

Forth and Tay Windfarm Developments: the next steps

North Berwick Seabird Centre, 24 October 2019

The Forth Estuary Forum hosted an event in partnership with the North Berwick Seabird Centre on offshore windfarm / wildlife interactions on the 24th October 2019. Three speakers: Ewan Walker, Ben King and Francis Daunt of EDF Renewables, Red Rock Power and the Centre for Ecology and Hydrology (CEH) respectively gave presentations which were then followed by questions from the attendees.



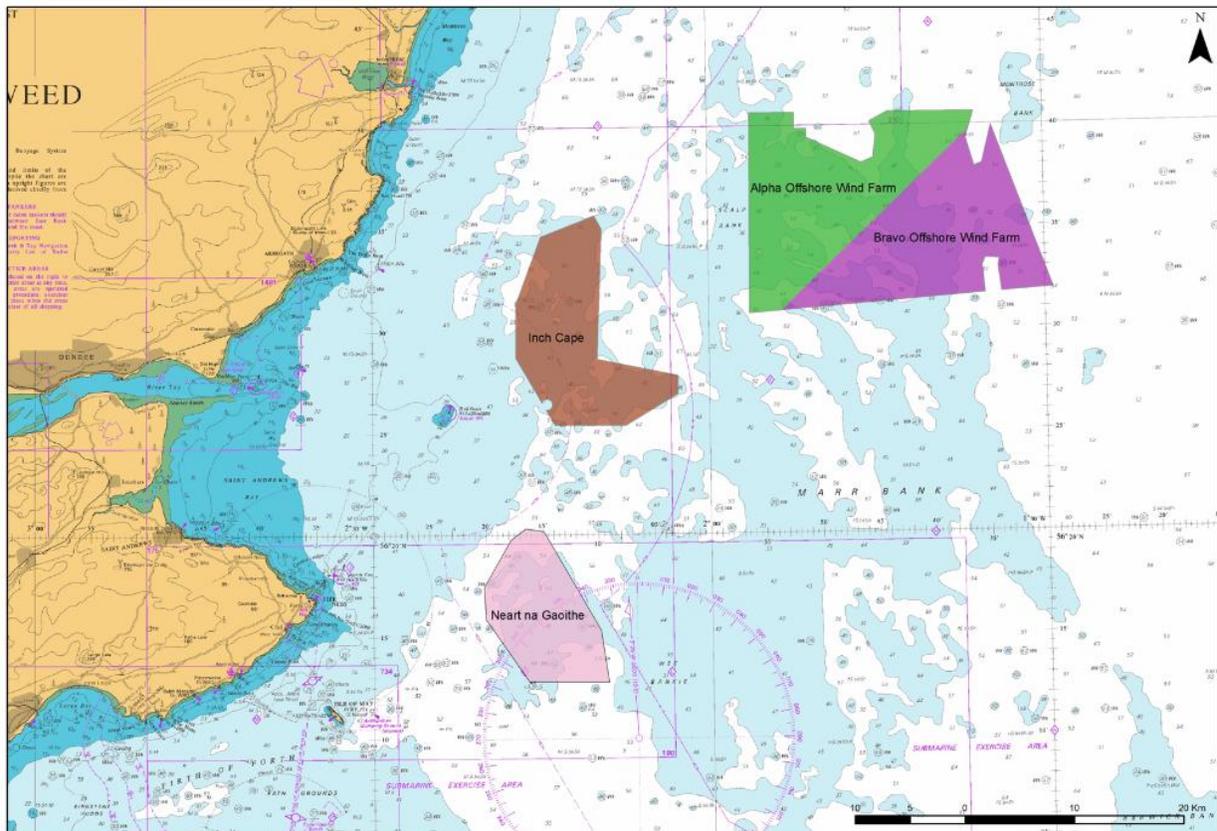
The Neart na Gaoithe windfarm will have 54 turbines 15km off Fifeness, with construction due to start in mid-2020 and finish in 2022; grid connection will be at Crystal Rig onshore windfarm in East Lothian and the turbines will provide power for 375,000 homes.

Data for the proposed Seagreen Alpha and Bravo sites (Scottish and Southern Electricity) which will lie further offshore were also presented, with construction due to start in April 2021. Preconstruction monitoring for birds and marine mammals is currently underway.

The Inch Cape project will be 50km north of North Berwick with connection to the grid at Cockenzie. There was discussion on how windfarms are tackling CO2 reduction: in 2018, offshore wind produced enough electricity to power 6.9m UK homes (26%). As well as reducing carbon emissions, development of offshore wind is resulting in other benefits. Requirements for EIA and related licencing mean that wind farm projects typically need to collect many years of monitoring data (pre-application, pre-construction, operational). This data gets collated and becomes publicly available for other uses. There is also research ongoing on how offshore wind farms can be used to maximise benefits, e.g. by planting oyster beds and using specialist materials that promote seabed community growth.

Forth and Tay Offshore Wind Farms

Project Name	Developer Name	No. of turbines	Capacity	Construction date
Neart na Gaoithe	EDF Renewables	54	450 MW	Onshore Nov 2019; Offshore mid-2020
Seagreen	SSE Renewables	Up to 150	Up to 1500 MW	2020
Inchcape	Red Rock Power	72	784 MW	tbc



Offshore Windfarm sites

The UK holds internationally important numbers of seabirds e.g. 91% of the global population of Manx Shearwaters and 68 % of the population of Northern Gannets; seabirds have declined in the last three decades but with marked regional differences, with pressures from climate change, predators, pollution, and marine plastics. There was discussion on ongoing research on the Isle of May in the Forth, with breeding success declining with increasing sea surface temperature. Windfarms may impact seabird populations due to collision risk, displacement and barrier effects. Forth/Tay wind farm assessments are aiming to quantify these effects and are a great opportunity to address these questions in well studied populations.

