

**SCOTTISH COUNCIL FOR DEVELOPMENT AND INDUSTRY (SCDI)
RESPONSE TO
DEPARTMENT FOR BUSINESS, ENTERPRISE AND REGULATORY
REFORM: CONSULTATION ON UK RENEWABLE ENERGY STRATEGY**

Introduction

1. SCDI is an independent membership network that strengthens Scotland's competitiveness by formulating policies to encourage sustainable economic prosperity. Its membership is drawn from businesses, local authorities, trades unions, educational institutions and the voluntary sector across Scotland.
2. Energy is at present the top public policy priority for many organisations in SCDI's wide membership. SCDI recently organised a major conference in Edinburgh with high-profile speakers and over 260 delegates from the energy industry, and the wider business and economic community. Key subjects for discussion were how Scotland, the UK and Europe could reach their respective renewable electricity, renewable energy and climate change targets. SCDI's response to this consultation has been informed by all their contributions. Further information can be found at: <http://www.scdi.org.uk/energy/index.html> . SCDI has also commissioned a major independent study from Wood Mackenzie which will look at future supply and demand of electricity, and the likelihood of Scotland hitting its target of 50 per cent of consumption coming from renewable sources by 2020. Through this research, SCDI intends to map out the necessary investment and infrastructure necessary to deliver the Scottish and UK Government's targets for renewable energy. This will be published in October and SCDI looks forward to sharing it widely, including with both Governments.
3. SCDI recognises the importance of the consultation on the UK Renewable Energy Strategy in meeting the key energy policy challenges. Discussions with members have revealed significant frustration with the plethora of inquiries, reviews and consultations in recent years. The UK Renewable Energy Strategy must put in a place an overall framework delivering immediate action and long term clarity.
4. SCDI has not answered every question. It offers comments on each chapter.

UK and Scottish Energy Policy

5. SCDI welcomes the greater attention on heat and transport in this consultation, which together make up about 65% of the UK's primary energy demand. As regards electricity, SCDI members are concerned

about a potential gap between supply and demand in Scotland and the UK. Scotland will lose around 30% of its electricity generating capacity from large power stations in 10 years and around 70% in 20 years. There has been significant underinvestment in the UK energy industry over many decades. Since privatisation, the margin in installed capacity relative to peak demand in Scotland has reduced from about 30% to 20%.

6. The consultation says that tackling climate change and ensuring security of supply are the two key energy policy challenges. SCDI would argue that supporting sustainable economic growth is equally important. The increasing costs of energy and price volatility are major concerns to households, businesses and the public sector. The 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 on to consumers at the factory gate and fuelling inflation. This means that affordability of supply to consumers and businesses is another key challenge. SCDI has set the following objectives for energy policy:

- **Security of Supply**
- **Decarbonising Supply**
- **Affordability of Supply**
- **Optimising Economic Benefit**

7. In addressing these overall challenges, SCDI believes that it will be important to maximise the exploitation and responsible use of indigenous resources and existing technologies for sustainable economic benefit, while accelerating new technology development. New technology and infrastructure may then be deployed alongside existing low carbon technologies, to harness the resources available to achieve our sustainable economic growth and climate change targets.
8. Scotland has the resources, research and technological capability, businesses and skills to make a disproportionately substantial contribution. In particular, the future development of electricity generation within Scotland is critical for the UK. At present, Scotland exports about 20% of the electricity it generates to the rest of the country. Large amounts of import capacity from the rest of the UK are constrained and might destabilise the system. In SCDI's view, Scotland continuing to meet own needs and exporting power is therefore the preferable energy future for Scotland and the UK. 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. This level of variable generation on the network is

likely to need significant back-up. 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. SCDI believes that the rest of the power supplied in and from Scotland should come from new nuclear and lower carbon fossil fuels, which it believes are needed to ensure security and affordability of supply, and to reach climate change targets. While, as the UK Renewables Advisory Board has acknowledged, significantly decarbonising heat or transport before 2020 will be harder, Scotland also has the potential to make a disproportionately substantial contribution in these areas.

Chapter 1: Renewables and the Energy and Climate Challenge

Q1: How might we design policies to meet the 2020 renewables energy target that give enough certainty to business but allow flexibility to change the level of ambition for a sector or the level of financial incentive as new information emerges?

Q2: To what extent should we be open to the idea of meeting some of our renewable energy target through deployment in other countries?

9. Clearly there will have to be some flexibility in policy-making given the scale of the challenge and the number of unknowns. However, the best way to promote investment is a stable environment. It is the industry which will be delivering the target and the Government therefore needs to respond to its recommendations at this stage. Thereafter, the temptation to tweak policies should be resisted unless it is absolutely necessary and should only be done in partnership with stakeholders.
10. The Government is right to look at the costs of different technologies and sectors to identify a scenario for 2020 which minimises costs. However, while SCDI agrees that that Delivery, Cost Effectiveness and Compatibility are key considerations for choosing particularly approach, it would also suggest that another key consideration is which technology and sector will have the greatest global impact in providing secure, clean and affordable energy, and therefore help to tackle the threat of climate change and bring economic benefit to the UK.
11. SCDI is not convinced about the UK achieving its own renewable energy target by trading a portion for supporting renewables in other countries. The Government has said that the UK target is achievable if barriers are removed to investment. Agreeing flexibilities at this stage may reduce the incentive to remove these barriers and gives the impression of planning to fail. Investment overseas would probably be at the expense of investment in those parts of the UK with the renewable energy resource, especially

Scotland, and while it would still lead to business opportunities for UK companies, many countries prefer local procurement and there would certainly be a loss to the supply chain in the UK. It is also unclear how the Directive will work. While renewable electricity may in theory be transmitted to the UK, if the investment in other countries is in heat, transport or energy efficiency, there will be no connection. SCDI's preference would be for investment within the UK in cost-effective renewable or energy efficiency options and for the Government to focus on removing any barriers.

12. SCDI notes the projection in Table 1.1 that final electricity consumption will decline between 2006 and 2020. Speakers at SCDI's energy conference generally predicted that even with energy efficiency measures demand for electricity would grow, not least because it is likely to be increasingly used in heating and transport.

Chapter 2: Saving Energy

Q3: In the light of the EU renewable energy target, where should we focus further action on energy efficiency and what, if any, additional policies or measures would deliver the most cost-effective savings?

13. SCDI supports the statement that "starting point for our energy policy is to save energy". But realistic assumptions on its impact of energy efficiency measures 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. Higher energy prices can act as a spur to energy efficiency, but it remains to be seen if rising energy costs will have a long-term impact. Government must ensure an appropriate balance between this spur and affordability, and offer support which helps households, businesses and communities to adapt. There is a need to reduce the link between energy-intensity and carbon-intensity in goods and activities.

14. SCDI welcomes many of the actions identified in this chapter, including:

- The introduction of the Carbon Reduction Commitment trading scheme for large non-energy intensive businesses and public sector organisations.
- The Carbon Emission Reduction Target to deliver energy efficiency improvement measures to households. The recently announced Home Energy Saving Programme and Community Energy Saving Programme with the aim of insulating all UK homes, where practical, by 2020.

- The introduction of a Suppliers Obligation to aligns the incentive of energy companies with a reduction in demand.
- The roll-out of Energy Performance Certificates to all buildings.

