MarramWind

MarramWind Offshore Windfarm

Consultation Two Booklet

2024

Contents

Welcome

MarramWind is a proposed floating offshore windfarm located off the north-east coast of Aberdeenshire. This exciting project, one of the first commercial floating offshore windfarms in the world, has the potential to deliver up to three gigawatts (GW) of renewable electricity, which could power the equivalent of more than 3.5 million homes.

In January 2022, Crown Estate Scotland awarded ScottishPower and Shell an Option to Lease Agreement for the MarramWind offshore windfarm and since then we have been developing our proposals. From 28 May – 1 July 2024, we held our first round of statutory consultation, presenting our early proposals and inviting stakeholder feedback. We have continued to refine the project design to account for this feedback and are now presenting our updated proposals as part of our second round of statutory consultation, which runs from 9 October to 19 November 2024. Throughout this information booklet, we have illustrated how stakeholder feedback received during the first round of statutory consultation has been considered in the development of the project.

This second round of statutory consultation is another key milestone in the preparations for our Environmental Impact Assessment (EIA) and consent applications, which we intend to submit in autumn 2025. We now invite you to read through this booklet to learn more about our updated proposals and share your views. Your feedback is important and will help us to develop a final project design for submission as part of our consent applications to the relevant authorities.

Information on how to respond to this consultation can be found in the ‘Have Your Say’ section of this booklet.

Working Together for a Cleaner Future

ScottishPower and Shell have over 70 years' combined experience in Scotland's offshore environment, with over 50 years' experience offshore in the North Sea. We also have over 15 years of combined experience in floating offshore wind energy. As world-leading energy developers, we bring together decades of experience working offshore, a long history of working in Scotland, and an innovative approach to delivering offshore energy projects.

About ScottishPower

ScottishPower is part of Iberdrola Group, a global energy leader and a major producer of wind energy. Responsible for progressing Iberdrola Group's renewable energy projects in the UK, ScottishPower manages the development, construction and operation of windfarms throughout the world and currently has 40 operational windfarm sites generating over three gigawatts (GW) of renewable energy.

ScottishPower continues to be one of the leading renewables developers in the UK and is investing almost £3 billion between 2023-25 across offshore and onshore wind and solar generation, increasing home grown green electricity generation in the UK to support energy security.

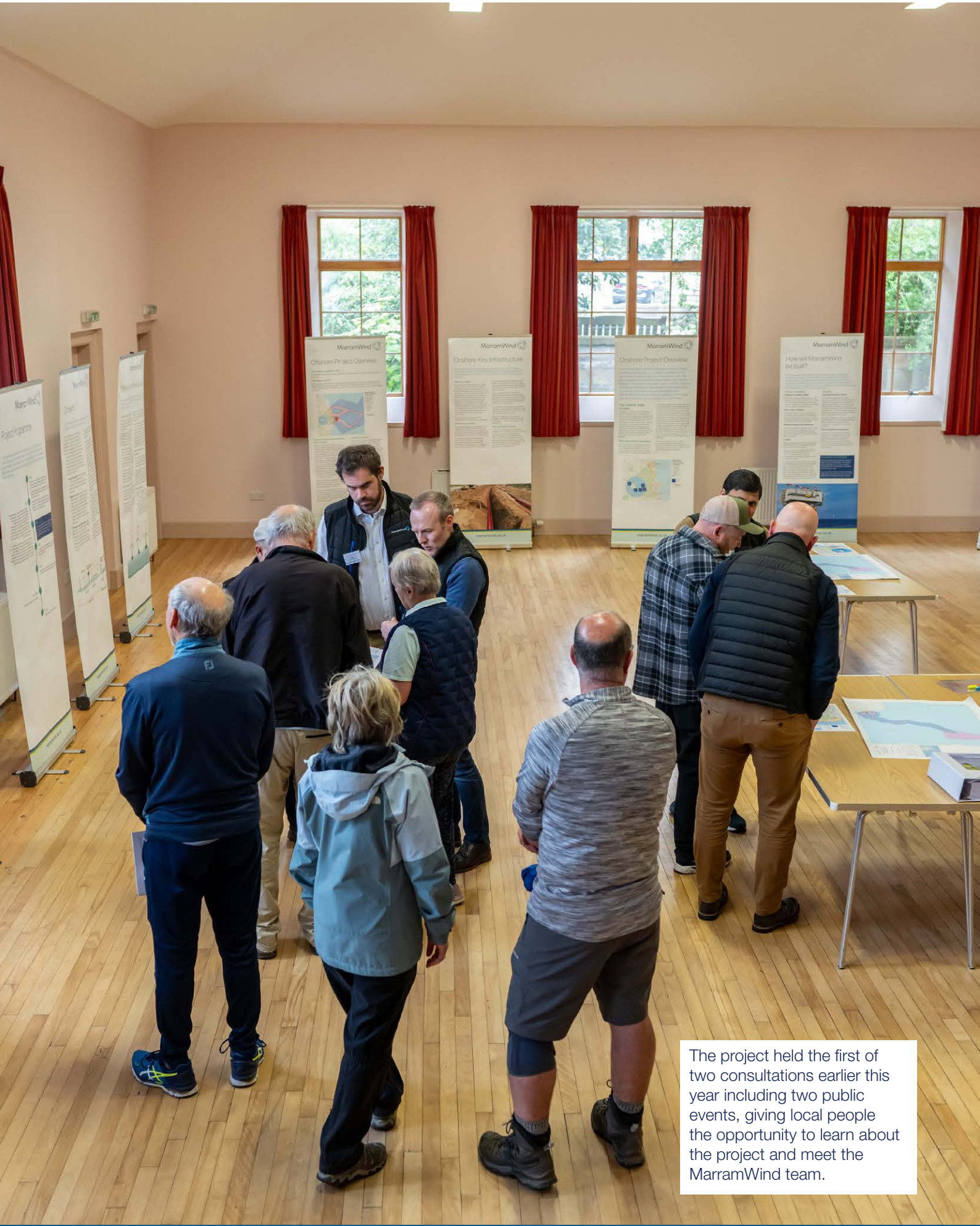
ScottishPower is the first integrated energy company to generate 100% green electricity in the UK. Focused on wind energy, smart grids and driving the change to a greener future, ScottishPower is investing over £8m every working day to make that happen.

About Shell

Shell has over 50 years of experience delivering complex offshore projects in the North Sea, and today employs around 1,200 in the North-East of Scotland. Floating wind is a natural extension of our capabilities in deeper offshore projects.

Shell today has more than 2GW of offshore wind capacity in operation and under construction. Globally, Shell is building an integrated power business that will provide customers with low-carbon and renewable energy solutions.

Shell's target is to become a net zero emissions energy business by 2050.



The project held the first of two consultations earlier this year including two public events, giving local people the opportunity to learn about the project and meet the MarramWind team.

About MarramWind Floating Offshore Windfarm

The proposed MarramWind floating offshore windfarm will consist of floating wind turbines. Situated in deep waters approximately 75km off the north-east coast of Scotland at its nearest point, the wind turbines will be barely visible from shore.

The renewable electricity generated by MarramWind will play a pivotal role in achieving Scottish and UK net zero targets for 2045 and 2050 respectively, while also supporting energy security and promoting energy innovation.

Optimising Sustainability

We are adopting a strategic approach, reflective of ScottishPower and Shell's sustainability targets. We have identified four sustainability key priority areas:

1. **Emissions Reduction:** we are committed to minimising, monitoring and measuring our greenhouse gas emissions where feasible.
2. **Embedding Circularity:** our ambition is to use resources and materials efficiently and optimise reuse and recycling across the project lifecycle.
3. **Nature Positive Development:** we are committed to ensuring negative effects on biodiversity are avoided where possible or mitigated effectively and that the project has an overall positive benefit on biodiversity.
4. **Optimising Social and Economic Performance:** we will seek to maximise the project's net economic effect while supporting local and regional economic priorities, including employment and skills development and associated business/supply chain opportunities.

We are adopting a holistic approach to sustainability, with all key priorities considered together. For each key priority we are reviewing options for enhancing sustainability, including exploring existing design options, new technologies and partnership opportunities. We will undertake studies to further explore and select which options can be taken forward. By adopting this approach, we will strive for an optimised sustainability performance that will benefit the environment and local communities.

For illustrative purposes only. The turbines used on MarramWind will have a different appearance at the water's surface.

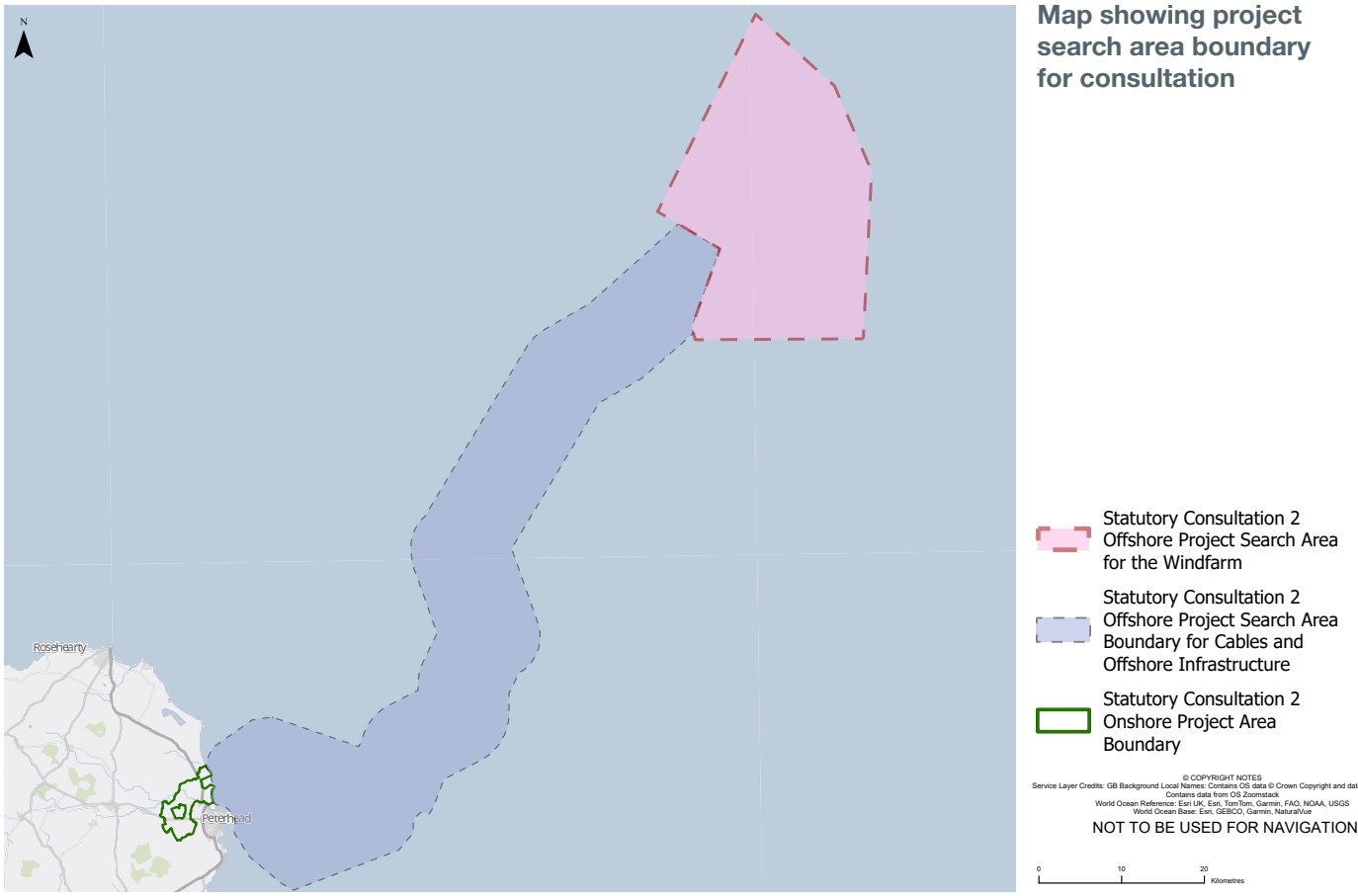
MarramWind is being developed with sustainability embedded as a core value, from development through to construction, operation and maintenance, and decommissioning.

MarramWind has defined a project search area boundary, shown in the map below, which has been refined since our first round of consultation. The expectation is that this boundary will be further refined in the future, as the best locations for the infrastructure are identified.

The current project search area ensures that we can adjust the project design through our design development, environmental assessments, and stakeholder feedback. Further information about the refinements made to the offshore and onshore project area boundary can be found in the 'Offshore Project Updates' and 'Onshore Project Updates' sections of this booklet.

For illustrative purposes only. The turbines used on MarramWind will have a different appearance at the water's surface.

MarramWind, generating up to 3GW of power, will connect to the national grid via the proposed Scottish and Southern Electricity Network's (SSEN) Netherton Hub substation to the west of Peterhead. This was confirmed by National Grid in their Holistic Network Design (HND) report and subsequent follow up exercise. While the HND is a crucial step for renewable energy connection, it is part of a larger picture. The Beyond 2030 Report builds on the HND, aiming for a clean, secure, and affordable energy future throughout the 2030s. This ambitious plan aligns with the UK Government's ambition to have a fully decarbonised electricity system by 2035 and will support delivery of the projects leased via ScotWind.



