SUBMISSION FROM SCOTTISH RENEWABLES

INTRODUCTION
Scottish Renewables is the leading voice in the renewable energy industry in Scotland. We represent more than 300 organisations working across a range of technologies including wind, marine, hydro and bioenergy. We are an apolitical organisation, but have been at the heart of debate on renewable energy targets in Scotland, pre-empting the increases of the renewable electricity target to 80 per cent and then 100 per cent with the publication of Driving the Low Carbon Economy Paper 1: Renewing our Ambitions in September 2010. We also pre-empted the raising of the overall renewable energy target - comprising heat, transport and electricity - from 20 to 30 per cent of demand by 2020 in our publication Driving the Low Carbon Economy Paper 8: Renewable Heat in March 2011.

In this submission we argue that Scotland can hit the 100 per cent electricity target with the right support from government, and set out actions to address the key risks to progress. We also argue that this would bring significant economic, environmental and employment benefits. However, we believe that the apparently more modest 11 per cent heat target represents a real and significant challenge, with demand figures and projections for this sector requiring verification. Given the heat sector’s greater energy use, greater emissions and greater impact on fuel poverty, we encourage the committee to focus at least as much time and resource on this part of the inquiry as on electricity.

Due to the very different challenges facing the two sectors, our submission is in two sections, with each setting out where we are today, the main barriers to the target, and the steps required to create the conditions for industry to meet the targets.

ELECTRICITY

TARGETS
Scotland’s renewable energy capacity has grown quickly in recent years, with more than 4200MW of renewable electricity generation capacity now in operation. This is sufficient to generate around a third of our annual demand for electricity and means that output from renewables is likely to be the country’s main source of electricity from this year.

To meet the target of generating the equivalent of 100 per cent of our electricity needs from renewables by 2020, Scotland will need somewhere between 13GW to 15GW of renewables capacity, depending on the level of demand for electricity. This means that Scotland requires an additional 9GW to 11GW of installed capacity to meet the targets. This may seem ambitious, but Table 1 shows there are some 23.5GW of renewable electricity projects in scoping, planning, with consent, or in construction; all of which could be generating by 2020.

1 www.scottishrenewables.com/publications/driving-low-carbon-economy-paper-1-renewing
2 www.scottishrenewables.com/publications/driving-low-carbon-economy-paper-8-renewable-heat
Table 1. Installed capacity of renewable electricity projects in the development process in Scotland

<table>
<thead>
<tr>
<th></th>
<th>In scoping</th>
<th>In planning</th>
<th>Consented</th>
<th>Under construction</th>
<th>TOTAL MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore Wind</td>
<td>4,537</td>
<td>3,837</td>
<td>2,054</td>
<td>965</td>
<td>11,393</td>
</tr>
<tr>
<td>Offshore Wind</td>
<td>9,535</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>9,635</td>
</tr>
<tr>
<td>Wave</td>
<td>670</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>670</td>
</tr>
<tr>
<td>Tidal</td>
<td>1,020</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1,020</td>
</tr>
<tr>
<td>Hydro</td>
<td>69</td>
<td>2</td>
<td>39</td>
<td>109</td>
<td>219</td>
</tr>
<tr>
<td>Biomass</td>
<td>6</td>
<td>468</td>
<td>49</td>
<td>65</td>
<td>588</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>23,525</strong></td>
</tr>
</tbody>
</table>

Source: Scottish Renewables Energy Database

Effectively, we need around a third of these projects in operation by 2020 to hit the target, which is why Scottish Renewables is confident that we can meet this objective.

Modelling work by GL Garrad Hassan\(^3\) suggested that 1600-1700 of hydropower, 6700-7500MW of onshore wind, 3000-5000MW offshore wind, 355-530MW biomass, 125-150MW energy from waste and 400-630MW of wave and tidal power would allow Scotland to meet anywhere between 80 and 120 per cent of electricity demand in 2020. These are simply scenarios, but give some indication of the relative scale of each sector required to meet the target.

Grid access and charging, market reform, and the consents process, are the main risks to progress. Given the importance of each of these areas, we set out our views on how these risks can best be mitigated to ensure that Scotland meets its 100 per cent target before looking at the other issues that the Committee has identified in its call for evidence.

**GRID**

**Grid access**

The renewable electricity target is predicated upon Scotland becoming a major exporter of renewable electricity to the rest of the UK and, in the longer-term, to other parts of Europe. The provision of sufficient network capacity to transfer the required levels of power to target markets is one of the key risks to the target.

However, recent weeks have seen a number of significant steps forward. Firstly, Ofgem announced in January that it would ‘fast-track’ the future business plans of SP Transmission Ltd (SPTL) and Scottish Hydro Electric Transmission Ltd (SHETL), which include the upgrades considered necessary to support the 2020 target.

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\(^3\) Renewable Energy Scenarios for Scotland in 2020 (2010) GL Garrad Hassan
including massive increase in connection with the rest of GB and connections to our island groups.\(^4\)

On 16 February, Scottish Power and National Grid announced the award of the contract for the West Coast HVDC link, which will add 2.2GW of export capacity and is projected to come into operation in 2015.\(^5\)

In the same month, the Electricity Networks Strategy Group (ENSG), a high level forum which brings together government, Ofgem, the electricity generators and transmission operators, endorsed the reinforcements outlined in these business plans, stated that they would allow the connection of an additional 10GW of new electricity generation,\(^6\) and that:

“It would also meet the Scottish and Welsh Governments’ 2020 renewable energy targets i.e. the equivalent of 100% of Scotland’s electricity demand should be met from renewables and 7 TWh per annum of Welsh electricity production by 2020.” (pp4)

In addition to these links between Scotland and England, SSE Interconnector entered into a partnership in 2011 to investigate the possibility of building an interconnector between Scotland and Norway, which would open up a new market for exports for Scottish generation and increased balancing capacity in the form of Norwegian pumped storage.

The recently published *Irish-Scottish Links on Energy Study* (ISLES) project has concluded that there is a clear business case for would see a new interconnected offshore transmission network between Scotland and Ireland by 2020, which would again release greater generation capacity.

