

SCDI RESPONSE TO ECONOMY, ENERGY AND TOURISM COMMITTEE: INQUIRY ON “DETERMINING AND DELIVERING SCOTLAND’S ENERGY FUTURE”

Introduction

1. SCDI members welcome the inquiry on “Determining and Delivering Scotland’s Energy Future”. Energy is at present the top public policy priority for many in the Scottish economy. However, this inquiry is the latest in a plethora of inquiries, reviews and consultations in recent years. Discussions with SCDI members have revealed significant frustration that these are appearing more frequently and have an ever shorter shelf life, set out to determine the energy future but succeed neither in delivering short term action nor long term clarity, and often put the politics of the debate before the policy. The success of this inquiry report will be judged on whether action follows and on the durability of its influence. Committee members must be prepared to follow the evidence and agree positions which are independent of party policy.
2. The International Energy Agency (IEA) has said that world energy demand is predicted to increase by 55% between 2005 and 2030, with much of this growth in China and India. Demand will be overwhelmingly met by fossil fuels (84 per cent) and energy-related greenhouse gas emissions will rise by 57%. While debate on “peak oil” continues, the IEA has already said that the world “faces an unsustainable energy future if governments do not radically change their energy policies in the next 10 years.” The Stern Review of the Economics of Climate Change estimated that if there is no international action on climate change, the overall costs and risks will be equivalent to losing at least 5% of global GDP each year, now and forever. It said that the power sector around the world needs to be at least 60% decarbonised by 2050. The European Union (EU) has agreed to a binding target for the UK to generate 15% of its energy from renewable sources by 2020.
3. The best estimate by the Royal Society of Edinburgh of population and economic activity in Scotland predicts an increase, with a consequential expectation of a 50% increase in Scotland’s energy demand by 2050.¹ Scotland will lose around 30% of its electricity generating capacity from large power stations in 10 years and around 70% in 20 years. Since privatisation, the margin in installed capacity relative to peak demand has reduced from about 30% to 20%. At UK level, one third of generation needs to be replaced in 10-15 years.
4. On current trends, there will be a growing gap between energy supply and demand in Scotland and the UK, and a growing global gap between greenhouse gas emissions and targets for stabilising the climate. There has been underinvestment in the energy industry over many decades. This will need to be redressed in the next 10-15 years to close these gaps. The scale of the challenge is without precedent – in mindset, skills, finance, raw materials and physical space. The opportunity for industry is that clean energy may be a \$1 trillion market by 2030. But, for the UK, the challenge is also that no fully competitive power market anywhere has ever been tested under conditions of such rapid change in which affordability must be balanced with investment in future capacity.
5. The increasing cost of energy is a major concern to households and businesses. Scotland’s manufacturing industry is finding it increasingly hard to remain competitive. The high cost of energy, in addition to other cost pressures, and the upward trend in prices, is making continued investment in Scotland compared to other locations more difficult to justify for some companies. Higher input costs are also being passed onto consumers at the factory gate and fuelling inflation.
6. This challenge requires informed debate and agreement on action. SCDI has the following observations on the current energy debate within Scotland:
 - **Scotland is integrated into the UK energy market. The Scottish Parliament, UK Parliament and European Union all have responsibilities for energy and climate change policies. Energy is**

¹ Inquiry into Energy Issues for Scotland, The Royal Society of Edinburgh, p.22

an internationally traded commodity and climate change is a global challenge. Scotland's energy future needs to be determined and delivered within this context.

- **There is always much discussion of opportunities and threats. While there are many opportunities, the balance is towards threats to the economy and global environment. Policy-makers must prioritise risk management.**
 - **Security of supply, climate change and affordability are generally recognised in the global debate as the main challenges. But within Scotland, too little attention is paid to security of supply. For the Scottish economy, a key question is how to create stability and certainty over periods of 20 or 30 years.**
 - **All technological energy solutions have environmental drawbacks. Policy-makers need to balance those against their top priority of sustainable economic growth and the greatest global challenge of climate change.**
 - **The technological priority is those which will have the greatest global impact. These will be the low carbon options: carbon capture, nuclear and renewables. Scotland has a comparative advantage in them all.**
 - **The differences between demonstration of new technology, small scale deployment and large scale deployment, and the lengthy timescales between each stage, should be understood and much more clearly stated.**
7. In response to SCDI members' concerns about the energy debate and the potential risk of an energy gap – which was also expressed at the National Economic Forum – SCDI has commissioned major independent research. This will address the issue of Scottish power generation between 2008 and 2020, the UK and EU contexts, and reach conclusions about the suitability and like effectiveness of Scottish energy and environmental policy goals and targets. SCDI will share the final report with the Committee when it is available towards the end of September. Some of the following recommendations are therefore provisional until this work is completed. In the meantime, to focus the dialogue and debate, SCDI is organising a major conference on Scotland's energy future with expert speakers to which Committee members are invited.

Question 1: 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?

