SUBMISSION FROM VATTENFALL

Introduction

Vattenfall has been developing and operating wind energy in Scotland and the UK since 2008. We have made a long term commitment to support the delivery of Scotland’s ambitious renewables and climate change targets.

Vattenfall is one of the largest energy companies in Europe with over 100-years of experience generating renewable electricity. Currently it generates energy from six energy sources: wind, biomass, hydro, gas, coal and nuclear. It also produces the most heat in Europe from combined heat and power plants distributed through extensive district heating networks.

It is investing principally in wind power in the UK because it is currently one of the most promising markets in Europe. In the UK, Vattenfall operates 590 megawatts (MW) of on and offshore wind power from five schemes, including Edinbane on the Isle of Skye.

Therefore, we consider it appropriate to present written evidence to the Committee on what we consider to be the key opportunities and challenges for both Vattenfall’s investment plans and Scotland’s ambitions.

Enclosed is our written evidence accompanied by an annex which describes the extensive activity we have undertaken in the past three years in developing our renewable energy capability in Scotland from our base in Edinburgh.

Vattenfall would also be pleased to provide oral evidence to the Committee and we look forward to hearing from you.
Vattenfall
Vattenfall is developing an extensive portfolio across the UK in both on and offshore wind. In Scotland we are developing five onshore schemes. If successful they will accompany our operating Edinbane Wind Farm on the Isle of Skye. Offshore we are a project partner with Technip and the Aberdeen Renewable Energy Group in the European Offshore Wind Deployment Centre. The EOWDC will prove strategically important to the success of Scotland’s offshore wind sector. Worth noting is our joint venture with ScottishPower Renewables to develop the 7.2 gigawatt (GW) East Anglia Offshore Wind Farm, one of the nine so called Round Three zones.

Elsewhere, we are in a joint venture with Pelamis Wave Power to develop a wave power scheme off the Shetland Islands. Recently Vattenfall signed a Memorandum of Understanding with Shetland Island Council and the Charitable Trust to work together on the successful and sustainable development of the Shetland’s ocean energy potential.

Finally, we are in a consortium, NorthConnect, assessing the feasibility of laying and operating an electricity interconnector between north east Scotland and Norway.

Vattenfall’s approach
Vattenfall is encouraged to invest in wind and wave power in Scotland because of the Scottish Government’s long-term support for the deployment of these technologies.

Vattenfall works to be among the leaders in the development of sustainable energy solutions in Europe. This is because we want to reduce carbon emissions from our own operations by a third by 2020 and to be carbon neutral by 2050.

To achieve this we have committed significant levels of capital expenditure across Europe in low carbon energy solutions. This includes wind power, but also carbon capture and storage (inter alia, in the UK with SSE), wave power, and the use of more efficient heating systems using sustainable sources of energy for district heating networks.

Since entering the UK market in 2008, Vattenfall has invested well over £1bn and is set to invest similar amounts in the future if its proposals are supported.

In building three wind farms in the UK in the past three years we have supported the UK supply chain with key contracts. These contracts secured employment for more than 1,700 people. One notable contract was for steel jacket foundations for our Ormonde Offshore Wind Farm. This contract supported around 400 jobs at Burntisland Fabrications. The Committee visited Methil in 2010 to view these jackets before sailing to the Cumbrian coast.

Where we can, Vattenfall will place contracts with UK business when investing in new generation. Vattenfall supports the UK Government’s vision of 50% UK business content in offshore wind capital expenditure.
The Economy, Energy and Tourism Committee
Since entering the UK in 2008, Vattenfall has engaged with Government, public bodies and industry associations to help deliver a successful renewable energy industry. This engagement has been extensive and we have sought to support policy development in planning, financial frameworks, network charging and investment, economic policy, skills, environmental effects and public acceptance. Of particular note is support for and investment in resolving and mitigating the impact of aviation radar issues on the deployment of wind power in the UK. We expand on this later in the document.

Vattenfall’s Onshore Wind Development Director for Scotland, Colin Ormston, contributed to the Committee’s recent round table discussion. Mr Ormston was keen to underline Vattenfall’s commitment to investing in wind power in Scotland and to be a progressive partner with Scotland to deliver its ambitious renewable energy targets.