One of our key concerns is that offshore wind developers are given greater certainty over the design, delivery and costs of their grid connections. The industry is supportive of DECC and Ofgem’s work to coordinate the delivery of offshore grid and the reduction in cables, associated infrastructure and costs\(^7\), but this work means that developers are not sure at exactly how their projects will be connected to the grid. This means that applications for consent must contain all possible grid connections, and appropriate scoping and environmental assessment must be undertaken for each possible route, adding time, cost and risk to the planning process. **We would encourage the committee to highlight this issue to both DECC and Ofgem, and to seek clarity around the timescales within which grid coordination will take place and seek assurance that this will not jeopardise the planning applications or construction milestones of the earliest Scottish offshore wind projects.**

\(^4\) [www.ofgem.gov.uk/Networks/Trans/PriceControls/RIIO-T1/ConRes/Documents1/Further%20assessment%20of%20RIIO-T1%20business%20plans.pdf](http://www.ofgem.gov.uk/Networks/Trans/PriceControls/RIIO-T1/ConRes/Documents1/Further%20assessment%20of%20RIIO-T1%20business%20plans.pdf)

\(^5\) [www.scottishpower.com/PressReleases_2283.htm](http://www.scottishpower.com/PressReleases_2283.htm)


\(^7\) [www.ofgem.gov.uk/Networks/offtrans/pdc/cdr/2012/Documents1/Coordination%20Consultation%2020301.pdf](http://www.ofgem.gov.uk/Networks/offtrans/pdc/cdr/2012/Documents1/Coordination%20Consultation%2020301.pdf)
Grid charging

The current system of transmission charges is explicitly designed to discourage investors from taking forward projects in Scotland by making costs higher than elsewhere in the UK. This represents a clear barrier to the investment required to hit the target. However, Ofgem has proposed to reduce these significantly as part of its review of transmission charges, Project TransmiT.\(^8\) We believe these proposals will encourage greater investment in renewable electricity in Scotland.

We remain concerned, however, that developments on Orkney, Shetland and the Western Isles will still face huge charges, with a wind farm on the Western Isles paying £77,000 for every MW (Megawatt) of capacity in 2012 under the reforms, compared to a charge of £2,000 per MW in south west England. This would mean the proposed Stornoway Wind Farm paying more than £11m annually compared to a £300,000 charge for an equivalent-sized project in south west England.

These figures charges quoted for the islands potentially make development uneconomic, meaning around 1GW of highly productive onshore wind capacity may not go ahead, jeopardising the Scottish Government’s 2020 target to deliver 500MW of community renewables projects. This represents a significant proportion of the capacity necessary to hit the target, and would mean that communities in Stornoway and Shetland will not benefit from planned community wind developments. Neither will it benefit consumers, with onshore wind on the islands being a cheaper source of renewable electricity than its likely replacement of offshore wind.

It is also a barrier to investment in our emerging wave and tidal sector. Orkney, Shetland and the Western Isles all have major plans for marine energy developments as they have the best resource, but they also have the heaviest charges. Scottish Renewables has calculated that planned marine projects totalling 1,600MW in the Pentland Firth and Orkney Waters would be charged £70m per annum under the proposed new tariffs, compared to a £3.2m charge if the same projects were installed in Cornwall.

Scottish Renewables has submitted detailed proposals on this issue\(^9\), and we hope that the Committee will back our call for reforms to the proposed charging methodology for the Scottish islands given their importance to the 100 per cent target; the benefits onshore wind on the islands would have for consumers; and the importance of these areas for wave and tidal power.

FINANCE

Renewables Obligation

It is not by chance that the Scottish renewables sector has managed to swim against the strong tide of global recession. Between October 2010 and 2011 this sector brought approximately £750m of investment to Scotland and with enough projects in the pipeline to deliver £46bn more in the next decade.

The Renewables Obligation (Scotland) has been fundamental to the rapid growth in renewable electricity capacity over the past five years. Scottish Renewables has

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\(^8\) www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=173&refer=Networks/Trans/PT

\(^9\) www.scottishrenewables.com/publications/scottish-renewables-response-project-transmit/
been broadly supportive of the Scottish Government’s proposed reforms of the banding levels set out in the 2011 consultation, with the exception of the poorly-informed proposals to cut support for hydro and biomass, both of which will impede the development of two of the renewable technologies which can make the biggest contribution to the balance of supply and demand for electricity.

Electricity Market Reform
EMR has caused massive uncertainty over the future support levels for renewable electricity generation, and the business case for investments which will begin generation after 1 April 2017 is not yet clear. Industry requires an early and clear indication of the strike price under the proposed Feed-in Tariff with Contracts for Difference for various technologies once EMR has been phased out.

While this may not impact on the deployment of onshore wind projects in the medium term, early offshore wind sites or the first wave and tidal arrays, continuing uncertainty or restrictive rates of return could slow down investment in Round 3 offshore wind sites and the build out of the Crown Estate agreements in the Pentland Firth and Orkney Waters.

Electricity Market Reform (EMR) is designed to reduce the level of risk and certainty over the return on long term investments in renewable energy developments. This would in turn encourage greater investment in the industry and reduce the cost of capital, pushing down costs of development and therefore electricity prices for consumers.

However, the complexity of the EMR proposals, the risks of timetables slipping and the introduction of new risks to investors all mean that it is not clear if EMR will actually deliver its intended benefits. We would urge the Committee to seek evidence from DECC on the latest proposals on EMR, and to seek detailed evidence on how these proposals will result in a more attractive investment framework and lower costs to consumers. Unless these reassurances can be provided, Scottish Renewables will favour continuation of the current revenue support mechanism or the introduction of a Premium Feed-in Tariff.

Capital Finance

The Scottish Government’s main role in attracting finance to the sector is to create the conditions for the deployment of renewables technology. With a clear and ambitious vision, a balanced, transparent and timely consenting process, the necessary levels of revenue support, adequate port infrastructure and necessary skills, the necessary levels of investment will follow to most of the sector.

