ENERGY POLICY: AN OVERVIEW

SEPTEMBER 2008

1. Purpose

This short document sets out the Scottish Government's approach to energy policy. It has three linked purposes:

- To provide a statement that encourages the involvement of all stakeholders;
- To provide a clear context for the work of the Scottish Government and its partners in policy development and delivery; and
- To encourage increased levels of innovation and investment in energy related projects in Scotland.

This document does not seek to repeat detailed information available elsewhere. However in the interests of continuity and completeness references are given at the end.

2. Desired outcomes

The Scottish Government's purpose is

> To focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing ***sustainable economic growth***

Energy policy can contribute to economic growth while at the same time helping ensure that growth is sustainable. Energy use is one of the biggest contributors to carbon emissions, emissions which threaten the sustainability of our planet. However, it is clear that there is an opportunity to exploit Scotland's comparative advantage in energy resources while meeting the carbon challenge.

Scotland is particularly well equipped as far as energy is concerned with fossil fuels and renewables in abundance and the skills, expertise and infrastructure to exploit these resources.

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.

Elements of the opportunity and challenge can be usefully set out in relation to the strategic themes underlying the Government's purpose as set out overleaf.

WEALTHIER AND FAIRER

- To promote a vibrant energy sector and supply chain which contributes to sustainable economic growth
- To promote energy developments which support and provide the stimulus for wider community generation
- To meet the above energy objectives in a way that helps reduce fuel poverty

SMARTER

- To ensure that we capitalise on the academic, engineering and North Sea skills that are available to build a renewables and wider clean energy sector that creates more intellectual property and more skills in Scotland

HEALTHIER

- To ensure more people and more communities have access to affordable energy

SAFER AND STRONGER

- To ensure that the operation of energy markets provide security of supply for Scotland

GREENER

- To promote and encourage changed patterns of energy production and generation which will reduce CO_2 emissions and contribute to climate change objectives
- To promote and encourage reduced energy consumption so as to contribute to climate change objectives

3. Environmental Targets

The Scottish Government has set a target of reducing carbon emissions by 80% by 2050. The current short term target is to achieve a reduction by 2011, as compared with 2005.

In order to achieve this target it is necessary to (a) estimate emissions which will result from current and planned activity and (b) identify further policy options for achieving the 80% target. Projections of expected emissions necessarily reflect assumptions on energy mix. Using projections of the energy mix for the UK as a whole can give a misleading picture for Scotland given both the different current mix and energy resources which will allow a different mix in the future. Projections therefore need to be adjusted for Scotland's specific characteristics. This work is in progress together with identification of future policy options.

It is clear that meeting carbon emission targets will require a strong contribution from changed patterns of energy production and consumption. On the production side, Scotland will need both more renewable energy and clean energy from fossil fuels. But Scotland has the comparative advantage to allow this to be achieved if there is sustained effort to overcome barriers.

The Scottish Government supports the EU target of 20% of Europe's energy requirements being met from renewable resources by 2020. Scotland will play its part in meeting the contribution proposed for the UK of 15% energy from renewable sources and will aim to go further than this to 20%. Working with industry and other stakeholders we will produce in 2009 a Renewable Energy Framework to set out how we will achieve this objective. A draft Framework will issue for consultation in September 2008.

The Framework will address, power, heat and transport aspects of renewable energy. However, this Overview document does not specifically address use of energy in transport. This document focuses on power and heat. Heat is the subject of a current detailed strand of work and we envisage setting targets, taking into account EU objectives.

For electricity, **the aim of the Scottish Government is that 50% of Scottish demand[1] for electricity should be met from renewable sources by 2020, with a milestone of 31% by 2011**. That milestone is equivalent to 5,000 MW of installed capacity. This is twice the capacity at Scotland's Green Energy Day in September 2007 when installed capacity of renewable energy exceeded that of nuclear generation.

[1] Demand here defined as ***Gross consumption*** (Generation – exports + imports)

4. Guiding principles

The Government will pursue the high level objectives set out in section 2 taking into account some important guiding principles. While most of our high level objectives may be shared with other countries, our means of achieving these is distinct.

Responsibility in the right place

We will press for powers to be passed from Westminster to the Scottish Government. For example, we believe the Scottish government should have responsibility for oil and gas resources and revenues and health and safety in respect of this industry.

We will also ensure that decision making is at local level wherever possible with the objective of full community engagement.

We will ensure clear responsibilities for public sector players which do not leave gaps or overlap. It is the role of the Scottish Enterprise and Highlands and Islands Enterprise (HIE) to provide business development support to individual businesses who seek to exploit opportunities in the energy sector – whether in production, the supply chain or energy services. We have already announced that responsibility for grant support for technology development by businesses will pass from the Scottish Government to Scottish Enterprise and HIE who will manage these programmes as part of their holistic approach to business support.

Ownership and benefit

We want to provide the conditions which will see strong commercial companies operating in Scotland who are competitive in international markets.

We are keen to see companies engage with communities and agreeing to share the benefits of commercial development.

We will also actively promote community led energy generation and energy saving projects. Such approaches can stimulate communities to take their activism into wider areas and promote community regeneration.

We are producing guidance on community engagement in renewable energy projects.

Innovation and ambition

Scotland is rich in energy resources and we must be ambitious in their exploitation. We are planning now for the huge export potential of renewable energy and clean energy technology. We will look forward on a 20 year time horizon, ensuring that the necessary additional infrastructure is developed. We are confident in our ability to be a world leader in clean energy.

We will encourage and promote continued growth in links between universities, industry and the public sector and improved integration in European energy research networks. We have launched the Saltire Prize to promote the development of renewable energy. We welcome the recently formed Energy Technologies Partnership.

Inclusive policy development

Energy Minister Jim Mather will continue to engage with stakeholders not just through formal advisory groups (which include the Forum for Renewable Energy Development in Scotland- FREDS) but also through a range of seminars and meetings. He will continue to encourage new ideas and a co-operative approach to removing any barriers to development. Our proposed Framework for Renewable Energy will be developed with industry and other stakeholders.