15. In terms of future action to save energy, SCDI has the following comments:

Transport

16. SCDI supports the introduction of a UK-wide road pricing system which would replace fuel duty. This would reduce congestion and carbon emissions, and benefit rural areas of Scotland and the UK where public transport is less available. Softer measures in workplace and communities such as providing more information on travel options have been shown to work without imposing a heavier burden on vehicle usage which in some areas is a necessity, not a luxury.
17. Improvements to the combustion engine, producing large fuel savings of over 20% and fewer carbon emissions, are being made. UK companies are testing smaller engines, some of which could work with hybrids or plug-in hybrids. These will be capable of breaking the 100mpg barrier and their whole-life environmental performance will compare very favourably with today's hybrids.
18. New diesel trains emit at least double the carbon dioxide per mile of a standard electric train. SCDI supports the progressive electrification of the UK network.
19. In response to the recent HM Treasury consultation, SCDI has argued that the proposed new Aviation Duty should closely reflect carbon emissions per aircraft type rather than the proposal for one based on Maximum Take Off Weight.
20. In the shipping sector, the large vessels required for safe and comfortable travel on longer and exposed routes in the Scottish ferry network have high energy costs per passenger and rising fuel costs are having a serious impact on operators. There are upcoming opportunities to introduce energy efficiency measures. Caledonian Maritime Assets Ltd, which owns the ferries, ports and harbours and infrastructure for the ferry services serving the West of Scotland and the Clyde Estuary, estimates that a £200m investment will be 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 for the Scottish Government in procuring the new ships.

21. It is surprising that more reference is not made in this chapter to the potential to promote more flexible working and home working through better access to ICT and video conferencing, and workplace travel plans. Ofcom has just published an action plan to encourage further investment and competition to deliver super-fast broadband to UK homes and businesses, and BT has said that its fibre-based broadband will become available for up to 10 million UK homes by 2010. The planning system can also discourage locating new housing where commuting and access to services and amenities is only achievable by lengthy car journeys.

Business

22. Energy efficiency is increasingly becoming a source of competitive advantage and profitability in the private sector. Rising energy costs are magnifying the benefits of efficiency, but businesses also view higher carbon emissions as a reputational issue in the global marketplace with which many cannot afford to be associated. While accepting that companies will not want to disclose their full competitive advantages, best practice should be shared within sectors and across industry. The Climate Change Business Delivery Group is leading this process in Scotland.
23. SCDI would highlight one example in the Scotch whisky industry, Diageo's plans to expand the Cameronbridge Distillery in Fife, including a bioenergy plant. This would reduce carbon dioxide emissions by 95% and involve substantial generation of Bio-electricity, Bio-Steam and Recovered Site Water. It could also provide heat to a local hospital and it is intended to achieve zero landfill.
24. A good international example in the retail sector which demonstrates the opportunities for introducing low carbon technologies is the Kavdrat shopping centre in Norway. This project has expanded the centre without additional energy use and with minimal environmental impact, by re-using energy, introducing more daylight, using seawater cooling from a local fjord to provide extra energy capacity; and distributing a tenants' handbooks for new entrant retailers to ensure best practice. More information on the project by Arup can be found at: <http://www.scdi.org.uk/energy/presentations/MartinSurrIDGEARUPScotland.pdf>
25. SCDI is also aware that the IT industry is taking steps to reduce the energy cost of manufacturing and the energy requirements to operate ICT equipment.

Homes

26. With the business sector already participating in Climate Change Agreements, the Carbon Reduction and the EU Emissions Trading Scheme, it would appear sensible to focus further action on the domestic sector. SCDI is aware of the statistic that raising energy efficiency standards in Scotland to the level of those in Scandinavia and Germany could save 20% of domestic energy consumption. Scotland suffers from three times the level of fuel poverty as the rest of the UK given its colder climate. There is some concern that Scotland has not so far received its fair share of funding through the Carbon Emissions Reduction Target initiative. Nor does the Home Energy Saving Programme at present apply to Scotland. SCDI hopes that that Scottish Government and power companies will conclude an agreement to fund insulation measures for fuel-poor households, which builds on the good progress made by the Scottish Fuel Poverty Forum.
27. SCDI believes that everyone (including Government, planners, consultants, media and the public) new needs clearer information on energy efficiency and microgeneration to increase awareness and improve advice, guidance and design. This information should be underpinned with further consumer incentives for early adoption to alleviate costs. There should be a review of funding mechanisms to ensure effective targeting of resources and that consumers are not confused.
28. Higher and more rigorously enforced standards are needed for new houses. SCDI's welcomes the aim to make all new homes zero carbon by 2016. However, the credit crunch has resulted in a major contraction of the house building industry, with cutbacks to skilled staff and the supply chain. SCDI understands that even if growth returns to 5% per annum in the near future, re-building the industry to the levels achieved before the credit crunch is likely to take decades. It is predicted that this will lead to more pre-fabricated construction. To support its recovery, it will be important that the Government does not impose unrealistic burdens and agrees with the industry what can be delivered in the new market conditions. Even at pre-credit crunch levels of development only 1% of the housing stock was new every year. If the expectation is that far fewer houses will be built, then, in addressing sustainable development and climate change, the need to focus more on the energy efficiency of the existing stock will be all the greater, and the planning system will need to be more supportive of microgeneration.
29. Incentives for better insulation are a particular priority for the existing stock. SCDI believes that the UK Government should consider measures such as a reduction in stamp duty and that the Scottish Government should amend the Local Government Act to allow the council tax rebates which are already available in England. There is also a need to consider more ambitious loan schemes for all. Smart metering would improve

consumer information and may change habits. Following the ongoing pilot, its roll-out must be mandated by the UK government for within 10 years from the passing of legislation. SCDI anticipates that this will lead to new tariffs which will include a much wider range of options e.g. price v. supplier-controlled appliances, price v. security of supply. Energy saving light bulbs are now competitively priced and should become standard as soon as is practicable. While SCDI notes that the UK Government has a voluntary agreement which aims to phase out incandescent light bulbs by 2011, it believes that the UK Government should introduce legislation to prohibit them.

Public Sector Leadership

30. SCDI would also highlight the potential for public procurement to 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.
31. Energy efficient street lighting could save local authorities approximately 25 to 30% of their energy costs, with a payback time on the initial installation of between 18 months and 2 years. However, local authorities have generally been slow to take advantage of this proven technology and continue to use less efficient and higher carbon conventional lighting. The reason given can be safety concerns. SCDI would therefore recommend that national and local government immediately set up several pilot schemes to establish appropriate guidelines and public acceptance for installation of the technology prior to a nationwide roll-out.

Chapter 3: Centralised Energy

Q4: Are our assessments of the potential of different renewable electricity technologies correct?

Q5: What more could the Government or other parties do to enable the planning system to facilitate renewable deployment?

Q6: What more could the Government or other parties do to ensure community support for new renewable generation?

Q7: What more could the Government or other parties do to reduce the constraints on renewable wind power development arising from:

- a. marine navigation
- b. environmental legislation
- c. aviation and radar
- d. any other aspects of regulation

Q8: Taking into account decisions already taken on the offshore transmission regime and the measures set out in the Transmission Access Review, what more could the Government or other parties do to reduce the constraints on renewable development arising from grid issues?

Q9: What more could the Government or other parties do to reduce supply chain constraints on new renewables deployment?

Q10: Do you agree with our analysis on the importance of retaining the Renewables Obligation as our prime support mechanism for centralised renewable electricity?

Q11: What changes (if any) should we make to the Renewables Obligation in the light of the EU 2020 renewable energy target?

Q12: What (if any) changes are needed to the current electricity market regime to ensure that the proposed increase in renewables generation does not undermine security of electricity supplies, and how can greater flexibility and responsiveness be encouraged in the demand side?