Map showing project search area boundary for consultation

Consents and Project Programme

The consenting process

Under the Scottish Government's National Planning Framework 4, MarramWind is classified as a National Development. This means that the need for the project has been established through Government policy, but that planning permission, marine licences and other consents or licences are still required for construction and operation. We will need to make separate applications for the following key consents for both the onshore and offshore elements of the project:

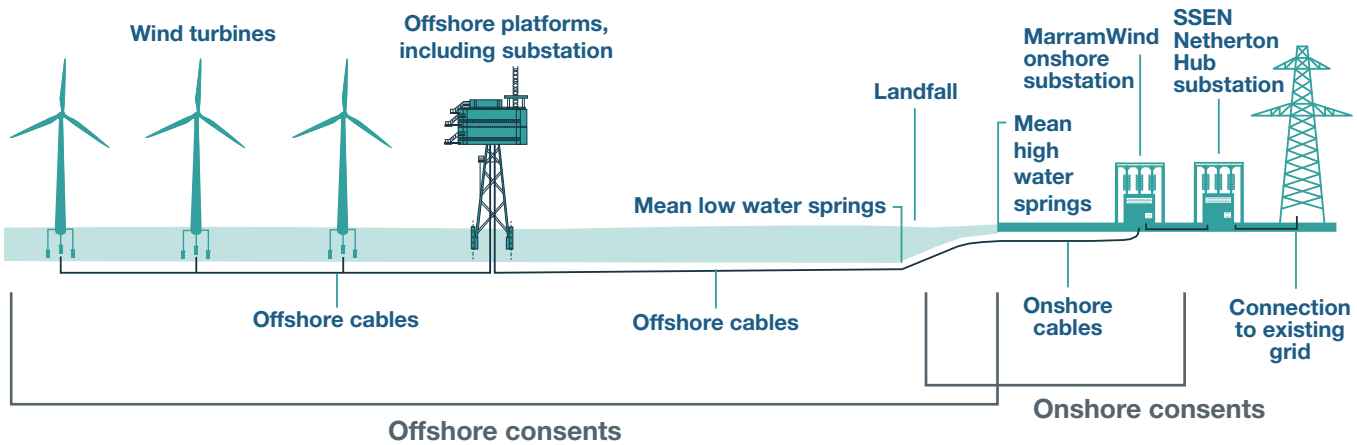
- **Section 36 consent,** under the Electricity Act 1989 (S36), is required for the offshore windfarm site. Permission is granted by the Marine Directorate (on behalf of Scottish Ministers), referred onwards as the Marine Directorate.
- **Marine licences,** under the Marine (Scotland) Act 2010 (0-12 nautical mile) and the Marine and Coastal Access Act 2009 (12-200 nautical mile), the Project is seeking marine licences. This is to undertake marine licensable activities, including the installation of cables or other infrastructure on or within the seabed. Permission is granted by the Marine Directorate.
- **Onshore planning permission,** under the Town and Country Planning (Scotland) Act 1997 (TCPA) is required for all infrastructure located above the average level of low tide (known as Mean Low Water Springs (MLWS)) and is granted by the local planning authority, Aberdeenshire Council.

Some consents and licences overlap between the MHWS and MLWS – this area is known as the intertidal zone. This consultation presents the project as a whole, including onshore, intertidal and offshore infrastructure.

Our first consultation, held earlier this year, was delivered in line with requirements set out in the TCPA. This second consultation, and the events we are hosting within the current consultation period will further fulfil the requirements set out by the TCPA, as well as the requirements for the relevant marine licences.

We will also be undertaking an EIA, which is the process of assessing the likely significant effects the project could have on the environment. In addition, we will prepare reporting to support a Habitats Regulations Appraisal (HRA). Further information on our EIA and HRA can be found in the 'Environmental Impact Assessment' and 'Habitats Regulations Appraisal' sections of this booklet.

The diagram below shows the infrastructure that may be required for the onshore and offshore elements of MarramWind, as well as which sections of the project are related to the different consents we need to apply for. Further information on the onshore and offshore infrastructure is provided in the 'Offshore Key Infrastructure' and 'Onshore Key Infrastructure' sections of this booklet.



Project programme

Developing MarramWind involves significant work, but our priority is to deliver a project that minimises effects on local communities and the environment, while delivering renewable energy. The programme below sets out the process and anticipated timeline towards developing MarramWind.

2022

ScottishPower and Shell were awarded rights to develop MarramWind within Plan Option NE7 of Scotland's 'Sectoral Marine Plan - Offshore Wind Energy (2020)' as part of Crown Estate Scotland's ScotWind leasing round. Environmental surveys and data gathering commenced in the marine and terrestrial environments to inform the EIA and project design.

2023

The MarramWind Scoping Report was submitted to Aberdeenshire Council and the Marine Directorate. The Scoping Report is available on the project's website **www.marramwind.co.uk**.

A Public Drop-In-Day event was held in Peterhead for stakeholders to learn about the project. A supply chain event was also held for local businesses and suppliers.

2024

Two rounds of public consultation are being held, each including public events and online Q&A sessions, providing stakeholders with opportunities to view and feedback on the project proposals during the development stage.

Launch of STEM outreach programme to help raise awareness of future career opportunities in offshore wind.

2025

Submission of necessary applications and consents to the consenting authorities: Aberdeenshire Council and the Marine Directorate. During the subsequent determination period, stakeholders will have further opportunity to comment on the MarramWind proposals.

2026

Anticipated planning decisions to be made for the offshore and onshore consents. Updated Supply Chain Development Statement submitted to Crown Estate Scotland.

Late 2020s

Construction anticipated to commence, subject to consent.

2030s

MarramWind anticipated to become operational.

Listening to your feedback - planning for the future

You said...

"...MarramWind should consider future projects and potential extensions to the windfarm to minimise disruption."

Our response…

In the offshore environment, the wind turbine site is 684 km^2, which is large enough to accommodate up to 3GW of wind turbine capacity. We are seeking consent to optimise this maximum capacity and the EIA process looks at the maximum effect that MarramWind could have. It is highly unlikely we would seek to extend MarramWind beyond its current boundaries due to the limits of the lease.

The boundaries presented in this consultation for the onshore infrastructure, including the cables and onshore substation, are the maximum areas that will be required for construction and operation.

Offshore Key Infrastructure

The offshore infrastructure includes floating wind turbines, cables that connect the turbines together, offshore platforms, and cables that transmit the power generated to shore.

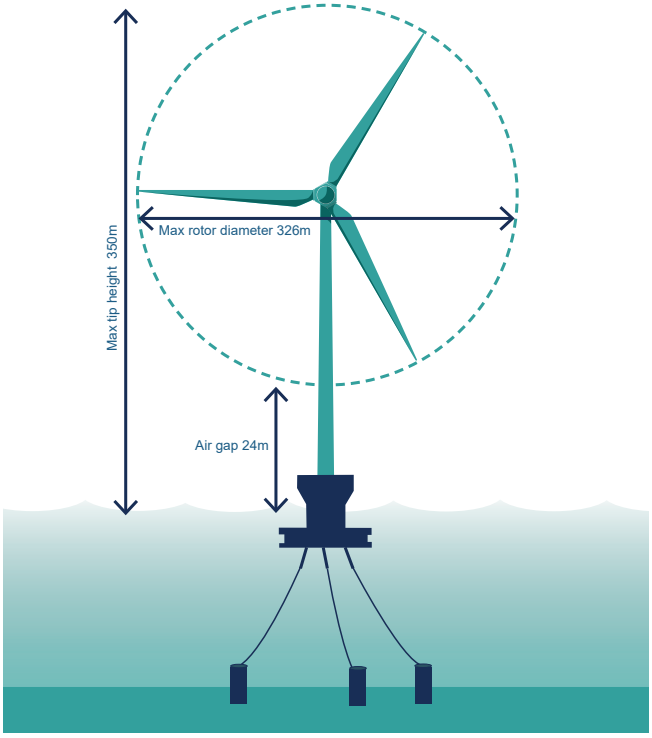
Electricity transmission

The electricity generated by our wind turbines will be transmitted by cables to the shore where they will connect to the onshore infrastructure and continue to a substation site and ultimately the national grid. We are currently reviewing different options for the transmission of the electricity generated by the offshore windfarm. These include High Voltage Alternating Current (HVAC) and High Voltage Direct Current (HVDC) transmission technologies, or a combination of the two.

The wind turbines will generate HVAC electricity, which is the electricity distributed by the national grid. It is common for offshore windfarms closer to shore to transmit electricity using HVAC transmission. As the transmission distances get longer, electrical losses increase. At a certain point, it becomes more effective to convert the HVAC transmission to HVDC transmission as HVDC cables do not experience electrical losses of the same magnitude as HVAC cables. The electricity is then converted back to HVAC at a converter substation onshore.

The infrastructure required for all the options is broadly similar, but HVDC transmission requires specific equipment for converting HVAC to HVDC electricity. This is done using an offshore converter station before being converted back to HVAC at an onshore converter station. The electricity is then connected to the national grid.

HVAC transmission in comparison may require an additional offshore platform approximately midway between the offshore windfarm and the onshore substation to house electrical equipment needed to stabilise the voltage of the electricity generated. Other differences include the number and size of the cables needed to deliver power to the national grid.



The floating wind turbines

The wind turbines have not yet been selected because turbine technology is advancing quickly and the models available at the time of construction will be more powerful and efficient than those available today. It is currently proposed that each wind turbine will individually have the capacity to produce up to 25 megawatts (MW) of power.

Depending on the final size of the wind turbines, the windfarm is expected to have between 126 and 225 turbines. The wind turbine specifications will vary depending on the size, as follows:

- Each wind turbine could have a **blade tip height up to 350m** from the water's surface, but as the windfarm will be located approximately 75km offshore at its nearest point, they will be barely visible from shore. The maximum rotor blade tip height depends on which turbine sizes are selected.
- The **maximum rotor diameter for a 25 MW wind turbine is expected to be around 326m**. Smaller turbine generating capacities are likely to have smaller rotor diameters. For the purposes of the EIA, MarramWind is assuming a maximum rotor diameter of 236m or 326m, depending on turbine size.
- Each wind turbine will have three blades, irrespective of turbine size. **The maximum rotor blade width is 5.1-10m** and the **maximum rotor blade length is 115-155m** depending on the selected turbine sizes.

- **Navigational lighting will be installed** on the wind turbines and floating units to reduce navigational and aviation risk in low light conditions. The specifics of this will be in line with relevant regulations and agreed with the Civil Aviation Authority and the Maritime and Coastguard Agency prior to installation.

Mooring and anchoring systems

Each wind turbine will sit on a floating unit that will be held in place by a mooring and anchoring system. The design of the mooring and anchoring system will depend on the size of wind turbine and floating unit used. A maximum of eight mooring lines will be required per floating unit. The exact number will depend upon the preferred mooring design for each floating unit type. Anchor type will also depend on the soil conditions and the maximum loads that the anchor needs to be able to withstand. Studies are underway to identify a preferred mooring design for anchoring each wind turbine to the seabed. This will include geotechnical surveys to determine the locally specific soil conditions. Further information on the options being considered will be available in the EIA, which will be available when we submit our application.

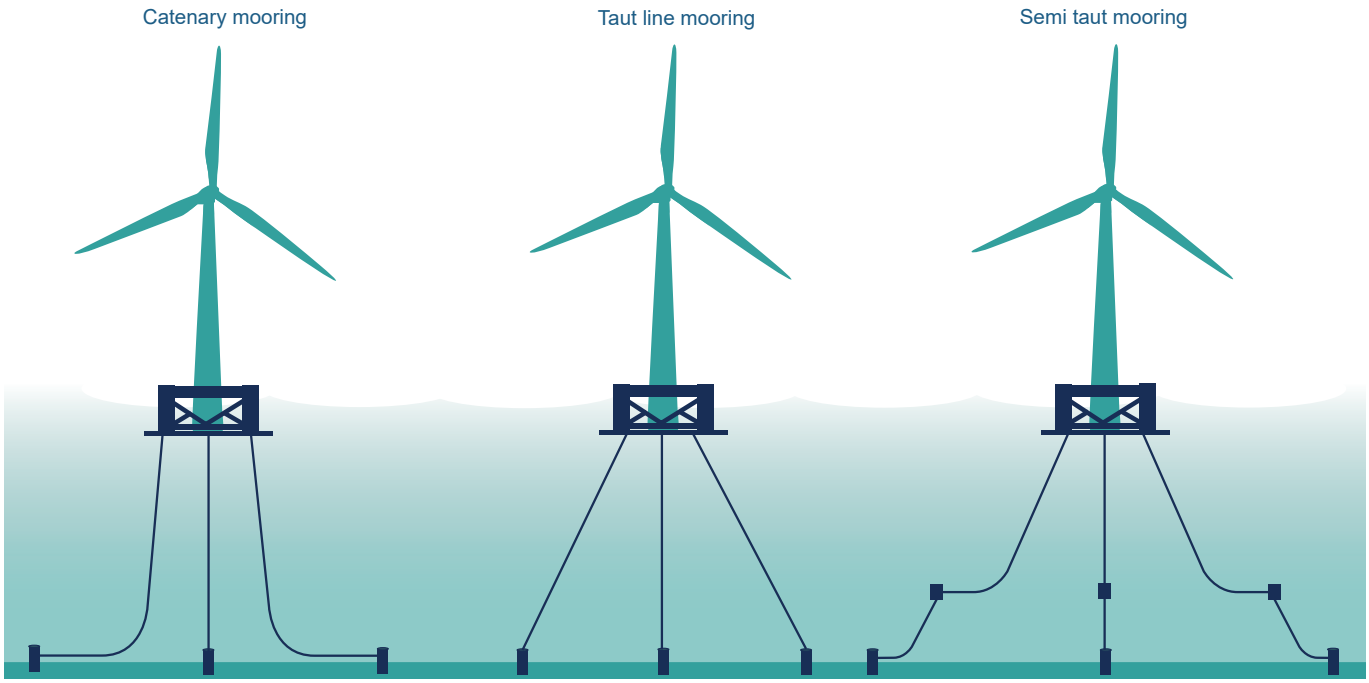
The mooring options currently being explored are catenary mooring, taut line mooring, and semi-taut mooring. The maximum worst case for the total mooring footprint will be calculated from the number of wind turbines, number of mooring lines, and anchor type dimensions. This will inform the assessments of benthic ecology, fish and shellfish ecology, and commercial fisheries.

