities. As part of its drive to create an integrated regional market, the EU is encouraging the development of infrastructure interconnections between neighbouring countries. One area of great interest to Scotland is the potential for a 'North Sea grid'.
- *Security of Supply:* Indigenous European oil and gas production is in decline (with the current exception of Norwegian gas, although perhaps not on a continuing basis) as North Sea fields reach maturity. In addition, the installation of gas-fired power plants across Europe is driving a growing overall reliance on gas in the energy supply mix. As a result, the region is becoming increasingly dependent on energy imports, most notably Russian gas. Recent disruptions in oil and gas deliveries to Europe as a result of conflicts between Russia and former-Soviet transit states have highlighted the issue of Europe's energy security, and prompted the EU to push for a diversification in energy suppliers and supply routes.
- *Environment:* The EU has made combating climate change a key focus of its energy policies, driven by its responsibilities under the Kyoto Protocol and its desire to be a global leader on the issue. Its key policies to reduce carbon emissions include the Emissions Trading Scheme (ETS), and the

generation via the Large Combustion Plant Directive (LCPD), which caps the release of nitrous oxides and sulphur dioxide into the atmosphere.

The United Kingdom

48. The United Kingdom Government is also a major influence on the Scottish energy sector. Under the Scotland Act 1998, regulation of the main energy sectors is reserved to the UK Parliament. In particular, Schedule 5 of the Scotland Act defines reserved matters under the heading of Energy and includes a variety of issues, namely—

- Electricity - generation, transmission, distribution and supply of electricity;
- Oil and Gas - including the ownership of, exploration for and exploitation of deposits of oil and natural gas. Offshore installations and pipelines, liquefaction of natural gas and the conveyance, shipping and supply of gas through pipe;
- Coal - including its ownership and exploitation, deep and opencast coal mining;
- Nuclear energy and nuclear installations - including safety, security and safeguards;
- Energy conservation.

49. However, there are certain explicit exceptions to these reservations, which enable the Scottish Parliament to legislate in relation to the promotion of energy efficiency. In addition, a range of other matters, relevant to the provision of energy supplies, are devolved, such as the systems of planning control and environmental controls. Scottish Government Ministers also exercise relevant functions which have been "executively devolved" under Section 63 of the Scotland Act 1998. These functions include the promotion of renewable energy, consents for power stations and overhead electricity lines and approvals for major land-based gas pipelines.³²

50. Some of the key UK Government policies that have been a feature of the Committee's inquiry include—

- EU Emissions Trading Scheme Phase II and Phase III;
- The Carbon Emissions Reduction Target scheme and its update;
- The UK Energy Act 2008;
- UK Carbon Capture and Storage demonstration programme;
- The role of the energy regulator, Ofgem, and its policies in relation to the transmission system;
- The development of offshore wind, wave and tidal energy and the role and policies of UK bodies;
- The UK Government's target to source at least 15% of electricity for use on the Government estate from combined heat and power (CHP) by 2010;
- The Renewables Obligation and proposals for change.

The Scottish Parliament, its devolved competences and the policies of the Scottish

Government

51. As stated above, energy and associated issues such as climate change are in many respects often partly reserved and partly devolved. Although “energy policy” is a reserved function, the Scottish Government has recently set out “an overview” of its own energy policy in a document published to coincide with the start of the Committee’s inquiry.³³

52. The central principles behind the Scottish Government’s energy policy are as follows—

“The main objective as far as Energy is concerned is to progressively increase the generation of renewable and clean energy, to migrate Scotland away from a dependence on nuclear energy.

The secondary goal is to increase the overall impact of energy generation and related activity such that Scotland not only maximises energy exports but also maximises the retention of wealth from that activity and also from the development of skills, intellectual property rights and manufactured products.”³⁴

53. The Scottish Government’s energy policy overview provides a helpful summary of some of the legislative framework that will drive the development of the energy sector in Scotland for decades to come and the various Scottish Government backed policies and initiatives that are currently in place. The merits of the Scottish Government’s energy policy are discussed at length elsewhere in this report.

54. On the legislative front, a series of targets have, or are likely to have, if the relevant legislation is passed, been set by the Scottish Government, namely—

- A statutory target to reduce the emissions of CO₂ by 80% by 2050 and an interim target of 42% by 2020 (relative to 1990 levels), as set out in the recently passed Climate Change (Scotland) Bill;³⁵
- A target (in line with EU legislation) for 20% of energy use in Scotland to be provided by renewable energy resources by 2020;³⁶
- In terms of heat produced from renewable energy sources, the Scottish Government will aim to provide 11% of heat such forms of energy by 2020;³⁷
- For electricity as a whole, the Scottish Government has a target of producing 50% of Scottish gross consumption³⁸ of electricity from renewable energy resources by 2020, with an interim ‘milestone’ of 31% by 2011.³⁹ This target has been expressed elsewhere in Scottish

- Government publications as 50% of generation. The figure of 50% is equivalent to 8.4GW of installed capacity;
- A target for a 30% reduction in emissions of greenhouse gases from both new housing and non-domestic buildings by 2020;⁴⁰
- An existing statutory target to eliminate fuel poverty in Scotland by 2016.⁴¹

55. Outwith legislation, the Scottish Government is also a major influencer of the workings of the energy sector through a range of policies and initiatives, including—

- *Support for technology* – through the programmes within bodies such as the enterprise agencies, Scottish Development International, Intermediary Technology Institutes etc;
- *Funding* – through the support provided community-scale and micro-generation technologies, contributions to The Carbon Trust and Energy Saving Trust, loans for small- and medium-sized enterprises, a central energy efficiency fund for the public sector and the new energy assistance package;
- *Technology prizes* – through competitions such as the Saltire Prize and the energy efficiency design awards;
- *Infrastructure development* – provision of funding for scoping studies looking to develop improved energy infrastructure between Scotland and Ireland/Northern Ireland and also Scotland and neighbouring nations in the North Sea;
- *Consents* – the Scottish Government has a major role in relation to consents for energy developments above a certain size.
- *Other initiatives* – such the national planning framework, streamlining of planning policies for renewable energy projects etc.

The challenges in context

56. The political and public policy landscape outlined above places immense challenges on the Scottish energy sector. Meeting the various legislative targets and goals will require significant adjustments to be made and for substantial investments of many billions of pounds to be made. To place these challenges in context, it is worth outlining what some of the above-mentioned objectives mean in reality.

Climate change

57. Now passed, the statutory targets set out in the Climate Change (Scotland) Bill for reductions in CO₂ emissions by 2020 and 2050, as well as the corresponding annual targets, will require significant effort. As Figure 9 shows, the figures for CO₂ emissions alone in Scotland have fallen from approximately 50 Mt to 45 Mt between 1990 and 2005 (a 10% fall compared to 1990 levels over this 15-year period). The target set out in the Climate Change (Scotland) Bill for

an 80% reduction by 2050 will require emissions to fall to a little under 15 Mt CO₂ equivalent. **The current trajectory for emissions reductions (based on the trend between 1990 and 2005) is not sufficient to meet this statutory target in Scotland.**

Energy and electricity targets

58. The Scottish Government has said that it wishes to see 50% of Scottish electricity generated by renewable sources by 2020, with a milestone of 31% by 2011. That interim milestone (only 2-years away) is

2007.⁴⁹ **The challenge is how this loss of capacity over the period between 2011 and 2023 can be compensated for.**

Social targets

63. The Scottish Government has also inherited a target set out in previous housing legislation to eliminate fuel poverty by 2016; fuel poverty being defined then as a household spending more than 10% of its income (including benefits or mortgage income support) on all household fuel use.

64. Based on Scottish Government figures, 35.6% of Scottish households were in fuel poverty in 1996, falling to 13.4% by 2002 but rising again to 25.3% by 2007⁵⁰. **Therefore, given the pledge of eliminating fuel poverty by 2016, this situation looks immensely challenging.**

In summary

65. The contextual analysis provided above is not designed to be critical of the performance of Scottish administrations, past or present, but to indicate the scale of the challenges ahead if these legislative targets are to be met. **The size of the investments that will be required in the energy sector to meet these objectives is immense.**

66. For example, in its report, the Scottish Council for Development & Industry has estimated that Scotland needs £10bn of investment in new electricity generation alone between now and 2020.⁵¹ Similarly, the oil and gas industry's lead trade body – Oil and Gas UK – has told the Committee of the need for the annual investments of nearly £13 billion in the North Sea to continue.⁵² Similarly, to develop the offshore wind potential across the UK, some witnesses suggested that £75 billion of capital expenditure will be required over the next 15-20 years.⁵³ Finally, in relation to fuel poverty, the Scottish fuel poverty charity – Energy Action Scotland – has said that that a 10-year investment programme of £170 million per year for the years up to 2016 (or £1.7 billion in total) was needed to attempt to bring all homes in Scotland up to a reasonable energy efficiency level⁵⁴.

SCOTLAND'S ENERGY FUTURE – OUR VISION

Introduction

67. At the outset of our inquiry, the Committee's key objective was to spell out our vision of Scotland's energy future. Our vision is not one of a series of possible scenarios that Scotland may like to follow in the years to come. Rather it is our considered view, after nearly 12 months of evidence-taking and substantive deliberation, of what Scotland's energy future should be.

68. There are many studies available which set out competing or alternative scenarios for energy supply and use in Scotland and which look at the technical or economic potentials of different types of energy technology. This is not such a study.

69. This inquiry report is a 'once in a parliamentary session' look at energy and the decisions that require be taken by the Scottish Parliament to realise our vision for the future.

70. We are confident that the Scottish Parliament and its committees will not be in a position within this current parliamentary session through to May 2011 to look again at the issue of energy in the level of detail that we have done. Therefore, given the pressures that are growing in the energy sector with impending power station closures, the climate change imperative, the need to realise the economic opportunities offered by this sector etc., this report is designed to provide clarity and certainty in terms of the way forward.

71. In short, our aim is to provide a vision of what Scotland's energy future should be, not what it could be. As such, our vision of Scotland's energy future is based on a series of equally important goals and premises that we consider must be at the very centre of our policy going forward. It is a measure of our determination to bring forward a clear and agreed vision that the Committee divided on only one issue in completing this report.

Building an efficient system

72. The Committee believes that Scotland's energy future has to be one where the concept of efficiency, in the broadest sense of the word (i.e. meaning not just energy efficiency), is embedded at the very core. This means that the focus of Scotland's energy policy has to be on building a system where efficiency is maximised in all respects.

73. In practical terms, this means that the Committee rejects the premise that energy consumption must, in any vision of our future, be allowed to continue to grow inexorably come what may. In a time of economic recession and with existing resources of fossil fuels finite, it is essential to build a society where we aim to supply and use energy as efficiently as possible.

74. Energy efficiency has long been described as the Cinderella of energy policy. The Committee believes that this is no longer tolerable and seeks appropriate shifts in the public policy landscape.

75. Similarly, our goal of efficiency means that the public policy and legislative framework has to be radically overhauled to be as efficient and co-ordinated as possible. By this we mean that we simply have to take the necessary steps to

build, for example, an efficient planning and consent system, and a coherent legislative and institutional landscape etc.

76. Our goal of efficiency also means providing a regulatory approach that reduces the current deficiencies in our energy sector, such as the need to move away from high carbon-content technologies, reduce the excessive generation and transmission losses, tackle grid constraints, eliminate the investment or fiscal disincentives hindering the efficient use of our indigenous energy resources in the North Sea or Scottish wind, wave and tidal resources etc.

Environmental sustainability

77. The Committee's next goal (in addition to efficiency maximisation) is that of environmental sustainability (or the minimisation of environmental damage). This means that we want to see a goal within Scotland's energy future where the environmental impacts of energy production, its distribution and use are minimised.

78. In doing so, we fully accept the premise that in realising this goal, there will be trade-offs between climate change objectives and other environmental issues such as visual amenity etc., although a balance will need to be struck at all times. However, it is time for decision-makers to face up to the reality that there is no such thing as a 'free lunch' when it comes to our energy choices. The core premise behind our second goal is that Scotland simply has no option but to respond to the climate change challenge and to meet the proposed 80% emissions reduction target by 2050.

Social justice

79. Our next goal is that of an energy system that delivers 'social justice' in our society. The Committee's vision for Scotland's energy future is one which sees radical steps taken to eliminate fuel poverty by 2016, keep prices affordable for our industry (and thus keep them competitive) and for the householder to be incentivised to install newer technologies.