32. SCDI supports a balanced mix for electricity generation in the UK to meet the objectives of security, lower carbon and affordable energy. The UK Renewables Advisory Board's latest report states that nearly half of the target for increased provision from renewable energy will need 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. It believes that the target is achievable, but only with a major commitment on the part of developers, grid companies and regulators, and a stable, attractive and reliable market environment for projects. A pressing need is to join up transmission, generation, regulation and planning.

33. The rapid expansion of offshore and onshore wind seem to be the most critical factors in hitting the UK's renewable energy target for 2020. Offshore and onshore transmission networks must, therefore, be developed and strengthened in time. In Scotland, it appears likely that onshore wind will have the most important role in meeting the Scottish renewables target. The UK Government expects that around one third of renewable capacity will come from onshore wind and a large proportion of this development will take place in Scotland. The average load factor for onshore wind varies between an estimated 26.9% of capacity and over 40% on the Northern Isles. In Scotland, the average is 30-40%. A geographically diverse portfolio of wind and good mix of renewables can smooth the effect across the country and should be supported in planning.

34. The differences between demonstration of new technology, small scale deployment and large scale commercial deployment, and the lengthy timescales between each stage, should be understood and much more clearly stated.
35. Scotland and the UK have been at the forefront of the technological development of marine energy technology. It must be hoped that wave and tidal can make a contribution towards the 2020 targets, but the priority should be to firmly establish Scotland and the UK as the home of the industry and scale it up to make a much more substantial contribution from 2020. ScottishPower Renewables is evaluating three sites in the UK, the Pentland Firth, Sound of Islay and the North Antrim Coast, for the development of three tidal stream projects, which could each supply between 5MW and 20MW by 2011. SCDI also welcomes the announcement by the Crown Estate that it is aiming through the application and consent procedure for wave and tidal energy projects in the Pentland Firth to generate more than 700MW of energy by 2020. There is definitely scope for relatively modest development of biomass capacity in Scotland. SCDI welcomes the publication by the Scottish Government of a study into Scotland's future hydro power potential. It found that around 650MW of smaller to medium scale projects, around half of the current installed capacity of hydro in Scotland, are financially viable, with an even greater potential. While not doubting that there is good potential for investment if delays in planning are minimised, access to the transmission grid ensured and regulations applied in an enabling way, SCDI is sceptical that there is much future scope for increased hydro generation capacity.
36. The planning system which is currently a barrier rather than a stimulus to development in all types of renewables. Delays put the 2020 target at risk and may lead to companies developing existing and emerging technologies investing in countries where there is a more supportive regime. Scottish 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. A culture change is also needed, with Government, the industry and NGOs working together to inform the public on the infrastructure needed for future energy supply. Sufficient resources should be given to planning departments in order that they are able to increase their efficiency. 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. Government could be even

bolder and set targets for approvals for the planning system and for all public bodies. This would increase certainty for developers which would encourage more local procurement.

37. SCDI sees a positive role for community windfarms and other renewable projects in winning greater acceptance for onshore wind. Co-operatives - with priority for local people - bring long-term local economic benefits and help in planning. These models should be encouraged and local authorities should make faster progress in approving these and other smaller schemes in the planning system. SCDI is not convinced that a compulsory Community Infrastructure Levy would be a benefit. It would simply be an extra tax which would discourage investment.
38. In determining offshore Renewable Energy Zones it will be important that the Crown Estate and the Scottish and UK Governments work closely together with the marine energy and shipping industries to ensure that they can safely co-exist.
39. 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 rejection of the Lewis windfarm project was a major disappointment as significant onshore wind generation would justify the investment in an interconnector which would unlock the vast marine potential. There is a feeling that European environmental designations are being too strictly applied in Scotland and concern that this will in due course affect the marine industry. There is a need for greater clarity in resolving conflicts between, on one hand, green energy and climate change targets, and socio-economic benefit, and, on the other hand, conservation. Scottish Natural Heritage (SNH) should be able to work with developers to advise how schemes could be compatible with wildlife and conservation designations. Locational guidance which is in preparation should reduce the likelihood of SNH objecting to planning applications for renewable developments. Statutory consultees in the planning process need to be resourced to respond swiftly. The Scottish and UK Government should demonstrate leadership and consistency in decision-making on major projects and infrastructure, not hide behind regulations.
40. Discussion is underway between civil aviation bodies, Ministry of Defence and the industry on aviation and radar issues, but action needs to be driven harder.
41. Achieving the renewable energy targets will depend on investment in the expansion transmission capacity on a scale which has not been delivered for many years. An increase of new transmission capacity of 8GW in Scotland is projected as needed. In particular, the upgrade of the Beaulieu-

Denny line is simply essential on any potential pathway towards the targets. It is the only practical and affordable way to proceed, and its completion will also unlock the upgradeable potential of the rest of the northern Scotland transmission network through relatively uncontroversial reconductoring on existing routes and towers, without the need for new overhead transmission routes. Any delay would be likely to halt development in large areas of the country with the best renewable resource.

42. The average time between planning application and completion of the construction of major infrastructure seems to be over ten years. The UK will not be able to meet its energy objectives if such projects are not fast-tracked. SCDI welcomes the inclusion of electricity grid reinforcements as a national priority within the Scottish Government's new National Planning Framework and the proposals for a National Policy Statement in the UK Government's Planning Bill.
43. Further significant infrastructure upgrades will also have to be made if the full potential of generation on Scotland's islands and marine energy is to be realised in the longer term. There is a lack of onshore capacity in the grid in the north of Scotland which is a disincentive to investment and there is some concern about a lack of clarity on decision-making regarding the various proposals. It would be the preference for the island authorities if so-called 'bootlaces' could be developed around the coasts of Scotland to take the power they generate to the population centres. SCDI welcomes the proposals for offshore grids, especially the Crown Estate's for an East Coast Grid Transmission network and the study by the Scottish and Irish Governments into a connection between Ireland and the west coast of Scotland. It will be important that Government supports sufficient generation capacity on the islands and offshore in order that investors have confidence in these proposals. Offshore grid developments increase the need to strengthen the onshore grid.
44. The offshore regime must work together in a co-ordinated way around the UK. Developing a grid will be a major challenge which calls for regular review. The decisions and actions of the Crown Estate will clearly have a pivotal role in the development of marine energy. In Scotland, SCDI welcomes the integration of the proposed National Marine Plan into the National Planning Framework. Details are needed on how the new Scottish and UK marine legislation will be co-ordinated.
45. The concept of a European supergrid is supported in principle by SCDI. This would be developed incrementally over 30 years, there are technical challenges to overcome and it would require billions of pounds of private sector investment. SCDI welcomes reports of talks led by Scottish Development International.