8. In the context of these challenges, SCDI would set the following objectives:
- **Security of Supply** – Meeting the needs of sustainable economic growth (achieve Scottish Government Economic Strategy targets) as the UK becomes a net importer and global competition grows for depleting resources.
 - **Decarbonising Supply** – Meeting Scottish, UK and European renewable energy targets for 2020 and interim and 2050 Scottish and UK climate change targets.
 - **Affordability of Supply** – Maintain economic competitiveness and affordability for business and consumers (especially the fuel poor) in the post-cheap energy era.
 - **Maximising Economic Benefit** – Investment must turn innovation into successful manufacturing industries and support employment in the energy industry.
9. Energy efficiency should have the highest priority, but realistic assumptions on its impact on demand must be made. Behavioural change and the supporting investment needed will take a number years. Studies show that consumers have often spent money saved through energy efficiency on other energy-intensive activities and it remains to be seen if rising energy costs will have a long-term impact. So there is a need to reduce the link between energy-intensity and carbon-intensity in goods and activities. Smart metering will improve consumer information and may change habits. Higher and more rigorously enforced standards are needed for new houses, and sustained investment is needed in the existing building stock. Raising standards in Scotland to the level of those in Scandinavia and Germany could save 20% of domestic energy consumption. Energy saving light bulbs should become standard. New technology is being developed and piloted by Scottish companies to monitor energy waste in buildings and should become more widely available. Microgeneration should have an important role, with a collaborative rather than individual building

approach increasingly taken. In Scotland, given its relative size, the public sector has a particular opportunity to show leadership. In the private sector over, energy efficiency will become a source of competitive advantage and profitability in a new way. Businesses will view higher carbon emissions as a reputational issue in the global marketplace with which many cannot afford to be associated. This is well illustrated by the success of the Carbon Disclosure Project.

10. SCDI welcomes the greater attention on heat and transport within this inquiry. Gas for heating and oil products for transport comprise about 65% of the UK's primary energy demand. A key issue is security of supply. While the contribution of oil and gas to UK energy needs is likely to increase from three quarters to 80% by 2020, the UK is now a net importer of both and the current rate of investment in the North Sea would produce only 12% of projected demand by that year. However, Oil and Gas UK estimates that 40% of UK oil and gas needs in 2020 can be achieved with sustained investment.² As the UK Renewables Advisory Board has acknowledged, decarbonising heat or transport before 2020 will be hard as the technology is many years from being available on a commercial scale. In the short-term, government must ensure access for affordable fuel, especially in rural areas, so people can access opportunities, and businesses get goods to market. In the future, decentralised power systems, use of waste heat, rail electrification and links between Carbon Capture and Storage (CCS) schemes and the transport network will be needed. It is important to note that some solutions will increase electricity demand.
11. With this in mind, SCDI would support a long-term approach which:
 - Maximises the exploitation and responsible use of indigenous resources and existing technologies for sustainable economic benefit, while accelerating new technology development.
 - Deploys, alongside existing low carbon technologies, new energy technologies and infrastructure to harness more of Scotland's natural and mineral resources to achieve higher sustainable economic growth and achieve climate change targets.
12. The future of electricity generation within Scotland is critical for economic growth and climate change, and, in SCDI's views, is an immediate priority which the Committee should seek to influence. All of Scotland's major power stations are scheduled to close by 2025 and schemes under construction or planned do not come near to replacing them. The potential for an electricity gap to open up from 2015 onwards is real, depending on demand patterns and plant closures towards the end of the next decade. The Scottish Government's target to generate 50% of Scotland's electricity from renewables is widely accepted and is essential to hit UK and EU targets. It can be achieved if barriers, including cost, are overcome. The UK Renewable Energy Strategy: Consultation estimates that a £100bn investment will be needed in renewables to achieve the target for 2020. Its initial projections show the costs to consumer and industrial electricity and gas bills from existing climate change policies, and the higher costs from increased deployment of renewable electricity, financial incentives for the renewable heat sector and the Renewable Transport Fuel Obligation.³ These are significant and need to be minimised. They are based on fossil fuel prices lower than at present and if the price turns out to be higher than the assumptions the percentage increase could be much lower. The Committee may want to look at the projected costs for each technology in more detail. In evidence to the UK Parliament's Environmental Audit Committee, E.ON UK has suggested that if the UK needs around 40000MW renewable electricity to meet the EU renewable energy target, 36400MW of conventional supply will also be needed to ensure that winter peak demand can be met.⁴ So the key question is how to supply the other 50% of Scotland's electricity needs, in particular a secure, clean and affordable base load.
13. A realistic scenario for 2020 and beyond would be peak demand for around 6.5GW. Wind capacity may be as high as 8GW and this may generate 3GW of clean energy on average. With particular weather patterns, however, generation from wind may be virtually nothing. Without complementary

² 2008 Economic Report, Oil and Gas UK, pp.38-40

³ UK Renewable Energy Strategy Consultation, Department for Business, Enterprise and Regulatory Reform, UK Government, pp.231-4, http://renewableconsultation.berr.gov.uk/consultation/consultation_summary

⁴ Carbon Capture and Storage, Environmental Audit Committee, House of Commons, pp.33-4

conventional supply, in those circumstances, over reliance on renewables would destabilise the entire system. There is therefore a need for about 4/5GW of conventional supply, given import and export capacity. Scotland also, at present, exports around 20% of its electricity generation on average to the rest of the UK market, which is a significant benefit to the economy. But this flow of electricity could, occasionally or more frequently, be reversed. It is therefore possible to envisage three potential scenarios for electricity generation and supply.

- **Scotland continuing to meet own needs and exporting power** – In addition to 50% from renewables, this would require at least three large power stations.
 - **Scotland balancing its needs over the course of a year** - Occasional supply from England, need for fewer new stations, but implications for economy and employment.
 - **Scotland dependent on power generation in England** - Balancing intermittent supply from renewables, but, again, with implications for economy and employment, and possible threat to the common UK electricity market which subsidising the growth in Scottish renewables.
14. In SCDI's view, the first scenario is clearly preferable in meeting the objective of future energy production in Scotland, especially as large amounts of import capacity from the rest of the UK are constrained and might destabilise the system. The issue is then how this should be delivered. Fossil fuels offer flexibility of supply to balance the output from renewables, but they emit some carbon emissions. The UK will need new gas fired capacity, particularly in the short term, given its affordability, reliability and efficiency. However, costs are rising, the UK cannot afford to become overly dependant on imports for its power supply and its own valuable reserves need to be carefully managed. The world will be generating power from coal for decades to come and efficient coal-fired power generation will be needed. But the price is increasing. With biomass blending, significant reductions in CO2 emissions can be achieved. However, CCS is unproven at full scale and decisions on new coal-fired power generation cannot wait for it to be successfully demonstrated. If it does not work, the emissions from new coal fired power stations will be locked in for 30/40 years. About 26% of the electricity generated in Scotland was from nuclear in 2006, supplying the equivalent of about a third of Scotland's electricity. It is the only proven low carbon conventional technology for base supply and the ability to diversify from fossil fuel prices. It is highly productive, but its output is less flexible. Therefore, SCDI 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.