Catenary moorings are more slack than other options, which make them suitable for areas where the water depth changes e.g. due to low or high tides. However, this option may involve the moorings resting directly on the seabed.

Taut line moorings are the tightest mooring lines. They take up less seafloor space and are better at keeping the wind turbine stable.

Semi-taut moorings are a combination of the taut mooring system and catenary mooring system. This option has shorter mooring lines and requires less seafloor space than the catenary system. Decisions on the most appropriate anchoring and mooring solutions are yet to be made as product development is advancing quickly and the future supply chain at the time of construction will have moved on from current product availability.

Further information on the options being considered will be available in our EIA. The chosen mooring system will comply with regulations, including navigational safety, and consider effects on the seabed and marine life.



Offshore platforms and substations

Offshore platforms will be necessary within the windfarm site to house electrical infrastructure, such as substation equipment or controls, and operational systems.

It is at these offshore platforms that the cables connecting the floating wind turbines connect to the cables that will transmit electricity to shore. The number of substations required for MarramWind will depend on whether the project chooses HVAC or HVDC technology (or a combination of both), and the layout of the windfarm site. Offshore accommodation options are being considered for project engineers and crew, with this likely to be provided in a module within the offshore substation. If HVAC technology is used, the length of the offshore cable route may require the installation of additional equipment to support transmission. This equipment will be located on offshore structures located at the approximate mid-point between the windfarm site and where the cables make landfall (where the cables come onshore).

Offshore and landfall cables

Electricity will be transmitted through offshore cables that connect the offshore windfarm with the onshore substation and then the national grid. The voltage, number and size of the cables required will depend on whether HVAC or HVDC technology (or a combination of both) is used.

The cables will be protected by burying them below the seabed for most of their length to landfall. In the few areas where cable protection cannot be achieved by cable burial, other methods will be used to protect them. This may include rock armour or concrete mattresses, the type, location and dimensions of which are yet to be determined and will be detailed in the EIA and marine licence application.

The maximum grid transmission route length offshore is 130-140km, depending on the precise locations of the landfall(s) and the offshore substation. The offshore cable corridor surveyed to date is typically 1-2km wide along most of its length. However, the final cable width is dependent on the water depth and will therefore be narrower in shallower water depths closer to the shore. The cables will be laid by a cable laying vessel in sections and joined together. The cable laying vessel buries the cables 1-2m beneath the seabed wherever possible.

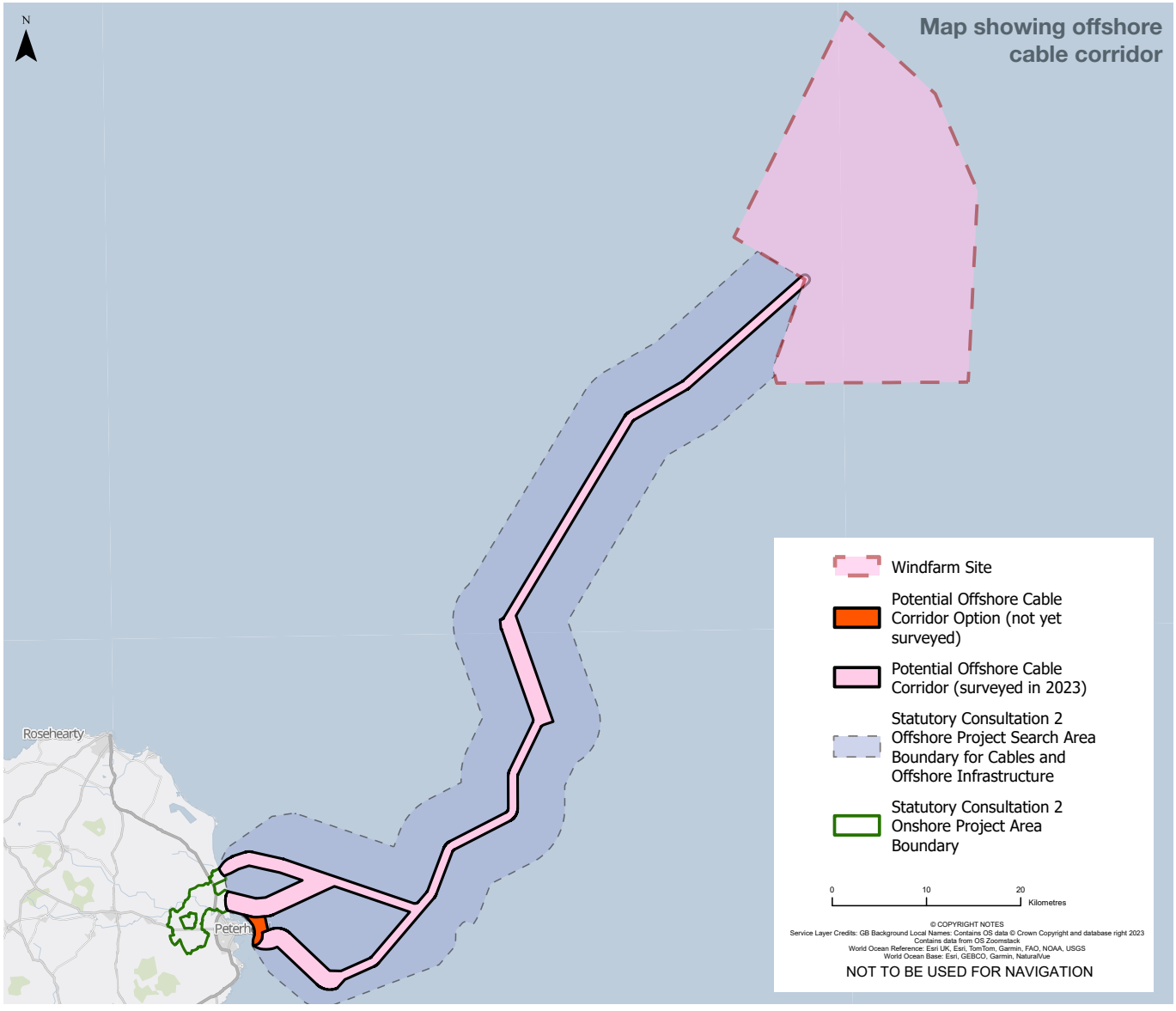
Offshore Project Updates

Since our first round of consultation, we have been working to refine our offshore project design. We have also been preparing to undertake collision risk modelling to determine the risk to seabirds from the wind turbines and analysing geophysical and environmental data obtained from the surveys we undertook in 2022 and 2023 to better understand the marine environment.

The offshore boundary includes the windfarm site itself and a broad potential offshore cable corridor for cables and offshore infrastructure between the windfarm and the coast, as shown on the map below. This corridor sits within a wider offshore project search area, which will allow space for potential changes to the offshore cable corridor as a result of our assessments.

The windfarm site

The windfarm site covers the area of Plan Option NE7, which was identified for development by the Scottish Government's Sectoral Marine Plan - Offshore Wind Energy in 2020. The windfarm site is 684km² and has water depths ranging between 87m and 134m. Work is ongoing to determine the windfarm site layout and exact locations of the required infrastructure. We are considering environmental sensitivities, marine users, seabed conditions, water depths, and the presence of existing infrastructure. The layouts are also being reviewed to enable co-existence with other projects such as those with licenses in the region.



Offshore cable corridor

Cable routing work is also ongoing to identify the optimal route for the offshore cables between the windfarm site and landfall(s) on the coast. This considers environmental sensitivities that need to be avoided as well as factors that could limit the technical feasibility of installation. We are engaging closely with technical stakeholders, such as NatureScot, commercial fisheries groups, and the Maritime and Coastguard Agency to understand how MarramWind's construction and operation could interact with other marine users in Scottish waters and what we can do to reduce effects and maintain navigational safety.

Landfall

At our first round of consultation, three potential search areas were presented where landfall(s) could be located:

- Scotstown Beach, north of Peterhead;
- Lunderton, north of Peterhead; and
- Sandford Bay, south of Peterhead.

Taking into consideration stakeholder feedback and the results of additional environmental and technical assessments, Sandford Bay has been discounted as a landfall option and the onshore and offshore cable routing associated with Sandford Bay removed.

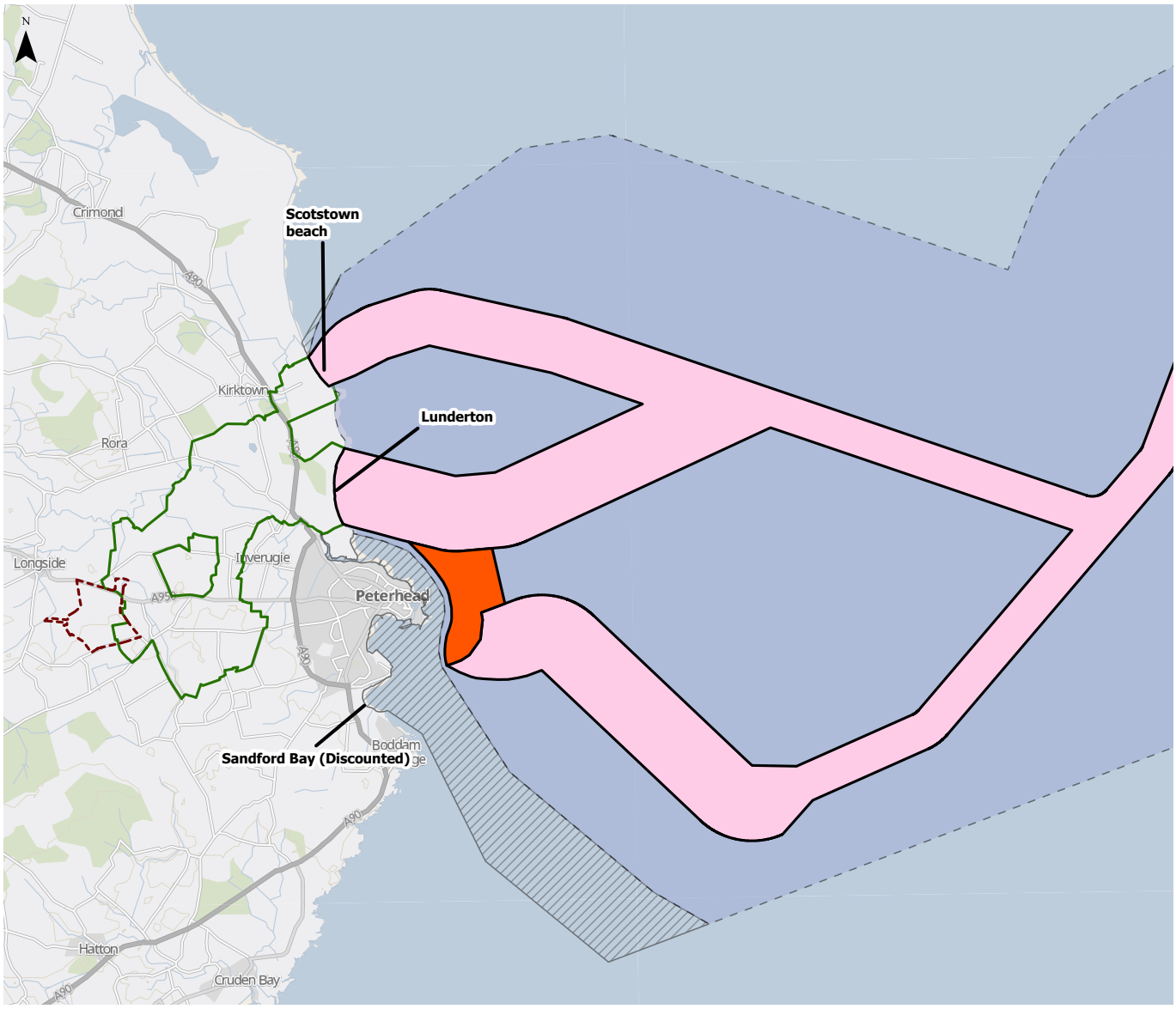
Sandford Bay has been discounted due to the proximity of the landfall to the Buchan Ness to Collieston Coast Special Protection Area (SPA) - a designated breeding ground for seabirds. Another key consideration that also informed this decision is the number of other projects in the vicinity that will limit space for routing the offshore and onshore cables and associated landfall infrastructure.

The offshore project search area boundary has also been refined since our first round of consultation. As the nearshore approach to Sandford Bay has been discounted, the southerly edge of the offshore boundary has also been reduced (shown in the grey hatched area on the map opposite). The southerly cable corridor remains in place however, as it can form the connection to the Lunderton landfall via a section around Peterhead (shown in orange on the map opposite). This area is being explored for feasibility but has not yet been surveyed. It is retained to offer design flexibility given the number of cables required. It is probable that the southerly route and the orange connecting corridor will be discounted, but the project is not yet able to make that decision.

Scotstown Beach and Lunderton continue to be viewed as suitable locations for landfall(s) from environmental and technical perspectives, enabling the routing of the offshore and onshore cables and associated infrastructure.

It is possible that both Scotstown and Lunderton landfall locations will be taken forward, although this is not the preferred solution which is to use a single landfall. It is not possible to confirm this at this time as we must ensure there is adequate space for the cables to come ashore, as well as for the onshore infrastructure required for the onward power transmission, such as construction compounds. Within the chosen landfall(s), a more refined landfall site will be identified where the offshore cables come onshore. These decisions will depend on further engineering and environmental considerations and technical surveys, stakeholder engagement, the location of other developments, the cable route itself, and the onshore substation location.