46. The UK's system of transmission charging results in higher and less predictable charges for Scottish based generators and is a particular disadvantage to those developing renewable energy projects in the Highlands and Islands where there is the best resource. The industry believes that this will increasingly become a barrier to renewable development as growing global demand for turbines drives up the cost of projects and the margin of financial return is squeezed, and will disincentivise investment in extending the life of and constructing new thermal plants to back up the variable power supply from renewables. The additional locational costs for generators in the north compared to the south amounts to 15% of their total costs, but appear to run contrary to Scottish and UK Government energy and climate change policy, by making it harder to finance projects in optimal, but peripheral locations. The Kingsnorth controversy shows the potential difficulty of locating new generation close to the population centres in the south east. SCDI has called for a fundamental review of locational charging. It is supportive of the proposals by the Scottish Government, ScottishPower, Scottish and Southern Energy, and the Scottish Renewables Forum for a new methodology in which there is a level-playing field with generators using the UK transmission network being levied at a uniform rate for each unit of energy that enters the system, irrespective of its location. This would appear a simpler, more predictable and fairer system, which is more aligned with Government policy objectives and would not impose extra costs on National Grid or the consumer. Locational signals could be provided in other ways under consideration by the industry. While National Grid believes that the biggest barrier to new generation, renewable or otherwise, is the current planning regime and not transmission charges, SCDI welcomes its constructive approach to considering these proposals.
47. The load factor for wind energy in the Northern Isles, Western Isles, the Highlands and Argyll and Bute is generally much higher than in other areas of the UK, reaching as high as 40% in the Northern Isles. Island generation is therefore a more reliable source of power for the UK, as well as creating socio-economic benefits for the communities. SCDI has long supported the capping of transmission charges from the islands and is very disappointed that the UK Government appears to have rejected it. There is a case for the higher banding of ROCs for generation on the islands if this will unlock more potential projects.
48. ROCs have been a success, but, as the consultation says, there is a danger that the investment may falter between 2010 and 2015 then grind to a halt. SCDI supports the extension of their duration beyond 2027, possibly by another 20 years. It remains cautious about the banding for emerging technologies and is concerned that changes to ROCs may create an uncertain investment climate. Commercially viable wave and

- tidal devices are not yet in operation and a higher banding for ROCs will not help develop the technology to the point when the ROCs would make it more attractive for investment by utility companies. Additional financial stimulus is necessary to deliver commercial projects, although in the long term the industry should be aiming to produce returns which do not require more ROCs.
49. 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 more speedily connect projects before major transmission reinforcements are made. However, there is significant concern that the 'Connect and Management' form proposed in the Transmission Access Review will limit its applicability in Scotland, and may remove any potential benefit and discourage investment. This would, again, seem contrary to the Scottish and UK Governments' policies.
50. The regulatory regime has served its purpose. Ofgem's remit now needs to be more strategic, supporting transmission reinforcements, and considering the total costs to consumers now and in the future, including the costs of climate change.
51. Greater variability of the power supply to the grid network will mean that the system needs constant balancing. Pump storage technologies can help address this variability, providing significant quantities of power at very short notice. However, one barrier to the development of pump storage is that it is currently treated and charged as electricity generation. It should be regarded as storage. Extra variable power could be used for electric and fossil hybrid vehicles.
52. 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.

Chapter 4: Heat

Q13: Assuming financial support measures are in place, what more could the Government do to realise the full potential of renewable Combined Heat and Power?

Q14: Are our assessments of the potential of renewable heat deployment correct?

Q15: Have we captured the key features of a Renewable Heat Incentive and a Renewable Heat Obligation as they would apply to the heat sector correctly? Would both of these schemes be workable and are there alternative ways of structuring the schemes to ensure that they can operate effectively?

Q16: Do you agree with our assessment that a Renewable Heat Incentive would work better in the heat market?

Q17: What more could the Government or other parties do to encourage renewable heat deployment with regard to:

- a. awareness raising;**
- b. air quality;**
- c. building regulations;**
- d. planning;**
- e. anything else?**

Q18: How far should the Government go in focusing on areas off the gas grid as offering the most potential for renewable heat technologies?

53. SCDI agrees that there is a need to promote greater community acceptance of Community Heat and Power (CHP). Highly distributed power systems are opportunities for billions of pounds of investment in brownfield sites, but will take time and mean changing social structures and attitudes. It is important to remember that 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. SCDI believes that all future small thermal generating plants near population centres should have specific arrangements for the use of waste heat. It must be ensured that new public procurement framework agreements in Scotland do not exclude CHP because it will never be practicable everywhere.

54. SCDI agrees that financial incentives should be introduced for renewable heat generation, including grants and either a Renewable Heat Incentive (RHI) or a Renewable Heat Obligation (RHO). The consultation compares and contrasts their merits in some detail. SCDI has been informed that a heat ROC or RHI equivalent to £40mWhr would transform the investment proposition for biomass CHP and district heating systems and stimulate the market. It is not in a position to add anything to the analysis in the consultation document. But it does believe that whether the RHI or RHO is chosen, it should be gradually introduced, be technology neutral and not be set at a level which leads to more fuel poverty.

55. There is an expectation with the RHO scheme that energy suppliers will pass through the cost of compliance to the end user. However, if one is designed, it must be recalled that this will not always be possible. Whisky distillers located in remoter areas of the Highland and Islands which are interested in using renewable energy would not be able to and would therefore face increased production costs. Extra incentives and assistance should be available to help the smaller distilleries in remote areas to investigate the potential use of renewable energy forms.
56. Local government had a key role to play. As large housing landlords, local authorities are able to exert influence over energy consumption in housing and help to create job opportunities in retrofit installation. Green targets can help to drive economic growth and provide additional opportunities in social justice. For instance, Fife Council is currently supporting projects which would result in a reduction of around 1 million tonnes of emissions per year (around one third of the total). It is intended that the first green business park will be built in Fife.
57. The installation of standard boilers rather than heat pumps in the Scottish Government's central heating programme has been a missed opportunity. For installation by businesses, the Carbon Trust offers interest free loans over 4 years. SCDI believes that the Scottish and UK Governments should consider the practicality and affordability of extending interest free loans to all households.
58. The new accreditation scheme for installation of heat pumps which has been introduced by the UK Government is causing fury in the Scottish industry because of the higher, multiple costs to installers, and additional bureaucracy. It cost £3,600 to gain accreditation under the Scottish Community and Household Renewable Initiative, which is hard for small businesses to absorb. It is a disincentive to getting involved in the industry, especially in rural areas. Following consultation with the industry, this accreditation system should be replaced.
59. SCDI understands that high levels of fuel poverty in off grid locations in the North of Scotland are likely to be a deep concern this winter. This problem will need to be addressed urgently with Government support, and affordable, low carbon or renewable heating technologies surely form part of the solution.
60. The possible environmental policy conflict between the carbon reduction benefits of biomass production and the effect on air quality from the particulates caused by burning biomass was an issue which was discussed at the SCDI Energy Conference. Particle control mechanisms will be necessary on boilers to address this issue, but it was also highlighted that newer technologies can lower levels.

Chapter 5: Distributed Energy

Q19: Do you agree with our analysis of the mechanisms for support of small-scale renewable electricity?

Q20: Given the analysis on the benefits, costs and potential, in what way and to what extent should we direct support to microgeneration electricity?

Q21: If you agree that better information will aid the development of distributed energy, where should attention be focused?

Q22: Do you agree with the Government's current position that it should not introduce statutory targets for microgeneration at this stage in its development?

Q23: What more could the Government do to incentivise retrofit of distributed energy technologies?

61. The Energy Savings Trust has estimated that microrenewables could potentially supply as much as 30-40% of the UK's total electricity demand by 2050. While their contribution to the 2020 target may be much more limited, the Government is right to take a longer-term view in considering mechanisms for support. One model for the new electricity networks would include more large-scale renewables, local self-sufficient networks and some commercial micro-generation. This would mean that suppliers need to look at new business models to maintain their revenues and there would be new, different regulatory pressures.

62. The increased grants and financial incentives for microgeneration from the Scottish and UK Government have been welcome, but they are still comparatively small and SCDI agrees that it would be appropriate to go further. Having weighed up the arguments, it would favour feed-in tariffs with an upper capacity limit at a level which is complementary to the ROCs system and does not undermine investor confidence in it. SCDI believes that feed-in tariffs could better support an expansion of smaller scale and decentralised renewable electricity schemes including domestic microgeneration, onsite and community owned renewables. It recognises the strong case for front-loading this support to stimulate demand.