Question 2: How can this future be delivered in Scotland and how can we meet the various targets and obligations?

15. Probably the biggest single challenge facing the energy industry is recruiting and training sufficient skilled people to research and development, design, manufacture and construct everything which must be done. SCDI would support a comprehensive survey of labour and skills requirements in the energy sector. It believes this would show that the key priorities should be:
- **Education/ Training** - Increasing participation in science, technology, engineering and maths. Universities and colleges which offer quality courses in these subjects need to be given sufficient resources to meet the demand. Some colleges are turning away young people from technical subjects due to funding limitations. Retraining and upskilling the (generally ageing) workforce for existing and emerging technologies e.g. the training for plumbers, electricians and building professionals to become installers of micro-renewables is inadequate and does not meet demand.
 - **Fresh Talent** – Many graduates are now from overseas so the availability of work permits must meet demand. There is a need to improve connectivity and provide high quality, affordable housing supply for the North East and Highlands and Islands, to promote and facilitate these locations as attractive places to live and work in order to attract and retain high calibre, skilled professionals.
 - **Collaboration** – Providing government policy promotes them, all sectors can offer a full career to new graduates. Collaboration on skills utilisation and crossover would be mutually beneficial.
16. The other overarching challenge is planning which is currently a barrier rather than a stimulus to development. If this continues, companies developing existing and emerging technologies will invest

in countries where there is a more supportive regime. The Planning Act 2006 and the National Planning Framework 2 (NPF2) are welcome, but legislative reform must lead to a more efficient system supporting wider policy objectives. Local authorities are updating their planning guidelines in response to the Scottish Government's SPP6 policy guidelines on Renewable Energy and it is to be hoped that this will have a significant impact. Key priorities should be:

- **Essential Infrastructure** – The current average between planning application and completion of construction seems to be over ten years. The Beaully-Denny project is essential to replace ageing infrastructure and for renewables. NPF2 recognises the importance of the electricity grid, but the gas distribution network is also in need of investment, including the St Fergus Gas Terminal. The Scottish and UK Government need to work closely together on cross border infrastructure.
 - **Nuclear** – The Scottish Government should revisit and reverse its opposition to new nuclear power.
 - **Culture Change** – Government, the industry and NGOs must work together and inform the public on the infrastructure needed for future energy supply.
 - **Resources** – Planning departments must be able to increase their efficiency.
 - **Targets** – Targets for renewables approved by the planning system for all public bodies would be appropriate and increase certainty for developers which would encourage more local procurement.
 - **Renewable Energy Zones** – Designated zones for offshore and marine renewables developments would improve certainty for investors and National Grid, and would also help to reassure existing industries, protect natural habitats and speed deployment. Where local authorities have designated areas as suitable for onshore renewable energy developments, developers need to speak with the planning authority at an early stage to identify whether their proposals fit within them.
 - **Getting the Balance Right and Government Leadership** – There is a need for clarity on resolving conflicts between clean energy and natural heritage. SNH should be able to work with developers to advise how schemes could be compatible, rather than a simple “yes” or “no”. Scottish Government should demonstrate leadership and consistency in decision-making, not hide behind regulations.
 - **Microgeneration** – Scottish Government should at least achieve the level of permitted development for single and small scale granted in England.
 - **Coal** - ‘Presumption against’ new opencast sites threatens an indigenous supply. It should be subject to the same planning regime as other developments.
 - **Coalbed Methane (CBM)** – A rational planning framework is needed to enable careful but accelerated development of the resource. Planning consents applying to other utility companies should apply to CBM to enable gas and power derived from the gas to be transported to the main grid connections.
17. Higher energy prices can help to tackle climate change and act as a spur to energy efficiency. But government must ensure an appropriate balance and offer support which helps households, businesses and communities to adapt. Microrenewables can play a significant role in Scotland's energy future. The Energy Savings Trust has estimated that this could potentially be as high as 30-40% of the UK's total electricity demand by 2050. However, a recent study by the Carbon Trust and Met Office found that wind turbine technology can often be inefficient in urban and suburban environments. SCDI's recommendations for energy efficiency and microgeneration are:
- **Public Information** – Everyone (including government, planners, consultants, media and the public) needs clearer information to increase awareness and improve advice, guidance and design.
 - **Consumer Incentives** – Information should be underpinned with rewards for early adoption to alleviate costs. There should be a review of funding mechanisms to ensure effective targeting and that consumers are not confused.
 - **Building Stock** – Higher standards for new property. Incentives for better insulation are the priority for existing stock e.g. amend Local Government Act to allow council tax rebates (as in England) and the UK Government should consider a reduction in stamp duty. The extension of the household loan scheme to SMEs is welcome, but there is a need to consider a much more ambitious scheme for all.
 - **Smart-metering** – Following the ongoing pilot, the roll-out must be mandated by the UK government for within 10 years from the passing of legislation.
 - **Domestic Lighting** – Energy saving light bulbs are now competitively priced so the Scottish and UK Governments should introduce legislation to prohibit conventional light bulbs.