Ecological surveys being undertaken on site in the project area



Map of potential offshore cable corridors and landfall zones

- Statutory Consultation 2 Offshore Project Search Area Boundary for Cables and Offshore Infrastructure
- Potential Offshore Cable Corridor (surveyed in 2023)
- Potential Offshore Cable Corridor Option (not yet surveyed)
- Offshore Search Area Removed following First Round of Consultation
- Statutory Consultation 2 Onshore Project Area Boundary
- SSEN Netherton Hub Site Boundary

0 1 2 3 4 5 Kilometres

Listening to your feedback - working with other developers

You said...

"...MarramWind should share cable corridors with other developers at landfall."

Our response…

We are actively engaged in collaborative discussions with other developers through the Peterhead Developers Forum. This allows us to exchange information and explore opportunities for cooperation. We are committed to open communication and will continue to work with other developers to identify potential synergies and optimise the project infrastructure development process while ensuring the technical viability and integrity of each project.

Listening to your feedback - your key landfall concerns

You said...

"...the key topics that MarramWind should consider in selecting a landfall are:

- **Seascape, landscape and visual considerations,**
- **Environmental protection,**
- **Construction methods and installation, and**
- **Intertidal wildlife, including birds."**

Our response…

Seascape, landscape and visual considerations are extremely important; the effects from the project on these are to be minimised where possible. Scotstown Beach and Lunderton are located within the North-east Aberdeenshire Coast Special Landscape Area. However, the lasting visual effect of the project at landfall will be negligible, as the onshore and offshore cables and transition joint bays (where the two cable types meet) will be underground and the ground above them reinstated.

Sandford Bay is partially within the Buchan Ness to Collieston Coast Special Protection Area. This has been a major factor in the decision to exclude Sandford Bay.

All sites are considered relatively challenging for construction and installation. However Sandford Bay is considered the weakest option in this regard.

Listening to your feedback - brownfield sites

You said...

"...brownfield sites should be used for the infrastructure, rather than the countryside."

Our response…

We appreciate concerns about minimising effects on the countryside. The use of brownfield sites was carefully considered during the initial site selection process. As part of our comprehensive assessment, we evaluated various factors, including environmental effects and technical feasibility. While no suitable brownfield sites were identified within the optimal search area near the grid connection point, we remain committed to minimising the footprint of the onshore substation and implementing measures to mitigate environmental effects.

Onshore Key Infrastructure

The onshore infrastructure includes an onshore substation and onshore cables. The onshore cables run from landfall(s) to the onshore substation and subsequently to the point of connection at the SSEN Netherton Hub substation.

Onshore cables

The cables will be laid underground within a cable corridor at an average depth of 1-2m. Points of access will be required along the cable route for maintenance of the cables during operation. It is expected that the width of the temporary onshore cable construction corridor for the underground cable will be approximately 135m. Following cable installation the project will require permanent access rights for maintenance purposes.

Listening to your feedback - cable effects on rural areas

You said...

"...there is concern about the effect of onshore cable routes on rural areas such as Longside."

Our response…

The onshore cables will be installed underground, therefore no pylons or overhead lines will be required. The temporary construction footprint will be kept to a minimum and on completion of the cable installation, any construction compounds and haul roads will be removed, and the land reinstated.

Cable installation on the East Anglia Hub

Onshore substation

The onshore substation is a key part of the project's transmission system. This is the point where the voltage level of the electricity generated by MarramWind is transformed to the voltage level required for the national grid.

The substation will be either fully or partially enclosed - a final decision has not been made and will be informed by stakeholder feedback, further engineering and environmental assessment. Illustrative images of a fully and a partially enclosed substation are shown here. As a final substation site has not been selected yet, these images are not site specific but are illustrative only and indicative of project requirements. The final design and layout will be determined as the project design evolves.

The substation infrastructure will comprise of outdoor and/or indoor high voltage electrical equipment, such as transformers, switchgear and, if necessary, equipment to convert HVDC into HVAC. A transformer is electrical equipment that helps change the level of electricity voltage. Switchgear is electrical equipment that helps connect and disconnect the circuits from the electricity network.

The substation infrastructure will vary in height, with a maximum approximate height of up to 32m. Indoor equipment will be installed in several buildings. Work is ongoing to identify the best technical and environmental solutions, which will determine final equipment requirements and the substation's size.

The substation and associated buildings could cover up to 16 hectares of land. A temporary construction area of up to four hectares will also be required. Subject to the substation design, additional land will be required for drainage, environmental mitigation and landscaping.

In our ongoing efforts to minimise the visual effects of the substation on sensitive views, we have carefully considered the use of tree planting as a natural screening method. By strategically planting trees around the substation, it would be possible to create a green buffer that blends seamlessly with the surrounding landscape as the trees grow. This approach not only helps to soften the industrial appearance of the substation but also enhances the overall aesthetic of the area.

For this approach we would select native tree species that are well-suited to the local environment, ensuring that they thrive and contribute positively to the ecosystem. These trees would grow over time to provide an effective visual barrier, reducing the substation's visibility from key viewpoints. Additionally, the introduction of these green spaces would also support local wildlife and improve air quality, further demonstrating our commitment to environmental stewardship.

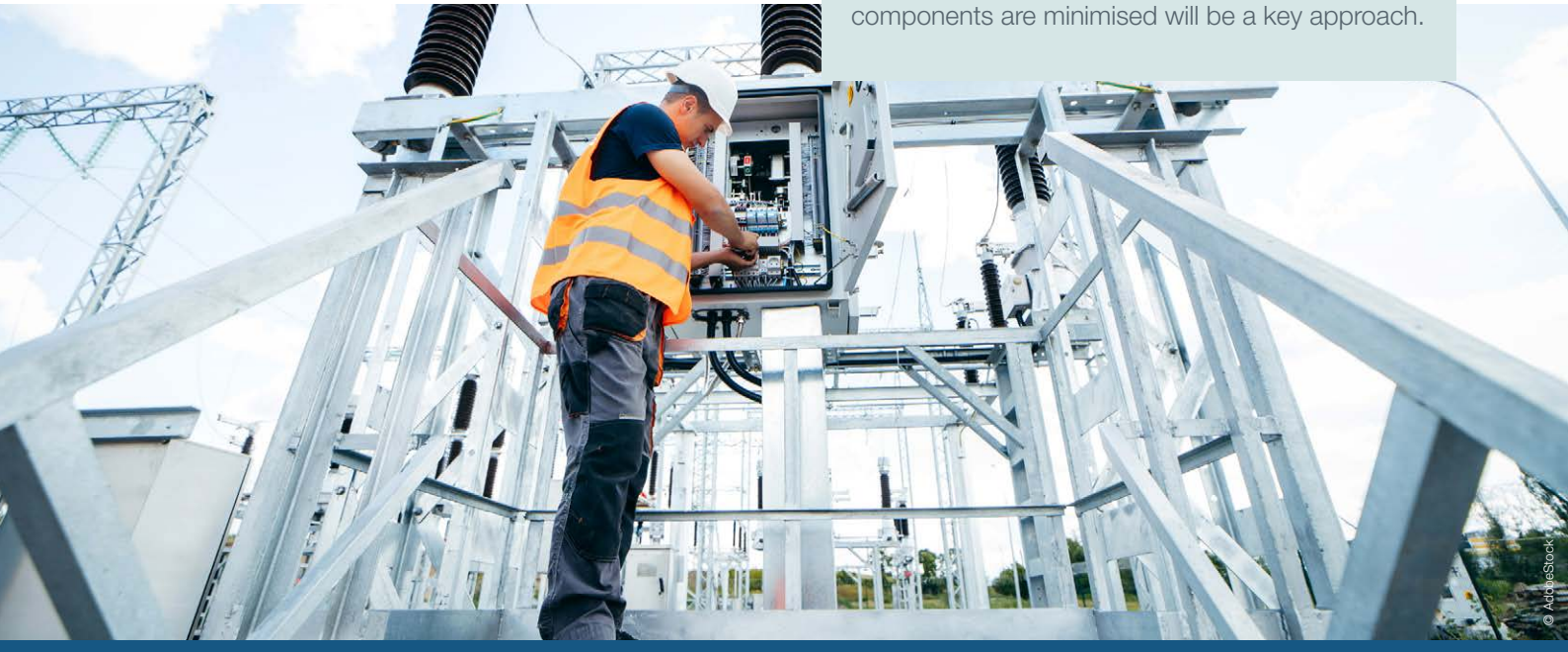
Listening to your feedback - substation design

You said...

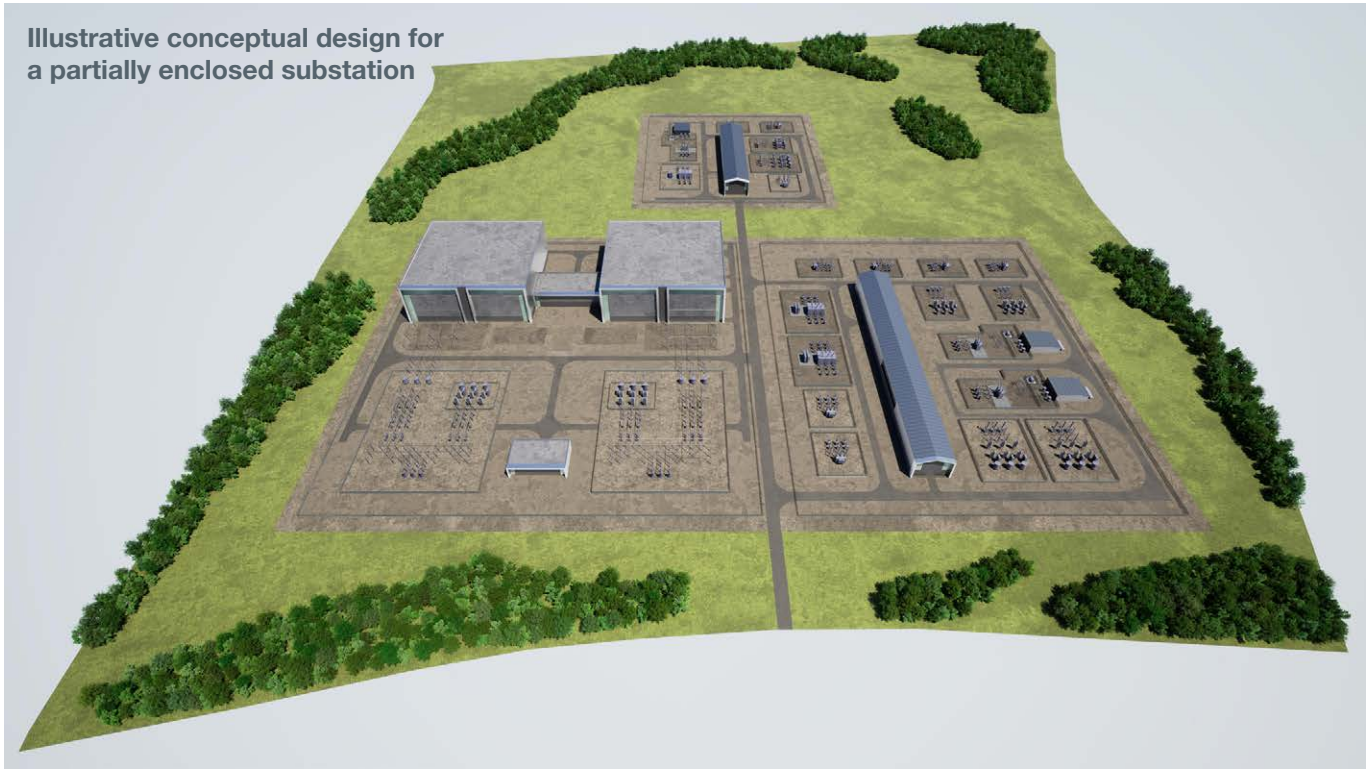
"...the substation should be built as low as possible and be sympathetic to its surroundings."