63. It is important that grant schemes and financial incentives should have criteria for measuring the likely carbon savings to ensure they save reasonable amounts of CO₂. 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 welcomes the acknowledgement in the consultation that too little attention has been paid thus far to more

community and business collaboration on small-scale microgeneration as the focus has been on schemes for individual buildings. This collaboration should be encouraged through finance, clearer and more consistent advice, and planning reforms e.g. General Permitted Development Rights.

64. In order to increase awareness of microgeneration and improve advice, guidance and design, SCDI believes that everyone needs better information - Government, planners, consultants, media and the public. As regards particular opportunities, SCDI has highlighted that the public sector can show leadership and establish the supply chain, while it has been demonstrated in Norway that supermarkets can make significant energy savings and showcase the technologies to customers.
65. With new house-building down by as much as 50% across the UK and the likelihood that it will take many years for the industry to recover to pre-credit crunch level, retrofit becomes even more important. So the Scottish Government should at least achieve the level of permitted development for single and small scale granted in England. However, the biggest barrier is often the availability of contractors. There is an urgent need to create capacity with more approved installers. The Carbon Trust is building up greater knowledge base on conversance with technologies and the public sector also has significant role.
66. While offshore grids for marine energy in the north of Scotland are being planned and constructed, a temporary solution would be possible if a smartgrid is piloted for decentralised energy in the area. This would involve the electricity generated from these variable power sources supplying local consumers and industries when it is available and the national grid supplying the electricity when it is not. This would enable the Government and National Grid to test the impact of more unpredictable power on the network and help to develop larger smartgrids.

Chapter 6: Transport

Q24: How can we best incentivise renewable and low-carbon transport in a sustainable and cost-effective way?

Q25: What potential is there for the introduction of vehicles powered through the electricity grid in the UK? What impact would the widespread introduction of these kinds of vehicles have on:

- a. energy demand and carbon emissions;
- a. providing distributed storage capacity;
- b. smoothing levels of electricity demand on the grid?

What factors would affect the scale and timing of these impacts?

Q26: Over what timescales do you think electric vehicles could plausibly contribute to our renewable energy and carbon reduction targets and what could the Government most effectively do to accelerate the introduction of such vehicles in the UK?

67. The scope for decarbonising transport fuel in the short to medium term appears to be relatively limited. High fuel prices are encouraging higher sales of more fuel efficient and hybrid cars, and on the number of conversions to LPG. These seem set to stay and this will incentivise renewable and low-carbon transport. Government must be careful that its policies do not impact on economic competitiveness and the cost of living - especially in rural areas where driving is a necessity not a luxury – and do not have unintended environmental consequences.
68. Biofuels will clearly be critical if the EU Renewable Directive for the transport sector is to be met. However, evidence has been presented that use of first generation biofuels would reduce agricultural production for food and biodiversity in Europe and the developing world and increase food prices. The Gallagher Review is welcome and its findings should be shared widely. SCDI believes that 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 specific renewables target for the transport sector of 10% by 2020 needs to be reviewed and appropriate environmental safeguards introduced. SCDI would like further support for research and development of second and third generation biofuels, especially non-crop based biofuels. It would highlight the work of the Scottish Association for Marine Science, based at the Dunstaffnage Marine Laboratory near Oban in the Highlands and Islands, which is investigating the potential and practicality of using micro- and macroalgae.
69. SCDI understands that there are concerns that the increased use of biogasoline in conventional petrol as a result of the Renewable Transport Fuel Obligation may have unintended consequences in the Highlands and Islands. INEOS is due to end production of conventional gasoline at the Grangemouth refinery once its new biogasoline facility is completed. Due to its character, biogasoline 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 in the Highlands. A “green” policy would therefore result in significantly increased carbon emissions from Grangemouth-based tankers travelling around a region which is the size of Belgium. This also has implications for the security of supply in the Highlands and Islands. The Gallagher Review has recommended that the introduction of biogasoline is delayed. Before it is

introduced, there is a need to ensure that the infrastructure is put in place in the Highlands and Islands.

70. Electric (EV) and Hybrid (HEV) vehicles are currently available and growing in popularity. It is estimated that Plug-in Hybrid Electric Vehicles, which could achieve an 85% reduction in CO2 emissions, and are probably 5-7 years away.

71. Barriers to adoption the widespread adoption of such vehicles in the UK are:

- Cost
- Proof of reliability and durability
- Lack of known residual values
- Lack of public charging infrastructure
- Need for 3 phase supply for most vehicle charging

72. One specific barrier which has been identified in relation to new EV taxis in the UK is that some local authorities, e.g. London and Liverpool, have a antiquated bylaws covering turning circles which were drawn up for horse drawn carriages.

73. Building critical mass would accelerate adoption. It:

- Enables supply chain to gain scale, prove reliability, durability and reduce costs
- Enables infrastructure providers to invest in charging stations
- Enables fleet and private vehicle operators to buy with certainty of being able to operate vehicles, charge vehicles, get replacements and have expectation of residual value

74. This could be done most effectively through:

- Public support for product development and reliability/ durability proving
- Public procurement of municipal EV vehicles: minibus, delivery, works vehicles
- Public subsidy and policy plan for EV city bus, HEV bus and EV taxi
- Public subsidy and policy plan for private operators of EVs, such as city car-share clubs

75. Scotland has a technological lead in EV batteries and vehicles. Glasgow-based Allied Vehicles will shortly produce the first of a new generation of a minimum of 1000 more fuel efficient minibuses, taxis and vans using batteries from Dundee based Axion Holdings, with interest in the vehicles from around the UK and Europe. Given the range of major energy and

public transport companies headquartered in Scotland, it is well placed to drive this technological development for the UK and become a leader in global transport. Axion Holdings has proposed that the Scottish Government subsidises 5000 EV vehicles over three years at a cost of £1000 per vehicle and a total cost of £15m. The UK Government and the other devolved administrations should consider similar schemes. Local government can play a major role in promoting the use of zero-emission electric vehicles, by adopting such vehicles for their own fleets. Such fleets, if powered by renewable energy, could significantly reduce regional CO2 emissions. Local government could also help to provide more plug-in points for electric cars, possibly in conjunction with major shopping centres as has already happened in some cities.

76. The UK and Scotland have ideal opportunities to showcase this technology in the vehicle fleets for the London Olympics and Glasgow Commonwealth Games.
77. Such piloting would enable a more rigorous analysis of the whole-life environmental costs of EV and HEV technology in comparison with the much more fuel efficient internal combustion engine cars which are being developed, as was mentioned in response to the Questions in Chapter 2. The evidence at present is disputed. Some studies claim that established technologies use much less energy in manufacture, transport, replacement and disposal, which makes the environmental costs lower than HEV over the whole life-cycle. At present, conventional vehicles have the advantage of more shared parts, greater economies of scale, production closer to the point-of-sale and longer lives. However, there is evidence that HEV vehicles are now retaining guide values in US car sales better than the average vehicle.
78. Hydrogen fuel cell cars are presently unproven and costly, with commercial production 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.
79. 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, following its review, the UK Government will later this year reverse its opposition and initiate a phased electrification of the network in the investment programme from 2014. According to the Department for Transport, 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 21 campaign for a UK high-speed rail network.

Chapter 7: Bioenergy

Q27: How can we best ensure that our use of biomass is sustainable?

Q28: How do you see the market for biomass developing to 2020? What are the implications for:

- a. imports:
- b. longer-term prices and costs?