Maximising the economic and employment opportunities

80. The last, equally important goal, in the Committee's view, is to support the transition to an energy system that delivers real and sustained economic and employment benefits for Scottish businesses and communities going forward, creating opportunities to increase the wealth generated from this sector of the economy (especially by seizing 'first mover' advantage for newer technologies), creating and sustaining jobs and employment in new sectors (e.g. marine renewables, cleaner coal technologies etc) and in some existing parts of the energy industry (e.g. offshore, deep water oil and gas expertise). The premise is that some of the older energy industries (e.g. conventional coal) are in decline

and will have to be replaced in time by newer opportunities, especially where Scotland can steal a lead on our competitors.

Our future energy system

81. In practical terms, translating the Committee's four central goals in our vision of a future energy system into what this would mean in practice is set out below.

Primary energy production

82. The Committee wants to see the continued development of Scotland's oil and gas resources in the North Sea in order to maximise the economic and employment benefits in the remaining decades to come and to further develop the tradable skills and competences in deep-sea exploration and production, transport and storage of carbon, decommissioning etc that can sustain this sector after the North Sea itself is depleted.

83. We also want to see increased diversification in the oil and gas sector towards marine energy, particularly offshore wind in the short-term, especially amongst the major, tier 1 companies. We would encourage those companies that have recently withdrawn from such investments to reconsider the opportunities on offer in Scotland.

84. Additionally, the Committee wants to see the proportion of primary energy production provided by renewables markedly increased in line with the challenging targets for the contribution of renewables (in the form of heat, electricity and transport fuels) to demand. This means taking bold decisions to provide for step changes and an acceleration of take-up of offshore wind and marine energy (wave and tidal), sustaining the current rate increases in the consents and construction of other forms of renewables and all the associated infrastructure requirements etc. (e.g. Beaulieu-Denny line and other transmission links).

Energy conservation

85. Before considering how best to meet future demand, the Committee wants to see a radical shift in policy towards energy efficiency and for substantial investments of resources in initiatives which focus on maximising the efficiency of supply and consumption of energy. These steps should be first in the hierarchy of priorities within a Scottish energy policy.

Meeting future energy demand

86. Having stated our view that we must place efficiency at the top of the hierarchy, the next key areas within the Committee's vision for Scotland's energy future are the efforts that need to be taken to tackle our use of heat, address

energy consumption patterns in the transport system and finally tackle the supply and use of electricity in Scotland.

87. In terms of heat, this means that it is imperative that we address the current waste of most of the excess heat produced in our energy system by making investments in far more efficient forms of environmentally friendly heat and power production.

88. For transport this means tackling the problems caused by a worrying growth in energy consumption in this sector and the corresponding emissions of greenhouse gases.

89. Finally, in relation to our future electricity system (in terms of generating mix), the Committee is of the view that we want to see Scotland move to an electricity system that meets the following criteria.

90. Firstly, a Scottish electricity system that ensures electricity supplies are consistent to meet future needs and that the choices of technologies minimise the environmental impacts and enable Scotland to meet its statutory targets in terms of climate change, fuel poverty etc. As such, the Committee fully supports the various climate, energy, environmental and social targets and legislative requirements that are in place, or are planned, in Scotland and we want to see an electricity system that provides the means of meeting these goals.

91. However, on the basis of the evidence received, the Committee recognises that some of the alternatives to the current means of producing electricity, such as cleaner coal-fired power stations equipped with carbon capture and storage or marine renewables off Scotland's coasts are not yet proven and will take some time to develop and will not be fully realised before some of the current generating stock is due to retire.

92. Consequently, the Committee accepts that there will be a need to extend the operating lifetimes of the current generation of nuclear power stations in Scotland to allow time for the transition to a new electricity system. Such extensions should only be permitted if the necessary safety audits prove that this is viable.

93. Secondly, the Committee wants to see a greater emphasis towards the decentralisation in our electricity system. This means putting in place policies to provide a marked increase in individual, community and municipal-scale production, distribution and use of electricity and heat through, for example, micro-generation, biomass-fired CHP-district heating systems etc.

94. The Committee accepts the need, however, in the short to medium-term for larger, centralised base-load and load-following plant albeit at potentially lower levels of installed capacity if demand falls through active efficiency and conservation measures and greater decentralisation.

95. The Committee agrees that any such base-load and load-following plant should minimise its environmental impact (especially CO2 emissions), be as efficient as possible (i.e. provide for little or no heat waste), provide for affordable electricity prices and provide for significant employment creation opportunities.

96. Finally, the Committee agrees that the transmission and grid infrastructure system requires massive investments in line with the recent Electricity Networks Supply Group (ENSG) report⁵⁵ in the short- to medium-term, coupled with efforts to develop more localised systems that facilitate increased individual, community and municipal-scale production, distribution and use of electricity.

The nuclear question

97. The Committee is well aware that one of the most contentious aspects of the energy debate is that of support, or otherwise, of nuclear power and the issue of whether it is necessary in terms of meeting future energy needs to consider building a new generation of nuclear power stations in Scotland as the current plants reach the end of their operable lives from, based on current plans, 2016 onwards.

98. The dilemma is whether Scotland should embark on a policy of seeking to reduce the demand for energy, invest substantially in renewable technologies and consider moving towards a marked increase in new forms of cleaner coal technology with carbon capture and storage technologies in time for the expected closure of the current generation of power stations in Scotland.

99. The Committee agrees that Scotland does not need a new generation of nuclear power stations to be constructed and sees Scotland's energy future as one that seeks to increase markedly investments in energy efficiency, in renewable energy, in cleaner renewable or fossil-fuel fired thermal plant, such as combined heat and power and district heating, energy-from-waste plants and which, if necessary, supports the construction of a new generation of larger fossil-fuel fired plants with carbon capture technologies. We consider the benefit from Scotland's place as part of a wider UK and eventually EU network as sufficient to manage any surplus or deficit issues.⁵⁶

100. The Committee's four goals – efficiency maximisation, environmental damage minimisation, socially just and wealth and employment creating – thus form the very core that underpins our vision of Scotland's energy future. The question is, however, once articulated, how is the vision to be realised and what decisions are necessary to be taken by the Scottish Parliament? This is the subject of our action plan which follows.

CONCLUSIONS AND RECOMMENDATIONS – THE POLITICAL ACTION PLAN

Introduction

101. Prior to the start of the Committee's inquiry, a leading energy industry figure told a conference of business leaders, ministers and parliamentarians that what was desperately required, in his view, was for the Scottish Parliament to spell out its vision of Scotland's energy future and, critically, its delivery plan.⁵⁷ He did not want an inquiry that analysed what the problems were or what the various targets and objectives should be.

102. He simply wanted the Scottish Parliament and the Scottish Government to accept the stated targets, for example, to reduce the emissions of greenhouse gases by 80% by 2050, to increase the use of renewable energy technologies to provide 50% of the electricity generated in Scotland by 2020, with a milestone of 31% by 2011 etc., and to spell out a political action plan for taking the necessary decisions.

103. This view was articulated in much of the evidence this Committee has received during the course of our near year-long inquiry. The desire for a clear and concise vision of Scotland's energy future and for a plan which provides for a consistent and stable framework to incentivise the substantial investments required in the energy sector, was a central theme in much of the evidence received.

104. The Committee believes that our conclusions and recommendations provide such a plan. Together the package of policies proposed provide a blueprint for decision makers over the months and years ahead if our vision of Scotland's energy future as set out previously is to be realised.

From vision to plan

105. In translating our vision of Scotland's energy future into our political action plan, the Committee makes the following package of recommendations which taken together form our plan.

106. This plan does not necessarily provide all of the fine, technical details of any initiatives that the Committee calls for. This is deliberate as what we believe is necessary from this inquiry is an unambiguous and concise statement of the political decisions that need to be made.

Energy policy, targets, legislative framework etc

107. The Committee has spelt out its vision of Scotland's energy future in the preceding section. We believe that this is the policy that will be required to meet the various targets for emissions reduction and the accelerated take-up of renewable technology; targets and goals that we wholeheartedly support and endorse.

Tackling energy consumption, keeping energy prices affordable and tackling fuel poverty

108. The Committee calls on the Scottish Government in the forthcoming budget round to consider substantially increasing resources for an area-based, targeted energy efficiency/conservation programme designed to tackle fuel poverty and reduce energy demand. Such a programme should have an emphasis on technologies suitable for the Scottish building stock, for concentrations of fuel-poor households in urban areas and for our off-gas-grid and rural areas. It should also involve a programme of home visits to provide advice rather than rely on helplines. The size of the investment could be in the order of £100-170 million per year over the next decade to come, with spending targeted on the basis of a geographical mapping of fuel poverty needs.

109. The Committee welcomes the recent announcements by the UK Government in its April 2009 budget and calls for a rapid acceleration of the proposed roll out of smart meters, with significant financial investment in an educative element to ensure people and businesses adopt and best use these technologies. We note, however, that further consultation is being planned and we believe that this must be completed as soon as possible to provide clear guidance on how smart meters will be delivered.

110. The Committee considers that fuel poverty is a blight on our society, is inconsistent with our goal for a socially just energy system and calls on Ofgem as the energy regulator to take all steps to ensure the transparency of social tariffs and require energy utilities to deliver on these and address problems with pre-payment meters. The Committee calls on Ofgem to take strong financial sanctions where abuses are found.

111. The Committee considers that the Scottish Government must also take substantive steps, with immediate effect, to achieve the sea change required to meet its statutory target of eliminating fuel poverty by 2016. Many of the recommendations we make in this action plan are designed to address this goal.

112. The Scottish Government must seek to work as a matter of urgency with the UK Government to tackle the shortcomings of the CERT scheme in Scotland which, as designed, does not best meet the challenges of Scottish building stock and the particular needs of off-grid and remote households. This might include a separate Scottish co-ordinating or delivery unit, with (executively) devolved responsibilities.

113. The Committee reaffirms its call on the Scottish Government for a rapid publication of its detailed energy efficiency action plan. Delay beyond 2009 is not acceptable.

114. The Committee believes that there is a need to take a more holistic approach to industrial and commercial energy usage and provide greater support and incentives to this sector to improve its energy efficiency. Indeed, the Committee is of the view that the efficient use of energy in this sector will be vital to minimise the effect of any future increases in energy costs on production and services in the Scottish economy. The Committee therefore calls on the Scottish Government to consider, in the next budget round, how measures such as Loan Action Scotland and the Renewables Obligation Certificates can better support the industrial and commercial sector to improve its energy efficiency.

115. The Committee is concerned that the results of Audit Scotland's recent work has uncovered a lack of a public sector lead in championing energy efficiency, a paucity of quality consumption data and too few energy managers/champions in senior, decision-making positions. This is a matter that requires immediate action from the Permanent Secretary in the Scottish Government and the chief executives of non-departmental public bodies, agencies and local government etc. The Committee requests a report from the Permanent Secretary within 2009 on what steps will be taken.

116. The Committee welcomes the progress that has been made in tackling the poor energy efficiency standards in buildings and notes the provisions in the Climate Change (Scotland) Bill, many of which have been improved through amendments made by this Committee and others. However, the Committee believes that tougher mandatory standards for building energy use are required and that these should be revisited regularly and progressively increased. It is also critical that adherence to these standards is monitored and enforced. The Committee considers that a greater use of energy service companies (ESCOs) should be explored as a means of promoting energy efficiency in both public and private buildings. The Committee believes that the Scottish Government should complete a study on this matter before the summer of 2010.

117. The Committee believes that a more streamlined approach to promoting energy efficiency would benefit individuals and businesses. It calls for the Scottish Government to examine the roles of all of the bodies active in the field with a view to determining whether they could either be merged or, in the shorter-term, encouraged to work more closely together.

Further developing renewable energy technologies

118. The Committee believes that it is critical that the Scottish Government accelerates the process to provide consent for strategic infrastructure developments in Scotland's electricity system. Central to this is a positive decision to provide a go-ahead for the Beaulay-Denny line within the next few months and other associated schemes such as Beaulay-Dounreay etc. Such a

decision must not be associated with unrealistic planning conditions that would have the effect of causing unnecessary delays or placing this critical component of Scotland's network in jeopardy. The Committee believes that the prize of unlocking the renewable energy resources in the north of Scotland is one that must be realised. The Committee welcomes the more strategic approach to developing grid infrastructure that was evident in National Planning Framework 2, but calls on the Scottish Government to further develop this and produce an associated delivery plan in the year ahead.