Key issues that we would highlight to the committee are the clear need for continued capital support to the wave and tidal sector as we begin the deployment of the first wave and tidal arrays if we are to take this sector to the next stage of demonstration; the devastating impact that the proposed cut in the RO would have on hydro development; and the critical role that investment in ports and harbours and technology development is having on decisions by companies like Mitsubishi and Samsung to come to Scotland.

PLANNING AND CONSENTS
The planning system is the decision-making process that guides the future development and the use of land in our towns, cities and countryside. It considers where development should happen, where it should not and how development affects its surroundings. Local decision-making, based on national policies, processes and criteria, is the primary means by which national priorities are reconciled with local interests. The robust framework creates the conditions to balance competing demands to make sure that land is used and developed in the public's long-term interest. Where the system requires swift improvement in order to continue balancing these demands whilst enabling the delivery of the renewable energy targets in the required timeframe is in keeping up with the pace of development through resourcing and engagement among planning authorities, statutory consultees, industry and the public.

Terrestrial planning
The 2006 Planning Act and second National Planning Framework (NPF2) set in process a modernised culture to make our planning system more sustainable, streamlined, fit for purpose and inclusive. This resulted in a leaner Scottish Planning Policy (SPP) and associated guidance which is filtering down to local structure plans, development plans and guidance. Renewable energy forms a more prominent part of these policies than ever before. Yet, our new, renewable ‘power stations’ are not like the traditional, centralised thermal power stations, in situ for decades; they involve constantly-evolving technologies, in smaller clusters, distributed across the country and off our coasts, each typically with planning consent for only 25 years. Our planning policies must strive to keep up with the pace of innovation across the various technologies within this sector, to ensure that they are ‘fit for purpose’ and ‘sustainable’.

Added to this, our renewable energy targets are evolving rapidly, with our ambitions rising as the industry moves to step up to each challenge. NPF2 and SPP were written at a time when our renewables targets were 20 per cent of energy and 50 per cent of electricity. These have since risen substantially, and so we need a planning framework that can deliver the levels of deployment needed.

At a local level, there remains a great deal of awareness raising and education to be done in ensuring factual, balanced information on renewable energy projects reaches communities and local politicians. Effective public engagement is fundamental to ensure fair, informed planning decisions are made in as short a time as possible.

The terrestrial planning system is also crucially important to the offshore and marine renewables sector, as those projects will need to deliver the power they generate onto the land, requiring substations, cables and overhead lines.

In order to ensure the balance between national priorities and policy objectives, we recommend the following actions:
- Align National Planning Framework 3 with the 30 per cent renewable energy target, ensuring all key grid upgrades are supported by NPF3.
- Monitor determination rates and times for all renewables projects centrally to identify issues and trends and to increase transparency.
Assess the consistency of local authority spatial frameworks and other renewables guidance with SPP and national guidance, with the content subject to scrutiny by Scottish Ministers

Review the Hierarchy of Developments for renewables, to ensure such significant developments as renewables projects are not treated as ‘Local’, with applications given appropriate consideration and an independent, objective recourse to review/appeal

Address the lack of resource in planning authorities and statutory consultees to deal with large, complex, technical applications within the required timescales, with consideration of shared services across authorities and reduction in volume of information required in applications.

Marine Planning
The marine planning system is still ‘under development’, and Scottish Renewables has worked closely with Marine Scotland and statutory consultees to help create a framework that is fit for purpose, contributing to the Scottish Government’s Task Force for Consents and Licensing, which reported in February this year. Work is ongoing to streamline the consenting process for offshore and marine technologies whilst improving the knowledge base of environmental impacts to ensure that decision-making is transparent, effective and efficient. We would encourage the Committee to focus on how these recommendations will be implemented and on monitoring their implementation.

A swift consenting and licensing process is crucial to give Scottish projects a ‘head start’ on other markets across the UK and Europe in order to attract investment and secure the necessary services from the supply chain at a time when there will be significant competition for resources. Government must continue to work closely with industry, stakeholders and local councils to ensure all parties are coordinated in working towards the same goal and timescales. Marine Scotland has managed this effectively up until now, but maintaining this level of engagement will be a great challenge once the number of applications submitted rises sharply.

Given the scale of projected marine and offshore wind development over the next decade, adequate resourcing of Marine Scotland and all statutory consultees, and swift training of marine planners, is crucial to ensuring the required deployment trajectory can be met. We would encourage the Committee to seek clear commitments from Marine Scotland and SNH on how they intend to put in place the necessary resource to manage applications for consent from numerous offshore wind and marine developments and that they can meet their nine month target for determining applications.

CARBON EMISSIONS
Despite repeated claims to the contrary, electricity generation from renewables displaces CO2-intensive production technologies such as coal and gas, and renewable energy is one of the key ways in which we will meet our 2020 and 2050 climate change targets. Estimates published by DECC suggest that renewable generation in Scotland in 2009 displaced 5.6m tonnes of CO2. This is around 9

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12 www.publications.parliament.uk/pa/cm201212/cmhansrd/cm120112/text/120112w0002.htm#12011297000139
13 www.publications.parliament.uk/pa/cm201212/cmhansrd/cm120112/text/120112w0002.htm#12011297000139
per cent of Scotland’s emissions in 1990, the baseline for the targets enshrined in the Climate Change (Scotland) Act.\textsuperscript{14}

Figures from the Committee on Climate Change suggest that Scotland’s power sector was responsible for 15.5 MtCO\textsubscript{2} emissions in 2010.\textsuperscript{15} This represents 21 per cent of Scotland’s 1990 emissions. Meeting Scotland’s renewable electricity target would therefore result in the displacement of the equivalent of 21 per cent of Scotland’s emissions, or half of the reduction required by the Climate Change (Scotland) Act.

However, it is impossible to calculate the precise impact of renewables generation in Scotland on Scottish carbon emissions, as electricity is traded across Great Britain in one GB-wide market. In our increasingly inter-connected market, greater generation from renewables in Scotland will mean a lower need for power from coal, gas or oil-fired generation in the rest of Great Britain, but not necessarily in Scotland. In coming years, the growth of renewables capacity and greater inter-connection with the rest of the UK will make it increasingly difficult to allocate carbon savings from renewables to one specific geographical location; rather these should be calculated for the system as a whole. What is beyond doubt though, is that Scotland’s renewable energy sector can and will make a disproportionate contribution to European targets on carbon reduction in 2020.

