SCDI
Scottish Council for Development and Industry

POLICY SUBMISSION

SCOTTISH GOVERNMENT
LOW CARBON ECONOMY: DISCUSSION PAPER

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SCDI is an independent and inclusive economic development network which seeks to influence and inspire government and key stakeholders with our ambitious vision to create shared sustainable economic prosperity for Scotland.

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Low Carbon Economy

1. SCDI is an independent membership network that strengthens Scotland's competitiveness by influencing Government policies to encourage sustainable economic prosperity. SCDI's membership includes businesses, trades unions, local authorities, educational institutions, the voluntary sector and faith groups.

1. Does this document sufficiently communication the vision, drivers and implications of a low carbon Scottish economy? How could this be improved?

Sustainable Economic Growth

2. SCDI has recently launched its strategic policy *Blueprint for Scotland* outlining its policy priorities - an outward and enterprising nation; maximising Scotland's assets; and realising the potential of our people. These priorities are all highly relevant to the vision of a low carbon Scottish economy. Scotland enjoys many competitive advantages in positioning itself as a world-leading sustainable economy. **In SCDI's view, the low carbon sector, along with higher exports, represents the greatest opportunity to replace demand in the economy which has been lost in the recession and will be lost due to the plans to cut public spending.** The natural environment already supports a large part of Scotland's economy and it will be vital to capture the maximum economic benefit from the sustainable development of Scotland's natural resources, especially energy. SCDI believes that Scotland should aim to become a world-leader in sustainable cities, sustainable regions and sustainable communities. It can create carbon neutral cities and world-leading, digitally-connected "distributed cities" in rural areas which deliver economic success and high quality of life.

3. As the Discussion Paper states, the era of cheap energy is over and, with unprecedented growth in global energy demand and potential decline in global production of conventional oil, security and affordability of supply is a key issue. Countries will need to work together on a Blueprint to secure their energy supplies as a Scramble for resources has been projected to drive prices higher. **Scotland should continue to take a regional view in developing policy.**

4. SCDI welcomes the establishment of the Scottish Energy Advisory Board for engagement between the Scottish Government and industry on key energy issues, including delivery of a low carbon economy. It will help to identify synergies with other energy sectors in implementing the Scottish Renewable Energy Action Plan, which was developed by the Forum for Renewable Energy Development in Scotland. **SCDI believes that the creation of action plans and benchmarking for all priority low carbon sectors** - including assets, investment, infrastructure, innovation, skills, and supply chain growth and internationalisation – **would provide focus, alignment and track progress.**

5. The role of Government in the low carbon economic transition will be a mix of push (through incentives) and pull (through obligations). The Scottish Government should be clearer on the need for incentives to drive early action.

6. While SCDI fully accepts the principle that the cost of acting to address climate change is greater than the cost of transitioning to the low carbon economy, the Paper is weak on details of the costs and the risks involved. **To engage the public and business in the agenda, it is important that the benefits and costs, and the opportunities and risks, are understood and explained.**

7. **The Scottish Government and the Scottish Parliament must consider the impact on economic growth and all businesses and jobs in their decisions.**

The Carbon Price

8. A strong and stable carbon price is required to incentivise investment in the low carbon economy. **If the current low price in the EU Emissions Trading System persists, a carbon tax should be considered.** A reliable, consistent and accurate method is also needed to identify, measure and verify carbon.

Legislation and Regulation

9. Leadership is necessary post-Copenhagen. **Mandatory climate change targets should put Scotland on a path to decarbonise electricity supply by 2030 and use significant amounts of renewable energy in heating and transport.**

10. As the Discussion Paper notes, the Climate Change (Scotland) Act has provided greater certainty, transparency and focus to policy-making which is helpful. **It is important that annual targets for greenhouse gases are set at levels which are evidence-based and establish Scotland on a trajectory to achieve its objectives for 2020 and 2050, while maintaining economic competitiveness.**

11. **Government should consider the longevity of its policies and avoid stop-start policy-making.** These should ideally have a horizon of at least 20 years. In the public sector, the introduction for the first time of carbon accounting in Scottish Budgets should incentivise organisations to implement Carbon Reduction Plans and this has the potential to kick start a low carbon economy.

12. **The Scottish Government and the public sector should avoid the gold-plating of standards for goods and services which have been set by the EU or UK. This would increase the regulatory burden on Scottish business.**

13. SEPA's involvement in the Better Regulation agenda is welcome. **The regulatory environment is complex and often contradictory. Industry is forced into devote significant resources to complying with a wide range of schemes, which, through a more enabling approach, would be better directed to carbon saving measures.** In the water sector, EU water quality regulations require investment in water and wastewater infrastructure, which are often carbon-intensive. Clarification is needed in the property sector in respect of the rights of and constraints on landlords in enforcing mandatory building improvements upon properties with tenants, and of how the 'polluter pays' principle works when the landlord not the tenant is the named energy consumer.