Our response…

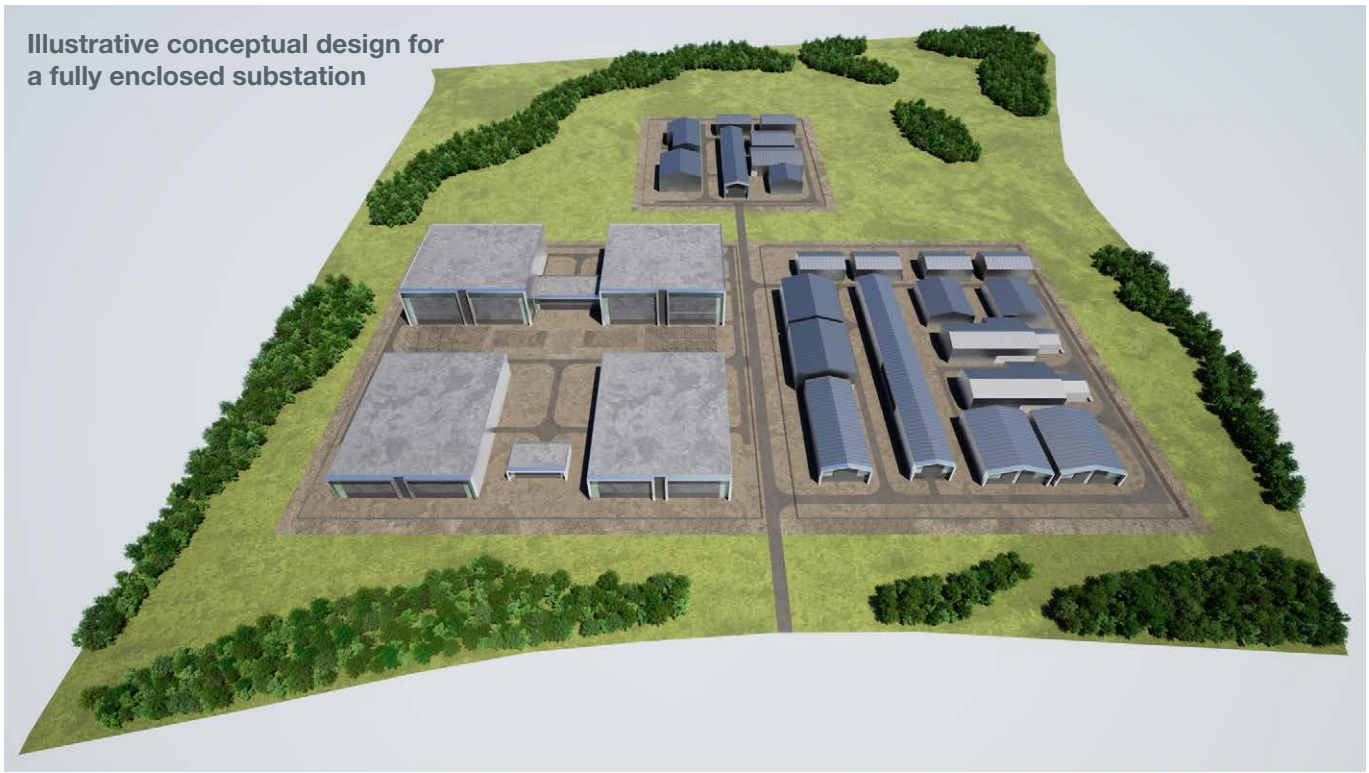
The minimisation of landscape and visual effects is being pursued through various mitigation techniques involving landscape and architectural strategies. Ensuring that the development components are minimised will be a key approach.



Illustrative conceptual design for a partially enclosed substation



Illustrative conceptual design for a fully enclosed substation



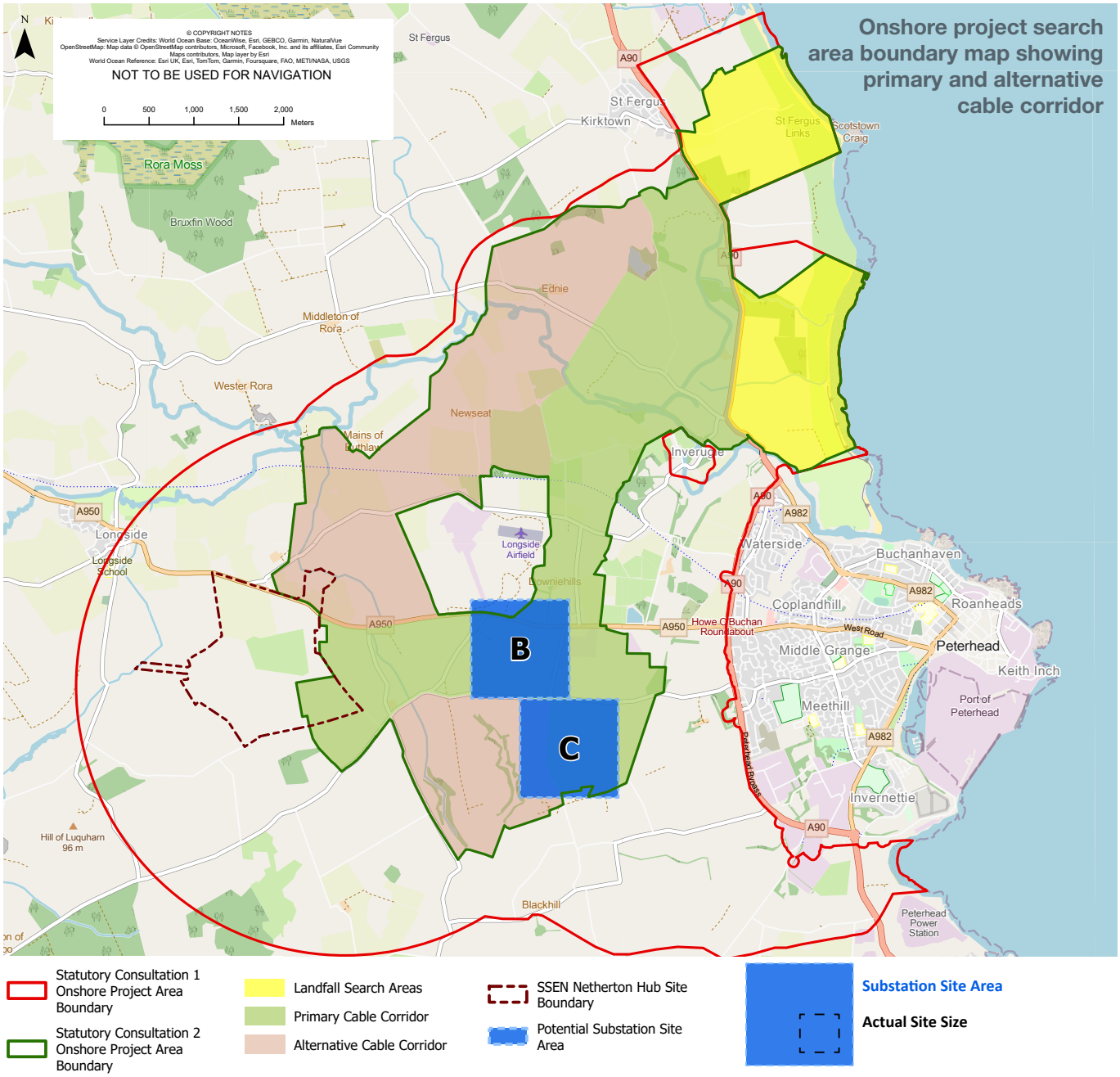
Onshore Project Updates

We are carrying out work to identify the onshore cable corridor and onshore substation site within the project search area boundary as shown below.

We are engaging closely with technical stakeholders, such as the Scottish Environment Protection Agency, Historic Environment Scotland, NatureScot, and Aberdeenshire Council to understand the potential effects from MarramWind's construction and operation on the local area and what we can do to avoid or reduce these effects.

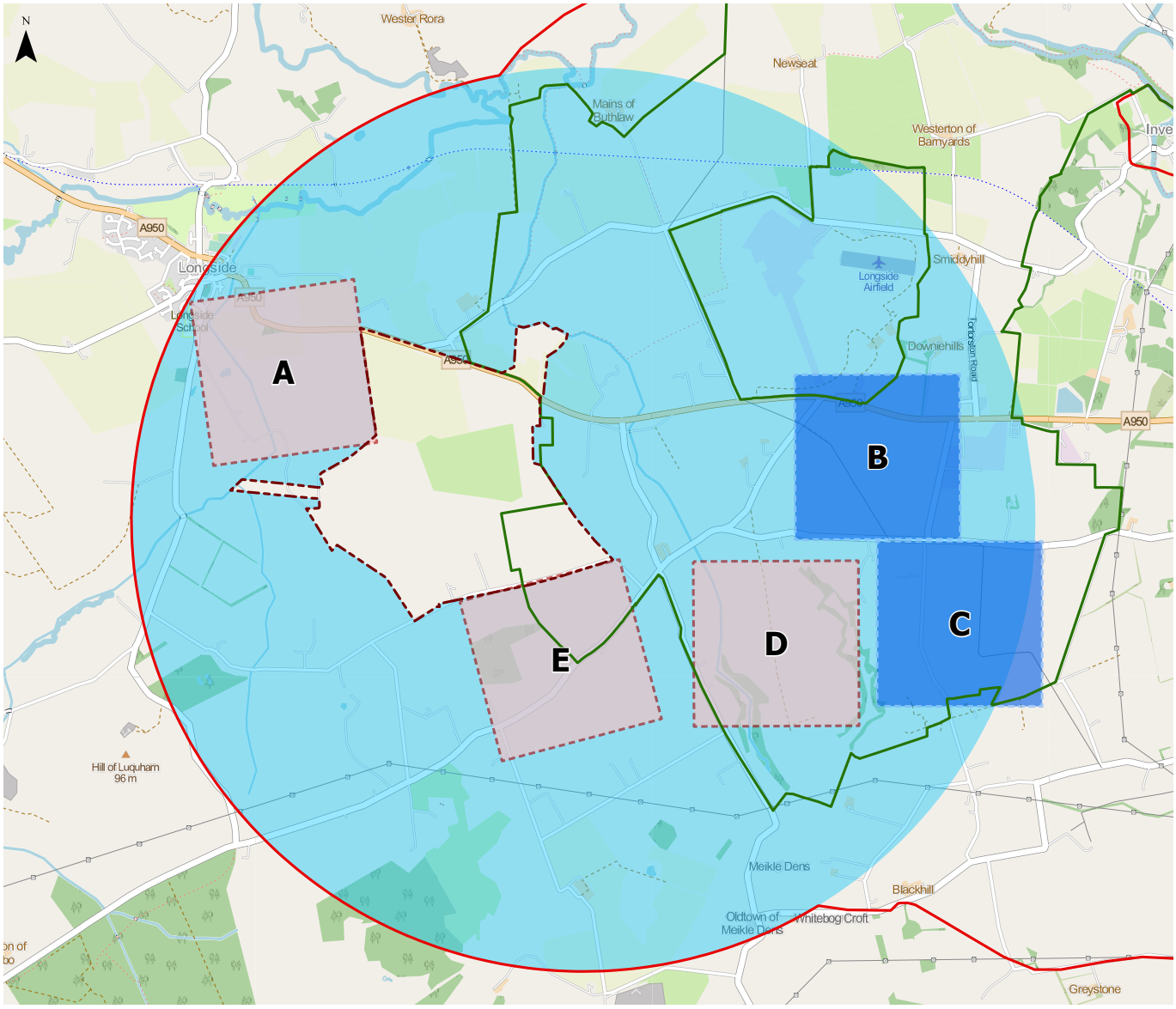
The current onshore project search area boundary has been significantly refined from that presented at our first round of consultation. This reflects:

- the shortlisting of two onshore substation options (labelled B and C on the map) from the five options presented in the first round of consultation;
- the removal of Sandford Bay as a possible landfall;
- confirmation that the project grid connection point will be in the southeastern corner of the SSEN Netherton Hub site; and
- refinement of the onshore cable corridor connecting landfall(s) to the substation and subsequently to the SSEN Netherton Hub.



This map shows the extent of the search area around the grid connection point at the proposed SSEN Netherton Hub, as well as the previous five site options.

The actual land required for the substation will be smaller in size than shown by the dark blue squares.



Map showing onshore substation search area around the proposed SSEN Netherton Hub

- Statutory Consultation 2 Onshore Project Area Boundary
- SSEN Netherton Hub Site Boundary
- Statutory Consultation 1 Onshore Project Area Boundary
- Statutory Consultation 1 Onshore Substation Search Area
- Progressed Potential Substation Site Areas
- Discontinued Potential Substation Site Areas

0 500 1,000 Meters

Ecological surveys being undertaken on site in the project area

Based on the results of further environmental and technical assessments undertaken since the first round of statutory consultation, and taking into consideration stakeholder feedback, substation options A, D and E have been removed as potential locations for the onshore substation.

Options B and C are now being taken forward for further assessment to identify a preferred onshore substation that provides sufficient space for its construction and operation. This assessment will take into consideration stakeholder feedback received as part of this consultation, further environmental and technical assessments, and stakeholder engagement with statutory consultees. The outcome of this iterative design and site selection process will be reported on in the Environmental Impact Assessment Report.

Onshore cable corridor

With the removal of Sandford Bay as a landfall, there is no requirement for an onshore cable corridor from Sandford Bay to the onshore substation. Furthermore, with the removal of three onshore substation options, there is also no longer the need to consider cable corridor routes to these sites. Consequently, the cable corridor search area has been adjusted to focus on a primary and an alternative cable corridor that connects the two remaining landfalls to the north of Peterhead to the two shortlisted onshore substation options (B and C). These are shown in green and brown respectively on the onshore project search area boundary map on page 18.

These two cable corridors each contain viable routes. The primary cable corridor is shorter and more direct, potentially reducing effects on the surrounding area. However, there are numerous other factors including landowner engagement, stakeholder feedback and environmental and technical constraints that influence the selection of a preferred cable corridor, the assessment of which has yet to be finalised.

The next step will be to identify a preferred onshore cable route within either the primary or alternative cable corridors. The identification of the preferred onshore cable corridor will take into consideration stakeholder feedback and further assessment of local environmental and technical constraints. This allows us to develop a design that connects the chosen landfall(s) and the SSEN Netherton Hub substation, via the chosen MarramWind onshore substation site.

Listening to your feedback - your key onshore concerns

You said...

"...the key topics that MarramWind should consider in siting onshore infrastructure are:

- **Landscape and visual considerations**
- **Environmental protection**
- **Construction methods and installation**
- **Traffic and transport."**

Our response…

An assessment was undertaken that incorporated, amongst others, the environmental topics listed as key aspects by stakeholders during our first round of statutory consultation. The two preferred onshore substation sites, B and C, are the best performing sites in all of the categories (as well as the best performing sites overall). Under the key themes identified by stakeholders, options B and C were considered the best performing sites over the other site options, as detailed below:

Landscape and visual considerations

The locations of Options B and C minimise the number of properties in proximity to the sites. In addition, due to the range of development and industrial influences along the A950 corridor they offer a better fit with the existing landscape and visual context than is found at any of the other site options. Furthermore, the sites offer the best potential for screening views of the substation.

Environmental protection

Options B and C have both been assessed to have a minimal effect on protected species and habitats and provide the best opportunities for enhancing surrounding habitats and increasing their ecological value.