Scale of operation

Electricity generation from fossil fuels has to date been carried out on a large scale. But we will help promote new patterns of generation which respond also to climate change objectives. Combined Heat and Power plants (CHP) involve the heat generated as a result of power generation being used rather than lost into the atmosphere. Such plants are likely to operate on a smaller scale than current coal generation, often with the involvement of local authorities and housing associations. We will undertake work to promote such decentralised energy networks.

Renewable CHP, in particular, can be carried out on a range of scales including community and micro (individual building) projects. This can reduce transport of fuel which adds to carbon emissions, help reduce fuel poverty and encourage greater interest in effective energy use. We have tripled the funding available for community and micro generation and are taking a range of other steps to promote and ease use.

Protecting the environment

Clean energy presents economic opportunities and climate benefits. But we must achieve cleaner energy in a way that respects the world around us - landscape and habitats. Planning and consenting regimes exist to ensure that coal production and wind power, for example, do not damage other valuable natural resources. Clear guidance on preferred locations was not available to wind energy developers from the outset but is now being developed. Equally, we are taking steps to ensure that marine energy faces a clearer picture from the outset.

Scotland in Europe

The Scottish Government is playing an active role in the implementation of the Energy Policy for Europe agreed at the European Council in March 2007. This sets ambitious targets to reduce carbon dioxide emissions, improve energy efficiency, increase levels of renewable energy, and to employ new technologies such as carbon capture and storage in energy generation. The Scottish Government will act to promote the interests of Scotland's energy sector in the development of European policy on competition in the energy industry and infrastructure development.

The Scottish Government also supports the steps which Scottish industry and research establishments are taking to develop, in partnership with European bodies, clean energy systems and processes, building on Scotland's own strengths in this area. The Government has announced and is working to develop a Scottish European Green Energy Centre based in Aberdeen which will promote increased involvement in European networks for research into and deployment of renewable and low carbon technologies.

5. Meeting Scotland's energy needs : generation and supply

In order to reduce carbon emissions it will be important that our use of fossil fuels for power and heat reduces, and that, where it continues, combustion is carried out in ways that reduces emissions.

Development of new technologies and industries will be led by the private sector. The EU Emissions Trading Scheme (EU ETS) will provide an important incentive for such change. However, the public sector needs to ensure a supportive context. Barriers to development of new technologies must be addressed. Some actions are for the Scottish Government itself, some for other public sector players while there is also a need to influence and help form policy on a level broader than Scotland alone.

The sections below give a brief indication of current actions in different sectors.

Production and supply of Heat

Heat usage in Scotland is estimated to account for 57% of our total energy demand, with 50% of that figure attributed to the domestic sector. Priorities for energy policy are reducing carbon emissions associated with heat – through promoting use of waste heat, combined heat and power plants and renewable heat sources. Renewable heat sources can help reduce reliance on oil in areas off the gas grid and potentially reduce energy costs and alleviate fuel poverty. All of these sources of heat also offer opportunities for business development and growth.

The Scottish Government is in the early stages of developing its approach to heat. A sub-group of FREDS has made recommendations to the Scottish Government on how to develop the *renewable* heat market in Scotland. The Government will take these recommendations into account in drawing up its Framework for Renewable Energy.

A range of technologies produce renewable heat: including: biomass, heat pumps, solar heating, energy from waste, anaerobic digestion and geothermal. The Scottish Government can provide financial support for the deployment of these in certain circumstances with support focused on community and micro generation.

The Scottish Government will now undertake further work on:

- use of waste heat from industrial processes;
- Combined Heat and Power (with renewable and fossil fuel energy);
- the infrastructure required to carry such heat to consumers;
- further incentives to promote renewable heat.

We will learn from others addressing the same issues including the UK Government.

Production and supply of Electricity

Scotland's electricity is currently produced by a small number of large coal, gas and nuclear generating stations, together with a larger number of smaller renewable plant (mainly

established hydro and onshore wind). We wish to move to a much greater proportion of renewable energy together with clean energy from coal and gas.

Electricity: Renewable sources

Scotland already meets 16% of its demand for electricity from renewable sources- primarily hydro and onshore wind. Progress towards the target of renewable generation meeting 50% of demand for electricity by 2020 will be driven mainly by the Renewables Obligation legislation, which obliges licensed electricity suppliers to secure increasing amounts of their supply to customers in Scotland from eligible renewable sources. The Scottish Government wishes to see a balanced mix of renewable technologies and therefore supports UK plans to amend this mechanism to provide varying levels of support to different technologies and thus drive the development of less mature technologies. The precise nature of any changes to the Renewables Obligation Scotland (ROS) will depend on full consultation and the subsequent agreement of the Scottish Parliament.

Emerging technologies are also supported with grants for capital expenditure, for example, the development of wave and tidal capacity, where we have a technological lead and a huge potential resource, the development of hydrogen fuel cell technology and the deployment of biomass energy which is underdeveloped in Scotland and the UK more generally. We also believe that there is significant offshore wind potential in the deeper waters around Scotland, and are partners with the UK Government in a Strategic Environmental Assessment.

As noted, Scotland has a specific competitive advantage in marine energy derived from our natural resource, research base and companies developing and deploying marine devices. To assist this a range of partners have invested in EMEC, the European Marine Energy Centre which provides test sites connected to the grid at sea off Orkney, In addition, the Scottish Government's **Saltire Prize** will provide a further stimulus to marine energy. We expect to see marine energy beginning to make a contribution by 2020 but developing at substantial scale in the decade thereafter. We are working with partners to examine the possibility of sub-sea grids which would allow export of this resource.

The Scottish Government is on track to meet its renewable electricity target for 2020 and the interim milestone for 2011. Annex A provides relevant statistical information.

Electricity: nuclear power

In meeting the remaining demand for electricity nuclear energy will continue to play a part for the life of the current power stations. But the Scottish Government is clear that new nuclear power is not wanted or needed in Scotland. There is no clear or reliable proposition on storage of nuclear waste and we are not willing to countenance such very substantial and also open-ended costs for this and future generations.