14. **SEPA should seek to influence new EU regulations and standards in ways which may support competitive advantages for Scottish technologies.**

The role of Government in Driving the Transition

15. In its report *Unlocking investment to deliver Britain's low carbon future*[1], the Green Investment Bank Commission has concluded that, given the state of the public finances, **funding the transition to a low carbon economy vastly exceeds the capability of the public sector. Private investment on a much larger scale than hitherto will be essential to deliver the required capital.**

16. **The Commission suggests that the scaling-up stage for low carbon technologies and business is likely to continue until 2020**, at which point they will be starting to become commercial. **It says that public funding will need to increase over the period to 2020 and will then peak**. It has identified that Government can address the main barriers to investment in four ways:

    - **Investment** – by investing alongside the private sector government can help to address the scale issue and can leverage public sector investment many times over with private sector finance
    - **Reducing uncertainty of returns** – by establishing coherent long-term regulatory frameworks that provide clarity on cashflows and investment timescales
    - **Mitigating risks** – by providing guarantees and insurance facilities a free market would not provide
    - **Raising rewards** – by providing higher subsidies at critical points in a project's lifecycle to prompt the market to invest, or removing subsidies for existing carbon-intensive modes of power generation to help level the playing field for cleaner energy and improve comparable rates of return for investors

Supportive Planning Process

17. The planning system also has an important role to play. **Planning authorities should be incentivised and empowered to approve low carbon developments.** SCDI has suggested that small thermal generating plants near population centres should have specific arrangements for the use of waste heat.

Energy Supply and Demand

1 http://www.climatechangecapital.com/media/108890/unlocking%20investment%20to%20deliver%20britain's%20low%20carbon%20future%20-%20green%20investment%20bank%20commission%20report%20-%20final%20-%20june%202010.pdf

18. **The strategy should acknowledge the continuing role of oil and (particularly) gas in a Low Carbon Economy, the importance of maximising recovery from the North Sea and of anchoring the oil and gas supply chain.**

19. Even if the UK's renewable energy targets for 2020 are achieved, the country will still rely on oil and gas to provide 70% of its primary energy, and indigenous oil and gas could still be satisfying 60% of the UK's demand for oil and 25% of its gas requirements – enough to meet all the needs of homes across the UK at that time. The North Sea is a mature basin where production has peaked, but there are still 20 to 25bn barrels of oil and gas to be recovered and a broad range of commercial opportunities which could attract investment in the right circumstances. This will require simplification and reduction in overall taxation.

20. Scotland has an oil and gas supply chain which is at the cutting edge of technological development and is exporting globally. The annual survey by SCDI and Scottish Enterprise of activity in the oil and gas sector has shown that overall sales have trebled in the 10 year of the research to £15.4bn and international activity now accounts for over 42% of the total. **The oil and gas supply chain can be as important wealth creator for Scotland and the UK over time as North Sea production and capitalise on opportunities in the renewable and low carbon sectors. Its growth would be curtailed by a premature decline in North Sea oil and gas, and it would be less likely to anchor in Scotland.** Policies should support a strong indigenous supply chain and the North East Scotland as the energy hub for the Eastern Hemisphere for leading global engineering, construction and supply businesses. Access to locally sourced skills, new technologies and expertise are especially important for the industry.

Decarbonising Energy Generation

21. **Concerns over the UK's gas supplies last winter highlight that – apart from upstream oil and gas - there has been significant underinvestment in the country's energy industry over many decades**. A substantial percentage of electricity generating capacity is scheduled to close over the next 15 years.

22. **SCDI supports a balanced mix for electricity generation in the UK, believing that a diverse range of technologies will be needed. Harnessing Scotland's low carbon resources will have a pivotal role in UK delivery.** Joined-up policy-making will be essential to attract investment and supply required skills.

Low Carbon Behaviours

23. **SCDI welcomes the emphasis on economic opportunities.** The bottom-line benefits of resource efficiency are important to stress at this time. SCDI understands that the recession in a lower take-up of advice services, but that the highest take-up was from construction, the worst hit sector. **In the future, it is likely that businesses may face decisions on investment in carbon reduction with smaller paybacks and corporate leadership will be vital.**

National Conversation

24. SCDI is supportive in principle of the creation of an oil fund, but is keen to hear more detail about the options, especially the impact on intra-UK financial arrangements and on the fiscal regime for the North Sea, which, as has already been noted, is a mature and highly-taxed province. The revenues generated for an oil fund should not be from additional taxation, but from the hypothecation of taxes which would otherwise flow. The structure of an oil fund should be such that the fund and potential income from it do not distort the domestic economy.

2. Section 2 identifies a range of low carbon economic opportunities based on Scotland's key strengths and opportunities and aligned with growing global market opportunities and domestic regulatory and legislative drivers.

a. are there significant additional opportunities that should be addressed by the Low Carbon Strategy?