- **Microgeneration** – Increased funding is welcome, but still comparatively small. Grant schemes should have criteria for measuring the likely carbon savings (e.g. small wind turbines) to ensure they save reasonable amounts of CO₂. More community and business collaboration should be encouraged through finance, clearer and more consistent advice, and planning reforms e.g. General Permitted Development Rights. SCDI would support feed-in tariffs at a level which is complementary to Renewables Obligation Certificates (ROCs) and does not undermine investor confidence in them. A feed-in tariff scheme could support an expansion of smaller scale and decentralised renewable electricity schemes including domestic microgeneration, onsite and community owned renewables. But there should be an upper capacity limit.
- **Public Sector Leadership** - Public procurement can help to create a supply chain of new technology. It should move quickly from securing Energy Performance Certificates to planning improvements to its building stock to 2020. The Scottish Government should consider a National Indicator for the energy efficiency of public sector buildings as part of ‘Scotland Performs’.
- **Private Sector Leadership** – All of Scotland’s priority sectors should have an energy efficiency and microgeneration strategy. The IT industry is taking steps to reduce the energy cost of manufacturing and the energy requirements to operate ICT equipment.
- **Emissions Trading Scheme** – Utility companies have received a ‘carbon windfall’ from their allocations under Phases 1 and 2. Independent sector analysis shows most have already invested this suppressing prices or investment in new capacity. A blanket windfall tax is unfair and would discourage investment, not only in new generation capacity but would send a wider negative signal to the business community as a whole. It would be preferable for the Scottish/ UK Government through the Fuel Poverty Forum, to explore options for enhanced investment in energy efficiency, such as the Carbon Emissions Reduction Target scheme.

18. The primary fuel for heating in the domestic sector is gas which, as current concern over this winter demonstrates, will make it particularly susceptible to security and affordability of supply issues as the UK imports an increasing percentage of its needs. While new import facilities are sufficient until about 2015, the UK is now competing for supplies and LNG cargoes are more often than not diverted to inflated price destinations such as the Far East. Optimising the recovery of North Sea oil and gas is critical. Low carbon solutions for heat are some way off, but it is vital that there is greater focus on the sector. Key priorities are:

- **Gas distribution network** – There is a need for further investment. New storage facilities are being urgently constructed, but projections suggest that there will be a need for more after 2015. This will also support the development of CCS.
- **Liberalise Market** – The Scottish and UK Government should keep up the pressure to break the link between oil and gas prices by ending the oil indexation in long-term contracts, and to liberalise the European energy market.
- **Renewable Heat Obligation** – Scottish and UK Government should introduce incentives for renewable heat generation. These should be gradually introduced, technology neutral and not set at a level which leads to more fuel poverty.
- **Community Heat and Power (CHP)** – There is a need to promote greater community acceptance. Highly distributed power systems are opportunities for billions of pounds of investment in brownfield sites in Scottish cities, but will take time and mean changing social structures. In a more densely populated area or with a significant off-taker, CHP does not have to be renewable – even gas fired would bring about carbon reduction benefits. All future small thermal generating plants near population centres should have specific arrangements for the use of waste heat. Public procurement framework agreements should not exclude CHP simply because it will never be practicable in all of the country. Where it would otherwise be landfilled, waste incineration for heat energy is preferable.
- **Biomass** – The recommendations of the Scottish Parliament’s biomass inquiry remain relevant. Scotland is well behind countries like Germany on agricultural waste to heat energy. The growing interest among farmers in the opportunity should therefore be further incentivised.
- **Heat Pumps** – The installation of standard boilers in the central heating programme has been a missed opportunity. For installation by businesses, the Carbon Trust offers interest free loans over 4 years. Scottish Government should consider practicality and affordability of an extension of interest free loans to all households. The new accreditation scheme for installation introduced by the UK

Government is causing fury in the Scottish industry because of the higher, multiple costs to installers, and additional bureaucracy. It is a discentive to getting involved in the industry, especially in rural areas. Following consultation with the industry, it should be replaced.