Q29: Should the Government take further regulatory measures to discourage biomass waste, including biomass waste, from going to landfill? If so, what types? What, if any, other measures should be taken to encourage its use to generate bioenergy?

Q30: What more could the Government or other parties do to help to ensure the provision of sufficient Waste Incineration Directive-compliant combustion capacity to burn available waste wood alongside other biomass, and what else might constrain the development of this capacity?

Q31: What further actions will improve supply chain efficiency, consumer confidence and sustainable growth of the biomass supply chain?

Q32: What barriers exist to the cost-effective deployment of anaerobic digestion, biogas and the use of biomethane injected directly into the gas grid, and what are the options to address them?

Q33: What action could we take to make biomass communications more effective to both improve public awareness and help to address acceptability issues, and how should this be delivered?

Q34: Are these issues constraining biomass supply and use other than sustainability, supply chain and information issues? How should these be tackled?

80. One of the great benefits of biomass is that it is not subject to variability issues like some other renewable sources. The claims made for it can therefore be regarded as more certain. The UK lags behind other countries in developing this resource and SCDI would like further incentivisation. In Scotland, there is scope for some modest development of biomass capacity through fairly small scale projects taking advantage of local fuel resource and by-products. For example, there is growing interest among farmers in agricultural waste to heat energy. If it would otherwise

be landfilled, waste incineration for heat energy is preferable, providing it is ensured that it is pre-treated and emissions are tightly controlled.

81. As the submission from the Scotch Whisky Association (SWA) explains, a number of distillers are investing in or exploring opportunities to convert distilling co-products as alternative fuels rather than animal feeds. This would supply cleaner heat and electricity for the distillery, reduce heat and electricity use by the animal feed plants and remove the carbon emissions from the transport of the by-products. The SWA is concerned, however, that the consultation seems to prioritise the reuse and recycling of biomass waste over its use as a renewable fuel. In the case of converting distillery co-products this may be interpreted as favouring the reuse or recycling of biomass in animal feeds over their potential use as a renewable energy form. This would be a barrier to industry sustainability. SCDI would welcome clarification on this point.
82. The SWA has also flagged-up concerns that, due to the increasingly narrow interpretation adopted by the UK, the Scottish Environment Protection Agency may have to consider distillers' by-product for heat energy as "wastes", which would then make them subject to waste legislation, increasing costs to the industry. Commercial imperatives would as a result force companies to abandon their investment plans for converting distilling co-products into alternative fuels, use less sustainable fuel sources onsite and use more energy offsite in continuing to convert the co-products into animal feeds. SCDI would support the SWA's call for the UK to adopt a definition of by-products which would support rather than threaten the sustainable energy projects that are being developed by the industry.
83. According to the consultancy Manor Lane Energy Ltd, on average, converting the co-products of one distillery through anaerobic digestion could supply it with up to two-thirds of its primary energy requirements for steam. However, the current ROC system incentivises converting the biogas into electricity and, as five times more is generated than can be used onsite, a grid connection must be sought and there will be transmission losses on energy. This position would change if a heat, steam or biomethane ROC was introduced and, as suggested in Paragraph 54, set at the equivalent to the £40mWhr. Other industries producing organic waste, including abattoirs, breweries, fish processors and bakeries, would also benefit.
84. Injecting biomethane into the gas network can reduce its carbon intensity. SCDI believes that it should be made at least as attractive to introduce it into the gas distribution system as to burn it on-site. SCDI is also aware of market research by the industry which indicated that there is sufficient organic waste from agriculture, local authorities and the commercial and

industrial sectors to generate at least 3tWhrs of biomethane. At present, biogas is used to generate electricity, but it suffers 30% transmission losses on the grid and, as there are often no heat users in proximity, the heat is wasted. While some of this organic waste could be used onsite or locally - as set out above in the case of distilleries – there is also the potential to produce a significant amount of bioenergy for transport in the national grid. One proposal is that if biomethane is injected into the gas network in one location, a Combined Heat and Power plant in another location should be able to take out an equivalent volume of natural gas for use where it is needed and still receive the ROCs given as if the CHP was immediately beside the biogas plant. This would mean that the biogas plants could remain in rural locations close to where the waste is sourced (avoiding carbon emissions through vehicle transport) and away from population centres where they may be planning difficulties, the digestate can easily be spread on the land as high quality fertiliser and there would be more renewable heat on the grid. Such a system already works at the 10mW biogas plant in Schwandorf in Germany which will inject biomethane at natural gas standards into the gas network. SCDI consider that this proposal is worthy of further investigation and consideration by the Scottish and UK Governments.

Chapter 8: Innovation

Q35: How can we adapt the Renewables Obligation to ensure that it effectively supports emerging as well as existing renewable technologies? Are there more effective ways of achieving this?

Q36: Is there evidence that specific emerging renewable and associated technologies are not receiving an appropriate form of support?

Q37: Are there barriers to the development of renewable and associated technologies that are not addressed by current or proposed support mechanisms?

85. A global energy technology revolution is needed. SCDI understands that the Energy Technology Perspectives 2008 launched at the G8 summit in Tokyo in June and the European Strategic Energy Technology Plan which will be presented by the European Commission in November show that deep emission cuts are technically achievable. Next generation technologies have been identified, but further research and development is required. A European Technology Map to 2030 has been produced. This will show that, on the energy supply side, Carbon Dioxide Capture and Storage is the main technology option, followed by renewables. On the energy demand-side, energy efficiency will play a major role. Electricity networks (European SmartGrids) to enable future technology developments have been mapped out but they will need to be

implemented. 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 (ETI) and – in Scotland - ITI Energy should lead work on these potential solutions with university and private sector partnerships. There is also a need for social research on behavioural change.

86. There is massive potential in marine. It is estimated that Scotland has 25% of Europe’s wave potential and 10% of its tidal. In light of that potential, it would seem likely that if marine energy becomes a commercial technology and grid infrastructure is put in place, Scotland will be a very attractive location for investment. This in itself would benefit the Scottish and UK economies, but it is not on the same scale of opportunity as becoming the world leader in research, development, expertise and manufacturing. Good progress is being made with the first commercial-scale operation of marine energy devices and ScottishPower Renewables has confirmed that it is evaluating three UK sites for the development of the world’s largest tidal stream 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 creation of EMEC in Orkney was welcome and the Saltire Prize is a laudable attempt by the Scottish Government to leverage in private sector funding. But the record elsewhere is mixed. The UK still has a technical lead, but the Iberians and Irish are working hard to catch up. The U.S. Department of Energy has recently announced the first companies and groups that have been awarded grants through its Water Power Competitive Grant Solicitation. The UK’s total planned investment also pales next to the long-term Danish investment in wind technology. Public funding has largely been spent on facilities. Similar funding to the Saltire Prize would go a long way towards some commercial deployments, with the precedent being the first round of UK wind projects.
87. The Scottish Government recently announced a consultation on proposals which would mean that new wave devices would receive five ROCs for every Megawatt of power produced and tidal devices would receive three ROCs, compared to one ROC for established renewables technologies. SCDI applauds the intent. However, it remains cautious about this banding for emerging technologies. It is concerned that changes to ROCs may create an uncertain investment climate. Scotland’s Marine Supply Obligation has state aid clearance. It is seen as the benchmark mechanism, but could be increased to reflect inflation in the industry since it was costed in 2005. Any changes should not reduce or disrupt funding. There may be a case for developers in nascent sectors to opt to receive a

lower ROC in exchange for a capital grant for R&D, demonstration and deployment.