Electricity: fossil fuels

Coal and gas will continue to play an important part in electricity generation, providing baseload, but there is a clear need for a reduction in associated emissions. We want to see Scotland playing a leading role in the development of **carbon capture and storage (CCS)** technology to allow us to continue to utilise fossil fuels while reducing the level of harmful emissions being released into the atmosphere. As elsewhere in Europe, the Emissions

Trading Scheme will provide a commercial incentive for investment. With existing skills and know-how from involvement in the North Sea, Scotland is well placed to take a lead and generate wider economic benefit. The Scottish Government is: assisting research on storage locations; pressing the UK Government for quick action; and seeking to be fully involved in European action to support CCS.

Microgeneration

A range of micro-renewable technologies can supply heat and power. These can assist in tackling climate change. They can help to reduce carbon dioxide emissions from homes, small commercial buildings, and community buildings, such as leisure centres and schools. But perhaps the more important impact of creating our own energy through microgeneration is that it can bring about a better sense of responsibility, raise awareness and engage others in the individual action we can take in tackling climate change. In addition, where microgeneration allows those off the gas grid to reduce or avoid oil consumption there are real cost benefits and impacts on fuel poverty. However, there are a number of barriers to increased uptake of microgeneration and these are being addressed by the Government. They include the planning and building standards regime, quality of information and advice and clear information about payback periods. An Action Plan setting out recent and planned actions will issue later in 2008.

Meanwhile in 2008/2009, **the Scottish Government has tripled funding available to support community and microgeneration**.

Security of energy supply

The operators of the electricity grid ensure supply on a day–to-day basis. Scotland is currently an exporter of electricity although the interconnector with England can import electricity if needed. The Scottish Government wishes to see Scotland continue as an exporter of electricity for economic reasons but also wishes to see Scotland able to meet its own needs in relation to electricity for reasons of security of supply, while acknowledging the potential to import; such as Norway does in exporting Hydro Power and importing power from other sources as occasionally needed. To this end we will continue to research and debate with key stakeholders the potential of sub-sea interconnectors and other appropriate upgrades to the grid infrastructure.

Some current generating capacity will come to the end of its life over the next 20 years, including nuclear stations. However, the Scottish Government does not consider this is a threat to supply. The operation of the regulated market with the signals this sends to incentivise generation makes it inconceivable that there will not be investment in new generating capacity in Scotland as can be seen from the investment activity across the energy sector in Scotland. The Government is however in dialogue with BERR and OFGEM to ensure that regulatory mechanisms- such as the **transmission charging regime**- do not pull investment away from Scotland and, in the case of renewables, from more remote areas of the UK but rather encourage exploitation of renewable resources – which are found predominantly in Scotland.

The Scottish Government also works closely with the energy industry, local authorities and key responders (e.g. Police and Fire) to ensure they have robust contingency plans in place for energy emergencies. This includes close liaison with the UK Government and

appropriate regulators to ensure that Scottish issues are represented, progressed and that best practice is implemented.

More widely, the Scottish Government engages closely with UK Government to ensure that Scotland's national infrastructure is resilient and well protected. The national infrastructure is the underlying framework of facilities, systems, sites and networks necessary for the functioning of the country and the delivery of the essential services which we rely on in every aspect of our daily life.

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6. Meeting Scotland's energy needs : energy consumption

Demand for energy continues to grow. Under current patterns of production, this leads to increased carbon emissions and tends to drive higher energy prices. Improving energy efficiency is widely recognised as the easiest and most cost-effective means of reducing carbon dioxide emissions. The financial benefits of doing so are clear: industry and society can achieve more with less energy; public services are delivered at lower cost; and fuel poverty is reduced.

Better insulated buildings and more energy efficient workplaces cut energy bills for householders and businesses. Energy efficiency can also be achieved through better practice in our use of energy (switching lights off, less use of standby). Reducing demand in these ways also puts less pressure on energy supplies.

The Stern Review states that:

> *Studies by the International Energy Agency show that, by 2050, energy efficiency has the potential to be the biggest single source of emissions savings in the energy sector. This would have both environmental and economic benefits: energy-efficiency measures cut waste and often save money.*[2]
>
> *Stern goes on to suggest that reductions in global CO_2 emissions due to greater energy efficiency could be between 31% and 53% of the total reductions achievable by 2050.*

However it is not always clear that individuals and organisations fully realise the benefits that can be achieved through simple energy efficiency measures. There are still barriers to be overcome: making use of and acting on clear and trusted information, disruption if works are taking place, and the initial financial investment - although most energy efficiency measures save money in a relatively short time.

The Scottish Government has devolved responsibilities for the *promotion* of energy efficiency and takes on the challenging role of changing behaviour through raising awareness and providing advice and financial incentives to improve energy efficiency across the public, business and domestic sectors. The Scottish Government funds:

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

The Scottish Government is also using **building standards and the planning system** to help achieve low carbon buildings. The objective is to set a route-map to the goal of zero carbon buildings. The recently published Sullivan Report recommends staged increases in energy standards for new buildings to substantially reduce emissions - the first stage will be introduced in 2010.

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[2] *Stern Review: Executive Summary p.13 [based on research in Energy Technology Perspectives, International Energy Agency, 2006.]*

Some regulatory powers associated with energy efficiency are the responsibility of Westminster, for example, the obligation on energy suppliers to support energy efficiency measures by their customers through the Carbon Emissions Reduction Target (CERT). The Scottish Government is concerned that Scotland may not be benefitting fully from CERT and we want to ensure a more strategic and integrated approach to maximising the impact of CERT in Scotland. We are therefore developing and implementing a CERT Strategy for Scotland in partnership with the energy supply companies, the Energy Saving Trust and Ofgem.

We will continue to work with the UK Government in such areas and encourage them to consider what additional energy efficiency measures could be adopted across the UK to cost effectively reduce carbon emissions. For example, an accelerated roll out of advanced displays and metering technologies and more accurate billing in homes could help to raise public awareness of what activities use the most energy and what changes in behaviour produce the greatest reduction in energy consumption.

Going forward we want to ensure that we have the right incentives in place to encourage energy efficiency and microgeneration and we are committed to continually reviewing, improving, simplifying and streamlining programme delivery to ensure that support is effectively targeted.