Vattenfall would be pleased to provide evidence to the Committee in its oral sessions. In particular Vattenfall would make an important contribution on the following issues:

1. The opportunities for Scotland’s planning system to ensure the timely delivery of renewable energy targets;
2. Markets, and in particular Electricity Market Reform, and its potential to enable or undermine investment in new generation;
3. Cost reduction in offshore wind through increased competition in the supply chain;
4. The development of marine energy technology in Scotland and the opportunities and risks associated with that; and,
5. Accelerating production of renewably sourced heat delivered through district heating networks.

Achieving the 2020 targets
In September 2011 Vattenfall’s Chief Executive, Øystein Løseth, spoke at the Scottish Low Carbon Investment Conference. He told the conference that Vattenfall was excited by Scotland’s example to the rest of the world in the development of its renewable energy potential and exemplar climate change legislation. He went on to say that Vattenfall will invest in renewables if the following criteria are met:

- There is sufficient resource (e.g., that average wind speed is of required strength)
- There is a route to market through wholesale markets, stable support schemes (e.g. Renewables Obligation) and electricity networks
- That there is a smooth planning, permitting and licensing system in place

He noted that Vattenfall’s future capital expenditure plans for renewables are significant and closed by saying:

Vattenfall, like other energy companies in Europe, has not avoided the impacts of recession and the credit crunch. Like other energy companies we

1 We expand on these issues from page 4.
have to take a hard look at our portfolios and investment plans. It is true that Vattenfall has multi-billion capital investment plans for the rest of the decade but the tests for making that investment are tougher than ever. We cannot make any promises on any individual project, to any individual market or to any individual Government. However, if there is a genuine partnership between the energy sector and Governments in creating predictable and stable investment environments then I believe that Europe’s, and the UK’s, and Scotland’s, ambitions can be achieved and in so doing ensure affordable, reliable low carbon energy for all of our customers.

Vattenfall believes that currently Scotland and the wider UK passes the test for investment but sees many future potential impediments to maintaining this promising status. We see three key risks to delivery of Scottish targets:

- Weakening political support for onshore wind and network upgrades in the Scottish planning system, at all levels;
- An uncertain future for financial support mechanisms in large scale renewables affecting all technologies; and,
- Weakness in labour force skills and supply chain, especially for offshore wind

Theme 1: The opportunities for Scotland’s planning system to ensure the timely delivery of renewable energy targets

The renewables action plans of both the UK and Scottish Government’s rightly conclude that onshore wind must make a telling additional contribution to current levels if 2020 objectives are to be achieved. The UK Government has targeted 13GW of installed capacity by 2020\(^2\) whilst the Scottish Government recognises the need for continued expansion of onshore wind in Scotland\(^3\). Without this additional contribution from onshore wind the targets will be not met or, if made up by technologies with likely higher levelised energy costs, met but at a higher cost to the consumer. The cost of production of onshore wind is falling and the industry is working hard to achieve parity with coal and gas production costs in this decade.

Onshore wind then is not just important in and of its own right in delivering targets, but also as an effective hedge against the potentially higher costs of less mature technologies.

Whilst not wishing to belittle the importance of financial support and adequate network availability, the biggest potential risk to the development of onshore wind in Scotland is the planning system.

Vattenfall acknowledges and welcomes the Scottish Government’s efforts to improve matters in planning and its 2011 Routemap for Renewable Energy in Scotland highlights some of the key challenges. Vattenfall agrees that the Scottish Government has a role in promoting and defending its planning policy to Local Planning Authorities. We also agree that it is sensible to encourage Local Planning Authorities to provide spatial planning advice in a timely manner and enable an efficient planning process through an early and effective planning service to guide development activity and thus avoid difficulty later on.

\(^2\) UK Renewable Energy Roadmap (2011), Department of Energy and Climate Change
\(^3\) 2020 Routemap for Renewable Energy in Scotland (2011), The Scottish Government
Vattenfall has also been encouraged by the Scottish Government’s efforts to resolve issues around radar. A significant amount of onshore wind capacity in Scotland is prevented from deployment due to interference with radar. Removing this barrier with technical solutions would go some way to accelerating the deployment of wind power in Scotland.