119. In our view, the existing grid infrastructure within Scotland and from Scotland to England is the first priority. We are supportive of strategic developments that can allow Scotland to export energy in directions other than just south of the border. The Committee is cognisant of the various proposals being considered for developing offshore grids, notably the sub-sea cables from the islands to the mainland, down the West and East coasts and the Northsea supergrid.

120. Building on any work already undertaken, the Committee calls for an audit of the other infrastructure, particularly harbour facilities that will be required to deliver wave and tidal energy and offshore wind energy in the future and for an associated delivery plan to be produced by summer 2010.

121. The Committee is disturbed at the evidence received in relation to the current and planned charging and access regimes to the transmission networks. It is particularly concerned that this is already undermining the viability of renewable energy developments in Scotland and could act as a major inhibitor to growth in this sector. The Committee supports the calls from the Scottish Government and the various energy utilities in Scotland for Ofgem and others to substantially rethink their planned charges.

122. The Committee is seriously worried that public bodies are continually failing to address the problems in the planning system. The Committee calls on the Scottish Government to work with local government to identify and if necessary provide additional funds in the next budget round that will substantially increase the numbers of planning officers specialised in renewable and other energy technology applications and the skills base of these officers.

123. The Committee calls for the establishment of a 'pooling' arrangement to share expertise across those organisations with a decision-making or regulatory role in the consent process.

124. The Committee calls on the Scottish Government to consider how community benefits from onshore and offshore renewable energy developments can be further promoted, drawing on the examples of favourable financial and regulatory regimes that exist within the oil and gas funds in Orkney and Shetland and in other countries. The Committee suggests that the Scottish Government

order to ensure that they fit with the Scottish Government's own commitments to reduce carbon emissions.

131. The Committee is concerned by the level of consent refusals, especially in relation to onshore wind. It calls on all the relevant authorities to be far more positive in relation to the planning and consents system and to accelerate agreements for projects within our energy sector.

Heat, including combined heat and power and energy-from-waste

132. Given that heat accounts for the majority of our energy demand in Scotland, the Committee supports a marked increase in investment in combined heat and power plants, particularly those using renewable fuels and those combined with district heating. The Committee believes that biofuels, as well as increased waste combustion, could play an important role in delivering more combined heat and power. This, however, must be in line with the waste hierarchy where efforts are made first to reduce, reuse, recycle and recover the energy contained within the waste. The Committee believes that only material that does not fall into one of these categories should go to landfill.

133. The Committee calls on the Scottish Government to carry out immediately a "heat-mapping" exercise in order to assess how combined heat and power and energy-from-waste could be most efficiently and effectively developed in Scotland.

134. The Committee recommends the rapid introduction of heat initiatives modelled on the renewable obligation certificates and the consideration of financial incentives, including local taxation or non-domestic rate rebates, for renewable heat installations.

135. The Committee calls for the Scottish Government to conclude its consultation on section 36 (of the Electricity Act 1989) consents as soon as possible and to use this opportunity to accelerate the take up of district heating associated with power stations. It should no longer be acceptable for a power station to be built without consideration of how to use its waste heat either through such technologies or in some form of localised heat network.

Transport matters

136. Given that transport does not fall within the remit of the Committee, the Committee limits its calls for action in this key area to highlighting the need for a comprehensive strategy to address the development and delivery of more sustainable transport as well as a reduction in energy consumption. The Committee considers that this is particularly critical given Scotland's dependence on oil and its consequent vulnerability to increases in the price of oil.

137. Whilst a matter for that committee, the Committee considers that the Transport, Infrastructure and Climate Change Committee may like to investigate this area in this or perhaps the next session of Parliament as a priority.

Supporting the oil and gas industry including diversification and skills development

138. The Committee calls on the Scottish Government and other public bodies to increase the involvement of oil and gas industry representatives in the various skills bodies (e.g. Scottish Funding Council, sector skills groups, Skills Development Scotland etc) and to promote the model of the oil and gas academy to other industries.

139. The Committee calls on the Scottish Government to work with the relevant parties to urgently remove all the blockages to realising the €40 million EU investment in an offshore wind test centre in Aberdeen.

Supporting newer, emerging technologies, including cleaner coal and marine energy

140. The Committee supports efforts towards achieving a timely development of carbon capture and storage technology, through the EU and UK competitions to demonstrate functioning commercial-scale technology and through the pricing of carbon at appropriate levels. The Committee calls for these competitions to be speeded up as far as possible and fully endorses the proposed project by Scottish Power at Longannet. The Scottish Government should take all steps to support Scotland's case for winning the UK competition.

141. The Committee calls for the Scottish Government to conclude its consultation on section 36 consents as soon as possible and to use this opportunity to drive the development of carbon capture and storage technology.

142. The Committee calls for the accelerated injection of substantial financial resources in the necessary strategic infrastructure development that will be required to develop our marine renewable energy potential (e.g. the need for improved ports, harbours, manufacturing capacity etc). Initial steps should be taken in the next budget round.

143. The Committee calls for the Scottish Government to step in and address the lack of continuity in financial initiatives that support project development, particularly the gap we have identified in development finance that is needed in order to bring projects up to prototype scale. We consider this gap will hinder the development of marine renewable energy. In particular, whilst we welcome the Saltire Prize, it does not fill the gap left by the commitment of all of the funds from the previous Wave and Tidal Energy Support (WATES) scheme and the Committee considers that a successor to this is required.

The nuclear question

144. The Committee accepts that there will be a need to extend the operating lifetimes of the current generation of nuclear power stations in Scotland. Such extensions should only be permitted if the necessary safety audits prove that this is viable.

145. The Committee's majority view on the construction of new nuclear power stations is set out in paragraph 99 above.

Job, skills, exports and economic opportunities

146. The Committee is very concerned, as we were during our inquiry into the tourism sector, at the institutional clutter in the skills and training sectors that are supposed to support the energy industry. The Committee calls on the Scottish Government to spell out how it intends to address this issue and report before summer 2010.

147. The Committee calls for a boost in the resources available to provide for an increase in apprentice numbers and in the number of people with the required technical skills to support the newer, emerging technologies. We also need funding to develop the transferability of skills in employees within existing sectors of the industry, including the nuclear, oil and gas industries.

148. The Committee calls on the Scottish Government in the next budget round to consider increasing the level of support and resources available for the international promotion of Scotland's energy industries. This would include increasing the number of ministerial-led trade missions (hosted by SDI, SCDI and UKTI) and ensuring co-ordination at Scottish and UK levels between these.

149. The Committee supports a call for the UK Government to ensure that the energy sector in Scotland has a sufficient supply of export guarantee finance.

KEY ISSUES

150. This section of the Committee's report outlines some of the main issues that emerged during our consideration of the evidence received. Our analysis of the evidence and the comments made by witnesses has underpinned the Committee's conclusions and recommendations made in the preceding section and the political action plan. Each of the key issues is explored in turn below, namely—

- The political and legislative landscape, energy scenarios and policy options;
- Tackling energy consumption, energy prices and affordability, including eliminating fuel poverty;

- Further developing and deploying renewable energy technologies;
- Grid and transmission issues, including the planning process and community benefits;
- Heat, including combined heat and power and energy from waste;
- Transport matters;
- Supporting the oil and gas industry, including diversification;
- Supporting newer, emerging technologies, including cleaner coal, carbon capture and sequestration and marine energy;
- The nuclear question;
- Jobs, skills, exports and economic opportunities.

The political and legislative landscape, energy scenarios and policy options

151. As outlined in the preceding sections of this report, the political landscape for energy policy is complicated, with a variety of governments and institutions involved, at both supranational and national levels. As a consequence, the policy drivers on energy supply and use in Scotland can be the responsibility of the EU, the UK Government or the Scottish Government. Similarly, the legislative framework contains a raft of directives, acts of various parliaments and regulations.

152. The Committee's inquiry and this report are primarily, but not exclusively, concerned with those aspects of policy and legislation that are devolved. However, during the inquiry itself, there were many occasions when comments were made by witnesses that referred to reserved or EU competences. This material is included in our report as it is impossible to ignore the interconnected nature of energy policy.

Government targets

153. The initial driver for the Committee as to why such an inquiry was needed came from the articulation by a variety of governments of a range of statutory targets and non-binding aspirations, which were aimed at tackling climate change and other issues through recourse to a greater role for cleaner and more efficient technologies and through changing patterns of energy supply and use.

154. The environmental imperative has been shaped in the main through concerns regarding the potential impact of increasing human-induced emissions of greenhouse gases. As the Scottish Government itself states in its preamble for the Climate Change (Scotland) Bill—

“The weight of international scientific evidence highlights the serious and urgent nature of climate change. The Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) is clear that emission of

greenhouse gases caused by human activity is the primary driver of the observed changes in climate.”⁵⁸

155. The Committee agrees with the Scottish Government in this respect, receiving virtually no evidence that disagreed with the premise that human activity is damaging and is causing climate change. As a consequence, much of the debate heard by the Committee focused on the solutions and the policy choices available and not on whether there is a need for action to be taken in the first instance.

156. The key to the Scottish Government’s proposals for the energy sector to help meet the long-term, internationally-driven target of reducing emissions of Kyoto Protocol greenhouse gases by 80% by the year 2050 is “to progressively increase the generation of renewable and clean energy”.⁵⁹

157. The secondary goal of the Scottish Government is to increase the overall impact of energy generation and related activity such that Scotland not only maximises energy exports but also maximises the retention of wealth from that activity and also from the development of skills, intellectual property rights and manufactured products.⁶⁰

158. Underpinning these objectives are a raft of both statutory targets and non-binding aspirations that are set out in preceding sections of this report. The main targets for energy relate to a desire to see a marked increase in the penetration of renewable energy technologies in the energy mix in Scotland. As a headline target, the Scottish Government has said that it supports the EU target of 20% of Europe’s energy requirements being met from renewable resources by 2020.⁶¹

159. A critical aspect of this ‘20% by 2020’ target is that it relates to all energy, not just electricity production. As such, the target is significantly more challenging than would have been the case if the target had related to electricity generation. Furthermore, the target of 20% of energy needs sourced from renewables by 2020 is binding. Finally, as indicated, although the UK as a whole has been set a target of 15% of its energy needs by 2020 as its contribution to the EU target, the Scottish Government has gone further and indicated that it will aim for 20% and not 15% by 2020.

160. The Scottish Government has also set itself targets for renewable energy technologies in both the electricity and the heat sectors. For the former, it has a target of meeting 50% of Scottish demand for electricity from renewable sources by 2020, with a milestone of 31% by 2011.⁶² In terms of heat produced from renewable energy sources, the Scottish Government is aiming to provide 11% of heat from renewable energy sources by 2020.⁶³ Furthermore, according to Scottish Government officials, such targets should be seen as a minimum and there is a “clear vision” to go beyond these figures as new marine and tidal energy comes on stream from 2020.⁶⁴

161. Driving this objective of going beyond the comparable targets in other parts of the UK for renewable energy technologies is the goal of exporting significant quantities of energy from such sources over the decades to come. As one Scottish Government official told the Committee, “export is fundamental to the long-term vision for Scottish energy”⁶⁵ and that—

“In the longer term, from 2030 to 2040, the exports of Scottish energy production could be very significant indeed. We could be talking about exporting something like three or four times our Scottish consumption to England and countries further afield, if the grid ideas that have been discussed come off.”⁶⁶

162. Interestingly, in the majority of the evidence received by the Committee there is strong support for these targets, although not necessarily for the goal of increased exports. What differs, however, are the views on how realisable they are and what are the best policy options to follow.

163. In the case of environmental groups, such as WWF Scotland, the case for such targets and the preferred policy choices of increased energy efficiency and penetration of renewable energy has been made. In his evidence to the Committee, Dr Richard Dixon, director of WWF Scotland, told the Committee that—

“We have done an energy scenarios report, which considers where global energy will come from by 2050. It deals with all sources of energy, not just electricity. It considers a growth in energy demand by a factor of two—a doubling by 2050—and asks how we might supply that energy. From our global work, we conclude that there is enough energy out there, and enough possibilities for energy efficiency, for us to meet the rising demand without resorting to nuclear, and to meet that demand while producing the right kind of reductions in climate change gases.”⁶⁷

164. His view is supported by others, such as Duncan McLaren, chief executive of Friends of the Earth Scotland, who said “in the longer term, the entire Scottish power system can be renewables-based, given storage and dynamic-demand-type technologies to provide back-up”⁶⁸ and also by Jason Ormiston, then chief executive of the main trade body, Scottish Renewables, who told the Committee that, “the 2020 targets that the European Union has articulated and brought forward provide incentives, but we need the Scottish Parliament and the Scottish Government to commit themselves to ambitious targets, which must be delivered by a predictable, clear and stable framework.”⁶⁹

165. A Scottish Government official provided the Committee with a succinct summary of its energy policy when he told us that—

“We are developing policies in parallel that envisage that, over time—by 2020 and then 2030—Scottish power generation will be predominantly low carbon.