The Scottish Government will set out later in 2008 how it is translating key objectives into action. This will take into account responses to the consultation on a draft Energy Efficiency and Microgeneration Strategy published in March 2007 by the previous administration. It will also reflect a number of pieces of research published in June 2008 and the consultation on the Scottish Climate Change Bill which seeks views on further incentives to encourage energy efficiency.

Later this year, the Scottish Government will introduce the **'Scottish Energy Efficiency Design Awards'**. In total £1 million will be available in prize money for innovation and design solutions for improving the energy performance of Scotland's existing housing stock, particularly those homes considered hard to treat. We want to kick-start and build up a programme of exemplar low carbon refurbishments that demonstrate workable solutions to social and private housing providers and the design, building and construction industry.

7. Energy: a key sector of the Scottish economy

Energy is a key sector of the Scottish economy. We have world leading technology and skills in extraction of oil and gas and related supply chains, and in production of equipment for power generation. The Scottish based utilities who supply electricity and gas- and who also generate electricity and own the electricity grid - make a major contribution to growth and employment. As indicated in previous sections, there are increasing business opportunities and strength in renewable energy, in clean energy from fossil fuels and in energy conservation.

Oil and gas

Although the North Sea is a mature sector, there will be opportunities for investment for many years to come. Oil & Gas UK highlight that so far around £390 billion (2007 money) has been spent on exploration and development of reserves in the North Sea. Investment is high, a sign of the confidence in the continuing attractiveness of the North Sea as a location for exploration and production. The North Sea has produced around 36 billion barrels of oil equivalent (boe) so far. Current estimates suggest that the reserves remaining in the UK Continental Shelf (UKCS) range from 16bn to 38 bn boe although the actual level of reserves recovered will depend on a range of factors including price, technology and the rate of further discovery.

While the North Sea is a mature sector, we should not accept that the rate of decline in recent years, which has been in the range of 5% to 7% per annum, should be seen as inevitable. Our aim should be to at least slow the rate of decline and maximise recovery using technologies such as Enhanced Oil Recovery as appropriate. This will require consideration of a whole range of fiscal and investment levers to ensure that long-term investment and deployment of the latest technology in the North Sea continues to be an attractive option.

The Scottish oil and gas industry, particularly in terms of the supply chain is a world-leader in many areas. We are ambitious to maximise the opportunities that such a position will provide. Along with the sector itself, Scottish Enterprise's Energy Team is playing a leading role in the continuing promotion and development of the energy supply chain in Scotland.

The skills and knowledge developed in Scotland since the development of the North Sea are a key strength for Scotland. Many of these skills will continue to play a vital role in developing our future, both within oil and gas but also through their transfer and adaptability to other sectors such as renewable energy. The oil and gas sector employs around 480,000 people across the UK, with over 100,000 skilled jobs in Scotland directly employed by the industry (an estimated 4% of Scottish workforce).

The Scottish Government should have greater responsibility over oil and gas resources and will continue to press our case. Based on average oil and gas prices in 2008/09 to date, initial Scottish Government estimates indicate that North Sea revenue may be in the range of £4 to £5 billion higher than the initial Treasury forecast in the UK Budget of £9.9 billion. The issue of Oil and Gas revenues will form an important part of the National Conversation.

Through the Deputy Chairmanship of Scottish Government Minister, Jim Mather, we also play an active role in PILOT, the UK joint industry/government taskforce which addresses issues that are vital for the oil and gas industry's future success.

Coal

Scottish opencast coal output remains healthy – in the range of 5 to 8 million tonnes per annum over the last 10 years, during which time output in England has fallen significantly. There remains almost 30 million tonnes of coal at consented opencast sites in Scotland and we support the continued extraction of coal. In tandem with the continued development of clean coal technology this will offer a long-term future for coal-based electricity generation. Scotland has the expertise and the necessary infrastructure in this area. We still stand ready to take a European lead in clean coal technology. This will present a massive opportunity to export this technology world wide, especially to countries such as India and China which have an ever expanding energy sector and where clean coal technology has a particular relevance.

The Scottish Government is represented on the UK Coal Forum which beings together the industry, electricity generators, unions, equipment suppliers and others involved in the industry in order that important issues facing the industry can be discussed.

Renewable energy

The main economic benefits to date from the growth of renewable energy have been in the areas of construction and consultancy services relating to the construction of wind farms. We continue to pursue, mainly though Scottish Development International, investment in research of manufacturing capacity and associated supply chain. The skills and knowledge that have been built up in the oil and gas sector sectors are also of potential value to the long-term development of the sector, in particular in relation to offshore development.

Renewable Energy can perhaps be considered still to be in its early stages of development with its full potential for contributing to economic growth still to be realised. Major opportunities for growth and employment still remain ahead of us through the development of new technologies in such areas as marine, tidal and offshore wind. The opportunities for Scotland in these areas are clear and considerable. Other sections of the overview provide more detail on the support we and other agencies are already providing in these sectors.

Supporting business

Scottish Enterprise and Highlands and Islands Enterprise (HIE) play an active role in promoting the continued growth and prosperity of the various energy sectors in Scotland. HIE is focused almost entirely on renewable energies, while Scottish Enterprise is engaged with both the academic and industrial sectors of oil & gas, conventional power generation, grid management, and most forms of renewable energies. Strategic support and advice is provided to companies in a number of ways.