- **Biomethane** – Injecting into gas network can reduce carbon intensity. It should be made at least as attractive to introduce it into the gas distribution system as to burn it on-site.
1. The scope for decarbonising transport fuel in the short to medium term appears limited, although there has been a welcome spurt in the number of conversions to LPG in the last six months. The demand for transport has been steadily increasing in recent years, but it can be limited or shifted to more environmentally friendly modes. Flexible working and home working can be promoted through better access to ICT and video conferencing, and workplace travel plans. BT's fibre-based broadband will become available for up to 10 million UK homes by 2010 and is an opportunity for investment in Scotland. The planning system can be used to discourage locating new housing where commuting and access to services and amenities is only achievable by lengthy car journeys. But many journeys are necessary and Scotland's economic competitiveness must be protected. Key priorities for transport are:
 - **Reducing Fuel Prices** - Comparative statistics show that the UK has the highest prices for fuel in Europe, and most of this price is made up of duties. HM Treasury should immediately introduce a Fuel Duty Regulator.
 - **Support Island Communities** – Prices on the islands are exceptionally high. As motor vehicles are a necessity of daily life and motoring costs make up a higher percentage of disposable income, the UK Government should introduce a dispensation scheme, similar to those in other EU countries.
 - **Demand Management** – A UK-wide road pricing system, which replaces fuel duty, would reduce congestion and benefit many rural areas of Scotland.
 - **First Generation Biofuels** – The European Commission's proposal for a Renewable Directive introducing specific target for transport sector of 10% by 2020 can only be met by using biofuels. Evidence has been presented this would reduce agricultural production for food and biodiversity in Europe and the developing world and increase food prices. More biofuels will be needed over time - and in Scotland biodiesel from the waste oil market or straight vegetable oil may offer particular environmental benefits - but the target needs to be reviewed and environmental safeguards introduced.
 - **Second Generation Biofuels** – The Scottish and UK Governments need to encourage more research and financially support non-crop based biofuels. The Scottish Association for Marine Science, based at Dunstaffnage Marine Laboratory, are investigating the potential and practicality of using micro- and macroalgae.
 - **Electric and Fuel Cell Cars** – A number of companies are planning to offer road-capable electric cars within a few years. Fuel cell cars are mainly unproven, costly and commercial production is many years away. One of the biggest obstacles is the lack of hydrogen fuelling stations and, as hydrogen is currently commonly produced from fossil fuels, overall carbon emissions may be higher than from a conventional engine. UK companies are testing new combustion engines which are 50% smaller than average and would use less fuel and produce fewer carbon emissions.
 - **Rail Electrification** - Only 39% of the UK rail network is electrified. New diesel trains emit at least double the carbon dioxide per mile of a standard electric train. The Scottish Government is committed to 350km of electrification and Network Rail has launched a feasibility study into five possible high-speed rail lines. SCDI hopes that, as seems possible, the UK Government will later this year reverse its opposition to electrification in the investment programme from 2014. According to the UK Government, high-speed rail increases energy consumption by 90% at top speeds. However, the environmental benefits compared to domestic air travel are still considerable and SCDI supports the Greengauge campaign for a UK high-speed rail network.
 - **Ferries** – The large vessels required for safe and comfortable travel on longer and exposed routes have high energy costs per passenger and rising fuel costs are having a serious impact on operators. Caledonian Maritime Assets Ltd estimates that a £200m investment is needed in new vessels over the next decade. Norway is currently allowing hydrogen-powered engines on vessels as part of a joint fuel system. New paint technology can reduce fuel use by 5%. SCDI believes that higher fuel efficiency and new engine technology must be priority considerations in procuring the new ships.

- **Air Travel** – In response to a HM Treasury consultation, SCDI argues for a new aviation closely reflecting carbon emissions per aircraft type rather than the proposal for one based on Maximum Take Off Weight. The Highlands and Islands’ air services continue to warrant an exemption.
 - **Internal Fuel Supply** – The recent tanker and Grangemouth disputes showed the vulnerability of fuel distribution. 90% is through Grangemouth. As imports grow, logistics and contingency arrangements must be kept under review. There is a growing threat of closures of rural petrol stations, reducing competition and increasing prices. These lifelines for communities must be sustained and radical solutions found to support them. SCDI understands that, subject to a review, the Renewable Transport Fuel Obligation will lead to Bio Gasoline replacing conventional petrol next year. Due to its character it cannot be shipped from Grangemouth or stored at petrol stations without modifications which are outwith the resources of smaller operators, and it is likely that it will be too expensive to construct blending plants on the islands or even the Highlands. A green policy would therefore result in significantly increased carbon emissions from Grangemouth-based tankers travelling around the region.
20. A balanced mix is supported for electricity generation to meet the objectives of security, lower carbon and affordable energy, while maximising the economic benefit to Scotland by supplying its own needs and maintaining its export credentials. Isolationism will result in higher risks to supply or price. The trend in many developed and developing countries around the world is towards a similar conclusion. This underlines the validity of the case, but it also means that the global supply chains for gas, coal, wind and nuclear are all getting choked. SCDI’s independent energy study will ask how options for Scotland’s energy mix will affect affordability to retail, commercial and industrial users and place the economy against its main overseas competitors. Decisions on new large scale power stations should be made within the UK demand and cost context, but at present the UK electricity market is not sufficiently incentivising investment in new conventional plant.
2. Parts of the UK grid network are in real need of replacement and upgrading, not just to connect new sources of electricity generation, but because they are 30 to 40 years old. The UK is also planning 33GW of offshore wind by 2020 which will need to be connected. Modernisation should promote investment, the strategic development of renewables and the export of power to England and, in the longer-term, Europe. The grid’s character will have to change. A smart grid is needed to go with smart metering. As generation becomes less controllable, it will have to be more controllable. Customer load will have to adapt to supply capability, for example demand from electrical appliances could be remotely turned down at times of lower supply. There is also the potential for more decentralised networks. Key priorities are:
- **Beaully-Denny** – The Select Committee on Innovation, Universities, Science and Skills estimated that 7684MW of wind power projects are waiting to be connected (although not all will come to pass).⁵ The project is essential for the islands and marine and the proposal is only practical and affordable way to proceed. Its completion will unlock the upgradeable potential of Beaully-Keith/ East Coast. The Committee should give it their unequivocal backing.
 - **Essential Infrastructure** – NPF2 and the UK Planning Bill are supported.
 - **Onshore Regulatory Regime** – The regime has served its purpose. It now needs to be more strategic, supporting transmission reinforcements, and considering the total costs to consumers now and in the future, including climate change.
 - **Transmission Connections** – Renewables projects can currently wait for 10 years for access to the grid. Grid access arrangements need to be improved and a more holistic approach taken to cost. SCDI welcomes recent moves by National Grid to reduce delays and its Transmission Access Rights proposals to more speedily connect projects before major transmission reinforcements are made. Network investment and growth in new renewables should happen in parallel and not in series.
 - **Transmission Charging** – The proposed introduction of zonal loss transmission charging in addition to Transmission Network Use of Supply charges will make it less attractive to export clean electricity from Scotland and harder to finance renewable energy projects in optimal, but peripheral locations. This seems completely contrary to Scottish and UK Government energy policy to address

⁵ Fifth Report, Select Committee on Innovation, Universities, Science and Skills, www.publications.parliament.uk/pa/cmselect/cmdius/216/21609.htm

climate change. A fundamental review is needed of locational charging before any decisions are taken at UK or European level. The Kingsnorth controversy shows the potential difficulty of locating new generation close to the population centres in the south east. Capping for the islands is supported by SCDI and, at the very least, mainland Scotland should be made one zone.