Longer-term, renewables will begin to displace carbon from other parts of the energy industry, including the petrochemicals sector, which accounts for many of the largest greenhouse gas emissions sources in Scotland. Renewable transport will also make a dramatic impact on air quality in our urban centres.

**ENERGY EFFICIENCY**

The Scottish Government has set a target to reduce primary energy use by 12 per cent by 2020.\textsuperscript{16} Reduced demand will of course mean lower output is required to hit the renewable energy targets. However, the Committee is right that the increased installation of air and ground source heat pumps and growing numbers of electric cars will have a positive impact on electricity demand. There is still great uncertainty over exactly when and how these technologies will expand, and therefore if these two trends are likely to cancel one another out. It is clear that the proportion of final energy use met by electricity will increase up to 2020 and beyond.

**COSTS**

There has been tremendous amount of debate on energy costs in recent months, with renewables wrongly being blamed for the sharp increases in household energy bills. There is now clear and consistent evidence from a number of sources including energy companies, the independent Committee on Climate Change, and Ofgem that the rising wholesale price of gas is the main driver in pushing up consumer energy bills. According to figures from the Committee on Climate Change, the average dual-fuel energy bill for a typical household increased from around £605

\textsuperscript{14} www.legislation.gov.uk/asp/2009/12/contents
\textsuperscript{15} http://downloads.theccc.org.uk.s3.amazonaws.com/1552_CCC_Scotland%20report.pdf
\textsuperscript{16} www.scotland.gov.uk/Publications/2011/10/04142510/0
in 2004 to £1,060 in 2010. By far the largest contributor was the increase in the wholesale price of gas, which added around £290 to bills.\textsuperscript{17}

The Renewables Obligation (RO), the main source of financial support for renewable energy production, added £20 to the average annual household energy bill in 2011.\textsuperscript{18} This is expected to increase to £48 per year by 2020, however, the Government’s package of green energy policies is projected to save consumers £94 a year (or 7 per cent of bills) by 2020.\textsuperscript{19} Part of this saving is down to the projected reduction in electricity prices as a result of increased levels of renewables generation.\textsuperscript{20} These savings are all based on the UK Government’s projections for gas prices but increases greater than those forecast would result in larger savings for consumers from green energy policies.

In addition to these costs savings, Ofgem has also stated that “greater reliance on non-fossil fuels such as nuclear and renewables, could reduce Britain’s dependence on gas imports,”\textsuperscript{21} highlighting the importance of renewables to energy security.

We would encourage the Committee to look at subsidies for other forms of energy. According to analysis by the OECD, reported in the Guardian newspaper on 27 February 2012,\textsuperscript{22} coal, oil and gas prices in the UK were subsidised by £3.63bn in 2010, compared to £1.4bn of support for renewables. Likewise, the annual cost of nuclear decommissioning in 2011-12 is estimated to be £2.9bn.\textsuperscript{23} This compares to £1.1bn of support to the renewables industry in 2009-10 through the Renewables Obligation.\textsuperscript{24}

Any assessment of costs and benefits should of course include an assessment of carbon emissions, energy security, the massive levels of investment, the thousands of jobs, and education and training opportunities for young people which the renewables sector is creating.

TECHNOLOGY

Scotland is home to a number of genuinely world-leading areas of technology research, development, demonstration and deployment in offshore wind, marine energy, and storage: we have the world’s first tidal power array consented in Islay, the first community owned tidal turbine in Shetland, the world’s first deep water offshore wind farm in the Moray Firth, and the best tidal, wave and wind resource in Europe, not to mention an abundance of intellectual resource in research, design, innovation and engineering borne from our universities and colleges. This work is recognised internationally.

\begin{footnotesize}
\begin{itemize}
\item[17] \url{http://downloads.theccc.org.uk.s3.amazonaws.com/Household%20Energy%20Bills/CCC_Energy%20Note%20Bill_bookmarked_1.pdf} (page 4)
\item[18] \url{www.decc.gov.uk/assets/decc/11/about-us/economics-social-research/3593-estimated-impacts-of-our-policies-on-energy-prices.pdf} (page 68)
\item[19] \url{www.decc.gov.uk/assets/decc/11/about-us/economics-social-research/3593-estimated-impacts-of-our-policies-on-energy-prices.pdf}
\item[20] Ibid (see page 56)
\item[21] \url{www.ofgem.gov.uk/Media/FactSheets/Documents1/Why%20are%20energy%20prices%20rising_factsheet_108.pdf}
\item[22] \url{www.guardian.co.uk/environment/2012/feb/27/wind-power-subsidy-fossil-fuels}
\item[23] \url{www.nda.gov.uk/documents/upload/NDA-Business-Plan-2011-2014.pdf}
\item[24] \url{www.ofgem.gov.uk/Sustainability/Environment/RenewabObl/Documents1/RO%20Annual%20Report%202009-10.pdf}
\end{itemize}
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Much of this is more relevant to progress after 2020, but technology development is required to underpin a number of areas, such as offshore wind and the marine sector.

The companies driving this technology development have largely spun out of our academic or industry base to meet the growing demands of the renewable sector, or have come to Scotland because of our natural resources, our academic and industry base and the Scottish Government’s commitment to the sector – embodied in the 100 per cent target.

**Offshore Wind**
The main challenge for the offshore wind sector is to deploy larger and more efficient turbines in order to bring down costs to the industry target of £100MWh. Scotland is playing a key part in this challenge, with work to design Gamesa’s next generation turbine being managed in Bellshill; the hydraulic systems for Mitsubishi’s revolutionary offshore turbine being developed in Edinburgh; and Samsung working with Scottish-owned company David Brown Gear Systems to develop a 7MW offshore turbine which will be manufactured in Methil.

Key to these efforts is the provision of suitable test sites, such as the European Offshore Wind Deployment Centre (EOWDC) in Aberdeen Bay and SSE’s site at Hunterston. A recent report from the UK Government’s Low Carbon Innovation Coordination Group’s Technology Innovation Needs Assessment (TINA) into Offshore Wind Power found the EOWDC could help deliver £4bn in value to the UK economy. One of Samsung’s main criteria for the siting of its European assembly site was the availability of suitable test sites.