That will happen through a combination of promoting renewable generation and accelerating the introduction of carbon capture and storage in thermal plants.”⁷⁰

166. In essence, the Scottish Government’s energy policy, for the electricity sector, relies on the promotion of renewable energy technologies and a move towards the introduction of cleaner coal technologies. This policy has received the support of some but not others. In relation to the latter, for example, Dave Watson of Unison Scotland told the Committee that—

“We would like the inquiry’s main focus to be the need for a balanced energy policy. All the energy trade unions are agreed that we need to generate electricity from a range of sources.”⁷¹

167. His view was shared by Robert Armour of British Energy who was more specific on what that ‘balanced mix’ should consist of—

“It is our contention that nuclear, which plays a major role at the moment and is a large and proven CO2-free means of generating electricity, has a part to play; that Scotland might want to play its part in the investment in a new fleet in due course; and that the Scottish manufacturing base might want to play its part in satisfying the manufacturing demand.”⁷²

168. This was a opinion also shared by others who gave evidence to the Committee, for example, Frank Mitchell of ScottishPower, who said that we must “ensure that we get the right mixture in place” and that we “require a combination of sources of generation, including flexible thermal with carbon abatement”.⁷³

169. Other utilities, however, took a slightly more optimistic view on the relative contribution to electricity supply from renewables and focused on some of the technological solutions to the intermittent nature of some sources of renewable energy. For example, Keith MacLean of Scottish and Southern Energy stressed that we will need “significant capacity” of back-up if the target of 50% generation from renewables is to be met and that demand-side management and storage will have key roles to play.⁷⁴

170. There were, therefore, mixed views presented to the Committee on whether the renewable energy targets would be realised in practice and what kind of contribution could be expected from the different types of renewable energy technologies. For example, Rob Hastings of the Crown Estate, confidently stated that “more than 10GW could be produced” by the programmes his organisation was running to develop offshore marine energy (wind, wave and tidal) in Scotland. He also thought that there could be “700MW in play by 2020” of wave and tidal energy alone through one of his initiatives.⁷⁵

171. Jason Ormiston (formerly) of Scottish Renewables stated that, for renewables other than wind energy, “if one considers the figures and what the

industry and a variety of reports think could be delivered by 2020, it seems that there could be well over 8GW of installed capacity by 2020".⁷⁶

172. From the perspective of the Scottish Government itself, Jim Mather MSP, Minister for Enterprise, Energy and Tourism, stated "... with some 5.5GW of renewable capacity currently installed, consented to or under construction, Scotland is already well placed to exceed the 2011 target for 31 per cent of gross consumption to come from renewable resources."⁷⁷

173. Others were less convinced. For example, in its written evidence, the Scottish Chambers of Commerce said that "there must be a recognition that our future energy needs will not be supplied by a single source rather by an energy mix and that a fully functional national grid system powered solely by renewable sources of energy is not feasible nor an economic proposition at this point in time."⁷⁸ Similarly, CBI Scotland stated that it remained "convinced that Scotland's energy future should not rely disproportionately on intermittent forms of generation".⁷⁹

174. The Committee also heard a range of views on some of the other non-electricity related targets and aspects of Scottish Government policy, particularly those relating to heat and to energy efficiency.

175. On heat, the Scottish Government has committed itself to an objective of 11% of heat demand being produced by renewable energy by 2020 as part of the actions taken now that the Climate Change (Scotland) Bill has been passed. The scale of this challenge was set out by a Scottish Government official who said that—

"The need to build a commercially viable renewable heat industry and to ramp up provision from the current estimate of less than 1 per cent of demand to the target—on which we consulted—of around 11 per cent of demand in order to meet the 2020 targets will, effectively, involve the development of a whole new industry."⁸⁰

176. The emphasis on heat within the Scottish Government's energy policy received the support of many in the evidence submitted to the Committee. For example, Keith MacLean of Scottish and Southern Energy told the Committee that "the vast majority of the big low-hanging-fruit opportunities are in heat rather than in electricity."⁸¹ Similarly, Andrew Haslett of the Energy Technologies Institute said "heat is the largest consumer of energy, and you must first decide how low you can make your heat demand by implementing efficiency measures".⁸²

177. Others, however, gave evidence to the Committee which outlined the scale of the challenges ahead in relation to meeting the targets being proposed for heat and for energy efficiency more generally. For example, Rob Hastings of the

Crown Estate said that “any notion that we can escape a need dramatically to increase the energy efficiency of the built environment is mistaken”.⁸³ Similarly, Dave Gorman of the Scottish Environment Protection Agency (SEPA) said that, in relation to the current use of renewable heat technologies and Scotland’s ability to meet EU targets, “... we are absolutely nowhere compared with other parts of Europe”.⁸⁴

Scenarios and policy options

178. Much of the evidence cited above on whether or not the Scottish Government is right to set the targets it has and whether its proposed policy of focusing on renewables and cleaner coal is advisable was closely associated with views on possible energy scenarios and how they can be realised.

179. It is already possible in the preceding section to identify differences of opinion between those, in terms of electricity at least, that believe it is possible to replace existing nuclear power stations and the current generation of conventional coal-fired power plant with newer forms of coal-fired thermal generation, increased renewables (in the forms of onshore and offshore wind, wave and tidal devices) and more decentralised generation (e.g. combined heat and power), and those that do not.

180. For example, the Stop Climate Chaos Scotland campaign has indicated that its preferred energy scenario is one where the “implementation of an energy hierarchy that puts energy saving and conservation at the top and works down through less desirable options as necessary, prioritising decentralised renewable energy over centralised energy, and prioritising demand management over deliberate efforts to meet increasing demand.”⁸⁵

181. This is not a view shared, at least in part, by others who gave evidence to the Committee. For example, in its written evidence, the Industrial and Power Association said that—

“It is accepted that security of supply requires significant capacity within the system that is constantly available and controllable. Since renewable sources cannot provide constant availability and control, power sources other than hydro, wind, wave and tidal power are required. This means that there will be a requirement for renewed investment in (clean) thermal and nuclear power to meet electricity demand over the next 40 years.”⁸⁶

182. Similarly, Scottish Engineering said in its written evidence that the future energy scenario for Scotland should be one where “no options should be ruled out, including replacement nuclear build as part of a balanced, sustained, long-term energy strategy.”⁸⁷ Likewise, the Scottish Council for Development and Industry (SCDI) stated that it “... supports a balanced energy mix in Scotland, with much higher supply from renewables and a backbone of new nuclear and

lower carbon fossil fuels, which it believes is needed to ensure security and affordability of supply, and to reach climate change targets”.⁸⁸

183. In its submission, however, Oil and Gas UK, the main trade body for the industry, took an even wider view to highlight its view that irrespective of what scenario for electricity is followed, oil and gas will still be a major component of Scotland’s primary energy demand. In evidence to the Committee, Malcolm Webb, chief executive of Oil and Gas UK said, “In 2020, when we achieve all the targets that the Government has set on renewables, as I hope we do, we will still rely on oil and gas for 70 per cent of our primary energy needs.”⁸⁹ This was a view echoed in other submissions that the Committee must not focus on electricity alone when it came to making recommendations on its preferred energy scenario for Scotland.

184. The other key area where differences of view were expressed on possible energy scenarios was the contribution that can be made by energy efficiency and energy conservation.

185. In a report commissioned by SCDI from consultants Wood Mackenzie, the central premise is that demand for energy, and electricity in particular, in Scotland over the coming years is set to grow. The report forecasts annual consumption to increase to 45.9TWh by 2020, a 9% increase on current levels of demand.⁹⁰ This forecast, however, is disputed by Duncan McLaren of Friends of the Earth Scotland who said that “From the available evidence on what is possible in improving energy demand in the economy as a whole, a 10 per cent increase in demand across the picture is unlikely.”⁹¹ His view was supported by Jason Ormiston (formerly) of Scottish Renewables who stated that—

“The most disappointing thing about the Wood Mackenzie report is not how it is written but its conclusions. Electricity demand is expected to increase by 10 per cent. With the current framework, one would expect that to continue, but the report must act as a warning signal that options and incentives for energy demand management must exist so that we can reduce demand for electricity and demand in other areas.”⁹²

186. However, Frank Mitchell of ScottishPower stated his organisation regarded “... the projected 10 per cent increase in demand as being in the mid-range” and that “it is a reasonable position to take”.⁹³

187. Such continued growth in energy demand in Scotland might, however, be mitigated if some of the moves within the EU reach fruition. For example, in February 2009, the European Parliament (EP) voted to endorse the EU’s Second Strategic Energy Review.⁹⁴ Part of the EP’s view was the call on the European Commission and the member states to adopt a 20% improvement in energy efficiency target (by 2020) immediately. Currently, any such target is non-binding but there have been calls to alter this status, for example, from the coalition of

European associations in the energy-efficiency sector.⁹⁵ This call was supported by Chas Booth of the Association for the Conservation of Energy in Scotland.⁹⁶

188. Interestingly, in his first of two appearances at the Committee, the Energy Minister himself did not place energy efficiency at the top of an energy hierarchy when asked directly by the Committee for his views on what the rank order of priorities should be. In his reply, he said only that—

“In Scotland, we have set out a clear strategy for the future—renewable energy and clean use of fossil fuels—and have in place our 10 pledges. We are involved in long, extensive and open-ended dialogue with all stakeholders, from developers and energy companies through to environmental campaigners. That dialogue is liable to create its own self-ordering dynamic.”⁹⁷

The provision of reliable data for policy formulation

189. One of the challenges faced by the Committee and indeed which is obvious from a cursory reading of much of the evidence submitted to us is the relative paucity of reliable and up-to-date statistics and data for energy in Scotland. Many of the more recent statistics are collected only at a UK level and, for certain key indicators, there is no disaggregated data at a Scottish or sub-Scotland, regional or local level. Additionally, there is often a mismatch between the different data sources in terms of the units used for the statistics, making comparisons problematic.

190. This is an issue highlighted to us by some of those who gave evidence to the Committee, most notably the Royal Society of Edinburgh. In its written submission, provided to us in late 2008, the Royal Society noted that the most recent, reliable statistics available at that date covered only the period 2002-2006, with the 2007 energy data not yet available.

191. The Royal Society of Edinburgh recommended the creation of an independent, authoritative audit body responsible for collecting and publishing reliable energy statistics. At the moment, in the Society’s view, there are considerable uncertainties and gaps in the available data that need to be resolved if public policy is to be well-informed and if progress towards agreed targets is to be monitored and adjusted.⁹⁸

192. Such a lack of up-to-date data is also, it would appear, an issue for the Scottish Government itself. During the appearance by the Minister, when questioned on the current levels of renewable energy penetration, a Scottish Government official conceded that, as at May 2009, “The last year for which we have figures available is 2007” and that the figures for 2008 will not be available until the end of 2009 itself.⁹⁹

Tackling energy consumption, energy prices and affordability, including eliminating fuel poverty

193. Central to the Committee's vision of Scotland's energy future is the premise that energy efficiency should be a priority. This is especially important if the EU were to move, as it has done with renewable energy, to binding targets for energy efficiency.

194. In the Scottish Government's energy policy, the Scottish Ministers state that they wish "to ensure that we have the right incentives in place to encourage energy efficiency" because "improving energy efficiency is widely recognised as the easiest and most cost-effective means of reducing carbon dioxide emissions."¹⁰⁰

195. Energy efficiency is one of the main areas of energy policy where the competences are partly reserved and partly devolved. Under the Scotland Act 1998, the Scottish Government has responsibilities for the promotion of energy efficiency and the role of changing behaviour through raising awareness and providing advice and financial incentives to improve energy efficiency across the public, business and domestic sectors. In this context, the Scottish Government funds¹⁰¹ —

- support provided by the Carbon Trust and the Energy Saving Trust;
- an interest-free loan scheme for small- and medium-sized enterprises;
- an energy efficiency fund for the public sector;
- programmes to alleviate fuel poverty through energy efficiency and improved heating.

196. The most significant forthcoming development in relation to energy efficiency is the planned publication of the Scottish Government's Energy Efficiency Action Plan. This plan is being developed under the framework of the Climate Change (Scotland) Bill.