25. The Low Carbon Strategy identifies the majority of Scotland's low carbon opportunities, though not all of them. SCDI makes the following comments:

Electricity

26. **SCDI supports a balanced mix for UK electricity generation. All technologies are likely to be necessary to ensure security of supply and to tackle climate change.** It is clear that maximising development in Scotland is fundamental to the UK's targets. SCDI's report on *The Future of Electricity Generation in Scotland*[2] found that Scotland can exceed its target of 50% of electricity from renewable sources by 2020 and keep exporting electricity to England and Northern Ireland. The report assumes that gas will have a role in the low carbon energy mix. This would mean that the sector will produce a third less carbon dioxide. It projected that onshore wind will provide more than 80% of the increase in Scotland's renewable electricity by 2020. Expansion at this rate will require £10bn of investment in new electricity generation before 2020.

27. Beyond 2020, the report stated that if Scottish demand is to continue to be served by Scottish generation, it is highly likely that new base load capacity will be needed. Carbon capture and clean coal may be available at that time, but **the report argues that as a proven, low carbon technology new nuclear should remain an option as a potential part of the longer-term generation mix.**

28. **Scotland has competitive advantages in offshore wind, wave and tidal, carbon capture and storage, in technologies and electricity generation.** The skills and offshore engineering expertise built up by the North Sea oil and gas sector based in Scotland will be critical in realising these opportunities.

[2] http://www.scdi.org.uk/energy/report/SCDI%20Future%20of%20Electricity%20Generation%20in%20Scotland%20091208.pdf

29. The Marine Energy Group has estimated in its "high scenario" that more than 12,000 jobs in the industry could contribute £2.5 billion to Scotland's economy by 2020[3]. Over half of capital expenditure by the industry is retained in Scotland.

30. The UK Government has estimated that the combination of retaining the existing power engineering industry and establishment of a new supply and service industry for CO_2 capture, transport and storage will be able to sustain 70,000-100,000 high value added jobs by 2030 and generate £3-6.5bn a year.[4] **These are higher estimates than stated in the Discussion Paper. This would imply that Scotland's aim should be to secure around 20,000 jobs in the sector.**

31. **As has previously been highlighted, gas will be an important part of the low carbon energy mix.** Combined cycle gas plants are far more affordable to build per MWh than any other source of electricity, and are more efficient and emit less CO_2 than modern coal plants. Gas with CCS would be at least as cost-effective on a MWh electricity basis as coal with CCS (assuming similar load factors) and would require less pipeline and storage capacity due to lower CO_2 volumes.

32. **Scotland has significant potential in forestry and energy crops for sustainable biomass development**. **However, it is unlikely to achieve the Scottish Government's target of 25% target for woodland cover if greater certainty is not created for forest industries about long-term policy.**

Grid

33. The UK's electricity networks were designed for a different age in which electricity has been mainly generated from a relatively small number of large scale plants. The network is increasingly under severe strain in Scotland, especially from North to South, as this pattern changes and renewables grow.

34. To support new electricity generation, it has been estimated that a £10bn investment in substantial network reinforcements and upgrades is required. **This is an opportunity has to be grasped in the next 5 years and investment in networks should look decades ahead and not simply replace like with like. There is a pressing need for developers, grid companies and regulators to work together to join up transmission, generation, regulation and planning.**

35. **The Beauly-Denny upgrade, further onshore reinforcements and subsea cables are all necessary. The development of grid connections to the Scottish islands would harness their high-capacity renewable resources. This is a once-in-a-generation socio-economic opportunity for the communities on the northern and western Isles. This should be supported by consents for sufficient generation capacity to make the links viable.**

[3] http://www.scotland.gov.uk/Publications/2009/08/14094700/0

[4] http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/ccs/occs/occs.aspx

36. **The commitment to the roll-out of smart metering by 2020 should be integrated with a move to a smart grid network by 2030.** Smart meters will enable customers to focus on economic value. **The UK Government Department for Energy and Climate Change has suggested that the roll-out of electricity and gas meters could deliver total benefits of £14.6bn over the next 20 years, mostly from reduced demand. Recently published evidence from Canada is that the roll-out of smart grid technology alone can reduce consumption by 6.5%[5], which would meet around 6% of the UK's 2020 CO_2 emission cuts.** Ofgem's Distribution Price Control contains a £500m Low Carbon Networks Fund which it is hoped will stimulate interests in smart grids.[6]

37. **Scotland has comparative advantages in skills and expertise in grid development and world leading university research capability.**

Heat

38. **Government and industry should work together rapidly to explore opportunities and technologies for renewable heat and the reduction of heat waste. A strategic plan is needed for local heat distribution networks.**

39. **Industrial and commercial heat represents 50% of heat use and, as a result, has probably the most significant, large scale and cost effective yet to be realised opportunities with the shortest payback times for renewable heat.**

40. District heating projects are often the best solutions for new and existing housing because they do not require costly infrastructure networks. **The new Renewable Heat Incentive will need to bridge the funding gap between costs and what it is fair for consumers to pay.** The successful feed-in tariff in Germany was also accompanied by a system of low-cost loans to consumers for installations.