Scotland is also home to the newly-launched £50m ‘Catapult’ centre to develop technologies to capture and use power from offshore wind, which was secured with the leadership of the University of Strathclyde and Scottish Enterprise, supported by Scottish Power and SSE’s centres for offshore wind deployment, both of which are in Glasgow.

With the deep water around our shores, Scotland is the ideal place to attract companies to test floating wind technologies, such as Statoil’s Hywind turbine. Norwegian firm Statoil is currently considering potential sites around the UK for demonstration sites and larger wind parks over the next 5-10 years. Such technologies have the potential to unlock large areas of deep water offshore wind resource by avoiding the need for substructures.

New turbines will require new installation techniques and operating schedules, and this is again an area where Scotland has a wealth of expertise. Companies such as Wood Group, Petrofac and Subsea7 are already applying their knowledge of working offshore to the new challenge of offshore wind deployment, helping drive down costs and grow a supply chain that can support Scotland and further afield.

**Demand Management and Storage**
Increased storage capacity is essential to balance the peaks and troughs in output from variable renewables with demand for electricity. Pumped storage is the largest-scale solution which can be deployed today, and we would urge the committee to
show strong support for SSE's proposals for some 1GW of additional capacity in Scotland.

There are other technologies in development, including hydrogen, with the University of St Andrews recognised as an international centre of excellence, and The Hydrogen Office in Methil playing a key role in accelerating understanding of the application of integrated renewables and hydrogen fuel cell systems.

SSE has begun the introduction of grid-connected battery storage with the connection of a 1MW battery in Shetland as part of its smart grid on the islands, a project managed by Smarter Grid Solutions, a leading company in this field, headquartered in Glasgow.

Wave and Tidal
Scotland’s wave and tidal sector is genuinely world-leading. Nowhere else in the world has the same number of technology developers, the number of devices deployed, the test facilities, or plans for the future on the scale of the Pentland Firth and Orkney Waters. Collaboration between academia, business and government has driven forward the development of this technology.

Key to maintaining this lead and converting early development into demonstration and commercial deployment will be the right balance in the emerging consenting framework for offshore renewables and access to finance.

We have supported the work of the Scottish Government to streamline the scoping, planning and consenting of marine renewables25 and will work with our members and regulators to see the proposals through to implementation.

The revenue support provided by the RO and the capital support provided by the Scottish Government has been central to bringing the industry this far. We have welcomed the Scottish Government’s proposals to maintain wave at the five ROCS band and increase tidal to the same band. We also welcome the Scottish Government’s commitment of £18m under the Marine Renewables Commercialisation Fund to help bridge the gap between demonstration and commercial projects. However, given the challenges faced by the marine renewables industry in sourcing capital funding due to the sector’s stage of development, we need to see continued commitment to capital support for the sector, with the recent release of the Fossil Fuel Levy allowing investment on a greater scale.

Bioenergy
Scottish Renewables supports the view of the Scottish Government that biomass should be used in the most efficient and beneficial way possible, and we encourage the utilisation of heat wherever feasible. There exists concern within the wood market that, should supplies from outwith Scotland become unavailable at any point in time, biomass plants would enter the domestic market and leave no material for the rest of the timber industry. To overcome these concerns, supply contracts for imported material may provide some comfort. For example, these could state that,

25 www.scotland.gov.uk/News/Releases/2012/02/Renewables
where a delivery were not able to be made, the supplier would be responsible for any
lost revenue and the plant would simply not operate. Scottish Renewables is
engaging with the Scottish Government to find ways to ease concerns over material
supply whilst ensuring that Scotland does not lose out on a viable form of thermal
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enewable energy generation to our UK and European neighbours.

All thermal electricity plants are effectively combined heat and power (CHP) plants
as both heat and electricity are produced. Other than in exceptional circumstances, it
is extremely difficult to locate projects where there is the capacity to sell both
electricity and heat from the outset. The establishment of projects which are based
on electricity-only generation at the outset can provide the basis for future
development of heat users (‘heat load’). These opportunities can only be realised if
the biomass project is commissioned, which in turn is only feasible on the basis of
electricity sales under long term contract.

The Scottish Government is proposing to set a cap on the scale of biomass
electricity plant in Scotland under the banding review of the Renewables Obligation
(Scotland). **Scottish Renewables has responded to argue that a limit of at least 20MW (or above) be set for biomass electricity to make small-scale CHP developments economically viable.**

Biomass electricity is relatively low cost compared to other renewable technologies.
For this reason, as well as its flexibility and reliability, the UK government views it as
playing a key role in meeting renewable electricity commitments. Regardless of the
Scottish policy on biomass, the UK market will require a significant supply of wood
cost
fuel from within the UK timber market as well as importing from international
markets.

**Onshore Wind**

Onshore wind is one of the most mature renewable technologies deployed globally,
and is likely to make up the lion’s share of renewable electricity generation in 2020.
The first two prototype wind turbines to generate electricity for the national grid in
Britain were made and erected by Howdens of Glasgow in the early 1980s; however
a lack of investment curtailed the UK lead in the market, which has since been lost to
Denmark, Germany and Spain. Yet, as one of the most cost-effective forms of clean
energy today, the sector is already making great steps in cutting our carbon
emissions and stabilising long-term energy costs. The wider supply chain holds
many hundreds of jobs in onshore wind development, construction, operation and
maintenance, with some of the world’s leading experts in the sector based in
Scotland, including Glasgow’s Sgurr Energy and Galloway-based Natural Power
Consultants.

Like all major forms of development, onshore wind farms undergo a rigorous
Environmental Impact Assessment as part of the planning process to ensure that the
environmental benefits of the project are maximised and mitigating any local
environmental effects. The industry has worked closely with government, agencies
and NGOs including Scottish Natural Heritage, SEPA, Forestry Commission
Scotland and RSPB Scotland to develop various forms of good practice guidance in
the development and construction process and to monitor effects on sensitive
habitats and species. These provide a range of guidance on how best to minimise
visual impact on landscapes, the management of soils such as peat, post-consent monitoring of birds and low-impact construction techniques. A number of habitat management plans have been put in place by onshore wind developers to improve surrounding habitats.