197. According to the Energy Minister, Jim Mather MSP, the Scottish Government anticipates "that the Climate Change Bill will be passed in summer 2009 and that the Energy Efficiency Action Plan will be published thereafter" and be the subject of public consultation.¹⁰²

198. The Scottish Government's plan has been under development for some time. The original proposal for such a plan/strategy for energy efficiency was first announced by the then Scottish Executive in December 2004.¹⁰³ By the 2007 election, no such plans were published. The new administration then stated that the energy efficiency plan would be published in 2008,¹⁰⁴ now subsequently revised to 2009 as indicated above. This was confirmed by the Energy Minister during his first appearance at the Committee to give evidence when he told the Committee, "We intend to publish the plan by the end of the year, following final

consultation in the summer.”¹⁰⁵ Similarly, one of his officials added that, “We do not have an energy efficiency action plan sitting on the shelf.”¹⁰⁶

199. This delay in the publication of the energy efficiency action plan has been a feature in some of the evidence heard by the Committee. For example, Chas Booth of the Association for the Conservation of Energy in Scotland said—

“We were first promised an energy efficiency strategy on 7 December 2004, so we have waited quite a long time for it. As recently as November last year [2008], the Scottish Government committed to setting “out in 2008 our Energy Efficiency and Micro-generation Action Plan, outlining the actions we are taking and plan to take across Government.”

The Scottish Government clearly has something drafted and ready to go. I understand that it does not want to publish it because it is worried that the plan will appear too weak, partly because of concerns about whether responsibility for energy efficiency is devolved or reserved and where the line between promotion and delivery lies.”¹⁰⁷

200. However, Elizabeth Leighton of WWF Scotland suggested that one reason for the delay was the need for the Scottish Government to await the publication of the UK Government’s own action plan.¹⁰⁸ As an interim solution, she proposed that the Scottish Government could “publish what it knows now”.¹⁰⁹ Similarly, Jason Ormiston (formerly) of Scottish Renewables said—

“the committee should call on the Scottish Government to publish its microgeneration and energy efficiency action plan quickly. It has now been 18 months in the making.”¹¹⁰

201. In response to the suggestion that the energy efficiency plan was being held up by the passage of the Climate Change (Scotland) Bill, Stewart Stevenson MSP, Minister for Transport, Infrastructure and Climate Change said “we are not sitting on our laurels; we are taking a range of actions to ensure that we continue to make progress.”¹¹¹ The Sustainable Development Commission Scotland identified, however, concerns in relation to the progress being made by the Scottish Government on energy efficiency.¹¹²

202. This Committee has already taken a substantial amount of evidence on energy efficiency and the Scottish Government’s proposals for an action plan and for energy performance certificates as part of our consideration of the Climate Change (Scotland) Bill. Our views and recommendations were set out in the report published in March 2009.¹¹³

Area-based energy efficiency schemes

203. One of the central issues to be raised during the Committee's scrutiny of the Climate Change (Scotland) Bill and this inquiry was the merits, or otherwise, of a public-sector led programme of investments in energy efficiency, particularly the policy options centred on an area-based scheme.

204. The proposal for an area-based energy efficiency investment programme is based on the concept of a scheme that provides for loft and cavity wall insulation and other energy efficiency measures to be provided to all homes within a geographic area, thereby ensuring a high proportion of domestic dwellings are brought up to a high standard of efficiency. Once one area is completed, the programme moves on to a different geographic area. Such proposals are often referred to as the 'warm zones' approach.

205. Such a scheme was highlighted during the evidence received from, for example, the Fuel Poverty Forum. The Rev. Dr. Graham Blount of the Forum said—

“The fuel poverty forum has recommended that, within region-based energy assistance packages, we should take an area-based approach. We cannot take such an approach in all areas immediately, but we can certainly undertake work in some areas.”¹¹⁴

206. Similarly, Norman Kerr of Energy Action Scotland suggested that what was needed in terms of energy efficiency was “a 10-year investment programme of £170 million per year for the 10 years to 2016 ... to attempt to bring all homes in Scotland up to a reasonable energy efficiency level.”¹¹⁵ Likewise, Duncan McLaren of Friends of the Earth Scotland said that the Scottish Government should “invest in five or 10 per cent of the buildings every year, with a minimum investment of £100 million per annum.”¹¹⁶

207. Such a regional or area-based approach was also supported by some of the energy utilities that gave evidence to the Committee. For example, Keith MacLean of Scottish and Southern Energy said, “We should consider opportunities to work with local authorities in Scotland on a regional or zone basis to roll out energy efficiency measures at the same time as greener generation technologies are rolled out—for instance, to ensure that an insulation programme goes on at the same time as a heat pump installation.”¹¹⁷

208. Criticism of the current energy efficiency schemes in terms of duplication and inefficient use of resources was made by Madeleine Hallward of the Energy Retail Association. She told the Committee in evidence that—

“Billions of pounds are being spent every year, but we are focusing on the same sorts of houses and measures while failing to target those who are fuel poor. Consideration needs to be given to how we strip out duplication and poor targeting in order to ensure that we have an energy efficiency programme that

encourages people to be mindful of the need to reduce carbon emissions while taking into account the fact that some people are incentivised by reductions in energy costs.”¹¹⁸

209. She also suggested that any area-based scheme for energy efficiency investments should have some degree of targeting of resources, stating that “the able-to-pay sector should be incentivised to make their homes energy efficient; people who are not able to pay should be quickly identified and targeted with effective measures”.¹¹⁹ Similarly, Phil Matthews of the Sustainable Development Commission Scotland said that “our concern is that the energy action not only delivers carbon savings but is targeted, as far as possible, at the people who are most in energy need in respect of fuel poverty.”¹²⁰

210. A different approach to any targeting of resources was suggested by the Scottish Fuel Poverty Forum. It said there should be “set aside funding for the warm zone or area-based approaches so that we can target specific areas” and the targeting would be done on the basis of “a fuel poverty map of Scotland, so [that] we are aware of the areas in which there is the greatest risk of fuel poverty”.¹²¹

211. Finally, in terms of the delivery of the scheme, the Committee heard views that any energy efficiency scheme such as the Scottish Government’s new Energy Assistance Package needs to be practical in nature and have an emphasis on home visits and aftercare. For example, Jean Morrison of SCARF (save cash and reduce fuel), an advice body, stated, “The fuel poor are the people who need help most, and one-to-one, face-to-face advice—not just advice by telephone—is required”.¹²²

Carbon Emissions Reduction Target

212. One of the key schemes that was highlighted and criticised, in part, during the evidence taken was the UK Government’s Carbon Reduction Emissions Target programme (CERT). CERT is a GB-wide scheme which places an obligation on energy suppliers to deliver measures to reduce carbon emissions. Under the existing scheme, by 2011, delivery measures must have been taken that will provide overall lifetime carbon dioxide savings of 154 MtCO₂ - equivalent to the emissions from 700,000 homes each year. According to the UK Government, it is expected to lead to energy supplier investment of some £2.8bn.¹²³ More recent announcements have suggested increasing the emissions reduction target and the level of investment.¹²⁴

213. The main criticism of the CERT scheme was not so much about the principles or the merits of the programme itself but that, as currently designed and delivered, CERT is not best adapted to meet the particular needs of the Scottish housing market. For example, a Scottish Government official told the Committee that “it is generally accepted among energy companies and the

Scottish Government, and more widely, that the way in which the scheme has been operated in the UK has tended to favour investment south of the border, rather than north of the border”.¹²⁵ He suggested that—

“... one reason is that the cheaper measures that the CERT scheme promotes, such as cavity wall insulation, cannot be undertaken in stone buildings, and there is a much greater number of those in Scotland than there is south of the border. Similarly, the nature of our urban tenement stock is different from that of housing stock south of the border.”¹²⁶

214. This was confirmed by the Energy Minister during the first of his two appearances at the Committee to give evidence, when he stated—

“The Scottish Government wants to ensure that Scotland gets its fair share of CERT and CESP activity—fair in relation to not only population but the other challenges that we face. Scotland is different: it has more rural and island communities, which are more costly to reach; it is also colder and has a larger proportion of harder-to-treat properties. For those reasons, energy suppliers are less likely to invest in Scotland and, if they do, a voluntary partnership is unlikely to deliver CERT or CESP in rural and remote communities such as those in the islands and Highlands of Scotland.”¹²⁷

215. This was a view supported by Energy Action Scotland. Its representative told the Committee that—

“Based on a Barnett-type formula, we believe that about 10 per cent of total CERT spending for the UK should be in Scotland, but our calculations indicate that the figure is currently somewhere between 5.5 and 7 per cent. We suggest that we are losing out at the moment and that the rules, especially as they are administered by Ofgem, need to be revisited so that we get a fairer share of the CERT budget.”¹²⁸

216. The other major criticism of CERT was that it was not best adapted for investments in off-grid and more remote households, which are more commonplace in Scotland than many other parts of the UK. Norman Kerr of Energy Action Scotland, for example, told the Committee that “... for CERT suppliers to deliver effectively, they must deliver to big concentrations of homes, especially homes in England, which will give them the biggest theoretical savings”.¹²⁹ This issue was put into context by Jean Morrison of SCARF. She said—

“The issue that contractors in rural areas face in working under Government schemes is that such schemes take a one-size-fits-all approach. Contractors are paid X amount of money for each installation. In the central belt, a contractor could install a gas central heating system in a day. However, in a more rural area, a contractor cannot install an oil system in a day—it requires several

different skills, which means that subcontractors must be brought in. It will cost more to install such a system in a rural area than it will cost to install a gas system in an urban area, yet, the contractor is asked to install it for the same price.”¹³⁰

Fuel poverty

217. Both the CERT scheme and area-based energy efficiency proposals are in part measures designed to tackle fuel poverty. Fuel poverty is currently defined as follows—

“A household is in fuel poverty if, in order to maintain a satisfactory heating regime, it would be required to spend more than 10% of its income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use”.

218. The most recent figures available from the Scottish Government – contained within the 2007 Scottish House Condition Survey – indicate that 586,000 households in Scotland are in fuel poverty, just over 25% of all households.¹³¹ Table 3 below provides trend data on fuel poverty.

Table 3: Fuel poverty in Scotland

Year	000's	%
1996	756	35.6
2002	293	13.4
2003/4	350	15.4
2004/5	419	18.2
2005/6	543	23.5
2007	586	25.3

Source: Scottish Government, Scottish House Condition Survey Key Findings 2007

219. The Scottish Government has, as of April of this year [2009], launched a new programme to tackle fuel poverty; the Energy Assistance Package (EAP). EAP builds on the existing energy efficiency advice network and is being delivered in partnership with existing advice providers, energy companies and the Scottish Government. Scottish Gas has been appointed to act as the managing agent for the final stage of the programme during 2009/10. Its current contract to manage the existing programmes is being extended by a year to March 2010 to deliver this.

220. The package will be supported by Scottish Government funding worth £55.8m per annum, and CERT funding from the energy companies. Government funding comes from a range of budgets across the Scottish Government as the package will deliver a combination of fuel poverty and wider poverty, climate change and energy objectives in a coordinated manner.

221. EAP is a significant component of the Scottish Government's efforts towards meeting the statutory target – set as part of the Housing (Scotland) Act 2001 – of eliminating fuel poverty in Scotland by 2016.