The problem is of direct interest to Vattenfall as a number of its schemes have been held up by radar issues in the past. That is why it has invested in technical solutions, participated in industry groups and participates in the Fund Management Board\(^4\). Vattenfall has also worked closely with the Scottish Government in delivering solutions in the south west of Scotland where the problem is particularly acute.

If the Scottish planning system is to deliver good wind farms in a timely manner it must be properly resourced. Typically the Scottish planning system is inadequately resourced. This is evidenced by case work backlog, long lead times to important project meetings, inexperienced officials and inconsistency in decision making by planners and statutory consultees across Scotland. These weaknesses result in unpredictability and delayed decisions, too many negative outcomes and a subsequent dent to investor confidence and foregone capital expenditure, much of which is from inward investors in construction and the supply chain. Developers also have the responsibility to present fully researched robust proposals which have been put together following an extensive and effective programme of public engagement where local people, communities and businesses have had a real opportunity to advise on the design of a wind farm and express their hopes for the project. **This is Vattenfall policy.**

Planners have a challenging role in reconciling local and national interests. There are some great examples of planners doing much to ensure these interests are reconciled. The self evident national social, environmental and economic benefits of wind power are sometimes insufficient to persuade some local people to support a scheme.

Vattenfall’s experience in the development of Edinbane Wind Farm on the Isle of Skye is an excellent example of a Local Authority supporting a wind farm by ensuring local interests are reflected in decision making. Edinbane’s construction was delayed by several years, delaying income to crofters and the community, due to the dogged opposition of six protestors against the wishes of hundreds of local people. The Highland Council consistently supported the scheme and even had to defend its approval in a Judicial Review. Unfortunately, there are too many examples of decision makers across Scotland being swayed by a tiny vocal minority thus denying a majority who support a proposal any influence in the planning system.

Where planners and developers have successfully reconciled these sometimes conflicting interests is due in large part to providing a good reason for a community to support a project (see Edinbane or our recently consented Clashindarroch Wind Farm). This might be achieved through the delivery of local economic benefit, passing business rate revenue to Local Authorities or financial incentives such as community benefit or community share and ownership schemes.

\(^4\) A RenewableUK organisation, leading on funding to solve radar problems.
As a developer, Vattenfall is working with local communities all the time and we are aware that we are engaging in long term relationships. At all stages of the project development process we value the input and support from local communities. At Edinbane we are already seeing the positive impact of the wind farm which by its existence is helping to drive a range of community, social and cultural projects through community funds established at Struan and Edinbane. In addition, the campsite at Edinbane, which has a clear view of the wind farm, was recently voted by the AA as the number one campsite in Scotland.

National and local interests can also be reconciled in planning by a properly crafted local development plan which reflects the genuine majority view of local people and recognises its role in promoting local, regional and national economic benefit. Decision makers should then rely on the Development Plan to help them make a decision. Whilst every proposal should be assessed on its merits, too often schemes that are proposed in areas of search defined by the Local Authority in a Development Plan are rejected without any recognition of a developer’s efforts to sensitively locate and design a scheme and deliver local benefit.

And then again, too often decision makers are swayed by a vocal minority which has typically not engaged in the development of a local plan.

Vattenfall works hard to be a good neighbour and delivers best practice in engagement with all stakeholders where it proposes to develop an onshore wind farm. We would be happy to discuss our experience with the Committee.

**Theme 2: Markets, and in particular Electricity Market Reform, and its potential to enable or undermine investment in new generation**

Vattenfall’s confidence to invest, once planning approvals are gained, are currently predicated on the expectation of a successful transition from the Renewables Obligation to new Feed-in-Tariffs with Contracts for Difference and the introduction of a Capacity Mechanism. Whilst our understanding and certainty about how the transition and new system will work has increased since 2010 the industry does not yet know how it will work in detail. This gap in knowledge is a cause for concern and we hope that legislation in May 2012 will provide the detail investors need.