Anaerobic Digestion

41. **SCDI would like to see a network of thousands of small Anaerobic Digestion plants to process organic waste, farm waste and purpose grown crops, with embedded methane production sites for injection into the gas grid.** The Discussion Paper refers to the technology being used to process organic waste. **SCDI supports widening of this definition to the process of controlled decomposition of organic materials under managed conditions.**

Biomethane

42. Injecting biomethane into the gas network is one way of reducing the carbon intensity of heating. **SCDI believes that it should be made at least as attractive to introduce biomethane into the gas distribution system as to burn it on-site. This could be achieved through greater flexibility in**

[5] http://www.metering.com/node/12823

[6] http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/network/smart_grid/smart_grid.aspx

renewables incentives which would encourage the location of biogas plants in rural areas. This would be close to where the waste is sourced and where the digestate can easily be spread on the land as high quality fertiliser, and away from population centres where there may be planning difficulties.

Energy Efficiency and Micropower

43. SCDI's report on *The Future of Electricity Generation in Scotland* forecast that demand would rise 10% by 2020. Energy efficiency is, as the Discussion Paper identifies, a significant business opportunity and **the Low Carbon Strategy should be aligned with the Energy Efficiency Strategy.** It will be important to monitor the regulatory and fiscal carrots which are now in place to promote energy efficiency to make sure that they are working in practice. **A streamlined and properly funded accreditation scheme should be introduced across Scotland and the UK for micro generation and small systems technologies**.

44. **ICT will have a critical role in improving energy efficiency, for example in monitoring and controlling the use of energy and the production of carbon.**

Transport

45. SCDI supports the roll-out of low carbon vehicles and alternative fuels. **Electric vehicles are likely to be the first technology to be influential in reducing Greenhouse Gas emissions from the transport sector. SCDI has recommended that the public sector take a lead, help to establish the market through its procurement purchasing power and support the development of charging infrastructure in streets and public places**.[7] **With mass market electric vehicles and hybrid cars due to be launched from next year, a national infrastructure for electric vehicles should be a priority.**

46. Studies show that carbon reduction targets for transport could only be approached with significant action on the demand side. ICT can enable better traffic monitoring and provision of real-time information can reduce congestion and associated carbon. **SCDI has supported the introduction of a variable UK-wide road pricing system to replace fuel duty.** By charging at the point of use for the real costs of driving, this would encourage rational decision-making between transport modes for specific journeys. This would reduce congestion and carbon emissions, and benefit rural areas of Scotland and the UK.

47. The Discussion Paper focuses on low-carbon technologies for the private car. However, the Scottish Government's Ferries Review highlights a target for a 5-10% reduction in emissions from shipping through technology measures by 2020. Potential technologies include LNG, biodiesel, hybrid and fuel cell. Hybrid vessels would be powered by a combination of diesel engines and electric motors fed from batteries or solely by electric motors in a diesel electric configuration. The batteries could be charged from a shore supply overnight.

[7] http://www.scdi.org.uk/pi/2009/LowCarbonVehiclesResponse-Oct09.pdf

Battery manufacturers are confident that the main drawbacks - the size, weight and cost of the batteries - will all fall dramatically in the near future. The availability of shore power to charge the batteries is of concern as many of the ports do not have this facility at present. **Total investment of £604m (or £37.75m per annum) in vessels is estimated in 2012-2022. The potential to take a lead in "eco-ferry" shipbuilding and supply chain is a significant additional opportunity which the Low Carbon Strategy should address.**

48. The Scottish Government's plans to electrify 200 miles of railway in the Edinburgh-Glasgow Improvement Programme by 2016 which offers significant supply chain opportunities. **SCDI believes that with Scotland projected to generate ten times the renewable electricity it consumes and challenging climate change targets for 2050 there should be an ambitious long-term programme of investment in electrification.** The next phases should be between Central Scotland and Dundee - including the Fife Circle - and around Aberdeen and Inverness, from where electrification should be extended.

49. Moving more freight from road to rail would reduce carbon emissions from supply chains and distribution systems. **Industry often finds that investment processes are slow and expensive, and would like more say over projects.**

Buildings

50. Domestic energy use accounts for 25% of total greenhouse gas emissions. New homes built today have already reduced their Carbon Emissions by 60% against a target level of 80% by 2050. Building standards being introduced in October this year will give us the highest technical standards of anywhere in Europe. No other industry sector has achieved anything like this level. This suggests that the focus should switch to the existing housing stock. **The Scottish Government should initiate an energy efficiency audit of the existing stock to assist householders with emission/ bill reductions. It should consider incentives, e.g. lower business rates for energy efficient buildings and encourage the UK Government to consider reducing VAT on building maintenance to 5%.**

51. The cost of meeting a 42% reduction in emissions from housing by 2020 (excluding emissions from electricity) is estimated to be about £16bn, though estimated fuel bill savings are higher than this total investment over the lifetime of measures. It does not appear as if there is a figure for business premises. **It is important that the Scottish Government details the costs of any proposals.**

52. **It is important that Government recognises that in the commercial property sector the owner and the occupier and energy user may have differing interests and rights. While policy may assume that the owners have the responsibility to enforce mandatory building improvements on rented properties, it is not clear that all leases give them the right to do so and impose loss of business for their tenants.** This landlord-tenant dynamic is also unrecognised in the Carbon Reduction Commitment with the costs falling on the owner if it is the named energy customer not the energy using tenant. **A**

balance must be struck between encouraging higher energy efficiency in buildings and encouraging more efficient energy use by occupiers.