A significant amount of onshore wind capacity is currently stuck in the planning process by restrictions on development around the Eskdalemuir Seismic Array, one of 170 seismic stations across the globe used to monitor compliance with the Comprehensive Nuclear-Test-Ban Treaty. The UK is bound by the Test-Ban Treaty not to compromise the detection capabilities of the Eskdalemuir station, and it is the responsibility of the Ministry of Defence to safeguard this station. Following a 2005 study indicating that wind turbines produce micro-seismic noise through vibration, a number of companies have begun to look at technologies which dampen the vibration effects of turbines, including Edinburgh-based Xi Engineering Consultants, and we would urge the Committee to engage with the MoD to assess how best we can ensure the development of onshore wind around Eskdalemuir without impacting on seismic monitoring.

Despite the huge amount of negative media coverage, recent polls have clearly shown that the public is supportive of onshore wind and renewable energy. For example, in December a YouGov poll commissioned by the Sunday Times found the majority of respondents wished the government to use more low carbon sources to meet future energy needs and less fossil fuel generation. An online poll by the Daily Mail found 60 per cent of those surveyed were in favour of building more wind farms to cut carbon emissions, and Scottish Renewables’ own YouGov poll published in 2010 concluded that 78 per cent of those surveyed agreed that ‘wind farms are necessary so that we can produce renewable energy to help us meet current and future energy needs in Scotland’ - up from 73 per cent support in 2005. An ICM/Guardian poll (published 1 March) found 60 per cent tend to support or strongly support a new wind farm development in their area. 51 per cent strongly opposed new coal and 61 strongly opposed new nuclear in their area.

SUPPLY CHAIN AND INFRASTRUCTURE
Scotland has built a strong renewables supply chain in recent years, with particular strengths in project management, civil engineering, offshore engineering, subsea structures, wave and tidal development and fabrication, and technical and environmental consultancy:

- We are home to the headquarters for offshore development of four of the key offshore wind developers in Europe – SSE, ScottishPower Renewables, EDPR and Repsol
- Established companies like RJ Macleod have weathered the downturn in construction due to significant revenues from renewable energy projects

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27 www.dailymail.co.uk/debate/polls/poll.html?pollid=1029654
29 http://www.guardian.co.uk/environment/2012/mar/01/local-opposition-onshore-windfarms-tripled
Subsea7, Petrofac, Technip and Wood Group are all gearing up to support the build out of Scottish Territorial Waters and Round 3 offshore wind projects. Bifab is the market leader in ‘jackets’ for offshore wind turbines. Pelamis, Aquamarine, Wavegen, AWS are world leading technology developers, with devices fabricated by companies such as Steel Engineering and Global Energy. GL Garrad Hassan, Sgurr Energy and Natural Power employ over three hundred people in Scotland and internationally, advising on the range of renewable energy projects.

Together these companies employ thousands of people across the country, and many of them are already working in overseas markets such as Germany, USA, China and Chile. The keys to growing this further are the ongoing political commitment to renewables and the certainty that provides to investors, and commitment to investing in the necessary infrastructure and skills and training provision to equip the industry with its future skills needs.

The 100 per cent target has sent a strong signal to investors, and many foreign firms have mentioned this as one of the main reasons for choosing to invest in Scotland.

**SKILLS AND WORKFORCE DEVELOPMENT**

The renewables industry is already a significant employer, and job numbers in the sector will expand rapidly over coming years as the supply chain gears up to meet demand in Scotland, UK and overseas. The largest contributors to this growth will be offshore wind, wave and tidal, and energy networks. It is estimated that offshore wind alone could directly contribute as many as 28,000 jobs to the economy. Scottish Renewables is working with the Fraser of Allander Institute at the University of Strathclyde to understand the current levels of employment in the industry and will release a report shortly.

Recent announcements on jobs include:

- November 2011. Moray Offshore Renewables (consisting of EDP Renewables and Repsol) announced details of a £4.5bn project to create the world’s largest offshore wind farm in the Moray Firth, with potential for up to 1,400 jobs during construction, and almost 300 jobs during operation.
- December 2011. SSE announced a Memorandum of Understanding with Forth Ports, Scottish Enterprise and Dundee City Council to secure Dundee’s position as a hub for Scotland’s offshore renewables sector.
- January 2012. Samsung Heavy Industries announced it will invest £100m to develop a new 7MW offshore wind turbine at the Energy Park at Methil near Fife, creating 200 jobs.
- February 2012. Scottish Power Energy Networks to create 300 engineering and technical jobs.
- February 2012. SSE lodged planning application to construct Scotland’s largest pumped storage scheme (600MW). This important technology means during times of low electricity demand energy can be stored ready to be used during periods of high demand. The scheme will see £800m invested and secure around 150 jobs.

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Universities will play a major role in filling existing gaps of expertise, and with Strathclyde University and Heriot Watt in particular taking a lead; Scotland is quickly becoming viewed as a global centre of excellence in research, design and innovation in the renewable energy industry.

The Energy Technology Partnership (ETP) which consists of around 250 academics and 600 researchers, it is the largest, most broad based power and energy research partnership in Europe. It recently established an Energy Industry Doctorate Programme in Renewable Energy and Low Carbon Technologies. This was again one of the key factors in the decision by Mitsubishi to locate in Scotland.

Likewise the college sector will play a vital role in ensuring the right skills are being delivered taught to an emerging workforce that will be required across the industry. The Scottish Funding Council (SFC) announced last summer that it would invest £300,000 over three years in the Scotland’s Colleges Energy Industry Partnership (SCESP), a network of colleges with an established track record in the sector. The Partnership aims to respond quickly to changing skills requirements from employers, pool expertise and resources, and reduce unnecessary duplication. Skills Development Scotland has enabled a more focused approach to building modern apprenticeships around renewable energy technologies and in 2010 the UK’s first Modern Apprenticeship for Wind Turbine Technicians at Carnegie College in Dunfermline. Furthermore, the Scottish Government has already shown strong commitment in launching 1,000 flexible training opportunities in energy/low carbon in 2012/13.