In addition, the review and proposed reforms of wholesale markets by Ofgem are welcome and need to be implemented quickly if EMR proposals are to work. Vattenfall remains concerned that reforms to drive liquidity into wholesale markets have not progressed quickly enough.

If these market design matters are not completed satisfactorily, or too late, it is difficult to see sufficient finance being raised to deliver targets. However, Vattenfall believes that the reforms can be made to work and if properly functioning markets are implemented then we believe there will be sufficient interest from investors to finance the £110bn required in the UK to hit 2020 targets.

**Theme 3: Cost reduction in offshore wind**

Offshore wind generation is planned to make the greatest contribution to the UK’s renewable electricity supply by 2020 and beyond. However, the UK Government has signalled that it will only maintain long term support if the levelised energy cost of offshore wind production reaches £100/ MWh by 2020. Cost reduction will come through the learning curve, application of innovation, development at scale and increased competition in turbine and foundation supply.
Currently, there is an urgent need for demonstration and deployment sites to provide ‘first run of production’ wind turbines the platform needed to demonstrate their capabilities in the offshore environment. If successfully deployed at demonstration sites like the European Offshore Wind Deployment Centre (EOWDC), of which Vattenfall is a project partner, the potential for demonstrating innovation and increased competition will do much to deliver cost reduction.

In a timely report, The Low Carbon Innovation Coordination Group’s Technology Innovation Needs Assessment (TINA) into Offshore Wind Power outlines what innovation and support is required to deliver both the enormous potential economic benefit of offshore wind and to drive down cost of production. The TINA report states: “Accelerating the achievement of high yield and reliable turbines requires a scale up of testing on existing and/or new sites and site consenting to enable testing of innovative designs. The new test sites and associated infrastructure that are already being planned by Narec and AREG are a significant step in this direction.”

Tellingly, the report says that the added value to business creation in the UK if innovation in turbines and foundations are successfully implemented would be in the region of £7bn. The report concludes: “The public sector investment required however is a fraction of the value that offshore wind innovation could bring to the UK economy, including helping to unlock £45bn (18 – 89) savings in meeting energy and emissions targets at lowest cost, and the £18bn (10 – 35) value add creation to UK GDP.”

The EOWDC would provide an opportunity for some of that innovation to be demonstrated ahead of full commercial deployment.

It is important that both the UK and Scottish Government’s enable the delivery of demonstration and deployment sites as quickly as possible to give new turbine suppliers sufficient time to have an impact on the turbine and foundations markets ahead of the deployment of so called Round Three schemes. Currently, with none currently operational in UK waters, there is a risk that new turbine suppliers will not have the necessary impact and potentially undermine the long term drive to reduce costs.

Schemes like the EOWDC if constructed will also provide a major boost to the young and growing Scottish offshore wind supply chain. This strategically important proposal, off Aberdeen, will provide a platform for the oil and gas industry to diversify its business interests, do much to encourage inward investors to locate in Scotland and place the north east of Scotland at the forefront of tackling the significant challenges facing the offshore wind sector.

Vattenfall would be pleased to talk to the Committee about the role that demonstration sites like EOWDC has in delivering its offshore wind procurement strategy.

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6 The Aberdeen Renewable Energy Group is a project partner in EOWDC and it is to this scheme TINA is referring.
7 The Low Carbon Innovation Coordination Group’s Technology Innovation Needs Assessment into Offshore Wind Power (2012); Chart 8, page 12
Theme 4: The development of marine energy technology in Scotland and the opportunities and risks associated with that

By 2030, if the UK is to decarbonise electricity generation, as recommended by the Committee on Climate Change\(^8\), then ocean energy technologies will need to make a telling contribution to UK electricity supply. Scotland has provided the grant funding and a strong framework within which technology developers can raise the early finance needed to prove and commercialise their technologies and this has encouraged Vattenfall to invest in ocean energy in Scotland.