53. Permission for low carbon buildings may not be granted as a result of conflicting planning guidelines. Wind turbines on a building may be refused due to their noise. **A presumption in favour of low carbon buildings would clarify this.**

Waste

54. Combined Heat and Power treatment plants could meet 3% of Scotland's total heat and electricity demand. The environmental benefits of energy recovery from waste are reaffirmed in the Scottish Government's Zero Waste plan. This is welcome, but community support for the energy from waste infrastructure is often undermined by negative campaigning. **Scottish and local government and the private sector will need to improve information and continue to show leadership on this issue if Scotland is to meet its environmental targets.**

55. A concern which has been expressed is that focusing solely on recycling targets creates a reduction in the quality of secondary raw materials. **There needs to a focus on quality through source segregated collection as well as quantity.**

Key Sector Opportunities

56. **There are significant additional opportunities for distilleries to generate heat and electricity from distillery co-products and reduce their carbon footprints which are not mentioned in the Discussion Paper.** This will require strengthening of the electricity grid in rural areas to enable them to export surplus power. **Investment in these new technologies by the industry will only occur when it is certain that co-products from food and drink manufacturing are classified as renewable fuels and not, as the Discussion Paper does, as waste. The Scottish Government should work with the EU and the UK Government to create a policy that allows certain kinds of heat-treated waste to be declassified as waste and reclassified as renewable fuel.**

57. Data centres use in the region of 2.2-3.3% of the UK's total electricity generation. **With its renewable energy resources and cool, stable climate, Scotland is an ideal location for green data centre development and SCDI welcomes the reference to them. The UK Government's Carbon Reduction Commitment scheme is a barrier to this opportunity because it places the onus to reduce emissions on the owner of the date centre rather than the end-user, and it does not recognise the use of renewable power sources.**

Community Projects

58. **The low carbon agenda should represent a significant economic opportunity for communities, particularly in rural, remote and island locations.** In "wind crofting" rural communities could harvest the wind though distributed networks of 5-10KW turbines over several thousand acres. A low-cost

DC network would connect the power to farms and homes, and, through a single grid interface, this could have commercial value by selling surplus energy. **Mechanisms should be encouraged which would retain more of the economic benefit of renewable electricity and heat generation in local communities.** This would increase support for new projects. The design of new mechanisms should be careful not to discourage new investment in projects.

Low Carbon Industry Zones

59. The Discussion Paper does not address cross-cutting low carbon economic opportunities. **SCDI believes that Scotland should explore the creation of 'low carbon energy havens' for businesses. Low carbon industrial zones in the vicinity of onshore CO_2 transport infrastructure could encourage carbon-intensive industries to locate (or re-locate) to Scotland. Renewable energy projects in remoter locations could be developed to supply cheaper power to local businesses which may reduce regional growth disparities.**

60. The water industry is the largest single energy user in Scotland. EU water quality regulations require investment in water and wastewater infrastructure which is often carbon intensive and has contributed to a historic trend of 1-2% increases year on year in Greenhouse Gas Emissions from water treatment. The benefits of these should be reconsidered. **Most businesses can reduce consumption and costs by around 30% through low or no cost improvements. The take-up of smart meters by businesses should be encouraged and, following the pilot, a route-map developed for the roll-out to households over 10 years.**

61. At present, greenhouse gas emissions from water treatment in Scotland are, on average, higher than the rest of the UK due to higher carbon intensity of wastewater treatment. **It is very important that Scottish Water is financed to invest in renewable energy and energy efficiency. In the future, Scotland could attract industries based on the greater availability of water, providing that the carbon intensity of its wastewater treatment can be reduced.**

Environmental Management

62. Services are the largest sector of the economy. In addition to technology, **there is a range of significant additional business opportunities which would generate high value, including design, systems integrating and marketing**.

Universities, Colleges and Industry-Owned Academies

63. The Discussion Paper is right to identify Scotland's universities as making a major contribution in moving towards a low carbon economy in Scotland. **However, it should recognise the role of Scotland's colleges. Moreover, capitalising on the highly regarded Scottish education and qualifications systems, there are opportunities which the Discussion Paper does not identify for colleges, universities and employers within key industry sectors to form alliances which export learning and skills development to**

global employers and governments. Opito – The UK's Oil and Gas Academy - has recently launched OPITO International delivers standards to improve workforce safety and competency in worldwide oil and gas regions. **With skills and health and safety training likely to be key concerns, there must opportunities to develop a similar export model in the low carbon sector.**

Decommissioning of Thermal Power Stations

64. The flip side of investment in the low carbon economy is decommissioning of existing fossil fuel power stations on a scale not previously achieved. **Scotland could develop further expertise and capacity to deliver on this programme.**

b. In the light of the Government's objective of accelerating Scotland's rates of productivity and economic growth, what are the opportunities of greatest economic potential within a global context? Which opportunities should we focus on in the short- to medium-term?