222. Commenting on the new energy assistance programme, the Rev. Dr. Graham Blount of the Scottish Fuel Poverty Forum said that EAP will provide for significant improvements but that—

“without a step change in investment in tackling fuel poverty—wherever that comes from—we will not hit the target. We cannot reasonably expect cheap energy to get us there, so we must consider other dimensions. A significant step change will be needed to achieve the target.”¹³²

223. Similarly, Norman Kerr of Energy Action Scotland talked of a “gap” between the current investment by the Scottish Government through EAP and his estimate that £170 million per year over 10 years is needed to meet the fuel poverty target.¹³³ Likewise, the Association for the Conservation of Energy in Scotland said—

“At current rates of investment and with the current powers in our arsenal, the Scottish Government will not meet that target, which is to abolish fuel poverty by 2016. We need considerably increased investment and powers to ensure that we bring buildings with the poorest energy efficiency up to standard. If we do not make a real effort to do that, Scotland will be cursed with a group of people in the hardest-to-treat houses who will be permanently fuel poor.”¹³⁴

224. In its evidence to the Committee, the Sustainable Development Commission Scotland said that—

“... the additional funding for fuel poverty is welcome but that it will not deliver the 2016 target for elimination of fuel poverty in Scotland. A step change is required in the resources for fuel poverty measures.”¹³⁵

225. Furthermore, the representative of the Association for the Conservation of Energy in Scotland identified one of the practical concerns with EAP—

“Mention was made of the energy assistance package, which will target investment at the fuel poor. From April, for the first time, the package will include air-source heat pumps and solid-wall insulation. We warmly welcome that, but we do not think it goes far enough. Ground-source heat pumps, which could do even

more to lift people out of fuel poverty, have not been accepted into the programme. Admittedly, the cap on maximum investment has been raised, but only to £6,500. You cannot get both solid-wall insulation and an air-source heat pump for that money—it is one or the other. It is not reasonable to ask people who are in fuel poverty to make a choice between proper insulation and a decent heating source.”¹³⁶

226. Similarly, Jean Morrison of SCARF, said that one of the problems with EAP is that—

“We are finding that many people who come to us are not people who you might consider to be the traditionally fuel poor. They are not the people who are targeted through the new package that is being proposed, but they are people who genuinely need help. People who are disabled, have no children and are under the age of 60, for example, are not eligible for the new package, although they might need to keep their house heated all day.”¹³⁷

227. SCARF also stated that EAP and renewable energy schemes were targeted at owner-occupiers and, therefore, would not be of value to social landlords. As such, SCARF called for such initiatives to be opened up to this sector.¹³⁸

228. Reiterating one of the criticisms made of the GB-wide CERT scheme, Norman Kerr of Energy Action Scotland noted that energy efficiency schemes in Scotland were not serving the more rural areas well. He said—

“The breakdown of the figures shows that only a quarter of all homes tackled under the Government programmes were in rural communities, while 75 per cent were in urban areas, despite the fact that the rural areas are the areas of greatest fuel poverty. We have taken the low-hanging fruit in areas where ... there is a concentration of homes; there is less of a concentration of homes in the rural communities and they are more difficult to reach.”¹³⁹

229. In his evidence on fuel poverty issues, Jim Mather MSP, the Energy Minister, stated that “We are improving targeting with the energy assistance package, and there is new funding for the area-based home insulation scheme.”¹⁴⁰ However, in response to a direct question from the Committee on the performance to date in meeting the 2016 target to eliminate fuel poverty and the need for a ‘sea change’ in policy responses, the Minister said—

“When we talk about a sea change, we are saying, in essence, that we have to tackle the core problem. For me, the core problem has always been that we run the country on a Barnett-formula block allocation from Westminster.”¹⁴¹

230. He added that “With the energy-assistance package and the area-based home insulation scheme, we are moving towards a sea change.”¹⁴²

231. After further questioning, the Minister added that—

“There is £10 million from the Carbon Trust and Energy Savings Trust; a potential £100 million a year from CERT; £60 million from the Scottish Government in the energy-assistance package; £3.5 million for community microgeneration; £15 million for home insulation schemes, with £15 million from other sources; a revolving loan scheme for small and medium-sized businesses, with £5 million invested to date; and a revolving loan scheme for the public sector, with £24 million invested to date. That represents a sea change from what has happened in the past.”¹⁴³

232. The Scottish Government was not the only government to be cited in the evidence in terms of fuel poverty. In its written evidence to the Committee, the United union reiterated—

“its call for a windfall tax to ameliorate the cost of living for pensioners and indeed all working families, and, help end the scourge of fuel poverty. A windfall tax would be equitable, just and affordable given the massive recent profits of BP - £37 million a day and Shell - £2 million per hour, both as of July 2008, and, the recent 35% price rise levied by British Gas parent company Centrica.”¹⁴⁴

233. Similarly, at the UK Government level, the Energy Saving Trust called for the use of the “Winter Fuel Payment (WFP) to install measures to address hard to treat homes, particularly for those in fuel poverty”.¹⁴⁵

234. Another union – UNISON – placed the emphasis on the role of the regulator and the issue of energy pricing. In its written evidence, UNISON said that the “UK Government should abandon its mantra of competition and review the Ofgem terms of reference to enable direct intervention on fuel pricing and establish incentives to encourage good practice by suppliers”.¹⁴⁶ This was a view also expressed by Energy Action Scotland who said that there were “gaps” in Ofgem’s current remit and that it was “worth revisiting to see whether it is still fit for purpose”.¹⁴⁷

235. Finally, one of the other key measures suggested by some of those giving evidence to the Committee was for the UK Government to step up efforts to encourage householders to claim the benefits to which they are entitled. Jim Patterson of ScottishPower, for example, told the Committee that “the Department for Work and Pensions has said that in 2006-07, between £9 billion and £10 billion of benefits were unclaimed”.¹⁴⁸ ScottishPower also highlighted a warm zone scheme in Newcastle-upon-Tyne, which had shown that for each pound investment in income maximisation, a return of £20 is possible via a customer making a claim for a benefit for the first time.¹⁴⁹

Metering and tariffs

236. One of the particular issues raised during the Committee's consideration of fuel poverty matters and energy efficiency more widely was that of metering, and the role of smart meters in particular, and tariff structures within utilities.

237. In relation to fuel poverty, the role of metering was the focus of much of the evidence received by the Committee. In particular, the use of pre-payment meters was highlighted. In its evidence to the Committee, SCARF outlined some of the issues it has with such meters. Firstly, SCARF had concerns that people using such pre-payment meters had to pay for their energy in advance and therefore did not receive any immediate benefits if costs fell. Second, SCARF said that it believed that fuel suppliers used such meters as a means to collect debt. Finally, SCARF raised the issue of standing charges whereby, if a customer self-disconnects so that they do not have to top up their meters, the standing charges continue to be levied. When the meter is refilled, the standing charges are debited first.¹⁵⁰ It should be noted, however, that Jean Morrison of SCARF also acknowledged that "... pre-payment meters are useful for people who have difficulty in budgeting, albeit that the tariff tends to be more expensive."¹⁵¹

238. In response, Jim Paterson of ScottishPower, said that "the provision of prepayment metering involves an additional cost, as the infrastructure has to be supported throughout the UK."¹⁵² He indicated that a recent price probe by Ofgem had concluded that "... the increased prices that we [ScottishPower] charge for the infrastructure reflect our costs."¹⁵³ However, in his evidence to the Committee, Steve Smith, Managing Director of Networks at Ofgem said, about utilities more generally across the UK, that—

"When we [Ofgem] considered the actual differentials in the marketplace, we found evidence that, for certain suppliers in certain regions, the differentials were significantly above cost. We said that that was not acceptable. We have gone out to consultation, and we are saying to the industry that we will consider introducing licence conditions that would mean that, unless the differentials were cost justified, we would be able to take action against the companies concerned, including fining them."¹⁵⁴

239. In addition to alleged problems with pre-payment meters, the other issue that was prominent in the discussions on fuel poverty was that of the tariff and charging structure used by utilities. Of particular note was the use of a 'social tariff' by utilities. According to Jim Patterson of ScottishPower, its "... social tariff is the cheapest rate available, regardless of the current charge."¹⁵⁵ He further stated that "Typically, the cheapest tariffs in the UK are direct debit tariffs; suppliers will provide that rate on a prepayment meter."¹⁵⁶

240. By way of providing assurance on this matter, ScottishPower provided supplementary written evidence to the Committee comparing tariffs. This is set out below in Table 4.

Table 4: ScottishPower's Prepayment prices and Quarterly credit prices

	Quarterly Credit			Prepayment		
	Daily Service Charge	Unit Rate	Annual Bill	Daily Service Charge	Unit Rate	Annual Bill
Electricity	16.60p	13.384p	£502.28	16.60p	12.779p	£482.28
Gas	11.62p	4.013p	£865.11	10.50p	4.031p	£864.67

Notes: (i) These figures are as published at September 2008 and are inclusive of VAT. They are based on the Ofgem approved industry average annual mains gas usage of 20,500kWh and annual standard rate electricity usage of 3,300kWh. (ii) The figures do not take account of ScottishPower's social tariff. Any customer who qualifies for ScottishPower's social tariff will benefit from the cheapest prices available in their area regardless of existing payment type

Source: ScottishPower supplementary evidence to the Committee

241. Similarly, British Gas told the Committee that it had introduced a social tariff (essentials tariff) "in February 2007 offering 140,000 eligible customers the equivalent of our monthly direct debit rates which is [British Gas's] lowest standard gas and electricity tariff."¹⁵⁷ Likewise, Scottish and Southern Energy said in its written submission that it "is committed to tackling fuel poverty, is already providing the cheapest social tariff on the market (Energyplus Care at 20% off standard rate), and will continue to deliver a strong programme aimed at its most vulnerable customers."¹⁵⁸

242. However, in evidence to the Committee, Steve Smith of the energy regulator, Ofgem, said that his organisation had been—

"... doing work to clean up social tariffs so that, if a supplier offers a social tariff, anyone who is advising customers can be clear that that tariff is the cheapest one available for that customer. We have said that that must be the case if suppliers wish to call something a "social tariff"."¹⁵⁹

243. The final aspect of metering considered by the Committee was that of the potential offered by 'smart meters' towards the efforts to tackle fuel poverty as well as reduce energy demand more generally. As explained by Madeleine Hallward of the Energy Retail Association, "Because of the [real-time] visual display element, smart meters will help to put people in touch with the decisions that they make and the effect that those have on their bill and on the amount of carbon that they emit".¹⁶⁰

244. In her evidence to the Committee, Ms Hallward noted that the UK Government had "... decided to issue a universal mandate for smart metering, so that every home in Britain will have a smart meter by 2020" and that she

expected "... the roll-out to consist of a 10-year programme" for which her organisation was currently awaiting a mandate and remit with the key criteria as to how this would be implemented.¹⁶¹ Key to this remit were the model that would be used to stimulate a market for the roll-out of smart meters, definitions of what a smart meter would be required to offer, the communications and education programme and details of the governance structure for the roll-out programme. In relation to this, the Energy Retail Association called for a "timely announcement".¹⁶²

245. In the UK Government's budget of April 2009, the Chancellor of the Exchequer announced that provision would be made for smart meters for SMEs and public sector sites. This would be part of a £8.9 billion spending programme over the 2008-11 comprehensive spending period.¹⁶³

246. The efficacy of smart meters was also commented on by the Energy Retail Association. In its evidence, the body stated that it "... expected that simply installing smart meters will result in a 1 per cent reduction in energy use and carbon emissions."¹⁶⁴ This is equivalent to 8 per cent of the United Kingdom's 2010 carbon emissions reduction target. Furthermore, the Energy Retail Association cited international examples of where an associated, targeted education campaign would increase such impacts stating, "in Ontario, there was a 6 per cent average energy conservation effect; in Finland, it was 7 per cent; and in Norway, a demand-response programme led to a reduction of 24.5 per cent."¹⁶⁵

247. Finally, in terms of costs, Ms Hallward indicated that the smart meter industry estimated that the costs of the roll-out programme being envisaged would be "between £6 billion and £10 billion" and that this would be met by the electricity supply industry itself, indicating that "The intention has always been that the industry would pay for the smart metering project and that the consumer would bear little or minimum cost".¹⁶⁶

248. Supporting the Energy Retail Association's call for a timely decision by the UK Government, Steve Smith of Ofgem said—

"As a result of the Energy Act 2008, the secretary of state has powers to mandate a roll-out for smart metering. DECC [the UK Department for Energy and Climate Change] has done various consultations, and the sooner we can get some clarity from Government on the model and the timescale the better. I do not think that suppliers and Ofgem see eye-to-eye on the best way, but we all agree that any further delay is unnecessary and that we need a decision so that we can get on."¹⁶⁷

249. It should be noted, however, that in relation to smart meters, the UK Government has now made further announcements on the proposed roll out of such technologies, indicating "that it intends to mandate smart meters for all

households, with an indicative timetable for completion by end-2020”¹⁶⁸ at a cost of around £7 billion, around one-third of which would be met by the final consumer and the rest by the industry.

Building standards

250. In terms of meeting any objectives for the reduction in greenhouse gas emissions and/or within any energy efficiency plan, energy use in buildings is a key component and, in particular, the contribution that can be made from improving building standards.