To realise our ambition of meeting the 2020 renewable energy target Scotland will also require a focus on the re-skilling of the existing workforce to support the transfer of existing skills in areas such as construction, engineering and manufacturing to the renewables sector. At this time it is difficult to see another sector which can make the same contribution to the challenges youth unemployment and economic recovery.

We would highlight the balanced approach of both the Scottish Funding Council and Skills Development Scotland to ensuring that the necessary training provision and academic courses are available to meet the industry’s future needs.

**HEAT**

Heat accounts for over half of energy demand in Scotland and produces 47 per cent of our CO2 emissions\(^{31}\) (see Figure 1). It also comprises around 60 per cent of domestic energy costs. However, at present, less than 3 per cent of heat is generated from renewable sources.\(^{32}\) If we are to meet our CO2 reduction targets, it is imperative that we de-carbonise our heat use through a mixture of demand reduction, energy efficiency and switching to renewable forms of heating. The Scottish Government produced a Renewable Heat Action Plan for Scotland in 2009 (updated in 2011) which outlined a number of actions to accelerate the growth of the renewable heat market. These, combined with incentives for consumers under the Renewable Heat Incentive should move us in the right direction, but a great deal

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\(^{31}\) [www.decc.gov.uk/assets/decc/consultations/rhi/1_20100204094844_e_@@_consultationonrenewableheatincentive.pdf](http://www.decc.gov.uk/assets/decc/consultations/rhi/1_20100204094844_e_@@_consultationonrenewableheatincentive.pdf)

more is needed to speed up this process in order to meet our targets and climate obligations and stabilise energy costs for consumers.

Electricity generation is relatively simple compared to heat energy development due to the ability to supply electricity to the grid that can then be transported to where it’s needed. However, when developing heat projects it is necessary to have a local consumer for the energy produced. This has resulted in very few large scale combined heat and power (CHP) developments.

![Proportion of Energy Consumption in Scotland by Demand Sector](image)

Figure 1. Approximate percentages of current demand

The Department of Energy and Climate Change (DECC) projects that UK dependency on energy imports could rise from an overall figure of 27 per cent in 2009 to 58 per cent by 2020. This leaves the country vulnerable to both geo-political tensions and volatile oil and gas prices. DECC also suggests that gas import levels could rise to 70 per cent by 2020. A move to renewable technologies would significantly increase our security of energy supply and reduce our exposure to volatile prices.

The role of heat in our energy system

Heat storage enables demand to be disconnected from generation. The integration of heat networks can help alleviate some of the challenges of the low carbon transition by storing excess electricity generation from periods of low demand in the form of heat and deploying it when required, thus reducing the need for additional generation. Incorporating ‘energy centres’ into these networks, which can accommodate a range of heat and CHP generation assets, gives an additional degree of balancing benefit as these systems can not only provide heat and help to maximise the value of any surplus electricity, but also act as back-up generation for times of low generation.

Targets

Before last year’s increases in renewable energy targets, the Scottish Government set a target of generating 11 per cent of heat demand by 2020 from renewable sources such as biomass (including wood fuel), heat pumps and solar thermal technologies. This level of renewable heat was required for Scotland to meet the previous target of 20 per cent of all energy demand from renewables by 2020, if we

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met our 50 per cent electricity and 10 per cent transport targets. However, the Scottish Government is reviewing its forecast for 2020 energy and heat demand and it is therefore unclear what level of output will be necessary to achieve the 11 per cent target. **It is crucial that these figures are clarified if we are to make meaningful progress on renewable heat.**

Scottish Renewables reported last year\(^{35}\) that in 2010 (before the implementation of the Renewable Heat Incentive - RHI), deployment of renewable heat was above the level projected in the Scottish Government’s Renewable Heat Action Plan. Based on the greater-than-expected proportion of industrial and commercial applications it was found that the forecast demand could be met with a significantly reduced level of installed capacity than had been initially anticipated. Based on 2010 trends for uptake, we forecast that the 2020 target would be met in 2018. Our analysis therefore assumed that the 11 per cent target would be met more comfortably than thought and that a 16 per cent target would be more appropriate objective. These projections will depend, however, on clarification of demand figures emerging from the Scottish Government, and may need to be reviewed as a result.

**COSTS**

The Renewable Heat Incentive (RHI) for commercial and industrial schemes was launched in November 2011. Registrations have been slow whilst Ofgem establishes the accreditation system. As of yet there is only one scheme registered in Scotland. More needs to be done to highlight the opportunity for renewable heat in Scotland, where approximately a third of all properties have no access to mains gas. Fuel poverty is prevalent amongst consumers in off-gas-grid areas, who are forced to source higher-cost heating fuels such as oil, which also emit greater levels of CO2. It is in these areas where the maximum benefit of renewable heat systems can be achieved. The RHI for domestic properties is scheduled to begin in October 2012, which will make it economically attractive for householders to change over to renewable heating sources, helping them to reduce fuel bills and cut their carbon footprint. By changing over to renewable sources of energy, householder will be insulated from volatile fossil fuel costs.

In 2010 detailed impact assessments\(^{36,37,38}\) were undertaken by the UK Government for each of the main energy policies. These show that the RHI delivers the optimal balance of saving large quantities of greenhouse gas emissions at a cost effective level.