Offshore Renewables

65. **Renewables now represent the fastest growing form of global industrial investment.** Capital expenditure for offshore wind in Europe over the next 10-15 years has been estimated at £150bn. In addition to its resources, **Scotland's oil and gas expertise is a key comparative advantage in the offshore wind, wave and tidal energy sectors. Scotland has the opportunity not simply to exploit their generation potential but to create a world-leading industry.**

66. The spatial framework for the development of key infrastructure and identification of early investment needs at port and near port locations is welcome. **SCDI recommends that the Scottish Government and enterprise agencies should target their support, including packages of grants and R&D incentives, at manufacturers of cabling, turbines, installation vessels and foundations, and at a near-shore testing facility for offshore wind technology.** Public investment should be made in operations which are sustainable in the long-term. **Scotland also has high-skill, high-value installation and maintenance capabilities which are likely to be as profitable and more adaptable.**

Carbon Capture and Storage

67. The International Energy Agency estimates that global CO_2 emissions from coal combustion are projected to rise by about 60% by 2030 to 18.6bn tonnes worldwide, two thirds of this for power generation. **This makes Carbon Capture capability essential for climate change targets and an opportunity of great economic potential for Scotland.** There is a need to move ahead quickly with demonstration and deployment of Carbon Capture and Storage technology. **At Longannet, Scotland has the best opportunity to deliver the UK's first big carbon capture and storage project in the UK Government's timescale. The bid should therefore be supported by the Scottish and new UK**

Governments through the Carbon Capture and Storage Competition. There may be further opportunities in Scotland at Peterhead and Hunterston.

68. **Scotland also has substantial capacity to store emissions from industry around Europe and generate revenue. There is therefore a need for clarity and consistency on leasing and licensing around the UK.** Industry and Government will have to make rapid headway with exploration and appraisal of saline aquifers to identify suitable stores in times for full-scale deployment of carbon capture and storage. Significant investment is needed to prove-up storage and springboard development. An appropriate approach should be taken to liabilities and fiscal concerns in the reuse of petroleum infrastructure.

Grid Development

69. The European Commission is producing a plan for an electricity supergrid linking Europe with North Africa to balance variable power from renewable sources. A North Sea electricity grid including Scotland would be an incremental part of its development. Work on a North Sea grid may begin in 2015. Electricity storage and smart grid technologies will also manage variable power supply. **Grid development is therefore a major domestic and international opportunity.**

Environmental Management and Energy Efficiency

70. Seventy-five per cent of people live in cities and, according to the Asia Development Bank, 44m people join Asia's city populations each year and 20,000 new dwellings and 250km of new roads are constructed every day. Energy consumption grew by 70% in the ten years to 2008. The energy efficiency of the buildings and transportation must be improved in these rapidly expanding cities or Greenhouse Gas Emissions will continue to rise. China is aiming to cut new the energy use from new buildings by 65%. **This represents a significant opportunity for environmental consultancy, environmental monitoring, design, buildings technologies, energy management and other businesses.**

Nuclear

71. The Discussion Paper mentions opportunities in nuclear as part of the emerging low carbon sector. Scotland has world-class academic research and supply chain capability in nuclear technologies. The UK has identified 10 sites for new nuclear build and it has been estimated that global new nuclear capacity could double by 2030, which represents an opportunity of great economic potential for Scotland. **The Scottish Government does not support the construction of new nuclear power stations in Scotland, but the Discussion Paper should explain how the Scottish Government, in partnership with the Scottish Energy Advisory Board, will support Scotland's research base and supply chain in taking advantage of these expanding UK and global opportunities.**

3. Already, many sectors and businesses are actively exploiting low carbon market opportunities. But an effective transition towards a low carbon economy

requires much greater awareness, activity and collaboration. How should the Scottish Government and wider public sector join up to best support business to exploit low carbon opportunities?

72. Businesses which are considering diversification into the low carbon sector are still often concerned about a gap between rhetoric and reality in the ambitions for low carbon technologies and lack of long-term certainty on Government policy. **The Scottish Government should commission an informed view about the commitment at European and UK levels to the renewable energy and climate change targets for 2020 and a realistic, independently-verified assessment of whether sectoral plans are achievable in that timescale.**

4. Building on the recent National Economic Forum discussion, how should the Scottish Government, in partnership with the wider public sector, research base and investment community, help increase the level of innovation, investment and skills support to match the scale of opportunity in low carbon markets?

