

Substation

Construction of the substation for the wind farm is likely to take 2 years and will include:

- Foundations will be designed and created to accommodate the weight and scale of the electrical equipment.
- Some of the equipment may be housed whilst others will be uncovered.
- Landscaping will be required to reduce visual impact

Detailed design of the substation is yet to be undertaken. There are two main options for the technology used to connect the wind farm to the existing substation. We will use either Alternating Current (AC) technology or Direct Current (DC) technology depending on the final power output of the wind farm.

If using AC technology the substation will be:

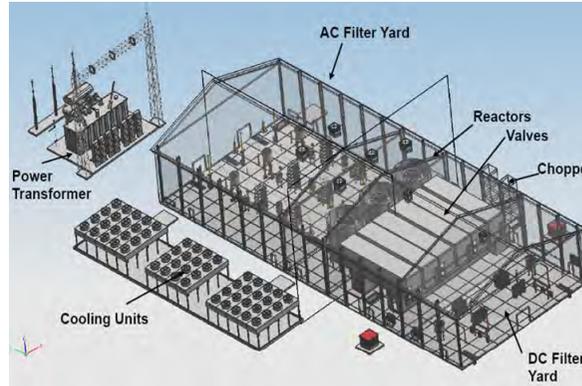
Approximately 140m wide by 150m long



Example of an AC substation layout

If using DC technology the substation will be:

Approximately 200m wide by 200m long and 25m in height



Example of a DC substation layout

Get in touch

Whether formal or informal, your views and opinions about the proposed offshore wind farm, even at this early stage, are welcome and valued. If you have any comments, queries or views about the proposals please feel free to contact BOWL at the address below.

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Digital copies of the Transmission Works Environmental Scoping Report are available from the project website at:
www.sse-beatrice.com



BEATRICE TRANSMISSION WORKS INFORMATION LEAFLET

Beatrice Offshore Windfarm Limited (BOWL) is the joint venture partnership formed between SSE Renewables (75%) and SeaEnergy Renewables (25%). In February 2009 we were awarded an exclusivity agreement by The Crown Estate to develop the Beatrice Offshore Wind Farm in Scottish Territorial Waters.

SSE Renewables is responsible for the development of Scottish and Southern Energy's (SSE) renewable energy projects across Europe. It is the UK's leading generator of renewable energy with over 2,300 Megawatts (MW) of renewable electricity projects consented.

SeaEnergy Renewables Limited (SERL) developed and delivered the world's first deep water wind farm development - the Beatrice demonstrator project (10MW) which is owned by Talisman Energy and SSE and is located in the Outer Moray Firth.

Where is it?

The Beatrice Offshore Wind Farm site is located as follows:

- On the north-western most point of the Smith Bank in the Outer Moray Firth.
- Approximately 13.5km from the Caithness coastline.
- This site is approximately 19km long and 9km wide.

There are a number of features located nearby:

- The existing Beatrice demonstrator turbines 11km to the south west.
- The existing Jacky oil platform is located just outside the site to the south west.
- The proposed Moray Firth Round 3 offshore wind farm zone is located directly to the east.

What are the key components?

Wind Farm

The wind farm will comprise the following:

- Between 142 and 277 turbines (tower, nacelle, rotors and hub).
- Turbine sub-structure and foundations.
- Electricity cables at the site connecting turbines to the substations.
- Up to 3 offshore electricity substations.
- Up to 3 meteorological masts.

The Transmission Works

In order for the electricity generated at the Beatrice offshore wind farm to reach the centres of demand it will need to be connected to the national electricity grid.

We have applied to National Grid for permission to connect to the grid and have received a grid connection offer from them which allows us to connect into the existing electricity substation at Blackhillock. This offer is based on available network capacity and connectivity to the wider electricity grid.

Grid Infrastructure

To make this connection to the existing substation at Blackhillock we need to develop the following infrastructure:

- **Offshore:** approximately 75km of subsea cable to the landfall point.
- **Onshore:** approximately 24km of underground cable
- **An electricity substation** nearby the existing substation at Blackhillock.

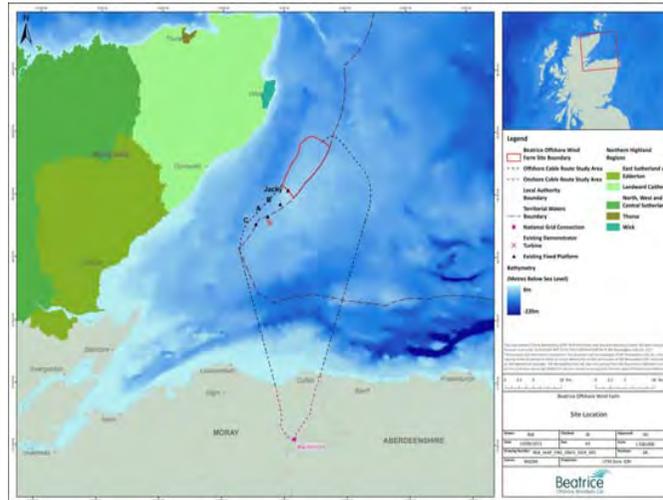
The onshore electricity cable will run from the land fall point on the coast and connect the dedicated wind farm substation to the existing substation at Blackhillock.

Following a site selection study looking at engineering feasibility and environmental impacts, we have identified a search area within which to develop the grid infrastructure.

No decisions have been made about where we will locate the substation, or the route the cables will take. We are therefore asking for comments from all interested parties.

We will now undertake more detailed assessments and studies to identify a preferred cable route and substation site within the study area. No decision will be made until full consideration has been given to any comments, views and suggestions provided by interested parties.

The diagram below shows the study area that we propose to use for the cables and the substation.



Study area for the offshore and onshore cable and substation

Offshore cable route

Offshore cable laying will require a number of specialist vessels including a large construction vessel and a number of specialist support vessels.

Offshore construction will be carried out 24hrs a day, 7 days a week and will take approximately 2 months.

There are a number of methods that could be used to install the offshore cable depending on the seabed type. These may include:

- Dredging a trench where the cable is laid first then backfilled with sediment.
- Ploughing the cable into the sediment where the cable is backfilled.

- Jetting the sediment to allow the cable to be buried deeper.

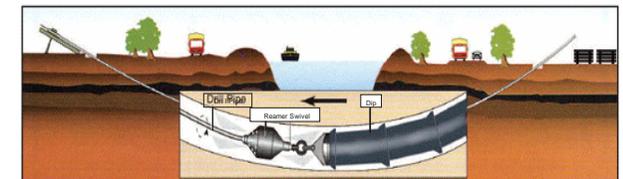


A typical cable laying vessel with cable trencher

Onshore cable route

The onshore cable will be underground. The installation of the cable will involve:

- Ground preparation work if required.
- Trenches will be dug with spoil stored for backfilling.
- Directional drilling may be employed for shore sections and crossing points such as roads, rivers and railways to avoid impacts to sensitive areas.
- Underground jointing pits may be required every 0.5 – 1km.



PULL-BACK



Cable installation onshore using directional drilling