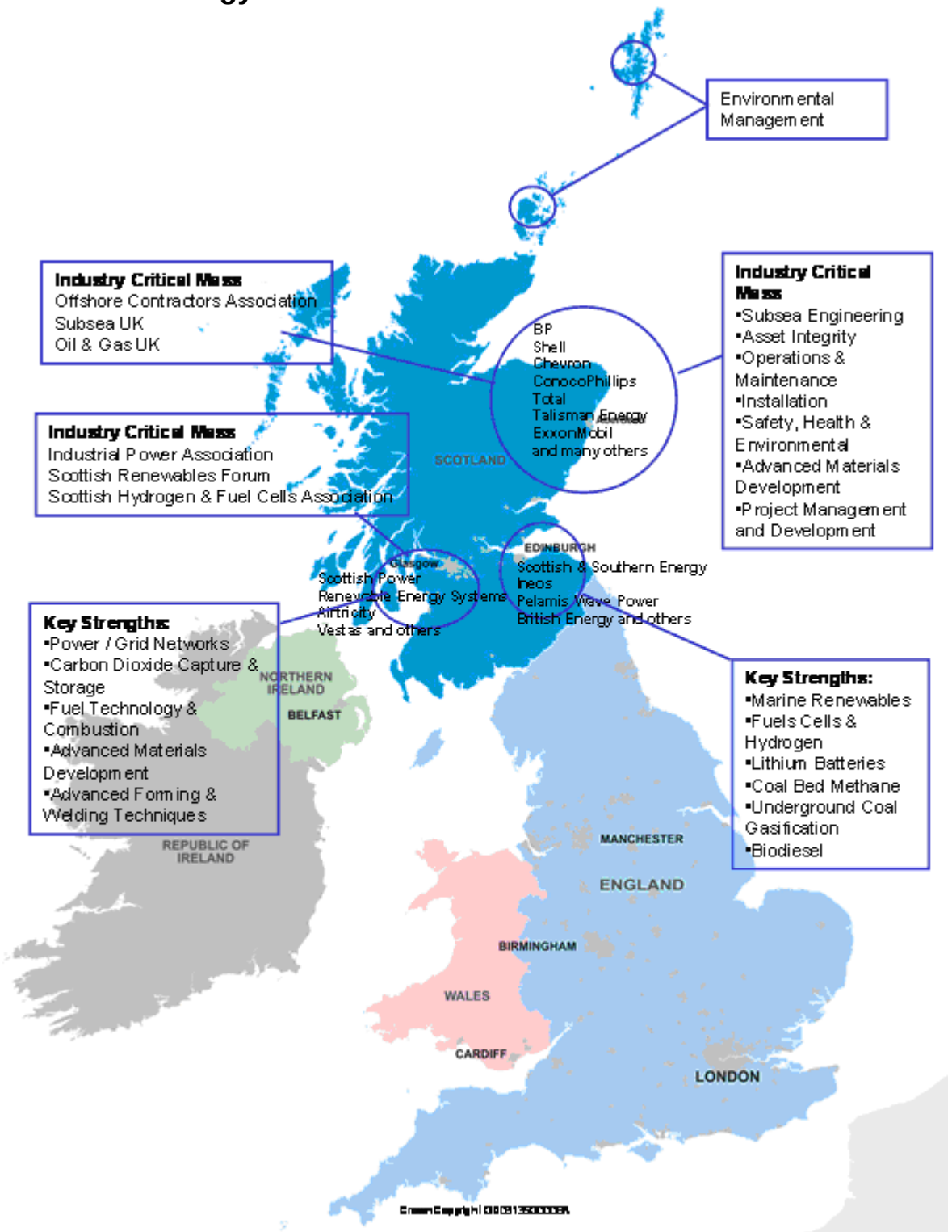
Although Scotland's energy businesses are already successful outwith the domestic market, assistance is required to support continued growth and sustainable business development in global markets. Focused in-country research is undertaken to map Scottish strengths with market requirements, and to provide five year forecasts of capital and operational investments in more than 70 countries. Tailored programmes are then developed by Scottish Development International (SDI) to assist market penetration.

Research, development, demonstration and commercialisation of new technologies remains a fundamental aspect of support, including stimulating greater energy research collaboration between Scotland's universities, and also with industrial institutes. Support ranges from conceptual and feasibility studies, through Proof of Concept and Enterprise Fellowship programmes, joint industry projects and similar.

Diversification and the transfer of skills and expertise is promoted strongly by Scottish Enterprise and HIE. Research into emerging sectors is undertaken and the findings disseminated to energy businesses, with support through account management to prepare for new opportunities. Support for cross sector collaborative projects is also provided e.g. oil & gas to offshore renewables.

The strengthening of key energy sectors and the development of supply chains is extremely important. Scottish Enterprise and HIE work very closely with bodies such as Subsea UK and Scottish Renewables to drive support for young companies and facilitate joint industry projects.

Scotland's Energy Industries



8. Supporting actions

Research, development and demonstration

Scottish energy research is world class and world-recognised. Our acknowledged research strength in energy includes power networks and petroleum engineering but also now includes cutting-edge research and demonstration in renewable wind, wave and tidal power, and low carbon energy solutions such as carbon capture and storage.

The work of our leading universities in energy research is informed by the Scottish Government's policy objectives in pursuit of sustainable economic growth and the development of the knowledge economy, taking advantage of new economic opportunities and access to overseas markets.