Construction methods and installation

Both options B and C provide sufficient space for the construction of the substation, with the sites both having suitable topography. Due to their location, the distance over which the onshore cables need to be installed is also kept to a minimum.

Traffic and transport

Options B and C have good access for construction traffic, with Option B located adjacent to the A950 and Option C only a short distance from the A90 via local roads. The sites are located further to the east and therefore closer to the A90, reducing the distance construction traffic will be required to travel on the local road network from the A90.

River Ugie

Environmental Impact Assessment (EIA)

What is an Environmental Impact Assessment?

Before we can build MarramWind, we need to carefully consider the potential effects on the environment and local communities. To do this, we are completing a detailed EIA that will be presented within two EIA Reports - one focusing on onshore infrastructure (including onshore cables and onshore substations) and the other focusing on offshore infrastructure (including wind turbines, subsea cables, and any ancillary offshore equipment).

The EIA helps us understand any potential environmental effects from MarramWind, and how we can avoid or reduce them. The EIA is essential to Aberdeenshire Council and the Marine Directorate, so that they can understand what is proposed before making their determination on the necessary consents.

Approach to assessments

In January 2023, we submitted our EIA Scoping Report to Aberdeenshire Council and the Marine Directorate, which outlined the environmental assessments we proposed to undertake to identify the potential significant effects from the project. The Council and Scottish Ministers consulted with specialist stakeholders on the Scoping Report, covering various environmental topics and their feedback in their Scoping Opinion has been used to refine our assessment approach. The Scoping Report can be found on the MarramWind website at **www.marramwind.co.uk**.

We have undertaken an extensive programme of surveys to better understand current environmental conditions. Where available, we have provided information on the emerging baseline data findings in the section below. Alongside our surveys, we are also engaging with key stakeholders, including government and statutory consultees, on the various assessments we are undertaking (as detailed in the following section). This allows these stakeholders to influence how we undertake the assessments so that the EIA meets their expectations.

The EIA assesses the likely significant effects of MarramWind for all project phases, including construction, operation and maintenance, and decommissioning. This is informing the siting and design of the onshore and offshore infrastructure. We are considering all potential significant effects to ensure that they are either avoided where possible or mitigated.

Listening to your feedback - health considerations

You said...

"...there is concern about the effect of Substation Site D on health for those that live in Blackhills."

Our response…

Substation Site D has been discounted with substation options B and C now being taken forward for further assessment to identify a preferred onshore substation that provides sufficient space for its construction and operation. The project substation will be constructed and operated in accordance with relevant health and safety legislation and consequently to avoid adverse effects on human health.

You said...

"...there is concern about the effect of living within a large industrial area on health and wellbeing."

Our response…

We are making every effort to ensure that the onshore infrastructure is designed, constructed and operated sensitively, minimising any potential effects on health and wellbeing. In addition, we are exploring opportunities to improve and encourage, for example, biodiversity and strengthen existing nature networks with associated benefits for wellbeing.

Full details of the survey work, the approach and findings of the assessments, and the proposed mitigation measures will be published in the publicly available EIA Reports that will form part of our application. The EIA Reports will allow Aberdeenshire Council and Marine Directorate, who will consider our applications, to make a well-informed decision on whether the project should be given permission to go ahead.

Offshore wildlife and habitats

We have already undertaken various offshore surveys and studies to understand the distribution of marine habitats and local marine wildlife. This has included:

- Digital Aerial Surveys to better understand the seasonal distribution of birds and marine mammals. This involved two years of offshore surveys using planes equipped with ultra-high-definition cameras;
- a Marine Environmental Survey to map seabed habitats and species. We will design the offshore wind turbines layout and cables to avoid environmentally sensitive areas; and
- eDNA Samples to understand the distribution of fish species, which is a less intrusive method than traditional fish surveys. eDNA sampling involves analysing water samples for fish DNA, eliminating the need to capture the fish to prove their presence.

We have further studies to undertake to inform the EIA, which include:

- underwater noise modelling, undertaken in the coming year to study sound levels during construction and operation, helping us minimise effects on marine mammals;
- fish and shellfish data analysis which, along with engagement with key organisations, will ensure our EIA is comprehensive;
- wave modelling to model potential changes to waves caused by the windfarm; and
- working with experts to understand the effects of electro-magnetic fields (EMF) on marine species like fish, crabs, and lobsters, to help us develop mitigation measures if needed. EMFs are invisible areas of electrical energy associated with the use of electrical power.

Good practice measures will be followed to minimise potential effects on water quality during construction. Measures will be described in bespoke environmental management documents which provide details on how to manage, monitor, control and report any incidents.

Listening to your feedback - protecting and enhancing marine environment

You said...

"...protecting and respecting marine life and habitats is important and disturbed areas should be left in a better condition than before."

Our response…

MarramWind is developing a Nature Positive Plan (NPP) that sets out how we intend to measure, monitor and enhance biodiversity. This will enable the project to achieve its biodiversity targets and meet the biodiversity requirements. The NPP will be submitted as part of our applications and therefore commitments will be secured through the consenting process in the same way as any mitigation and compensation measures.

Commercial Fisheries

Respondents to our first round of statutory consultation rated commercial fisheries in the top five most important offshore topics that we should be considering.
To understand the activities of commercial fishing operations in the region and the views of fishing representatives, the project meets on a quarterly basis with various fishing organisations. We also met with the Scottish Fishermen's Federation, the Scottish Pelagic Fishermen's Association, and individual inshore fishers during our first round of statutory consultation. These meetings highlighted an interest in understanding the potential for electro-magnetic fields around buried cables to influence crustacean distribution. The fishing representatives shared their knowledge of certain areas that are good grounds for scallopers, lobster pots, and trawling for white fish and prawns.

Listening to your feedback - surveying crabs and lobsters

You said...

"...a survey on brown crabs and lobsters should be undertaken before and after the offshore cable is installed."

Our response…

To inform the EIA, a survey of marine life on the seabed was undertaken in 2023 across the wind turbine site and along the offshore cable corridor. Burrows identified could possibly have been made by the Norway lobster. The survey did not identify brown crab or European lobster. However, this does not indicate these species are not present so we are working with commercial fisheries to understand marine areas, particularly in the nearshore environment that are targeted for these species. Any potential requirement to undertake species-specific surveys at the pre-construction or post-construction stage of the project will be subject to advice from the Marine Directorate and NatureScot and consent conditions.

Shipping and navigation

We carried out vessel traffic surveys in August 2022 and January 2023. To keep our data up to date, we also completed an additional survey in July and August 2024 and have another similar survey planned for November 2024. These surveys have helped us understand the patterns of other maritime users who pass through the windfarm site. This information is important as we prepare our Navigational Risk Assessment, following the guidelines set by the Maritime and Coastguard Agency. The assessment will include detailed baseline data from our vessel traffic surveys, ensuring the safety and coordination of all maritime activities in the area.

We will be engaging with key stakeholders to understand any potential hazards to users of the sea, including commercial, fishing and recreational vessel operators. The Navigational Risk Assessment will provide mitigation measures required to ensure the project is safe for all users.

Landscape and visual

Respondents to our first round of consultation rated landscape and visual considerations as a key topic that we should be considering.

We have undertaken landscape and visual surveys of the landscape in the project area boundary to better understand the local landscape character, key characteristics, landscape elements and visually sensitive areas.

Substation options B and C were assessed as most able to accommodate a substation due to reduced landscape and visual sensitivity relative to the surrounding landscape. This is largely down to the range of development and industrial influences along this part of the A950 corridor, which would allow a better fit with the existing landscape and visual context compared to the other site options. They also lend themselves to a range of landscape and architectural mitigation options to provide screening and improve the visual appearance of the development, including opportunities for landscape enhancement.

Norway lobster

Listening to your feedback - landscape and visual considerations

You said...

"...there is concern about the visual effects from key viewpoints."

Our response…

The wind turbines will be located approximately 75km offshore. Even with their maximum blade tip height of up to 350m, on a clear day they will be barely visible on the horizon due to the limit of the naked eye and the curvature of the Earth. With cloud cover, this visibility will be even further reduced.

You said...

"...there is concern that substation sites C, D and E are too remote and rural – a large substation in those locations would greatly exceed that of agricultural vernacular and would therefore be an eyesore in the local landscape."

Our response…

Substation options D and E have a 'remote' character being some distance from the A950 corridor, within a rural setting, away from other development. Part of option E contains areas of woodland and option D is located between the wooded river corridors and valleys of East Den and West Den that would be less able to accommodate the substation. However, options D and E are not being taken forward.

The northern part of substation site C is closer to the urban influences of Peterhead and the A950 indicating some reduced sensitivity. It is also however acknowledged that the southern part of substation option C (around Hillhead of Cocklaw) is visible from a wide area.

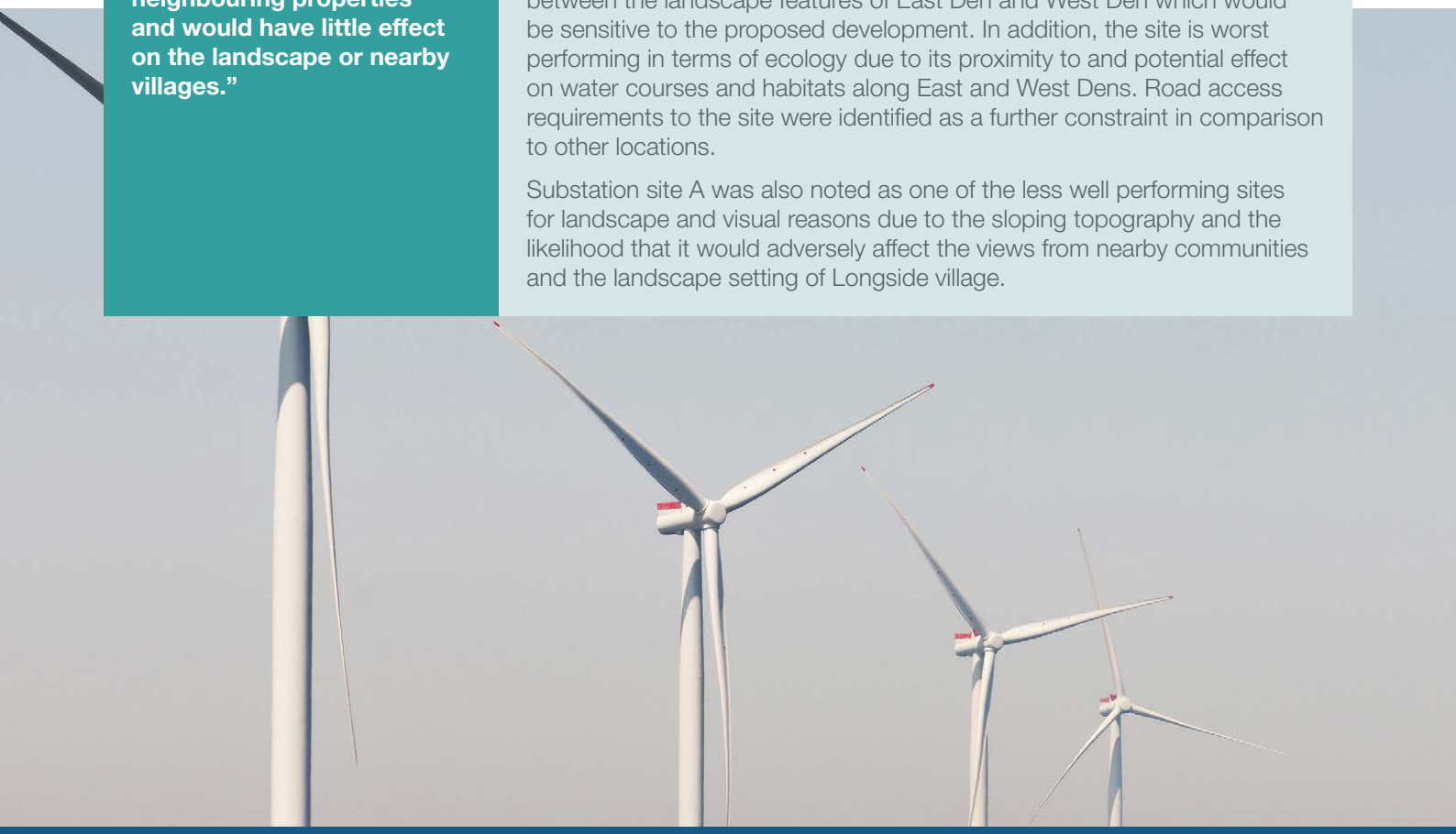
You said...

"...Site D is preferred by some stakeholders because it is well-screened from the neighbouring properties and would have little effect on the landscape or nearby villages."

Our response…

Substation site D was assessed as one of the less well performing site options as it is less able to accommodate the substation development due to its remote and slightly elevated location. It would also be located between the landscape features of East Den and West Den which would be sensitive to the proposed development. In addition, the site is worst performing in terms of ecology due to its proximity to and potential effect on water courses and habitats along East and West Dens. Road access requirements to the site were identified as a further constraint in comparison to other locations.

Substation site A was also noted as one of the less well performing sites for landscape and visual reasons due to the sloping topography and the likelihood that it would adversely affect the views from nearby communities and the landscape setting of Longside village.



Onshore wildlife and habitats

Respondents to our first round of consultation rated onshore wildlife, including birds and environmental protection (for both onshore and landfall), as important topics for consideration.

Over the past two years, we have conducted a comprehensive ecological study, including both desk research and field surveys, to inform the potential siting of onshore infrastructure. Surveys have been undertaken to identify local habitats and animal species, including two years of breeding and winter geese surveys, and collation of protected species data for otter, water vole, bats, and fish habitats.