251. In his evidence to the Committee, Norman Kerr of Energy Action Scotland stated that “It is undoubtedly the case that Scottish building standards have not matched the building standards of our European counterparts”. He also said that “...building standards are now reviewed regularly, and it would be fair to say that homes that are built under the current legislation are at least 25 per cent more efficient than those that were built four or five years ago.”¹⁶⁹

252. However, as Norman Kerr himself noted, it has been estimated that 80% of the homes currently inhabited will still be in use in 2050. Consequently, the challenge in his view is to address the energy needs of existing buildings as building standards do not apply retrospectively.¹⁷⁰

253. This was conceded by a Scottish Government official in his evidence to the Committee when he stated that—

“Buildings account for more than 40 per cent of the emissions in the UK. However, as only 1 per cent of the building stock is replaced annually by new build, it will take a considerable time to achieve a significant improvement in the overall building stock.”¹⁷¹

254. In his evidence to the Committee, Jon Cape of RENEW, was critical of the gradual approach being adopted by the Scottish Government to achieve a target of zero carbon homes by 2016 through encouraging the take-up of renewable energy. He indicated that he would prefer to a requirement that large-scale building developments should be required to have all their energy demand met by renewable energy with immediate effect.¹⁷²

255. The importance of retrofitting was also highlighted by Dave Watson of UNISON Scotland who said that—

“Retrofitting is particularly important, not just in housing but in public buildings. In recent years there has been a drive to knock things down and build anew, but we need to focus on refurbishing existing facilities.”¹⁷³

256. One of the most recent announcements made by the Scottish Government during the course of the inquiry is very relevant to the issue of building standards. This was made by Stewart Stevenson MSP, Minister for Transport, Infrastructure and Climate Change, in response to the 'Sullivan report' (originally published in 2007), which was produced by a panel established to advise on the development of a low carbon building standards strategy to increase energy efficiency and reduce carbon emissions.¹⁷⁴

257. The panel's report, amongst its many recommendations, stated that the 2010 change in energy standards for non-domestic buildings should deliver carbon dioxide savings of 50% more than 2007 standards and, similarly, that for domestic buildings should deliver 30% savings in emissions.¹⁷⁵

258. However, in his response, the Minister for Transport, Infrastructure and Climate Change, outlined his plans for a 30% emissions reduction target for both domestic and non-domestic buildings. As a justification for moving away from the Sullivan report's 50% target for non-domestic buildings, the Minister told the Committee in his evidence that—

"It is simply a question of getting the right balance in working with the industry on its delivery capability. We would expect to see further requirements for improvement in energy standards in subsequent updates of building standards over the three-year cycle."¹⁷⁶

259. The Minister also took issue with the view that Scotland has relatively poor building standards. He said, "Far from our standards being poor, by setting the target of 30 per cent on top of what we have already done, we are setting standards that are higher than anywhere else in the British Isles and in the majority of jurisdictions in Europe."¹⁷⁷

260. There is, therefore, a marked difference of opinion between this view and that outlined by Norman Kerr of Energy Action Scotland who, as noted above, believes that "Scottish building standards have not matched the building standards of our European counterparts".¹⁷⁸

261. During the visit by some of the members of the Committee to Germany, representatives of the German Energy Agency (DENA) were able to provide evidence of a marked improvement in their building standards and cited the Federal Government's legal requirements that are providing for a regular tightening of building standards which must provide for a reduction in energy consumption compared to the year prior to when the standards are changed. So, for example, in 2009 the planned standards for new buildings and refurbished buildings must result in 30% less energy consumption than in 2007. A similar reduction is being planned in 2012 compared to 2009 levels.¹⁷⁹

262. In Germany, the Committee also learnt about the key role that energy service companies (ESCOs) can have in helping to deliver energy efficiency improvements in both publicly and privately-owned buildings. The Berlin Energy Agency, for example, has successfully tendered energy service contracts to achieve significant energy efficiency savings in public buildings at minimal cost to the public purse.

263. One of the key issues raised in the evidence, however, is that it is as important to ensure adequate monitoring and enforcement of building standards, with appropriate sanctions, as it is to set such standards in the first place.

264. Finally, as part of the Committee's report on the Climate Change (Scotland) Bill, its members were able to successfully amend the Bill at stage 2 to extend the provisions relating to the use of energy performance certificates to the domestic sector.

Industrial and commercial energy demand

265. In addition to building standards issues, the Committee also heard evidence on the efforts needed to reduce the energy demand in industrial and commercial sectors and improve on energy efficiency. The evidence received also touched upon wider issues, such as energy pricing and its effect on competitiveness.

266. Indeed, it was this issue that Ken Richardson of the Chemical Industry Association chose to highlight as one of his prime concerns. He told the Committee that—

270. One public sector funded body seeking to do this in its advice to industry on its energy demand is The Carbon Trust. However, as noted by Niall Stuart, “The Carbon Trust has a good model, but, given its resources, it cannot possibly give everyone the intensive support and advice that they need”.¹⁸⁴ The role of The Carbon Trust and that of The Energy Saving Trust is covered in more detail below.

271. In terms of other public sector responses and initiatives, Niall Stuart of SCDI was supportive of the Loan Action Scotland programme itself – which provides financial support to business for energy efficiency – but was critical of some aspects of its operation—

“I understand that loan action Scotland has payback times—if returns on an investment are not delivered within four years, it will not provide finance. I wonder whether we could make the arrangements a little more lax and consider more realistic investment returns. Investment in solar energy, for example, will not be paid back within four years; I am not sure about investment in biomass energy. However, the terms could be made more flexible.”¹⁸⁵

272. Additionally, in relation to heat specifically, Mr Alexander of Diageo noted that—

“... renewables obligation certificates [ROCs] and ensuring that financial investments are sound in the long term are big issues for us. The fact that heat is not currently eligible for ROCs is a big issue for us, because heat accounts for 90 per cent of the energy in distilleries. We produce about 20MW of thermal heat as opposed to 6MW of electricity. I know that the Government is looking into whether that issue can be addressed through climate change legislation or other routes. Ensuring the financial viability of big investment projects is a big issue for us.”¹⁸⁶

273. Outwith industry, the Committee also heard a number of views on energy use in the retail sector and supermarkets in particular. It has been suggested in a report published by the University of Edinburgh’s Business School that supermarkets could account for perhaps 1% of the direct greenhouse gas emissions across the UK and that their influence via their supply chain is even greater.¹⁸⁷ The report also states that one supermarket company has estimated that the emissions generated by its supply chain in producing the goods that it retails are seven times greater than its own emissions; and those generated by its customers in consuming them is three times greater.

274. On average, according to the authors of the report, electricity accounts for 50%–60% of the direct emissions of the supermarket sector.¹⁸⁸ The scope to make savings here and also in relation to energy consumption is therefore significant with the report citing best practice examples where energy efficiency savings of up to 60% were made compared to traditional stores.

275. According to Andrew Pinkerton of Keppie Design, one of the main challenges is that, “In many cases, supermarkets are developed on a standard format.” In the past, Mr Keppie stated that he believed that costs considerations were central to choices of design but that latterly energy consumption is now a key factor.¹⁸⁹ He stated that “Supermarket designs are being refined and what we see being built now is very efficient.”¹⁹⁰

276. In terms of the supply chain, Niall Stuart of the Scottish Council for Development and Industry told the Committee that, “Many supermarkets now use biodiesel to run their fleets to deliver goods to their stores.”¹⁹¹

The role of the public sector

277. The Committee also took evidence from Audit Scotland in response to the findings of its survey of energy efficiency in the public sector, specifically central government, local government and the National Health Service (NHS). In their evidence to the Committee, officials from Audit Scotland noted that “Energy consumption in the public sector has been reduced by 4.8 per cent over the three years to 2006-07, although the public sector's spending on energy has increased significantly, rising by 47 per cent over the same period, which is due largely to a significant rise in energy prices.”¹⁹²

278. However, Audit Scotland’s representatives also said there was “a lack of comprehensive data, especially in relation to transport use, and that the frequency of reporting is variable, which makes it difficult to monitor progress accurately.”¹⁹³ This was caused, in part, by a “limited use of accurate metering technology” across the public sector.¹⁹⁴

279. Audit Scotland also pointed to differences within the public sector bodies that they reviewed. In evidence, Audit Scotland officials indicated that there had been a marginal increase in energy consumption within central government but that this was offset by better performances in local government and in the NHS.¹⁹⁵ One suggestion for the variance was the presence, or otherwise of an ‘energy manager’.¹⁹⁶

280. This is an area on which the Parliament’s Public Audit Committee has been critical. In a letter to the Scottish Government’s Permanent Secretary, Convener Hugh Henry MSP stated that his committee was “concerned” that not all public bodies felt it necessary to provide data to Audit Scotland on their energy performance.¹⁹⁷ In addition to promising to address this issue, the Permanent Secretary told the Public Audit Committee that the Scottish Government believed “achieving genuine senior management commitment to improving energy performance is vital for public sector organisations” and that “... within the Scottish Government, senior management are already engaged with the need to improve energy performance.”¹⁹⁸

281. One area where the public sector could help was highlighted by Jon Cape of RENEW in his evidence to the Committee. He noted that in order for local energy plans to be most effective, such plans—

“... should involve anchor public sector energy customers as a result of the public sector buildings estate shifting to CHP. It will be a bit of a stretch to meet the Government's target for moving Government buildings to CHP by 2010, but we back the effort to do so and think that a fresh effort should be made.”

282. His view was that this would enable the public sector estate to play a leadership role in energy consumption.

The Carbon Trust/The Energy Saving Trust

283. These two bodies were established by the UK Government in the early part of this decade. In broad terms, The Carbon Trust seeks to work with organisations to reduce carbon emissions and develop commercial low carbon technologies. The Energy Saving Trust, however, focuses more on the consumer and is a source of free advice and information for people across the UK looking to save energy, conserve water and reduce waste. Both bodies receive funding from the Scottish Government.

284. Although the Committee's inquiry did not focus specifically on the work of these two bodies, some of the evidence received did touch on one specific issue, namely whether these two bodies should be merged or at least be encouraged to work more closely together and share services.

285. On this issue, Jon Cape of RENEW said “There would be merit in a joint operation, if not in a full merger” and that “There is a need for much more joined-up thinking, and a joint operation to inform and develop local energy network opportunities would be fantastic.”¹⁹⁹ The issue for Mr Cape were the “bunkers” that both organisations worked within.²⁰⁰

286. His view was broadly supported by Phil Matthews of Sustainable Development Commission Scotland who said—

“... the Energy Saving Trust and the Carbon Trust perform slightly different functions and have different target audiences. There are issues to do with having a coherent approach for whichever parts of society are trying to access energy information, and potential for greater co-operation probably exists. However, I am not sure that that necessarily means that the two bodies should be merged.”²⁰¹

287. The principle of a full merger was not supported by Niall Stuart of SCDI who noted that the two trusts did similar things but quite differently. He did concede, however, that “The shop fronts can be merged by all means, but specific sectoral advice must be available.”²⁰² He also said that—

“... perhaps there is scope to work together in marketing. There could be one phone number and one website. Services and support would be much more visible, because marketing budgets would be pooled. At the moment, the two organisations are competing for the same business to some extent. The front end of the services could be pooled and people could be directed behind the scenes to the support that they need.”²⁰³

Fossil fuel levy

288. One final issue raised during some of the discussions on energy efficiency and efforts to reduce consumption is whether the Scottish Government can gain access to some of the funds currently realised through the ‘fossil fuel levy’.

289. According to the Scottish Government, the UK Government has blocked through its public spending rules the spending of money saved under the fossil fuel levy for investment in renewables in Scotland and it is arguing for these rules to be relaxed.²⁰⁴ In figures received by the Committee from Ofgem, the balance in the Scottish levy account stands at £158 million, as at 9 April 2009.²⁰⁵

Further developing and deploying renewable energy technologies

290. The further development and deployment of renewable energy technologies in Scotland is a major and critical component of the Scottish Government’s energy policy and a substantial contributor to any efforts to decarbonise the energy system and therefore reduce carbon dioxide emissions and meet the targets that are to be set.

291. It is probably fair to say that this was one of the areas of the inquiry where the Committee received the greatest amount of evidence. However, much of that evidence was not limited just to the development and deployment of renewable energy technologies as such. Some of the evidence received related to the transmission grid, to planning matters etc., and as such had ramifications across different energy technologies. For example, the challenge of balancing the costs to be paid by Scottish-based utilities in constraint charges due to grid capacity issues with the costs to be paid by consumers across the UK applied equally to renewable electricity generation as well as power from more conventional thermal plant.

292. Therefore, these broader matters, whilst critically important to the Committee’s inquiry, are covered in subsequent sections of this report. This particular section focuses on those aspects of the evidence that were primarily or exclusively related to renewable energy. Furthermore, it should be noted that the issue of the development of marine renewables and some of the research and development matters (offshore wind, wave and tidal power) are also covered later in this report.