88. There is a need for more early projects to maintain the marine industry's centre of gravity in Scotland. Npower and Wavegen have submitted plans for the first commercial wave power station at Siadar, Lewis, and SCDI trusts that it will be supported. 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.
89. SCDI understands that the industry is likely to develop in a similar way to other energy industries, with locally-based companies developing the technology and installing demonstration devices themselves, before partnering with larger utility companies which would finance and construct full-scale power plants there and around the world. This has been the process through which Scottish Power Renewables' and other utilities are now developing wave and tidal projects. For this process to be centred on Scotland and not elsewhere, it must remain an attractive location for technology companies. Currently there is a critical gap at the pre-commercial deployment phase where there is no appropriate funding mechanism in place. Two ROCs on their own are wholly inadequate and need to be augmented by both additional revenue support and capital grants. The UK must continue to offer support for research and development which is competitive with the funding announced earlier this year by Ireland. In parallel with support for pre-commercial projects technology developers need continued support for ongoing R&D. At present no funding is available for marine energy from the Technology Strategy Board and the alternative funding sources either do not offer sufficient support or – for reasons such as the requirement to surrender licensing right to Intellectual Property for seven years to the ETI - are unattractive to the companies. This means that there are no longer significant financial incentives for companies to base themselves in Scotland and the UK.
90. Potential sources of funding are available. The £42m UK Marine Renewables Deployment Fund is still unspent because no device has reached the required stage of technological readiness. SCDI welcomes the indication in the consultation document that funding will be distributed before the end of this year. The application of the rules on eligibility could also be more flexible to provide support to the industry. The Scottish Government's Wave and Tidal Energy Support Scheme, which was used to kick-start marine energy R&D, could be re-opened. Funding from the Scottish Renewables Obligation is currently held by HM Treasury and could be made available to spend in Scotland. £98m earmarked for renewable energy in Scotland sits unspent in the Fossil Fuel Levy. If all this funding was combined it could make a real difference to capital

support for the early development of projects in Scotland. An appropriate balance would then need to be struck between support for the priorities of getting devices in the water and continuous technological innovation. Suggestions which have been made in a paper by Pentland Firth Tidal Energy are: one-off grants which would maintain Scotland's leading position over the next two or three years; a new rolling scheme which could sustain investment by R&D companies indefinitely; and match funding from Government for money companies raise on the market or privately.

91. SCDI supports early designation of development zones for marine energy to speed up deployment. The Crown Estate has been considering how it will proceed with leasing wave and tidal energy sites, and has outlined the application and consent procedure for the Pentland Firth. SCDI believes that the Crown Estate should recognise that it will be impossible to leap from the single scale energy devices which are being tested at locations including EMEC to a full-scale power plant of 200-300MW. Smaller demonstration commercial power plants of perhaps between 5 and 25 MW will be needed to demonstrate to utility companies considering significant investment the reliability, efficiency and environmental impact of such farms. SCDI is aware that the industry believes the Crown Estate's intention is for five year leases in nursery areas within these sites. There is concern that the substantial investment required for the construction, operation, monitoring and decommissioning of these demonstration plants could not be justified for such a short year lease. The companies recommend that there are intermediary areas within these zones between the nursery areas and full-scale power plants, with leases available for at least 20 years, for demonstration plants, which could be extended into larger generating capacity. Another suggestion might be rolling five years leases which operate on a 'use it or lose it' basis.

Chapter 9: Business Benefits

Q38: What more could the Government or other parties do to ensure that the UK secures the maximum business and employment benefits from the EU renewable energy target?

92. Scotland and the UK are well placed to capitalise on their natural resources and offshore expertise to accelerate technology leads in several key areas. SCDI welcomes the work by Scottish Enterprise, Highlands and Islands Enterprise, Scottish Development International and trade associations to support the industry.
93. Particular opportunities in Scotland which SCDI would highlight include the Fife Energy Park; the 'Energetica' initiative in North East Scotland which business has identified as potentially offering the opportunity for a £1.5bn

strategic investment, which would generate £500m per annum for the local economy; and the potential re-development of the Nigg Fabrication Yard in the Highlands and Islands which would supply and service the offshore wind and marine energy industries. On a smaller scale, there are opportunities in batteries, biomass and microgeneration.

94. The loss of the UK's lead in onshore wind energy is a lesson which cannot be forgotten. While it is now a proven technology, efforts to attract more manufacturing related to the supply chain into Scotland are ongoing. A major problem is the lack of guaranteed work. REpower had concluded an agreement with the supply chain in the Highlands and Islands to source parts from local companies but withdrew for this reason following the Scottish Government's decision to reject the Lewis Windfarm proposal. The Arnish Yard in Stornoway on the Western Isles has yet to receive a single order from the UK, but supplies developers overseas. It is perhaps the case more attention should be paid to supplying parts of devices, not necessarily the whole. The offshore wind market - where turbine manufacture is a key constraint and the Scotland and the UK have a lead - and offers greater promise in terms of developing a wider indigenous supply chain. Marine energy is another major opportunity. The aim should be not simply to exploit the resource, but to create the world's leading technological hub. The announcement by ScottishPower Renewables that a new company is to be established in order to manufacture tidal turbine devices in Scotland is especially welcome in this respect. However, the support mechanisms for early deployment of new technologies are a persistent and significant challenge, and there is still a lack of support from Government for manufacturing, as is demonstrated by the business failure rate.
95. Biomass production is a job intensive process so it can stimulate employment opportunities. Manufacture of biomass boilers should become possible in Scotland to replace imports, as happened in Ireland. Demand to stimulate investment is important to the process, but it is felt that there is no co-ordination to help drive this process forward. Consumers and producers of "low grade" heat need to come together or the enterprise networks need to bring them together.
96. The SWA's consultation response refers to a project on Speyside which plans to utilise distilling co-products from a number of nearby distilleries to produce bioenergy. Remote distilleries tend to be smaller in size and therefore the potential to harness the energy embodied in the distilling co-products is considerably reduced. Incentives and assistance should be available to help operators in remote areas to investigate the potential use of renewable energy forms – perhaps through incentivising the creation of consortia of companies to achieve economies of scale.

97. A key technical challenge for the marine industry is connectivity to the grid. A secure, economical cable supplier would be beneficial, but there is no manufacturer left in the UK. SCDI believes that the Scottish and UK Governments and Energy Technologies Institute should invest and work with the industry to agree a standard cable and to re-establish a cable manufacturer in the UK. This would also bring opportunities to export equipment. For example, China's domestic production of offshore cabling currently does not meet demand.
98. Skills gaps and shortages have been highlighted by the Scottish Renewables Forum as one of the three greatest challenges facing the industry. There is, in fact, a global skills shortage for renewable (and other energy) technologies. SCDI supports the comprehensive survey of labour and skills requirements in the sector.
99. SCDI welcomes the initiatives which are now taking place within Scottish schools, such as Careers Scotland's 'The Path is Green' and the increased number of relevant university and college courses which can familiarise people with the industry. Such initiatives come too late, however, to hit the 2020 UK renewable energy target. Renewables will need to employ skilled workers from other industries if it is to be achieved. There appears to be no shortage of people keen to enter the industry, but one issue which was discussed at SCDI's energy conference is a disconnect between the skills supply and the 'demand pull' from industry. It was suggested that the industry has often been reluctant to accept graduates due to a lack of business experience or workers with transferable skills.
100. Possible solutions suggested included:
- An adult modern apprenticeship to bridge the gap.
 - Collaboration with the oil and gas industry on skills utilisation and crossover both ways would be mutually beneficial.
 - Fast-tracking recruitment from other industries and countries. The UK immigration system should seek to attract high calibre, skilled people rather than act – and be presented - as a barrier, and retain the talent from overseas who are studying in our universities and colleges.
 - Promoting and facilitating the locations with the renewables resource as attractive places to live and work. There is a need to improve connectivity and provide high quality, affordable housing in Highlands and Islands.
 - Retraining and upskilling a generally ageing workforce for existing and emerging technologies. The skills challenge is not always a shortage of numbers. Training for plumbers, electricians and building professionals to be microrenewables installers is

inadequate and does not meet demand.