**Costs for 1–5MW Biomass Developments**

The European Commission expressed concerns over DECC’s original proposals in September 2011, stating that the large biomass tariff under the RHI was set too high. The Commission gave state aid approval for the RHI, subject to a reduction in the large biomass tariff. This resulted in the tariff for biomass developments being reduced from the proposed 2.7p/kWh to 1p/kWh. Although large projects were still economically viable at this level it resulted in a large number of smaller projects being abandoned. This resulted in a large number of projects being abandoned as

\(^{35}\) Scottish Renewables (2011) Renewable Heat: Achieving Scotland’s Potential


\(^{38}\) DECC (2010) Impact Assessment for the Feed-in Tariff
they were not economically viable at the reduced level. This was particularly the case for projects in the 1-5MW scale, which is a very common industrial heat requirement bracket. If economically viable, such projects could result in a great deal of development and significant volumes of carbon emission reductions. **We would therefore recommend that a new band be introduced for 1-5MW to make these projects viable.**

**INFRASTRUCTURE**

**District heat**

District heat networks have long been used on the continent to deploy large volumes of renewable heat. However, despite strong political support, there has been very little in the way of development in Scotland. Heat networks offer great possibilities for grid balancing, maximising the value of all electricity generated from renewables and disconnecting generation from demand. The barrier to widespread deployment has been the capital cost of the network. Under the RHI it is only the boiler that is currently considered for support. Network costs in urban areas of Scotland are estimated to be around £1.5M/km, which has proven difficult to overcome when establishing a business case.

A further barrier is the difficulties developers face in getting potential heat customers to enter into contracts pre-construction, which has led to financiers classing developments as high risk. Unlike electricity, heat cannot be transported long distances; it must be used in a relatively local facility to the generation source. If the demand for heat disappears, so does the project viability.

In Sweden it is compulsory to join a heat network if a connection is available. Gothenburg’s district heating system stretches over 1,000 kilometres of pipeline, and supplies over 80 per cent of all homes, as well as official and commercial buildings, with heat recovered from industrial activities such as refineries and power production. By using energy twice in this way, Gothenburg city saves some 3 billion kWh of primary energy and over one million tons of carbon dioxide emissions annually.**39 Government could play a transformative role in encouraging local heat users to join any potential networks.**

**PLANNING AND CONSENTS**

In England and Wales, general permitted developments for air-source heat pumps were introduced in September 2011 provided the unit complies with the MCS Planning Standards or equivalent standards. The Scottish Government does not support this position and believes that planning permission should be necessary for every installation. This presents an additional burden to householders looking to reduce their costs and carbon emissions, and has resulted in limited levels of deployment to date. With the RHI for domestic properties scheduled to begin in October 2012, and we believe that the Scottish Government should follow England & Wales in classing air-source heat pumps as permitted developments in the planning system.

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FINANCE
The perceived risk of developing heat loads has significantly stifled the deployment of CHP units. Financiers are unwilling to lend due to concerns that, should the heat load disappear, the project will become unviable. The Scottish Government proposal in its consultation on the Renewables Obligation (Scotland) banding levels not to support large scale biomass has heightened this concern. Previously development plans could be made so that if the heat client were to cease to exist, the plant would still be economically viable as a biomass power station. The government’s proposal to limit the eligibility for support to plants under a certain threshold has resulted in a great deal of uncertainty and concern for potential CHP projects that fall outwith this limit.

The launch of the domestic phase of the RHI later this year should stimulate significant interest in renewable heat technologies, offering huge potential to cut costs, particularly in off-gas grid areas where there is a higher risk of fuel poverty. However, the upfront capital cost of these units is still likely to be a major barrier to widespread deployment. RHI payments should be sufficient to cover any repayments, but there is a clear role for the government in helping to establish soft loan schemes so that those who stand to benefit the most from the RHI can access capital funding. The Scottish Government should establish a soft loan scheme to complement the RHI by reducing the capital cost barrier to householders.

Green Deal
The Scottish Government’s Energy Efficiency Action Plan set a target of reducing Scottish final energy consumption by 12 per cent by 2020. Energy efficiency is the most cost effective way to reduce energy bills and reduce emissions. The Green Deal, due to be launched in October 2012, will allow householders and businesses to install energy efficiency measures and pay back the capital cost from savings accrued over the lifetime of the efficiency measure. This removes the upfront capital cost barrier that inhibits many people from taking forward such measures. Due to the housing stock and climate in Scotland, the opportunity to benefit is greater than elsewhere in the UK. Efficiency measures will have shorter payback times due to the higher than average energy usage, meaning a greater number of measures will meet the “golden rule” criteria set by the scheme. Details about how the scheme will function are not yet fully known but every effort must be made to ensure that businesses and householders are made aware of the potential benefits to them. The Scottish Government needs to work closely with DECC to ensure that the skills of Scotland’s tradespeople are recognised when developing accreditation criteria and that the industry is fully aware of all the necessary accreditation and certification to avoid delay in deployment once the scheme goes live.

TRANSPORT
Renewable transport will make a modest contribution to the 30 per cent renewable energy target, but will make a massive contribution to carbon savings in the future. Scottish Renewables is working with its members to define the impact that electric transport will have on electricity consumption; the potential ‘smoothing’ of supply and

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demand for electricity; and the infrastructure required to support the mass roll out of electric vehicles.

CONCLUSION
As argued at the beginning of our submission, Scotland’s renewable electricity sector provides around a third of Scotland’s electricity needs and can meet the 100 per cent 2020 target with a small proportion of projects in scoping and planning. The barriers to future growth are well understood and the Scottish Government, DECC, Ofgem and National Grid are working to remove the remaining barriers to progress.

Progress is also being made on the deployment of renewable heat, but there are still many questions to be answered about the levels of future demand and how we best support investment in renewable heat technologies. It is here that we believe the Committee should focus the majority of its inquiry, given that heat accounts for half of all energy use and over half of Scotland’s carbon emissions.

We are confident that the inquiry will re-affirm the success of the renewables industry and the important part that the Scottish Government’s targets have played in its development. We also hope that it will highlight the sector’s contribution to our energy needs today and in the future, and put to bed once and for all many of the myths that have dogged the debate on energy policy in Scotland for too long. Despite the huge amount of negative media coverage, renewables provide a significant proportion of our energy needs, support thousands of jobs, and are attracting billions of pounds in development. The industry’s growth over the coming decade will only increase the economic, environmental and employment benefits for Scotland.

Finally, although there is a huge amount of information to cover in the remit of this inquiry, we would urge the Committee to look beyond its present horizons, and to begin the next chapter in the debate on renewable energy’s contribution to Scotland’s future economic growth and environmental leadership: the potential scale of our renewable heat and electricity sectors in 2030 and beyond.

Scottish Renewables
5 March 2012