However, to provide adequate confidence to justify commercial scale investment several small arrays must be up and running in the period 2015-2020. This is presently inhibited by a number of factors, including the lack of visibility on revenue support post 2017, and time-limited publicly funded grants such as MEADs\(^9\) ending in this Comprehensive Spending Review period. Additionally, uncertainty over transmission grid access and charges from Scottish islands undermines confidence in future roll-out. The Scottish Government’s efforts to streamline consenting for marine renewables are welcome, and should be sustained to avoid obstructing this important new energy source.

Vattenfall would be pleased to talk to the Committee about the challenges faced by project developers in Scottish waters (technical, environmental, public acceptance) and its work to forge strategic supply chain partnerships to avoid constraints in component supply.

Theme 5: Accelerating production of renewably sourced heat delivered through district heating networks.

Vattenfall produces and distributes more heat than any other business in Europe. In 2010 it delivered 44.5 terawatt hours equivalent of heat to urban customers in Sweden, Germany, Netherlands, Denmark, Poland and Finland. The vast majority of this heat was distributed through district heating networks. Vattenfall operates many of these networks, often in partnership with municipalities. The heat is produced from combined heat and power plants (CHP) located in proximity to urban areas using, increasingly, locally sourced renewables fuels such as biomass.

Vattenfall’s heating business has grown over sixty years with a number of drivers promoting that growth. These drivers include planned growth in household numbers; post war power plant deployment policy directing use of CHP; in reaction to 1970’s oil price shocks; and, lately in the drive to promote carbon emission reductions through enhanced efficiency and a switch to more sustainable fuel sources.

Interestingly, whilst energy efficiency is expected to reduce total demand for heat in Europe demand for heating from district schemes is expected to grow because energy is produced more efficiently through CHP plants\(^10\).

Also worth noting is that infrastructure investment requirements for district heating schemes can be significant and may require incentives to be installed. Vattenfall

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\(^8\) The Committee on Climate Change; The Renewable Energy Review (Executive Summary) [http://hmccc.s3.amazonaws.com/Renewables%20Review/Executive%20summary.pdf](http://hmccc.s3.amazonaws.com/Renewables%20Review/Executive%20summary.pdf)

\(^9\) Marine Energy Array Deployment, run by the Technology Strategy Board [http://www.innovateuk.org/content/competition/marine-energy-supporting-array-technologies.ashx](http://www.innovateuk.org/content/competition/marine-energy-supporting-array-technologies.ashx)

\(^10\) Vattenfall 2010 Annual Report (2011); page 22 [www.vattenfall.com](http://www.vattenfall.com)
believes that a possible combination of publicly supported grant funding, incentives for the electricity part of renewably fuelled CHP and the Renewable Heat Incentive could promote the deployment of green, efficient district heating networks in Scotland.

Whilst Vattenfall currently has no plans to invest in the development and distribution of heat services in Scotland we would be happy to share our experience with the Committee.

Vattenfall
March 2012
Annex – Vattenfall activity

Vattenfall AB
Vattenfall is a leading European energy company owned by the Swedish state. It is the sixth largest utility, sixth largest generator of electricity and the biggest producer of heat through thousands of kilometres of district heating networks. It produces this energy from six sources: coal, gas, nuclear, wind, biomass and hydro.

Vattenfall in Scotland
Vattenfall’s principle activity in Scotland is the development and operation of onshore wind. We currently operate Edinbane Wind Farm\textsuperscript{11}, on the Isle of Skye. We are proud of our strong relationship with the community on this part of Skye. It is also worth noting that Vattenfall contracted with Dingwall-based RJ McLeod to undertake civil engineering works for the £50 million scheme.

We also have in development five onshore wind farms, including the consented Clashindarroch Wind Farm\textsuperscript{12} in Aberdeenshire. If developed successfully all of these projects would require more than £100 million of capital expenditure. We are committed to contracting with the local, regional and national supply chain where we can and so we would expect any capital expenditure in Scotland to benefit Scottish business.