Innovation

73. Substantial investment in R&D will be needed to reduce the costs of new, low carbon technologies and achieve testing, demonstration and deployment targets. **Government and the public sector will need to continue to support business in reducing the risks in the pre-commercial phase by offering well-targeted and timed interventions - such as direct financial incentives, regulatory signals, and advice and assistance with intellectual property and supply chain partnerships - tailored to the needs of each technology.** It is important that a coherent programme for the long-term development lifecycle for renewable energy technologies is sustained during public sector spending reviews to provide sufficient certainty to private sector co-investors. There is already unhelpful uncertainty about Technology Strategy Board programmes. **Investment by the UK and Scottish Governments in education, research and enabling infrastructure should be sustained in the fiscal consolidation.** In order to monitor their success and maximise value for money, Government should clarify where and when direct support will be needed for delivery.

74. Innovation should be encouraged outwith technology sectors e.g. in design, systems integrating and marketing. Knowledge networks could support this.

75. Scotland is in the top quartile of OECD countries for academic research but at the bottom of the third quartile for business investment in R&D. **Stimulating investment by all industry sectors in low carbon R&D and innovation should be a high priority.** The purpose of the proposed Scottish National Energy Laboratory would be to bridge the gap between the research community and industry by co-ordinating research, development and demonstration work to realise and maximise the work coming out of colleges and universities.

76. In its Blueprint for Scotland, SCDI has recommended policies to maximise the international reputation, profile and impact of Scotland's higher education,

including centres of excellence. A combined approach by Scotland's universities should be taken to managing the exploitation of their intellectual property rights and this could include the creation of a single Office of Technology Transfer.

77. Entrepreneurship also has an important role to play. Recently published research by the Hunter Centre for Entrepreneurship found that business start-up rates in Scotland fell significantly below UK rates last year, and to their lowest since recording began in 2000. Scotland was third bottom of 20 developed countries.

Investment

78. The Green Investment Bank Commission has highlighted that £550bn could be required for investment in supply chains and infrastructure in order to meet UK climate change and renewable energy targets between now and 2020. By contrast in 2009 the entire global spend on clean energy and clean technology was £97 billion, of which the UK share was only £6-7 billion. There will be a highly-competitive global market for private finance. **Scotland's low carbon natural resources and industry advantages make it internationally recognised as an attractive place to invest, but one of the major issues for delivering a low carbon transition is the scale of the finance necessary.**

79. The Commission identified the following barriers to investment:

- **Market investment capacity limits** and **limited utility balance sheet capacity**
- **Political and regulatory risks** stemming from the fact that government policy determines expected returns and the history of policy changes
- **Confidence gaps** among investors given technology risks, lack of transparency in government policy and high capital requirements for commercialisation
- **The challenge of making large numbers of small, low carbon investments attractive to institutional investors.** (Several banks explained that modest local projects, for example those requiring debt of less than £20 million, involve the same transaction and diligence costs as large projects and require the attention of a limited pool of qualified staff. To maximise their effectiveness and the time of their investors, banks focus on larger projects.)

80. **A stable, attractive and reliable market environment for projects is key.** In respect of component manufacturing, **suppliers will only expand their capacity if they are confident that demand will remain high over the payback period of those investments.** Supply chains need to be certain that policy-makers have developed and will deliver a long-term vision for sustained capacity growth. But the Commission concludes that, even in the unlikely event of a return to financial market conditions pre-credit crunch, the market would be unable to finance low carbon infrastructure at the scale and speed required to meet the targets. **Scaled-up Government intervention is vital at an early stage to facilitate an improved flow of public and private capital at an early stage. SCDI strongly**

supports the release of the Scottish Fossil Fuel Levy fund, without an equivalent reduction in the Scottish Consolidated Fund, for this purpose.

81. With regard to timescales, the Commission has suggested:

- 2010-12 – mobilisation of large amounts of news investment
- From 2015 onwards, updated support schemes will be more technology specific and aligned to the maturity of the sector
- By 2020, support schemes for certain technologies can start to be phased out

82. The Commission has proposed that the primary focus of the Green Investment Bank should be on lowering risk for investors, rather than simply providing capital. Its priority would be to support the areas where maximum impact and speed to implementation can be achieved e.g. scale investment in energy efficiency, investment in enabling technology, such as smart grids, and support of both proven and high impact third-round offshore wind. It would enable aggregation of small low carbon projects. It would co-invest with the private sector as an enabler when opportunities are brought to it and where involvement would accelerate market activity and its absence would leave activity unviable. **The Scottish Government should clarify at an early stage the role of the Green Investment Bank in Scotland and maximise any opportunities.** It is important that it supports interventions in areas not prioritised by the Bank.

83. International sources should also be maximised. **SCDI welcomes the creation of the Scottish European Green Energy Centre to lever in significant resources of the EU Framework Programmes and European Investment Bank.** SCDI supports exploration of investment from Sovereign Wealth Funds. However, the Scottish Government should proceed with some caution. A recent study found that a group of funds with nearly $500 billion estimated in assets, including funds from Russia and Qatar, provides only the most basic information.