Wherever possible, we will avoid identified resting, roosting, commuting or foraging sites of protected or notable species, as well as sensitive seasonal periods for wildlife. For instance, seasonal restrictions could be implemented to restrict our works if they are considered to cause significant disturbance to waterbirds that use agricultural land close to landfall(s). Habitats of high value, such as certain types of woodland, wetland or river habitats, and dune habitats will be avoided wherever possible.

In addition to these measures, a Nature Positive Strategy (NPS) has been developed, which sets out how MarramWind intends to measure, monitor and enhance biodiversity. The NPS will be used to develop an NPP, which will describe the measures to be developed, implemented, monitored and reported throughout the project life cycle.

Listening to your feedback - protecting and enhancing onshore environment

You said...

"...that local habitats, flora, fauna and landscapes should be left in a better condition than they currently are to encourage greater biodiversity."

Our response…

An ecological desk study and a programme of baseline surveys for habitats, protected species and birds have been undertaken across a two-year period, helping to avoid and where necessary mitigate effects to features of biodiversity and conservation, as well as identifying opportunities for ecological enhancement. These enhancement opportunities will be used to inform the development of MarramWind's NPP, which will identify a suite of measures to improve and encourage biodiversity and strengthen existing nature networks.

Water vole

Onshore water environment

The project area features various water bodies, including rivers, ditches and ponds. It is also home to a Drinking Water Protection Area, and the River Ugie, whose tributaries are designated as important surface water bodies. These water bodies must maintain a good status by addressing ecological and chemical conditions.

We have identified several private water supplies, such as springs and wells, as well as flood risk zones and WFD water bodies. We have also undertaken ecological surveys to map aquatic habitats.

During construction, we will follow industry good practice for pollution prevention and will avoid construction works close to watercourse channels. For sensitive areas, such as the River Ugie, we will use techniques such as Horizontal Directional Drilling (HDD) to install cables below watercourses. HDD is a trenchless construction method for installing cables used where it is necessary to cross sensitive features, such as watercourses or roads without disturbing them. The cables are then pulled through via entry and exit pits. We are also committed to maintaining the existing field drainage systems during construction and reinstating them once work is complete.

Listening to your feedback - onshore water environment considerations

You said...	Our response…
"...there is concern about the damage to drinking water taken from wells."	We have identified private water supplies (including springs and wells) based on information from Aberdeenshire Council and questionnaires completed by water supply owners. This information is being taken into consideration during the ongoing site selection process to help minimise any potential effects. The project will also comply with industry good practice for pollution.
"...there is concern about field drainage and damage to water courses."	Care will be taken to ensure that existing field drainage regimes are not affected by the project, and field drainage systems will be maintained during construction and reinstated on completion. We have made such commitments as part of environmental mitigation measures and will continue to do so as part of our ongoing water environment assessments.

River Ugie

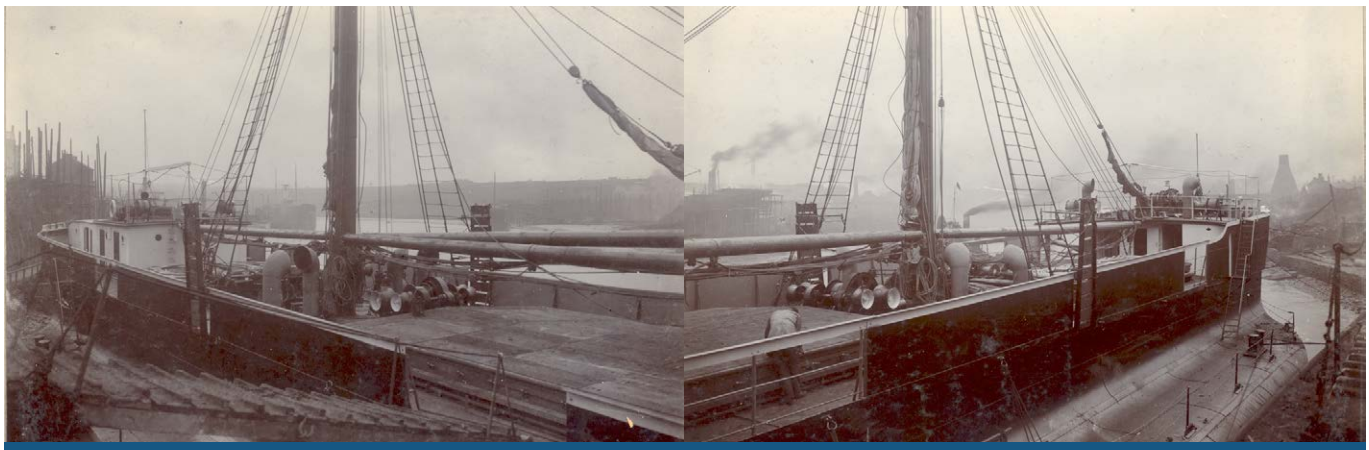
Cultural heritage

Archaeology and cultural heritage continue to inform the ongoing design changes. We are dedicated to protecting cultural heritage assets and aim to avoid or minimise any potential harm to these important sites, both onshore and offshore. Any new discoveries we make will be shared with the public, contributing to a better understanding of Scotland's history and archaeological resources.

We have been undertaking surveys to obtain data crucial for identifying and protecting cultural and heritage assets offshore, ensuring that sensitive and significant sites are avoided. Our survey methods include the use of sound waves to create detailed images of the seabed and what lies on and below it.

We also employ magnetometry to detect objects containing iron, such as shipwrecks. Additionally, sub-bottom imaging helps us uncover environmental information about submerged landscapes before sea levels rose thousands of years ago.

As we move closer towards our construction phase, we will conduct a more detailed survey of the offshore cable route and wind turbine site to further identify and avoid cultural heritage and archaeological assets. Our surveys have already discovered several previously unknown shipwrecks, which we will carefully avoid. When significant wrecks are found, we notify Historic Environment Scotland to ensure appropriate management strategies are put in place for their preservation.

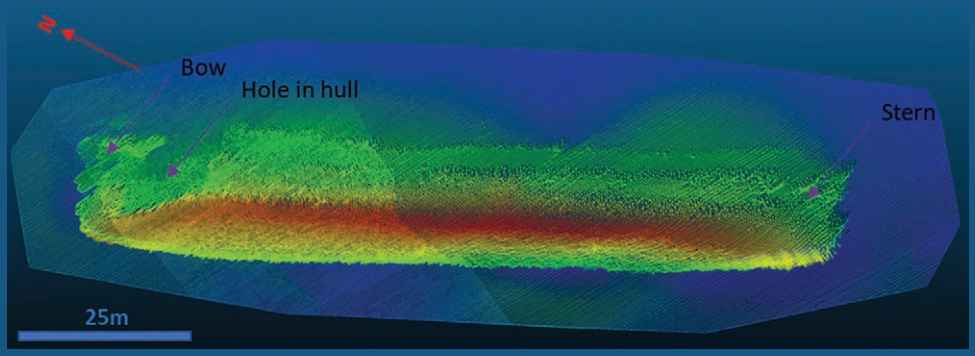


An underwater discovery

Data gathered by sonar scans carried out during geophysical and environmental surveys for MarramWind has identified the likely resting place of the SS Tobol, which was torpedoed by a German U-boat in 1917.

The shipwreck believed to be that of Tobol was among several discovered during the survey works for the 3GW windfarm being developed by ScottishPower and Shell. The ship was built in Sunderland at the turn of the 20th century and was operated as the SS Cheltenham by a steamer company until it was captured by Russian warships in 1904. A year later, it was transferred to the Russian Imperial Navy and renamed SS Tobol after the river in Russia, before being relocated to the Russian Volunteer Fleet in 1916. It was torpedoed by the German U-boat U-52 on 11 September 1917 while sailing from Blyth to Arkhangelsk.

After its discovery, an exclusion zone of 250 metres was put in place around the wreck – which is 100m long, 22.5m wide and 10.5m high and appears to be in good condition – to protect it during the MarramWind survey works.



Traffic and transport

As part of our substation site selection process, we have reviewed the local road network to understand effects from our construction and operation vehicles. The two substation option sites are located near the A950 and the C38B Kinmundy-Peterhead road. These roads would provide good access to a substation construction site from the A90. By choosing these substation sites, construction traffic will use the A90 and A950 which will minimise effects on the road network and nearby communities as the access routes primarily pass through sparsely populated rural areas.

We will work with Transport Scotland and Aberdeenshire Council to assess and develop measures to mitigate any short-term effects on the road network to be used for construction access. Management and mitigation plans will be developed and will include a commitment to working with other contractors to manage effects of MarramWind and other sites being developed at the same time. The plans will include enforcement of any restrictions on delivery timings to minimise the effect on people, wildlife, and buildings located nearby the proposed construction access route.

Operation, maintenance and decommissioning of MarramWind are not expected to have any noticeable long-term effects on the local road network.

Listening to your feedback - traffic and transport considerations

You said...	Our response…
"...there is concern about the effect of Site D on local traffic in Blackhills."	Substation option D has now been discounted, with options B and C identified as potential sites to accommodate the onshore substation. Site B has been chosen as it is located adjacent to the A950, which in turn can be accessed from the A90 via the Howe of Buchan Roundabout. The A950 passes through a generally rural area, is of a good standard and is considered able to accommodate construction traffic. Site C is located adjacent to the unclassified road which links the A90 with Kinmundy. The road is rural in nature, supports two-way operation and interchanges with the A90 via a large priority junction. The form of the unclassified road is considered able to accommodate the construction traffic. Both sites are located within 3km of the A90 which forms part of the trunk road network and provides a bypass around Peterhead. The location of the sites will support an access strategy which promotes access from the east to minimise the temporary effect of construction traffic on local communities including Blackhills.
You said... **"...there is concern about the inconvenience caused by construction."**	Our response… A Construction Traffic Management Plan will be prepared in consultation with Aberdeenshire Council, with this supporting the implementation of measures to mitigate the temporary effects from construction traffic, particularly during the morning and evening peak periods. Measures will include: • specifying acceptable construction traffic access routes; • identifying any times HGV deliveries will be required to avoid; • management of deliveries via a booking system to avoid vehicles arriving in convoy; • providing a suitably sized storage area onsite to support the stockpiling of materials and reducing the number of deliveries, where possible; • providing access arrangements to minimise vehicle delays; and • car sharing to reduce employee vehicles.

For illustrative purposes only. The turbines used on MarramWind will have a different appearance at the water's surface.

Air quality

The air quality in Peterhead and the wider Aberdeenshire area is very good. Aberdeenshire Council has been monitoring air quality across the region for many years, and the results consistently show that air quality levels are well within safe limits.

Potential effects on air quality from MarramWind could arise from temporary construction activities, including construction traffic and dust along the exposed cable route and excavation points. These activities will be short–term only and appropriate mitigation measures will be put in place through a Construction Environmental Management Plan (CEMP) to address any issues.

Noise and vibration

The construction and decommissioning phases of MarramWind could generate noise and vibration, such as construction traffic and excavation points. These activities will be relatively short–term and appropriate mitigation measures will be put in place through a Construction Environmental Management Plan to reduce the levels of noise and vibration.

The operational phase of MarramWind has the potential to generate noise, particularly those in the vicinity of the onshore substation. As part of the operational phase noise assessment, baseline sound surveys will be undertaken at sensitive locations around the onshore substation site. The operational noise levels likely to be generated by MarramWind will be predicted and, where necessary, mitigation measures to reduce the noise emissions will be considered.

Listening to your feedback - noise effects

You said...

"...there is concern about the noise from the operational substations on local house prices and the quality of life for local residents."

Our response…

A noise and vibration assessment will be prepared to accompany the EIA and will consider the potential noise and vibration effects associated with the construction and operational phases of MarramWind. The assessment will draw on the results of background noise surveys carried out at sensitive locations in proximity to the proposed onshore substation. Any potential effects that could have a significant effect on sensitive locations will be evaluated within the EIA Report.

Furthermore, noise limits will be agreed with Aberdeenshire Council. The proposed development would be required to meet these noise limits and, where necessary, appropriate mitigation measures will be implemented to ensure these limits are met.

Greenhouse gases and climate change

During our first round of consultation, the majority of respondents agreed that offshore windfarms are an important part of the solution for addressing climate change.

Although MarramWind will be providing renewable energy, some greenhouse gas emissions will be emitted during the construction and installation of the infrastructure, as well as from the maintenance and decommissioning of the project. A full project life cycle assessment of greenhouse gas emissions will be undertaken to identify appropriate mitigation measures. As part of our project's commitment to sustainable development and environmental enhancements, we will be continuously looking for opportunities to incorporate measures that reduce greenhouse gas emissions during construction and maintenance where feasible. Measures such as these will be reported within a carbon assessment as a part of the EIA.

Aviation

As part of our commitment to responsible development, the project is undertaking a comprehensive aviation and radar impact assessment. We have commissioned a leading consultancy in aviation and renewable energy to conduct this crucial work. They will assess the potential effect of the windfarm on both civil and military aviation, including airspace users and radar systems. This will involve in-depth research, analysis, and engagement with key stakeholders to develop effective mitigation strategies that ensure the safe coexistence of the windfarm with aviation operations. The findings of this assessment will be incorporated into the EIA.