Vattenfall is also a project partner with the Aberdeen Renewable Energy Group and Technip to develop and operate the European Offshore Wind Deployment Centre\textsuperscript{13}, in Aberdeen Bay. The Deployment Centre will prove itself important to the development of offshore wind around the world. This is because it will provide an opportunity for the deployment of ‘first run of production’ offshore wind turbines to demonstrate readiness for full scale commercial deployment. This is important to help drive down the levelised energy cost of offshore wind because it will increase competition in the turbine and foundation supply chains and promote innovation. It is the Project Partner’s vision to see the development of Scotland’s north-east as a hub of innovation and expertise in the development of offshore wind, strongly linked to the oil and gas industry, and at the same time stimulate the region’s economy. By extension it will place Scotland at the centre of offshore wind development globally and potentially prove a catalyst for the creation of a strategic Scottish cluster in the global offshore wind supply chain.

In Ocean Energy we have joined with Edinburgh-based Pelamis Wave Power to develop a wave power array off the Shetland Islands. The project, called Aegir\textsuperscript{14}, is in the early stages of development. We hope to be able to purchase a Pelamis machine, test its capability and if successful develop a multi-machine array off Shetland with up to 12 machines. If in turn this is successful we would seek to extend this into a larger array with additional machines.

The potential scale of the development and the potential of wave power around the Shetland Islands led to a Memorandum of Understanding being signed last year between Vattenfall, the Shetland Charitable Trust and the Council to explore the sustainable development of its ocean energy resource. We believe this is an innovative approach to community engagement necessary because of the novel

\textsuperscript{11} http://www.vattenfall.co.uk/en/edinbane-wind-farm.htm
\textsuperscript{12} http://www.vattenfall.co.uk/en/clashindarroch.htm
\textsuperscript{13} http://www.vattenfall.co.uk/en/aberdeen-bay.htm
\textsuperscript{14} http://www.aegirwave.com/
technology being used and the importance of ensuring the local community benefits from the development of ocean energy around its shores.

Lastly, in Scotland we are part of a consortium, NorthConnect\textsuperscript{15}, to investigate, in partnership with SSE and others, electricity network interconnection between north east Scotland and Norway. Whilst in the early stages of feasibility assessment, Vattenfall believes that greater levels of integration across Europe and between the Continent and the UK can do much to promote the investment in reliable, affordable low carbon electricity generation.

**Vattenfall in the rest of the UK**

Vattenfall operates, develops and supports three technologies in England and Wales.

In onshore wind we have an extensive portfolio of schemes, including the under construction Swinford Wind Farm in Leicestershire. This project demonstrates our commitment to the UK supply chain because we have contracted with a Welsh civil engineering firm and ensured the wind turbine supplier sources steel towers from Mabey Bridge, a UK manufacturing company. Both contracts, for an 11-turbine wind farm, will sustain over 200 jobs for the period of works.

Vattenfall is among the world leaders in the development, construction and operation of offshore wind. We recently completed commissioning of the Ormonde Offshore Wind Farm, off the Cumbria Coast. This 30-turbine wind farm uses Fife-based Burntisland Fabrication’s steel jackets as foundations for world’s largest commercially available wind turbines. The Committee visited the site at Methil in 2010 ahead of their disembarkation from Fife\textsuperscript{16} and learnt that this single contract for 31-jackets secured employment for more than 370 skilled workers in Scotland.

We are also in a joint venture with ScottishPower Renewables to develop one of the major Round 3 offshore wind energy zones. The East Anglia Offshore Wind Farm could deliver up to 7.2 gigawatts of capacity. It is our involvement in schemes such as these which makes developments like the European Offshore Wind Deployment Centre such a strategically important project.

Elsewhere in English waters we operate two schemes, one of which, Thanet, was until recently the worlds largest operating offshore wind farm.

Finally, it is worth noting that we participate in the development of carbon capture and storage technology\textsuperscript{17} in the UK. This is in support of SSE and Doosan Babcock at SSE’s Ferrybridge plant in Yorkshire.

Jason Ormiston
Head of Public & Regulatory Affairs in the UK
Vattenfall

\textsuperscript{15}http://www.vattenfall.co.uk/en/archive-details.htm?newsid=84B36BC3E7A3486DB51C5709FCC825AA&WT.ac=search_success
\textsuperscript{17}http://www.vattenfall.com/en/ccs/ferrybridge.htm