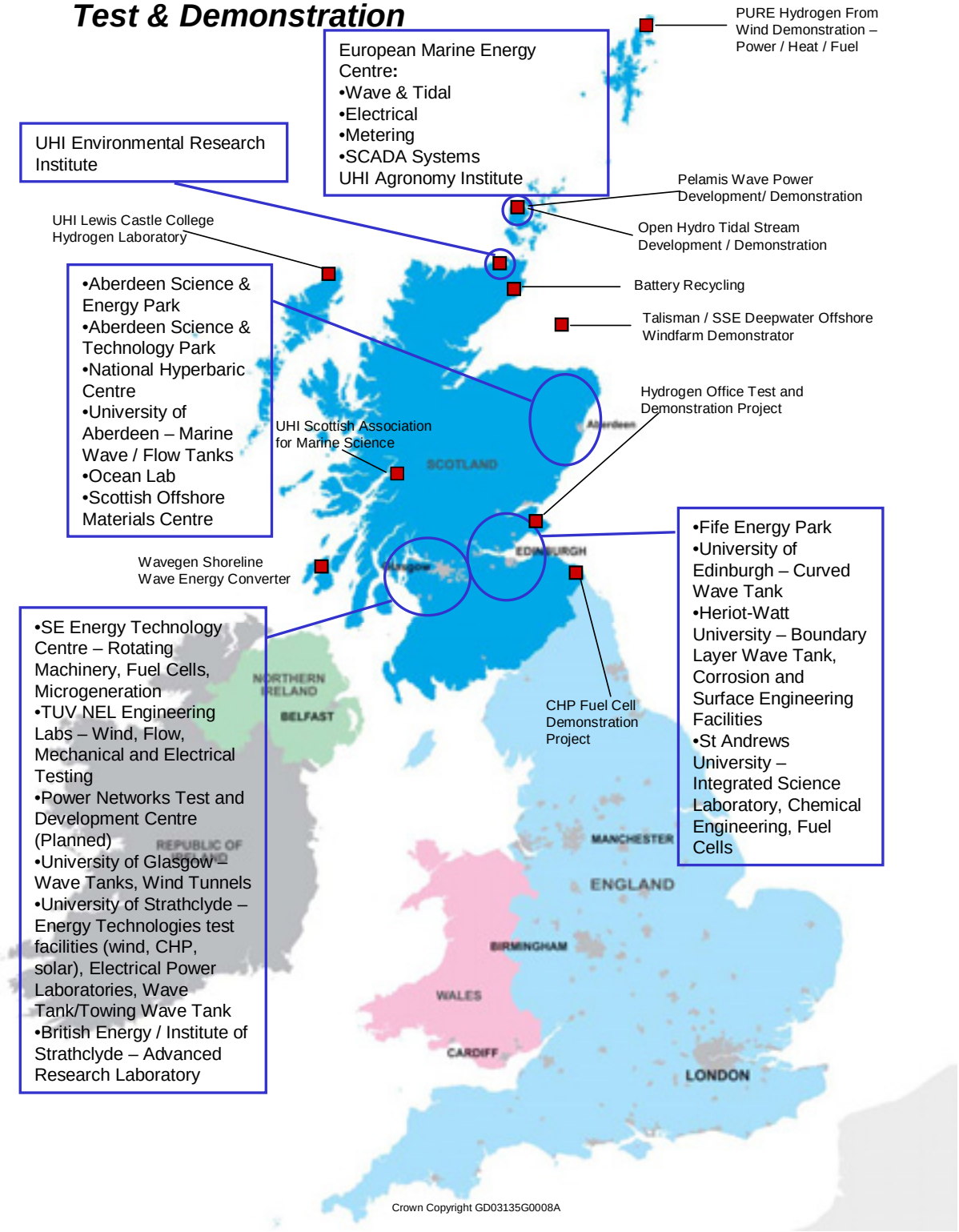
Collaboration is at the heart of Scotland's research success. The recently formalised **Energy Technology Partnership (ETP)** focuses on universities in the cities of Glasgow, Aberdeen and Edinburgh but also draws together all the key Scottish university based research and development teams involved in energy technologies (eg fuel cell research in St Andrews) and is linked to key universities in England and abroad. The Partnership is founded on the principle of research pooling, and acts as a common platform for seeking funding from UK and international funding bodies and industry.

The Partnership is supported by an advisory committee on which industry bodies are represented. A supervisory body involving Government, other parts of the public sector and key industry figures is also being established.

Scotland's world lead in the development of low carbon energy technologies places us at the heart of delivering the EU's new Energy and Climate Change policies. The European Commission and Scottish Government are supporting the establishment of a **Scottish European Green Energy Centre (SEGEC)**, tasked with the development of pan-EU joint projects in green energy research and deployment, EU-wide dissemination of research findings, obtaining research funding, and engaging industry in the formulation of EU-wide solutions to the demanding energy and climate change targets.

The work of the universities, ETP and SEGEC is also complemented by the intermediate technology institute for energy – ITI Energy – which identifies technologies required to address future global market opportunities then funds and manages research and development programmes and the subsequent commercial exploitation of new intellectual property.

Scotland's Renewable Energy Test & Demonstration



Supporting actions: Infrastructure

The shift to a renewable future poses significant issues for Scotland's electricity infrastructure. The grid at present does not provide significant capacity in areas where Scotland's renewable resource, especially our wave and tidal potential, is at its strongest.

New investment has been authorised by OFGEM and further proposals are under consideration (eg islands connections). The Government's draft National Planning Framework identifies these proposed grid reinforcements as being national strategic developments. The framework will be considered by Parliament. Where such a strategic developments are included in the final document this will establish need. This will mean that individual applications to, for example, transmit or generate electricity (under the Electricity Act 1989) will not need to demonstrate need for the development with assessment focusing on more detailed locational issues.

While the National Planning Framework will assist the development of electricity infrastructure (and potentially of large scale thermal generation) the Scottish Government is concerned that current mechanisms for promoting and regulating the electricity grid do not sufficiently encourage the development of emerging technologies. The Scottish Government is in dialogue with the UK Government on promoting a more strategic approach to investment in new capacity as well as better management of access to existing networks. The Scottish Government listens carefully to industry and engages with BERR, OFGEM and National Grid. This includes pressing for changes to the current charging regime which provides a disincentive to investment in Scotland and responding to the Transmission Access Review.

The Scottish Government is also looking forward to the grid infrastructure which will be required to allow the full development of renewable energy and in particular development of marine and offshore wind energy. **The Government is undertaking scoping and feasibility studies into offshore grids between Scotland, Northern Ireland and Ireland and between Scotland and other nations bordering the North Sea.** We work with those with related interests including the Crown Estate.

Supporting actions: Skills

Sector Skills Councils ("SSCs"), of which there are 25, are UK wide independent organisations developed by groups of influential employers in industry or business sectors of economic or strategic significance. The Scottish Government's skills strategy set clear expectations for SSCs in Scotland: to identify and articulate employers' skills needs; to work with employers and stakeholders to develop skills solutions; to produce robust labour market intelligence for their sector; to contribute to the development of vocational qualifications.

The Alliance of Sector Skills Councils ("the Alliance") will co-ordinate and support SSC led activity across the UK. The Alliance is a new organisation (1 April 2008) comprising all 25 of the SSCs, and it provides a forum for them to come together as a network to address common issues and share good practice. Scotland will have its own arm of the Alliance, which will support the network of SSCs in Scotland.

A Sector Skills Agreement ("SSA") is developed by the SSCs in consultation with employers and other key stakeholders. It is the vehicle used to outline the skills needs in the sector, and the steps which have to be taken to address these. SSCs lead on the delivery of the actions identified in the SSAs, working in partnership with key stakeholders such as Skills Development Scotland and further and higher education institutions.