- **Grandfather Rights** – Clarity is needed on connecting new power stations.
 - **Offshore Grids** – The aim at present should be to get the vision correct, make licensing and regulating consistent with future development and build the case for investment. Studies by The Crown Estate on an east coast line between Shetland and south east England and by the Scottish Government for grid links to Ireland and to northern Europe are welcome. The concept of a European supergrid is supported in principle by SCDI, but this would be developed incrementally over 30 years, there are technical challenges to overcome and it would require billions of pounds of investment from the private sector. SCDI welcomes reports of talks led by Scottish Development International. The development of offshore grids increases the need to strengthen the onshore grid.
 - **Storage Technologies** – Greater intermittency of the power supply to the grid network will mean that the system needs constant balancing. Storage technologies would help address this variability and extra intermittent power could be used for electric and fossil hybrid vehicles. Pump storage is currently treated and charged as generation. It should be storage.
3. The contribution from oil and gas to meeting the UK's energy needs is likely to increase before decreasing – up from three-quarters today to 80% by 2020. The UK Continental Shelf (UKCS) could still be meeting a substantial proportion of this demand in 2020 and beyond if investment can be increased. BERR's mid-case view on reserves still to be recovered from the UKCS is 25bn boe⁶. With sustained investment it could still provide 40% of the UK's oil and gas needs in 2020. However, the current rate of investment would produce only 12bn boe and 12% of the UK's oil and gas in 2020. Whatever happens, it is recognised that UKCS production is declining and this means an increasing reliance on imports, especially of natural gas. Key priorities should be:
- **Maximise UKCS output** – Generating more investment for exploration, production and to sustain assets in a mature, high cost province which has to compete for mobile international investment. The general consent in the industry is that, in the medium term, the fiscal regime is unsustainable and a simplification and reduction of taxation is required. The Scottish Government and Parliament need to continue to make this case to the UK Government.
 - **Unlock Difficult to Reach Reserves** – The UK Government and industry need to agree on specific incentives to make this economical and on gas infrastructure which meets operators' and UK strategic interests e.g. west of Shetland.
 - **Anchor Global Supply Chain** – A major implication for Scotland of reduced activity in the North Sea is the potential decline in investment and jobs. SCDI's latest annual survey highlights the record sales from the Scottish oil and gas supply chain of £12.9bn in 2006/07. It is now active in around 100 countries.⁷
 - **Prepare to Import** - Scotland's geography and North Sea infrastructure should be advantageous in competing for imported supplies.
 - **Decommissioning** – This will require investment of an estimated £22bn. Scottish Enterprise and Highlands and Islands Enterprise are working with the Scottish supply chain on accessing opportunities.
4. Coal fired power stations will be in existence for at least another 40 years and the growth in China and India is now being matched elsewhere. The priority, therefore, is cleaning them up, not substituting them. Clean coal and CCS will be needed to get the UK and the world over the emerging electricity gap. The UK still has substantial reserves of coal for approximately another 200 years. CCS would have the greatest impact globally on carbon emission, but it is still unproven full-scale technology and, in the short-term, new capture-ready plants cannot be ruled out. Scotland is also at the forefront of developing coalbed methane in the UK and Underground Gasification. Key priorities are:

⁶ "Barrel of oil equivalent" which equates gas and other fossil with oil to enable comparisons

⁷ Survey of International Activity in the Oil and Gas Sector 2006/07, Scottish Council for Development and Industry

- **Indigenous Coal** – This should be promoted. Advantages over imports include security and affordability of supply, lower carbon emissions in transportation and local economic benefits. SCDI welcomes the recent supply agreement between Scottish Resources Group and ScottishPower.
- **Carbon Reduction** – Clean coal technology, CCS and blending with biomass for co-firing can make coal fired generation more compatible with carbon reduction. Chinese coal plants are well ahead of the UK in abatement of CO₂ by efficiency improvement.
- **CCS** – All new coal plants should be capture ready. There is a need to accelerate the pace of demonstration, development and deployment. The aim should be CCS commercialisation from 2020. Consents to trial or apply technologies requires collaboration between the Scottish and UK Governments. The former should take a more active lead in developing joint work. One demonstrator project in the UK is insufficient. Incentives for CCS development, such as recycling of the CO₂ Allowance Auction by HM Treasury, should be accelerated. Further incentives will be needed for commercialisation.
- **Scotland's CCS Demonstrator Project** – While it was disappointing that the Peterhead project, which SCDI backed, did not proceed, the Scottish Government should now get more firmly behind ScottishPower's shortlisted proposal in the UK competition.
- **Enhanced oil recovery** - Energy companies need appropriate legal and financial frameworks to stimulate deployment of these early projects. The UK Government should work with the industry to resolve issues around tax, incentives, licensing and regulation of gas storage in mature fields in the North Sea. BP is maintaining the Miller pipeline for potential future use.
- **Onshore Coalbed Methane** – CBM contributes 8% to 10% of domestic gas in the US and is developing rapidly in Canada, Australia, India and China, and can become significant here, contributing new indigenous gas for decades to come.
- **Underground Coal Gasification** – This could generate substantial electricity for around 50 years.