Further information on these developments are available at: <https://nngoffshorewind.com/>; <https://www.seagreenwindenergy.com/>; <http://www.inchcapewind.com/home>;

<https://www.ceh.ac.uk/our-science/science-areas/biodiversity> and also at the Marine Scotland website: <http://marine.gov.scot/marine-projects>.

The following is a summary of key points raised in the Q&A session following the three presentations:

How to improve windfarm monitoring going forward?

Forth windfarms have an opportunity that hasn't been afforded previous projects because there are very well studied animal populations. The companies are in the process of putting together a package of different measures to monitor different species and different impacts from different Special Protection Areas and are also looking at measures such as radar and cameras on some of the turbines to see whether collisions are happening.

How will the data be used in the future?

The data collected is required as a condition of the consents to monitor wildlife, and it is a requirement of the developers and the regulators to work together to design a monitoring regime which is appropriate for that project but will change over time, learning from previous projects.

Marine Scotland arrange symposia: everyone within the industry get together to share lessons learned. In terms of consistency of monitoring around windfarms and the sensitivities around seabirds, monitoring will change depending on the area in question, whether winter populations, breeding populations, individual species are being investigated. The same approach may not be employed at every windfarm.

What will windfarms do to address particular issues?

There are technologies to reduce collision risk, that have been used onshore: a camera system with sensors to sense birds coming close to the turbines which can be set for different distances, and when a bird comes close to the rotor it emits a noise. They have yet to be tested offshore.

If there was a really unexpected and extremely high level of impact on seabird populations in the windfarms, Marine Scotland would have the power to shut it down.

Are artists' impressions of the windfarms from viewpoints e.g. North Berwick available?

Artists impressions are available from the developers' websites and Marine Scotland website (see above). Environmental Impact Assessments are available with non-technical summaries and photo montages of the windfarm appearance.

What is the carbon balance of constructing turbines in such numbers?

There was a study that was done on fabrication of wind turbines in a Saudi Arabian port in a theoretical environment: the amount of time that it would take to repay the carbon that would be associated with construction in the life of a turbine would be a single year. Therefore within a 25 year operational lifetime, there are 24 years of net gain after the carbon is paid back.

Why were the proposed areas chosen?

This was due to a combination of water depth and ground conditions. The East Coast is an easier place to build wind farms compared with the hard rock ground conditions off the west coast of Scotland. The west coast conditions are also much rougher with greater wave height *etc.*

Water depth is also limited to around 50 meters, so the farms will interact with e.g. banks where marine mammals, fish and seabirds gather.

Floating foundations are becoming more feasible. Presently there are only testing demonstrator examples e.g. off Peterhead. The technology will develop over the next 10 or 20 years.

What are the implications for pile driving on the sea bed?

These proposed sites will be mostly drilling since the ground conditions demand that drilling is the best way to install the pylons; there will however be some pile driving but not very much.

Noise going into the marine environment is one of the main concerns about construction, but monitoring work has been more focussed on marine mammals rather than fish.

When pile driving is happening, there is a standard practice of acoustic deterrents or marine mammal observers; acoustic deterrents will scare away marine mammals so that they're not in the vicinity of the actual pile driving.

Also there will be marine mammal observers on the construction vessels, to make sure that there's nothing in the water around the driving location.

Where will the turbines be constructed onshore?

One of the companies is at the point where they are signing contracts for all the different pieces of work so can't say anything specific, but the company will adhere to their supply chain plan.

The two sites have differing turbine heights due to differences in the timing of consenting *etc.* and advancements in technology. Will the different heights have an impact on seabirds?

One of the speakers has been working on theoretical impacts of the sites in terms of displacement rather than collision risk so couldn't comment. However, the rotor height is a key factor in the risk of collision. The higher the rotor, the lower the risk of collision, and one of the developments has increased rotor height to reduce impact. A bigger gap between the sea surface and the rotor allows more birds to go under.

Are the current ecological impact assessments fit for purpose?

There was some discussion about how long studies should be undertaken *post-construction*. When the impacted species are long lived, e.g. birds and mammals, where the effects may not be felt immediately, there's a much more complex conversation that needs to be had. For example, bird effects can have 'carry over' or 'downstream effects' that aren't felt immediately so may not be detected in short term surveys.

There may also be sub-lethal effects that change behaviours and have knock on consequences in subtle ways. It cannot be assumed that effects aren't there if they are hard to measure.

The vast majority of seabird mortality occurs in the winter: this is important since a lot of seabirds stay in UK waters, although some species e.g. kittiwakes go to the Labrador Sea off Canada. However, a significant proportion of puffins, guillemots and razor bills are staying quite close to the colony for significant parts of the year, so winter ecology is crucial and hasn't been assessed in nearly such detail in this context. Winter is when the vast majority of adult mortality takes place.

What other interactions with wind farm sites and seabirds are there?

Many bird species moult their feathers once a year and is an extremely important process because they have to recondition themselves and is very costly since they are flightless during this six week period. They have very few options to move so they go to reliable high energy foraging spots and stay there. There could be a severe potential bottleneck to the population if development sites were to overlap with these foraging sites during the moulting period.