SSAs have been developed for Scotland by Cogent, the SSC which covers the nuclear and oil and gas industries, and Energy & Utility Skills the SSC which covers the electricity, gas, waste management and water industries.

OPITO: the academy for the oil and gas industry.

In December 2007, a training academy for the oil and gas sector in the UK - OPITO – was launched. OPITO is an employer led and funded initiative, and it works in partnership with Cogent to ensure that the training available at the oil and gas academy meets the needs of the sector and complies with national occupational standards.

OPITO has established a global reputation, and has subsidiary operations in the Middle East, Africa and Asia, operating in 23 countries through a network of 66 learning providers. They have also reached landmark agreements with the Governments of Thailand and Indonesia.

Supporting actions: Protecting the environment

Our commitment to renewable energy and sustainable economic growth needs to be balanced against environmental and social considerations. We need more renewables but not at any price - the best applications to generate or transmit electricity are those that take care to resolve environmental and planning concerns in advance. To help this process a new Scottish Planning Policy on Renewable Energy (SPP6) was issued in 2007 to give clarity and purpose to the planning and consenting system for renewable energy. **Planning authorities are now drawing up supplementary planning guidance on locational issues in respect of renewable energy in their areas.**

The Government has also announced new plans to streamline its own role in the consenting process. Working with the industry, the Government's aim is to make decisions more quickly by improving the quality of applications, introducing more certainty about turnaround times and ensuring that more robust procedures are implemented. By introducing a target time of nine months - where there is no public local inquiry - Ministers are keen to ensure that the various consultation processes are completed as quickly as is possible while ensuring that all parties have the opportunity to make representations. A number of other innovations are being introduced to improve the quality of applications, including new scoping guidance which will give applicants a clear steer on the issues they have to tackle in their application before it is submitted.

Since May 2007, and at August 2008, the Scottish Government has determined 18 applications for consent to generate electricity.

8. Conclusion

Energy is a key sector for Scotland and the Scottish Government, in terms of its strategic importance; its current and potential contribution to economic growth and employment as well as contributing to reducing carbon emissions.

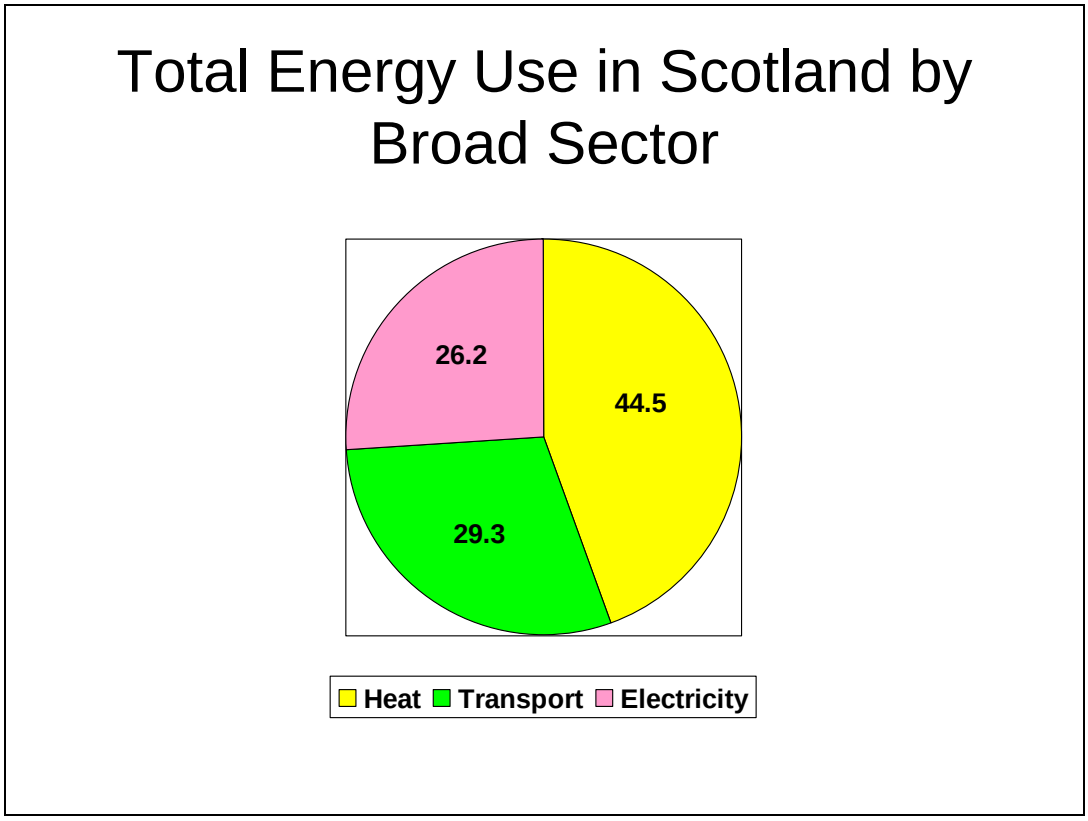
This overview provides a statement of purpose and an overall context for the detailed work of delivery and development of policy, both existing and in the future. We hope that it give an indication of what we wish to see the Energy sector look like in Scotland; what it can contribute towards the overarching purpose of the Scottish Government and how we aim to achieve our various energy targets.

It aims to provide clarity as to our guiding principles and approach and how we can work with other Stakeholders to meet our goals. We will continue to engage with companies, wider stakeholders and other governments to help achieve our ambitions for energy.

For example, we will consult shortly on a Framework for Renewable Energy and on issues relating to thermal generation - licensing of carbon storage and guidance for applicants for consent for new thermal generation.