Policy background

293. Both the Scottish Government's energy policy overview of September 2008 and the more recent energy sector report of May 2009²⁰⁶ place great emphasis on the development and rapid deployment of renewable energy technologies such as onshore wind, biomass etc. Indeed, as previously stated, the Scottish Government's main objective in terms of its energy policy is "... to progressively increase the generation of renewable and clean energy."²⁰⁷

294. The importance of renewable energy technologies to the Scottish Government was re-emphasised by the Energy Minister in his first appearance before the Committee during the inquiry. He said—

"... Scotland has remarkable renewable energy resources—up to 25 per cent of European offshore wind and tidal resources and 10 per cent of European wave resources. Overall, Scotland has the potential to deliver up to 60GW of renewable electricity resources."²⁰⁸

295. Of particular importance to the Minister was the ability to build on the current position whereby Scotland is a net exporter of electricity through the additional potential offered by such technologies to become a major exporter of renewable electricity to the rest of the United Kingdom and further afield.

296. As a consequence of these objectives, the Scottish Government has set challenging targets for the take-up of renewable energy and Scotland's contribution to the UK's target as set by the European Union. As previously indicated, the Scottish Government has set an interim 2011 target of 31% of generation from renewable resources. This is part of the Scottish Government's commitment that 50% of Scottish electricity will come from renewable sources by 2020.

Renewable obligation certificates and feed-in tariffs

297. One of the central pillars of government policy at the UK level for the development of renewable energy technologies is the system of providing renewable obligation certificates, or ROCs, through the renewables obligation. A ROC is a 'green' certificate issued to an accredited generator for eligible renewable electricity generated within the United Kingdom and supplied to customers within the United Kingdom by a licensed electricity supplier.

298. Through the renewables obligation, the UK Government places an obligation on licensed electricity suppliers in England and Wales, Scotland and Northern Ireland to source an increasing proportion of electricity from renewable sources. In 2005-06, it was 5.5 per cent (2.5 per cent in Northern Ireland) and in 2006-07, the obligation is set at 6.7 per cent (2.6 per cent in Northern Ireland)²⁰⁹.

299. Suppliers meet their obligations by presenting sufficient ROCs. Where suppliers do not have sufficient ROCs to meet their obligations, they must pay an equivalent amount into a fund, the proceeds of which are paid back on a pro-rata basis to those suppliers that have presented ROCs. According to the energy regulator, Ofgem, the UK Government intends that suppliers will be subject to a renewables obligation until 31 March 2027²¹⁰.

300. The ‘alternative’ to ROCs used in some EU countries such as Germany is the feed-in tariff. Such tariffs are part of an incentive structure to encourage the adoption of renewable energy through government legislation. The regional or national electricity utilities are obligated to buy renewable electricity at above-market rates set by the government. As such, the higher price helps overcome the cost disadvantages of renewable energy sources. One key difference of feed-in tariff schemes compared to ROCs is that the incentives are open to all, not just licensed electricity suppliers such as large utilities.

301. Some of the evidence received by the Committee called into question the merits of the ROCs system whilst other witnesses, although occasionally critical of the renewables obligation system were reluctant to change over for fear of disrupting the support scheme and the progress made to date.

302. An example of the former was the evidence of Steve Smith, Managing Director Networks at the regulator, Ofgem. Mr Smith was very clear when he presented his views. He said, “The renewables obligation has been terrible value for money since its inception. It is one of those classic schemes that was a good idea in theory—we supported it at the time—but practical experience has shown that it is just very expensive.”²¹¹

303. His criticisms of the scheme and ROCs were that there is no link between the levels of payment and the functioning of the wholesale electricity market, that customers still have to pay for the scheme through higher bills despite the problems that are currently manifest in connecting new renewable energy plant to the transmission system and that, overall, it represented a poor deal to the final consumer. His preference was for change to the incentive initiatives to provide a flat-fee to developers for each unit of electricity actually produced, although he was open to different fees for different forms of technology in order to help stimulate the less mature renewable energy technologies.²¹²

304. In short, Ofgem’s representative outlined the case for a replacement of the current ROC scheme with a feed-in tariff. His view was not shared by Jason Ormiston (formerly) of the Scottish Renewables Forum. He said the idea of changing to a feed-in tariff was “kind of academic”²¹³. In his view—

“... the renewables obligation exists and all the investment decisions about renewables are being made now and are being based on what we understand the market for renewable electricity will be. A change in any system would create

huge confusion, huge uncertainty and an investment hiatus that we can ill afford, given climate change targets.”²¹⁴

305. Similarly, Audrey MacIver of Highlands and Islands Enterprise said “... now is not the time for a wholesale change to the process—we want to take renewables development forward”²¹⁵ and Alex MacKinnon of ScottishPower said “... we are against a significant change in the funding mechanism for renewables.”²¹⁶

Financing renewable energy developments and the impact of the recession and ‘credit crunch’

306. In addition to considering the current financial climate and its impact on the energy sector more widely, such as activity levels in the North Sea and the availability of finance for investments in new transmission grids etc., the Committee also heard evidence of the increasing problems facing the developers of renewable energy projects, exacerbated by the current recession.

307. In his evidence to the Committee, by way of an overview, Charles Yates of Grant Thornton stated that—

“...banks are reluctant to lend to any project right now. Eighteen to 24 months ago, they were lending too much and to the wrong kind of project, but the pendulum has now swung in the opposite direction and it is hard even for good projects to get bank lending. Even if a project has long-life assets such as wind turbines, which will generate income for a long period of time, banks want to lend only in the short term, for a period of seven years or so.”²¹⁷

308. He also said that “... bank margins have increased considerably from about 1 per cent above LIBOR—the London interbank offered rate—to about 3 per cent”.²¹⁸ His views were shared by Andrew King of Energy4All, a community project developer, who stated that “... my general impression is that there is a flight to quality.”²¹⁹

309. Additionally, for the community-led developments, the problem according to Mr King is one of “... the almost total absence of risk capital.”²²⁰ This meant that communities, who did not typically have access to large amounts of equity to invest into a renewable energy project, were finding it difficult to take a project through planning to completion. In his view, the “... market structure makes it exceedingly difficult for communities to develop and fund projects.”²²¹ This was because “... community ownership receives zero credit in planning and grid considerations.”²²²

310. A more general suggestion made by Mr Yates was for the Scottish Government to provide a financial guarantee for a proportion of the debt finance for a particular set of renewables projects, for example, community-based

projects, in order for them to address the problem of a lack of risk capital.²²³ The quid pro quo would be that the bank or financier steps up the level of finance it makes available to other similar projects as, with a government guarantee, it would not need to invest as much capital in the project than would have been the case without one.

311. For the larger, commercially developed renewable energy project, Mr Yates of Grant Thornton provided evidence on the emerging trends in terms of access to finance brought on by the credit crisis and the recession. He stated that banks “do not trust one another and will not syndicate, so only club deals are available.”²²⁴ He explained that this meant that a bank will not lend a developer a sum of say £300 million for a project and then get other banks to provide it with part of that £300 million. Instead, in his view, the bank will now lend only £50 million and the person will have to find five other banks that will lend £50 million. That, in his view, simply adds to the complexity, cost and time of developing renewable energy projects.

312. One alternative funding stream suggested are the initiatives being developed at an EU level by the European Investment Bank (EIB) to provide finance for renewable energy projects. Mr Yates thought these provided “some comfort” but noted that the EIB “has detailed procedures and ways of doing things and a reputation for being somewhat bureaucratic.”²²⁵

313. The potential impact of the more recent problems with the financing of renewable energy projects was put into stark light by Mr Yates in respect of the Scottish Government’s targets for the take-up of renewables. He said, “... time is running out quickly and the targets are ambitious” but that the situation was not yet irredeemable if government intervenes appropriately.²²⁶

Grid and transmission issues, including the planning process

314. The issues relating to the electricity grid system, the development of transmission and distribution networks and the complexities and vagaries in the planning system for all types of energy projects were very significant components of the evidence received by the Committee. A substantial proportion of this evidence related to renewable energy technologies, especially onshore and offshore wind, hydro and biomass etc., but not exclusively, covering also conventional, thermal power plant and distribution networks such as sub-stations.

315. In many respects, the issues of access to the grid and the development of transmission networks, and that of the planning process, are closely inter-related. Consequently, these are dealt with in turn below.

The development of Scotland’s electricity transmission and distribution system

316. Without a rapid shift to a more highly decentralised electricity system, the part to be played by the current transmission and distribution network, including links with other neighbouring countries, is fundamental to what kind of choices can be made to the generating mix and how rapidly this can be achieved.

317. In considering the evidence we have received on this matter, the Committee has identified a number of issues that are explored in more detail below, namely—

- Scotland's part in the wider electricity market;
- the proposals at a GB level to change the system of charges on generators;
- the need to upgrade and develop the current transmission and distribution, including the role to be played by the Beaulieu-Denny line and other projects;
- the potential offered by the development of a North Sea supergrid.

Scotland's part in a wider electricity market

318. The Scottish electricity system is currently an integral part of a wider market across the rest of the United Kingdom through the interconnectors between Scotland and England and between Scotland and Northern Ireland. Since April 2005, there is now a single set of wholesale electricity trading and transmission arrangements known as BETTA (British Electricity Trading and Transmission Arrangements). National Grid UK is Great Britain System Operator and, following the introduction of BETTA, now operates the two Scottish transmission systems and its own England and Wales system as one, balancing electricity supply and demand across Great Britain. The electricity industry in the UK is regulated and National Grid UK is subject to price controls set by the energy regulator, Ofgem.

319. It is the role of this regulator that forms the basis of much of the evidence received by the Committee on this matter. For example, as noted by Maf Smith of the Sustainable Development Commission Scotland—

“There are clear tensions because we are part of the Great Britain market. We have seen that with charges and the way in which the regulatory system encourages different types of generation.”²²⁷

320. For the Sustainable Development Commission Scotland, the key issues were how the regulator took into account the necessity of tackling climate change and how it struck a balance between the issues of the price paid by the final consumer of their electricity and the wider sustainability issues.

321. Similarly, Jason Ormiston (formerly) of the Scottish Renewables Forum said of Ofgem that it is “... perhaps less sympathetic to some of the needs in Scotland” although he did agree that the regulator “... has a clear idea of what

the requirements are for the future and it is working with the industry to deliver them.”²²⁸ For the Scottish Renewables Forum, the key issues were more to do with the costs of accessing the grid and also the charging and pricing regimes at the UK level.

322. In some respects, having an integrated Scottish electricity system with that of the rest of the UK is central to delivering the Scottish Government’s objective making “Scotland a major exporter of renewable electricity to the rest of UK and further afield”.²²⁹ However, the Scottish Government has also said that the “... current access arrangements result in delays in connection time” and that “There are also major challenges on grid charging and system balancing, where the current Electricity Transmission Charging Regime, proposals for targeting constraints costs on Scottish generators, works against the development of clean, renewable energy in Scotland and unfairly penalises Scottish energy companies.”²³⁰

Grid access, charging and system balancing

323. This, somewhat complicated issue, was central in much of the evidence received by the Committee. The disputes that the Committee heard related to whether the current problems that developers in Scotland face in connecting to the grid were to do with the planning process or were to do with the charging regime that is being proposed by Ofgem and National Grid, particularly as it will affect Scottish generators.

324. As Jason Ormiston (formerly) of the Scottish Renewables Forum noted in his evidence to the Committee—

“A current short-term problem is that connection offers have been made to an awful lot of projects, but they cannot connect to the transmission and distribution networks until after 2018. Some of those renewable electricity projects have planning consent; some of them are going through the planning system at the moment and are due to get determination in the next few years.”²³¹

325. In his view, the current statutory framework in the UK was not sending out the right locational signals to develop and then

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frankly, unacceptable, particularly on security of supply grounds. [...] A generator that wants to connect must be given a sensible timeframe for doing so that is consistent with how long it physically takes to build the plant.”²³³

327. His view was shared by Alison Kay of National Grid who said that her company recognised “that access needs to be sorted out and that the situation is not perfect.”²³⁴ National Grid, as the transmission system operator in Scotland, was trying to address this problem by prioritising developers with projects that were “ready and able to connect” and, in the longer-term, through its transmission access review (TAR), trying to bring in new system access arrangements.

328. In supplementary written evidence supplied to the Committee by Ofgem, the regulator, states that National Grid has told it that it has identified 450MW of Scottish renewable generation which could be advanced in terms of connection dates. This, according to National Grid, would represent a 16% increase in the installed renewable capacity in Scotland²³⁵.

[Next](#)

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