- Bringing the economically inactive back into the labour market, for example by working with social enterprises and local authorities.

101. In education, there is a continuing need to increase participation in science, technology, engineering and maths in schools and in tertiary education. Universities and colleges which offer quality courses in relevant subjects in Scotland need to be given sufficient resources to meet the demand. Some colleges are turning away young people from technical subjects due to funding limitations.

102. Along with the export of technology, there is major economic opportunity for UK companies in international consultancy. For instance, China witnessed \$10 billion of investment in renewables in 2007. With 6GW of installed capacity, the 2020 target is for 30GW, although it is widely expected that more will be achieved. China currently lacks the expertise in renewables to grow at their desired rates and this is particularly true in relation to offshore wind. Local staff with local knowledge of the business environment are key for successful investors. This should be supported by the international offices of the UK's enterprise networks.

103. The investment in renewable energy offers the opportunity to be innovative and bring wider economic benefits. For instance, the current lack of grid infrastructure to transmit the electricity generated by marine and wind energy in the north of Scotland to the population centres has already been highlighted as a barrier to its development. One potential solution with spin-off employment benefits in what is a regeneration priority area would be to attract a high-energy using industry, such as a data centre. Such an investment may prove particularly attractive given the opportunity for a multinational company to be associated with a world-leading green energy development, along with the greater security and cooler climate of this remote location. Another example would be that it is estimated that £100m will need to be spent on the ports infrastructure for Clyde and Hebrides ferry services over the next ten years. There is the opportunity to construct wave power stations during this redevelopment, as is currently being done in northern Spain.

104. Renewable energy is massive investment opportunity in which the Scottish and UK financial services industries are well-placed to benefit. The Renewables Advisory Board suggests a £100bn capital investment is expected by 2020.

Chapter 10: Wider Impacts

Q39: Do you agree with our analysis of the likely impacts of the proposed

increase in renewable deployment on:

- b. carbon dioxide emissions;**
- c. the local environment;**
- d. security of supply;**
- e. energy prices;**
- f. fuel poverty;**
- g. the energy market;**
- h. the economy;**
- i. any other wider issues that we should be considering?**

105. As previously stated, SCDI has set the following key objectives for energy policy:

- **Security of Supply**
- **Decarbonising Supply**
- **Affordability of Supply**
- **Optimising Economic Benefit**

106. SCDI accepts the Stern Review's conclusion that action - over and above carbon trading under the Emissions Trading Scheme - is necessary to stimulate the development and deployment of a broad portfolio of low-carbon technologies, including renewables, and reduce costs. This will help to achieve the objectives of Security of Supply, Decarbonising Supply and Optimising Economic Benefit up to 2020 and beyond, and, in the longer-term as the costs of fossil fuels continue to increase, the objective of Affordability of Supply. As regards the impact of attaining the renewable energy target on energy prices and fuel poverty over this period, it is difficult to comment on the assumptions because the price of oil is so volatile and unpredictable at present, and there is a great deal of global economic uncertainty. But SCDI agrees that the costs to the consumer and industry over the period are likely to be significant and need to be minimised as far as possible.

107. The consultation refers to the Stern Review's conclusion that the cost of taking action can be limited to around 1% of annual global GDP. However, it is worth pointing out that he has revised this cost up to 2% of annual global GDP and there is still much uncertainty about the accuracy of this figure. Even so this compares favourably with the estimate of a 5% to 20% loss of annual global GDP if successful action is not taken, with the costs rising the longer action is delayed.

108. The uncertainty and higher costs associated with renewable development does underline the need for the Scottish and UK Governments to pursue an energy policy which support a balanced energy mix with a diversity of low carbon supply. The recovery of North Sea oil

and gas should be maximised, and greater certainty around energy policy, including the role of renewables, and a more competitive fiscal regime are essential to promote investment in upstream and downstream infrastructure. SCDI believes that the Scottish and UK Government should assume that there will be a need for greater installed capacity on the electricity grid, even with energy efficiency and storage measures, not just to balance the variability of renewable sources, but because more heat and transport fuel may be supplied by electricity. From a Scottish perspective, SCDI has presented a scenario for 2020 where 4/5GW of conventional supply would be required alongside 8GW of wind capacity to meet peak demand of 6.5GW in all weather patterns. The business case for investment in these new power stations will only be justified if they can export electricity to the rest of the UK when it is not needed in Scotland. SCDI believes that this conventional supply should include nuclear as it is secure, clean and allows diversity away from fossil fuel prices in a period when it is accepted that higher prices will become an issue.

109. The economic opportunity for the UK should not be underestimated. Renewable energy can build on the country's strengths in energy, revitalise manufacturing as financial and business services retrench, and create a long-term, world-leading industry, with particular potential benefits to regeneration priority coastal areas.

Chapter 11: Delivering the Target

Q40: What more could the Government or other parties do to ensure the UK meets the EU renewable energy target?

Q41: Do you agree with our overall approach to developing a UK Renewable Energy Strategy?

110. The overall approach being taken to developing the Strategy is supported by SCDI. It has frequently said that it 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. SCDI has long called for a single Department of Energy, headed by a Secretary of State for Energy, to be re-created. It warmly welcomes the announcement by the UK Government of a Secretary of State for Energy and Climate Change.

111. The question over whether there should be further devolution of energy powers to the Scottish Parliament is one which is regularly commented on in the Scottish Government's National Conversation and the Calman Commission established by the UK Government and the

Parliament to review the Parliament's powers. SCDI will be discussing this issue with both the Commission and Scottish Government, and helping our broad membership to engage with both processes. Should any further devolution be recommended and then take place, this will have an impact on the overall approach in the period of the UK Renewable Energy Strategy.

112. Energy is a key priority sector in the Scottish Government Economic Strategy and for Scottish Enterprise and Highlands and Islands Enterprise, and a number of nationally important infrastructure projects and high growth potential businesses are being supported. But there is some concern that public policy relating to renewable energy and the delivery of that policy in Scotland is the responsibility of a plethora of different administrations, government organisations, regulators, and private companies. While there is a lot of good work going on, it can at times seem as though it is not joined up and that not all these organisations are fully aligned with the priority and support which Government has for renewable development in national policy.

113. The crucial role of local government, Scotland's enterprise companies and other public bodies is recognised. In SCDI's experience, local authorities in Scotland are generally growing in support of renewable electricity and are making more progress with energy efficiency, and a number recognise the opportunities for investment. SCDI welcomes the work which the Scottish Government, local authorities and Scottish Natural Heritage (SNH) are undertaking on locational guidance to reduce the likelihood of SNH objecting to planning applications for renewable developments. However, it is probably the case that local authorities are less aware of the opportunities in renewable heat and transport. As Scotland's planning system is reformed and new style Structure Plans and Local Plans are introduced, it is important that more priority is given to these areas. SCDI also has some concerns that the centralisation and aggregation of public sector procurement in Scotland may potentially have an impact on decentralised supply of heat and power, and on the creation of markets for supply of electric vehicle.

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