ANNEX A
ENERGY SUPPLY DATA

Energy Usage



Energy consumption, based on sum of demand sectors in Scotland, 2002

	Solid	Oil-based	Natural gas	Electricity	Renew & heat sold	Total	Units
Domestic	3.02	5.82	34.48	12.27	0.46	**56.05**	TWh
Industry	1.11	5.09	17.65	10.34	1.13	**35.32**	TWh
Services	0.04	2.78	11.37	11.28	1.36	**26.83**	TWh
Transport		46.77		0.3		**47.07**	TWh
Refineries		10.65				**10.65**	TWh
Total	**4.17**	**71.11**	**63.5**	**34.19**	**2.95**	**175.92**	TWh

Note: 1 Terawatt Hour (TWh) equals 1000 Gigawatt Hours (GWh)

Electricity Generation

Electricity Generated by different power sources (i.e Output)

	2005 GWh (b)	% of total generated	2006 GWh (b)	% of total generated	% change 2005 to 2006
Nuclear	18,681	*38*	14,141	*26*	*-24*
Coal	12,186	*25*	17,547	*33*	*+44*
Gas	9,371	*19*	11,634	*22*	*+24*
Oil	1,902	*4*	2,141	*4*	*+13*
Pumped storage hydro	643	*1*	1,184	*2*	*+84*
Renewables	6,464	*13*	6,962	*13*	*+8*
Total	**49,246**	***100***	**53,609**	***100***	***+(***

Source: BERR Energy Trends, December 2007

Notes:

a *Some of the above electricity generated was exported*

b *The columns above, when summed, give total generation i.e. the first row in Table 2, below*

Total Electricity Generated and Consumed in Scotland

	2005 GWh	2006 GWh	% change 2005 to 2006
Total generated	49,246	53,609	*+9*
Total consumed (b)	35,753	35,675	*-0.2*
Total exported	7,315	10,941	*+50*
Gross Consumption (a,c)	41,931	42,668	*+1.8*

Source: BERR Energy Trends December 2007

Notes

a ***This is the figure against which we calculate the percentage of Scottish demand met by renewables.***

b *Total consumed figure is calculated on total generated less own use (in 2006 this was 4,597 GWh), transfers and losses (2,397 GWh)*

c *Gross consumption is total consumed including own use and losses (or generation less transfers).*

Summary Table of Capacity and Output

	% of installed capacity as at end of December 2006	% of output	
		2005	2006
Nuclear	*21*	*37.9*	*26.4*
Coal	*30*	*24.7*	*32.7*
Gas & Oil	*21*	*22.9*	*25.7*
Hydro pumped storage	*6*	*1.3*	*2.2*
Renewables	*22*	*13.1*	*13.0*
Total	***100***	***100***	***100***

Source: BERR – see footnotes above.

Notes:

a *Additional data from BERR shows that in Scotland in 2006, of the renewable electricity generated, natural hydro generated 61%, wind and wave 29%, landfill gas 6% and other biofuels 4%..*

http://www.berr.gov.uk/energy/statistics/source/electricity/page18527.html

BERR definitions:

ANNEX B
ORGANISATIONAL ROLES

The Scottish Government works in partnership with a range of organisations:

- The **Scottish Government** works to deliver the Government's high level Energy policy objectives set out at the beginning of this policy overview. The Enterprise, Energy and Tourism Directorate includes staff who assist Ministers in exercising the Government's devolved powers in renewable energy, the promotion of energy efficiency, and in consenting for power generation. The Directorate also pursues Ministers' objectives in relation to the operation of energy markets, energy transmission, the development of the electricity grid, and supporting new technologies such as carbon capture and storage. All this involves interaction with the EU, the UK Government and regulatory bodies such as OFGEM.
- Within the Scottish Government the Energy team must work closely with The Climate Change & Water Industry Directorate who lead on the Scottish Climate Change Bill and Emissions Trading, which are strong features of Energy policy. The Transport Directorate is responsible for the development and implementation of policy on Transport emissions, low carbon transport, and biofuels. Policy on alleviation of Fuel Poverty is led by Housing & Regeneration Directorate.
- **Scottish Enterprise and Highlands & Islands Enterprise (HIE)** are responsible for promoting the contribution of energy businesses to economic growth. Their energy teams aim to help grow Scotland's share of global energy markets, further develop renewable energy ventures and make the most of decommissioning opportunities in nuclear and oil and gas sectors. The Networks support the sector through a range of programmes for companies in the oil and gas, renewable energy and conventional power generation sectors. They provide a variety of grant and funding options to companies developing new products and technologies – particularly ground-breaking ones.
- **Scottish Development International (SDI)** is managed in partnership between the Scottish Government, Scottish Enterprise and HIE. Its role is to broaden Scotland's international appeal as a first choice source of knowledge and to assist the growth of the Scottish economy, by encouraging inward investment and helping Scottish-based companies develop international trade. In the Energy sector, SDI aims to develop and build upon Scotland's world-class expertise in oil and gas, wind, marine, fuel cells, biomass, carbon capture and storage, and subsea engineering. It does this by providing advice to inward investors on locations, recruitment, training, market advice, and the promotion of partnerships for Scottish companies with overseas investors to open up new channels for overseas exports, markets and technologies.
- **Scotland Europa** is a partnership of public, private and voluntary bodies that have combined to provide a central point of contact for Scotland in Europe. Based in Brussels, it promotes Scotland's interests to the key institutions of the EU and has direct links to the regions of Europe. In Energy policy, Scotland Europa has been responsible for providing intelligence and research on the development of the European Union's Energy & Climate Change policy, working closely with the **Scottish Government's European Office**. It hosts seminars for a wide range of interested parties, to promote Scotland's Energy interests amongst the EU institutions,

and leads on the coordination of applications for research and innovation funding from EU programmes such as FP7 and Intelligent Energy.

- The **Energy Technology Partnership (ETP)** draws together all the key Scottish university-based research and development teams involved in energy technologies. It is founded on the principle of research pooling, and acts as a common platform for seeking funding from UK and international funding bodies and industry. It is working to develop Scotland's basic, strategic and applied energy research agendas, building capacity, reputation and capability, bidding for collaborative work and performing the overall role of co-ordinating Scotland's energy research activities
- The **Scottish European Green Energy Centre (SEGEC)** is a collaborative partnership between the Scottish Government, Scotland Europa, ETP and the European Union, which will work to promote EU-wide deployment of renewable and low carbon energy technologies. Its principal task is to develop networks and partnerships with research and deployment bodies for green energy technologies in other EU member states. It will build on the many existing EU-wide projects underway in Scotland, and strengthen them to build a core cluster of research expertise in green energy for the EU.

ANNEX C
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