84. **SCDI has recommended that consideration is given to how local authority pension funds can be encouraged to invest in local infrastructure projects.**

85. **The planned Scottish Investment Bank should provide mezzanine finance to help growth and exporting businesses in the low carbon sector.**

Procurement

86. Public procurement has an important role in stimulating the supply of resource-efficient solutions. SCDI is aware of concerns about the length of time taken to develop and awareness of the Scottish Sustainable Procurement Action Plan.

87. SCDI has recommended that 0.5% of the Scottish public sector's annual £8bn public procurement budget should be ring-fenced for innovation. This would boost funding for innovation by £40m, including low carbon technologies.

88. Government must ensure that new public procurement framework agreements do not exclude Combined Heat and Power on the basis that they will never be practicable everywhere. Mechanisms should be put in place to provide reassurance to early adopters regarding supply, maintenance and competition.

Skills

89. **The low carbon economy can create thousands of new jobs in Scotland over the next decade if industry has access to a pipeline of appropriately skilled people** e.g. Energy and Utility Skills has estimated that 3000-4000 new works will be required by the renewables sector every year until 2020, with the main demand post-2014, and the Alliance of Sector Skills Councils believes that jobs in the waste disposal sector will increase by almost a third (c.4,500) by 2017 with recycling jobs expected to increase by 50% to 4,500. **A wide range and different levels of technical skills competencies will be needed. Science, Technology, Engineering and Maths (STEM) skills are a high priority.**

90. The existing workforces in a number of energy sectors are ageing and the supply of new graduates is currently unlikely to be sufficient to support industry demand. Skills provision should be better aligned with the needs of the low carbon industry, with employers involved more closely in skills development and training.

91. **There should be a greater emphasis on STEM in the curriculum, and encouragement should be given for the reinstatement of Technological Studies, which has declined in many areas.** SCDI's private sector-funded network of Young Engineers and Science Clubs around Scotland are playing an important role in this respect and in facilitating collaboration between industry and schools. **There should be a more joined-up approach by the Scottish Government, Skills Development Scotland, the education system and skills providers to encouraging both STEM subjects and careers.** Their crucial role in shaping the future of society should be highlighted, along with information and advice on the long-term job opportunities and rewards in the low carbon sector.

92. Upskilling and reskilling of the existing workforce with new green skills will also be important. **Cross-cutting "Green Teams" could be created in workforces.**

Regulation

93. Many low carbon technologies are nascent and will require a great deal of testing, demonstration and deployment over the next ten years and beyond in challenging environments. **This should be recognised by Government, its agencies and the wider public sector in flexible regulatory regime.** As technology is developed, the private and public sectors should work together closely to understand and minimise the impacts of activity on the environment.

5. How should the Scottish Government and its partners coordinate their activities to ensure that innovation, investment and skills support is aligned effectively?

94. The Scottish Government, the wider public sector and its partners have made significant improvements to coordinating their activities in energy. The establishment of the Scottish Energy Advisory Board and the Advisory Theme Groups have further improved focus and dialogue with industry and academia. **Such co-ordination will need to be extended across the low carbon sector.**

95. In its recent report, *Government funding for developing renewable energy technologies*, the National Audit Office has called for clear intermediate targets for schemes against which progress towards renewable energy targets and longer-term objectives can be measured. SCDI has recommended the creation of sectoral action plans and benchmarking for all priority low carbon sectors to provide focus, alignment between the private and public sectors and civic society and track progress. **SCDI and its academic partners the Fraser of Allander Institute plan to launch an Annual Scottish Low Carbon Energy Review and Supply Chain Survey, building on SCDI's oil and gas survey and Fraser of Allander's Economic Commentary. This will include information and analysis on innovation, investment and skills support.** Scottish Enterprise and Highlands and Islands Enterprise have warmly welcomed these plans and will be working with us on them. **SCDI believes that this will be an important contribution to benchmarking progress and identifying opportunities in the domestic and international low carbon markets for Scottish businesses.** The Scottish and UK Governments and the wider public sector can support businesses to internationalise into new markets, including through their overseas offices. The information for the Low Carbon Energy Review and Supply Chain Survey would then be linked to SDI's and SCDI's **international trade activity**. SCDI will meeting the Scottish Government in the near future to discuss this proposal and would be pleased to work in partnership to deliver this work.

96. **SCDI believes that this would be an important first step to the creation of a 'Register of Assets' which would bring together information on Scotland's economic, human and natural resources.** This could make available - in an easily digestible form - facts on its labour market, education performance, availability of language and STEM skills, renewable energy potential and oil and gas reserves, and so on. This 'Register of Assets' would broaden understanding of economic policy and be the core of Scotland's investment proposition. It would be linked to medium-term sectoral growth plans and the National Performance Framework. **This Register would include information on Scotland's renewable energy resources and a key objective would be to capture for long-term investment a share of the value of their development.** It would mainstream the low carbon opportunity throughout the Scottish economy and ensure co-ordination between the private and public sectors, and civic society.

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