24. SCDI supports a balanced energy mix, including the option of new nuclear power stations, which is needed to secure sustainable economic growth in Scotland and for Scotland to play its full part in achieving global climate change obligations. The trend in modern economies, such as Finland, and among some leading environmentalists, is to the same conclusion. Uranium is sourced from stable countries, readily stored and there are substantial supplies. Emissions average around 15g of CO₂ per kWh of electricity generated, which is about the same as wind. Between them Torness and Hunterston B power stations avoids the emission of about 8.5 million tonnes of carbon dioxide each year, which is equivalent to an 80% reduction in Scotland's road transport. Clean electricity generation from nuclear provides base load and preserves UK gas reserves for purposes like secure and more affordable heating. Key points are:

- **Planning Approval** – Nuclear power needs to continue to play a central role in clean, affordable and reliable base load in medium to long term. Investment priorities will be determined by the market. The Scottish Government should urgently reconsider its position, commission independent evidence and international comparisons, and allow proposals to go through planning.
- **Competition for Investment** – New nuclear power stations are each multi-billion investment opportunities. The new UK fleet could be worth £20bn to the supply chain and create 100,000 jobs.⁸ British Energy currently employs about 1000 people between its Torness and Hunterston B power stations plus about 100 contractors at both. Scotland should position itself to take advantage of this major investment.
- **Community Support** – There is strong local support at existing sites for nuclear power, which has created irreplaceable highly-skilled jobs and economic benefits.
- **Investment in Existing Sites** – Building on existing sites makes the most of exiting resources.
- **Long-term Waste Management** – This has been technically and politically resolved by societies such as Finland. This demonstrates that it is by no means an insurmountable obstacle and that much of the political debate in Scotland has been about stalling decision-making.
- **Waste Storage Sites** – There are investment opportunities for which Scottish local authorities, with their enhanced responsibilities, should be able to bid.

⁸ Speech to Unite Conference, Secretary of State for Business, Enterprise and Regulatory Reform, Rt Hon John Hutton MP, 26/03/2008

5. The UK Renewables Advisory Board's latest report states that the UK's 2020 target for renewable energy still achievable if barriers are overcome.⁹ Nearly half of this increased provision needs to come from bulk electricity. SCDI supports the Scottish Government's target to generate 50% of Scotland's electricity from renewables by 2020 as an essential contribution to EU renewable energy and climate change targets. With other technologies still in their infancy, nearly all of this will come from onshore and offshore wind, and biomass. But, for all the political rhetoric, Scotland still languishes around 21st out of 27 European countries for renewable energy. Key points are:
- **Onshore Wind** – Still has an important role to play. Government should be bold and set targets for the planning system and the public bodies involved.
 - **Offshore Wind** – Most critical for 2020 target. There is a need to make sure that offshore regulation works together in a co-ordinated way around the UK. Integration of the National Marine Plan into NPF2 will be welcome. Grid, transmission ownership and pricing regimes must also be resolved.
 - **Geographical and Technological Diversity** – The average load factor for onshore wind renewables varies between an estimated 26.9% of capacity and over 40% on the Northern Isles.¹⁰ In Scotland, the average is between 30 and 40%. A geographically diverse portfolio of wind and good mix of renewables can smooth the effect across the country. This needs to be supported in planning.
 - **ROCs** – The Renewables Obligation has been a success. However, there is a need to extend its duration beyond 2027, possibly by another 20 years. Otherwise, investment may falter between 2010 and 2015 then grind to a halt.
 - **Manufacturing** – Government has supported R&D, but there is still a lack of support for manufacturing, as is demonstrated by the business failure rate. Where investment has been made, the results, as with the recent disappointing announcement on the Vestas factory in Campbeltown, have often been disappointing. The Arnish Yard is still to receive an order from a Scottish project. Firm planning targets would encourage more local procurement by developers. Turbine manufacture is a key constraint to offshore wind and it is vital that the Scottish supply chain benefits from it and from marine. Public finance and support will be needed or Scotland will lose out again to other countries when it comes to production.
 - **Funding** – There is still £98m earmarked for renewable energy in Scotland sitting unspent in the Treasury's Fossil Fuel Levy. Its rules must be changed.
 - **Nigg** - Given the circumstances surrounding its potential re-development and its links to developments in Scotland's energy sector, the Nigg Fabrication Yard should also be considered as a nationally significant project in NPF2.
 - **Island Generation** – The load factor in the Northern Isles, Western Isles, the Highlands and Argyll and Bute is generally much higher than in other areas of the UK. Load factors can reach 40% in the Northern Isles. This supports the case for more island generation. This could involve capping the transmission charges and/ or higher banding of ROCs to fund infrastructure investment.
 - **Smaller Schemes** - Local authorities need to make faster progress in planning.
 - **Community Windfarms** – These models should be encouraged. Co-operatives, with priority for local people, bring long-term local benefits and help in planning.
 - **Investment Opportunity** – Renewable energy is an opportunity for the Scottish financial services industry which is well-placed to benefit. The Renewables Advisory Board suggests a £100bn capital investment is expected by 2020.
 - **Ports** – Significant investment is needed to support the renewables industry.
26. There is still good potential for smaller scale hydro developments in Scotland.
27. There is massive potential in marine. Good progress is being made with the first commercial-scale operation of marine energy devices. However, the technologies are still at least five to 10 years away from scale commercial deployment and the priority is the step beyond single devices and test sites to a complete commercial scale deployment. The development of the industry is not helped by over-optimism from politicians or by claims from companies that they are already sourcing power from

⁹ 2020 VISION – How the UK can meet its target of 15% renewable energy, Renewable Advisory Board

¹⁰ Digest of UK Energy Statistics 2008, National Statistics

marine generation. The creation of EMEC was welcome and the Saltire Prize is a laudable attempt to leverage in private sector funding. The Scottish Government's record elsewhere is mixed – its rhetoric must now be matched by delivery. Scotland still has a technical lead, but the Portuguese and Irish are trying to catch up and promoting local procurement. Key priorities are:

- **Funding** – The UK's total planned investment pales next to the Danish investment in wind. Public funding largely has been spent on facilities. Similar funding to the Saltire Prize would go a long way towards some commercial deployments. The precedent would be the first round of UK wind projects.
 - **Marine Supply Obligation (MSO)/ ROCs** – SCDI is cautious about the banding of ROCs for emerging technologies. Investors like certainty, so changes to ROCs might be a disincentive. MSO has state aid clearance. Priority should be to get devices in the water. MSO is seen as the benchmark mechanism, but could be increased to reflect inflation in industry since it was costed in 2005. Any changes should not reduce or disrupt funding.
 - **Other Incentives** – The £40m UK Marine Renewables Deployment Fund is still unspent. The inflexibility in the application of the rules has not helped. If it was combined with the Scottish Government's Wave and Tidal Support Scheme (WATES) and the Scottish Renewables Obligation (which is currently held by HM Treasury from Ofgem and should be spent to support renewables in Scotland) it could make a real difference to capital support for the early development of projects in Scotland. The new Scottish Government has not yet awarded WATES funding and more needed for demonstration and pre-commercial projects.
 - **Connectivity to Grid** – Key technical challenge. Scottish Government needs to invest more in research. A secure, economical cable supplier needed, but no manufacturer is left in the UK. The Scottish and UK Governments and Energy Technologies Institute should invest and work with the industry to agree a standard cable.
 - **Planning** – Need more early projects to maintain industry's centre of gravity in Scotland. Npower and Wavegen have submitted plans for the first commercial wave power station at Siadar, Lewis. But SCDI understands that it will be a challenge to develop follow-up projects until the initial projects have been demonstrated at a reasonable scale. SCDI supports early designation of development zones to speed up deployment.
28. The continuing relevance of the recommendations of the Scottish Parliament's Environment and Rural Affairs Committee's biomass inquiry has been highlighted, as has its potential. This can also be seen by the announcement from Diageo of the largest single investment in renewable technology in the UK by a non-utility company, a proposed facility at its Cameronbridge distillery in Fife which will integrate convert co-products and residues from distillation into steam and electrical energy for use in the distilling process.
29. While not losing sight of the 10-15 year challenge, there is also a need to support research into technologies which may only be developed and commercially deployed further into the future. A proliferation of "centres of excellence" should be avoided. The Energy Technologies Institute and ITI Energy should lead work on these potential solutions with universities and the private sector. There is also a need for social research on behavioural change.

Question 3: What decisions need to be taken, by when and by whom to deliver of Scotland's energy future?

6. SCDI does not believe that the current UK Government departmental structure is appropriate for a policy area of the strategic importance of energy. The importance of a joined-up approach by the Scottish and UK Governments has been emphasised and a more focused approach to UK energy policy should better support interaction with the devolved administrations. It believes that a single Department of Energy headed by a Secretary of State for Energy should be re-created.
31. Identifying a timeline for decisions is complicated by the fact that some are ongoing or need to be taken as soon as possible or will only start to have an impact many years in the future because of the long lead time on investment. The full range of SCDI's recommendations is set out in answer to the Committee's first two questions, but the following table summarises some of the key decisions:

| Decision | By When | By Whom | What Impact |
|--|---|--|---|
| Initiate a debate around Scotland's energy future | During and following energy inquiry | Scottish Parliament (with UK Parliament) | Informed debate/ consensus around 4 objectives for energy and 3 potential scenarios for electricity |
| Approve Beaulieu-Denny scheme | Next year | Scottish Government | Completed in 2012 |
| Pass NPF2 and UK Planning Bill | Next year | Scottish/ UK Governments and Parliaments | Unblock planning system, hit 2020 renewables targets |
| Introduce Renewable Heat Obligation | Following current UK renewables consultation | UK/ Scottish Governments | Faster progress on decarbonising post 2015 |
| Set policy framework for conventional supply to replace capacity | Without delay | Scottish Parliament/ UK Government | Avoid danger of electricity gap at some point after 2015 |
| Maximise UK oil and gas reserves | Incentives for marginal areas in next Budget, reduce/ simply overall tax in medium term | UK Government | Meet 40% of UK oil and gas reserves in 2020 |
| Approve one or preferably more CCS demonstrator projects | Next year | UK Government | Project working from 2015, aim to decarbonise existing power from 2020 |
| Establish offshore regulatory regime | Following current UK renewables consultation | Scottish Government, UK Government | Increase offshore wind massively post-2015, make progress on marine |
| Reform regulatory regime and Ofgem's remit to reflect all costs to consumers | Following current UK renewables consultation | UK Government | Supporting new strategic infrastructure over next 10-15 years |
| Review transmission charging regime | Following current UK renewables consultation | UK Government, Ofgem | Support investment where resources are most plentiful |
| More funding for commercial deployment of marine | Following Scottish and UK renewables consultations | Scottish and UK Government | Begin to deploy pre-2015, make real progress between 2015 and 2020 |
| Support Scottish-based production through funding, planning and procurement | Following Scottish renewables consultation | Scottish Government | Some immediate local economic benefits, new manufacturing industries in offshore and marine post-2015 |
| Higher building standards, improve energy efficiency of existing stock | Introduce new standards and incentives as soon as possible | Scottish Government, construction industry | 10-year programme for existing stock |
| Mandate smart | Next year | UK Government | Roll-out for no later |

| | | | |
|---|-------------|--|---|
| metering | | | than 2019 |
| Electrification of UK rail network | End of year | UK Government | Gradual programme from 2014 |
| Commission study of skills needs in the energy industry | Immediately | Scottish Government, Skills Development Scotland | Influence Curriculum for Excellence, Universities Future Thinking Taskforce, Skills Development Scotland etc. |

Gareth Williams
Policy Manager – North
Scottish Council for Development and Industry
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