Listening to your feedback - climate considerations

You said…	Our response…
"...there is conern that developers have no interest in reducing climate change and are only interested in making money for themselves and their investors, many of whom are not from Scotland."	ScottishPower and Shell are committed to tackling climate change. Shell has set an organisation target to become a net-zero emissions energy business by 2050 and Iberdrola, ScottishPower's parent company, has set a similar target for 2040. Both companies are making significant investment in renewable energy and low carbon projects, which includes offshore windfarms such as MarramWind. MarramWind offshore windfarm is expected to generate enough electricity to power the equivalent of more than 3.5 million homes. This will help support the reduction in carbon intensity of the UK energy system, as well as enhancing the UK's drive for energy security and green energy independence.
You said…	Our response…
"...there is scepticism about our ability to influence the earth's climate and the amount of money being spent to meet Net Zero targets in proportion to the global percentage of Scotland's CO_2 emissions."	Carbon emissions in the atmosphere have a global effect. Although when viewed on a global scale the benefits of individual projects may appear minor, the renewable energy produced by the windfarm will support the reduction in carbon intensity of UK energy and therefore will support UK and global efforts to reduce CO_2 emissions.

Habitats Regulations Appraisal

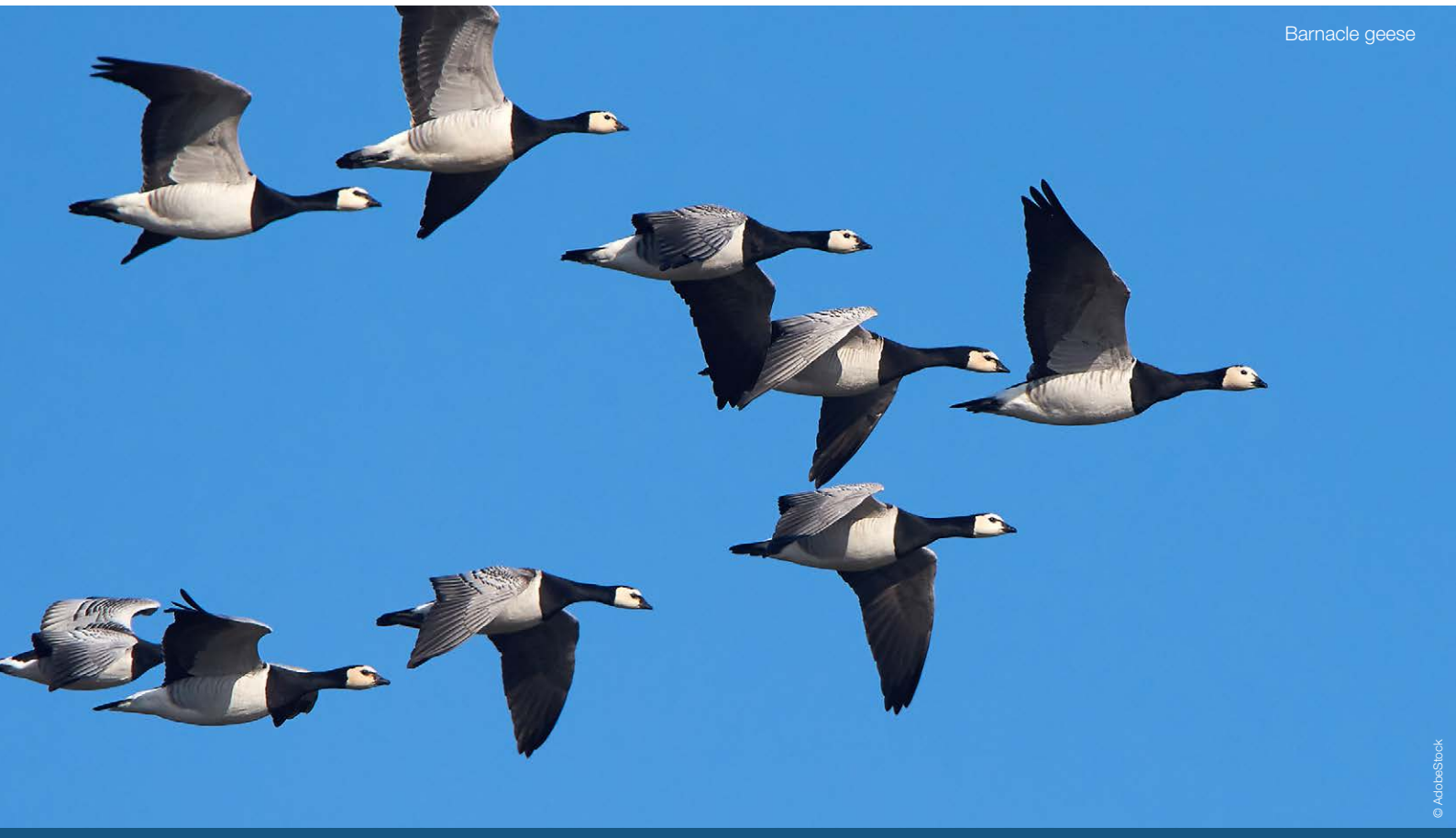
A HRA is required under Scottish law to be undertaken where there is potential for a project to affect certain types of nature conservation sites.

The conservation sites considered in HRA are:

- **Special Areas of Conservation** (including those proposed but not yet formally designated), which are designated for the presence of "qualifying features". These may include specific habitats, combinations of habitats, species or assemblages of species, or combinations of these;
- **Special Protection Areas (SPA)** (including those proposed but not yet formally designated), which are designated for the presence of "qualifying features". These may include bird species that are rare, vulnerable, in danger of extinction, or requiring protection due to their habitat needs. Migratory bird species are also included as qualifying features in some SPAs; and
- **Ramsar Sites**, which are designated for the presence of "qualifying features" that are defined by criteria set out in the Convention on Wetlands of International Importance (the Ramsar Convention). These are typically wetland habitats that support important communities of birds.

Alongside the work to deliver the EIA, the Project team has prepared an HRA Screening Report. That report explains the HRA process and identifies the sites that could be affected by the project. It was submitted to Aberdeenshire Council and the Marine Directorate for review and consultation on 16th August 2024 as they are the competent authorities with responsibility for HRA. They will respond to the report with a formal Screening Opinion that will be used to inform the next stage of the HRA. Where the HRA Screening Report identifies the potential for "likely significant effects" on a designated site to occur and the Screening Opinion agrees with this conclusion, it will become necessary for an Appropriate Assessment to be undertaken by Aberdeenshire Council and the Marine Directorate.

MarramWind will be responsible for preparing a Report to Inform Appropriate Assessment, which will be submitted to Aberdeenshire Council and the Marine Directorate alongside the EIA to support the consenting applications. If necessary, this will provide information on the compensatory measures that could be delivered to reduce any risks to designated sites. The Report to Inform Appropriate Assessment will be publicly available upon submission.



Barnacle geese

How Will MarramWind Be Built?

Project Programme

Construction works are anticipated to commence in the late 2020s, subject to consent. Given the scale of the project, construction may involve phased installation of both the onshore and offshore infrastructure over the course of the construction phase. It is anticipated that the infrastructure necessary for each phase will be installed sequentially. We will consider all options to minimise the impacts of a phased construction.

The total construction phase for the offshore infrastructure within the windfarm site, including the offshore wind turbines, is anticipated to be between eight and twelve years, but this timeline will be refined as details emerge about the project phasing design and supply chain availability. The offshore cables and landfalls associated with each phase of the wind farm will be installed towards the beginning of that phase's construction.

Offshore

Offshore cables

Before the installation of any offshore cables, the seabed will be prepared and cleared of obstacles, such as debris and boulders. The offshore cables will then be laid 1-2m beneath the seabed wherever possible by cable laying vessels in sections and joined together. Burial protects the cables from damage, with other protection methods such as concrete mattresses or rock berms used where burial is not possible.

Wind turbine installation

It is expected that the wind turbines will be assembled onto their floating unit at a port and then towed to site and connected to the pre-installed anchor and mooring system. Should there be advances in wind turbine installation it may be that turbines could be installed on the floating unit offshore.

Offshore substations

The foundations for the offshore substations will be built near to a port and transported to site for installation, which is likely to require the use of specialist heavy lift vessels. Once the foundations are installed to the seabed, the platform topsides, i.e. the substations and associated infrastructure, can be lifted into place.

Offshore worker accommodation

The accommodation of crew will either be onboard vessels or within an accommodation and welfare block on the offshore substation. A separate accommodation platform is being considered but is unlikely to be taken forward due to the environmental effects and cost of a stand-alone facility. The offshore substation may have a helideck so crew can be transported to the offshore substation via helicopter, although vessels will also be used.

The role of ports

Ports are central to the development of offshore wind, serving as a location for component manufacturing, assembly, storage and/or marshalling ahead for transit to the wind turbine site. Operation and maintenance activities are also dependent upon suitable ports.

We are currently engaging with a range of key stakeholders, including local authorities, port operators and the Scottish Government, to explore different options for port utilisation. We are also dedicated to investing in Scottish port and supply chain facilities to enhance their capabilities and help maximise the social and economic benefits generated by the project, which will include job opportunities.

By identifying and investing in key port facilities, we will ensure successful delivery of MarramWind while supporting the growth of the Scottish offshore wind sector. A range of facilities are being considered for the installation and operation of MarramWind but no decision has been made on the ports to be used.

Certain port infrastructure improvements or expansions may be necessary to support MarramWind's construction and operation. These, along with other effects from port operations related to MarramWind, will be subject to assessment and will be authorised under separate consenting legislation.

Landfall

How landfall is constructed depends on the chosen landfall(s), coastline features, and other technical or environmental constraints.

The cables at landfall(s) will be buried and installed either by open cut construction or by HDD. Open cut construction involves digging a trench and laying the cables either directly into the trench or within a duct. The trench is then backfilled with excavated material. Cables may be installed in either a single operation or drawn through ducts at a later stage. A decision has not been made on a preferred solution, which will depend on further design work and local conditions.

At the shoreline, the maximum width of land required to install the cables will be 360m. The onshore part of the landfall(s) will include up to six underground transition joint bays where the offshore and onshore cables are joined together. The offshore cable laying vessel will approach the shore then the marine cables will be pulled into the transition joint bays by machinery within a temporary onshore construction compound.

This compound will be located above MHWS at the landfall(s). The land will be reinstated after completion of the construction phase. An inspection chamber or equivalent permanent access arrangement may be left in place at the transition joint bays. The location of the compound at the landfall/s is still to be determined.

Access to landfall construction site(s) may require temporary access routes and/or the strengthening of existing roadways. Construction vehicles accessing the temporary landfall construction areas will require access routes from the A90 for delivery and removal of construction materials.

Onshore

Onshore cables

The temporary cable construction corridor is expected to be 135m wide and will provide access to construction traffic, and space for cable assembly, trench excavation and storage space for excavated soil. The temporary corridor may require extending beyond this width in certain locations to provide space for access at crossings, avoidance of obstacles, and HDD.

Up to two main, temporary, construction compounds will be required close to the onshore cable corridor. These will be logistic hubs and will include welfare facilities, storage, accommodate building materials, parking, and site offices. We will identify where these will be located through environmental and technical assessments and stakeholder engagement.

A number of temporary construction compounds will be required to enable the construction of joint bays and installation of underground cables.

Underground cables and associated ducts may be laid in either a single operation in trenches, or ducts may be installed in the trenches to allow the cables to be subsequently pulled through at a later stage. The trench is then backfilled. This approach removes the need to undertake repeat excavations. Following cable installation, haul roads and any construction compounds will be removed. Where it is necessary to cross sensitive features, such as watercourses, roads and railways crossings, trenchless construction methods such as HDD will be used to install ducts under the crossed feature. The cables are then pulled through via entry and exit pits.

The underground cables will be installed in sections. Joint bays will therefore be required at intervals along the cable route to enable the cable installation and connection process. These joint bays will be underground structures with a link box located at or above ground level. Link boxes enable electrical checks and testing to be carried out during operation.

Access for construction vehicles to the temporary construction areas along the cable corridor route will require temporary access routes from existing roads for the delivery and removal of construction materials.

Onshore substation infrastructure

The onshore substation infrastructure will require site preparation works, installation of foundations for cables, pipes and equipment, construction of substation buildings, installation and commissioning of electrical equipment, drainage, environmental mitigation and landscaping. The onshore substation infrastructure will be built within the designated site boundary over the anticipated eight to twelve year construction period (the expected period for the offshore infrastructure construction). Site access will be required, including for the delivery of construction materials and electrical components, so an access road(s) will be constructed. A temporary construction compound will also be required but will be dismantled and the land reinstated when the construction work is complete.

The majority of construction vehicles accessing the substation will include HGVs, concrete mixer trucks, and vans. However, there will be a small number of abnormal loads to enable the delivery of large electrical equipment such as the electrical transformers.

Onshore worker accommodation

The accommodation requirements for onshore construction workers will be carefully considered but are not yet determined. However, the potential effects on accommodation as well as local community facilities and services will be assessed as part of a socio-economic impact assessment. This approach ensures any potential effects on the community are identified and managed.

Listening to your feedback - construction considerations

You said...

"...construction methods and installation should be efficient and limit disruption during construction."

Our response…

We understand the importance of minimising disruption during the construction phase. We are committed to utilising efficient construction methods and best practices to streamline the process and reduce any potential effects on the local community and environment. This includes:

- careful planning and scheduling - we will develop a construction plan that optimises the sequence of activities, minimises construction traffic, and avoids peak times where possible;
- use of modern construction techniques - we will explore the use of innovative and efficient construction methods, such as prefabrication and modular construction, to reduce on-site construction time and minimise disruption; and
- effective communication and engagement - we will maintain open lines of communication with local communities and stakeholders throughout the construction process, providing regular updates on progress and addressing any concerns promptly.

You said...

"...there is concern about the number of companies involved in the development and the perceived detachment of the project infrastructure. The public should have been presented with a completed plan at consultation."

Our response…

We understand the concerns raised about the number of companies involved and the perceived fragmentation of the project infrastructure. While the various elements are interconnected, they often require specialised expertise, necessitating collaboration with different contractors. However, a comprehensive plan is in place to coordinate these various contractors during the construction phase, and to ensure our compliance with relevant regulations and legislation for construction, design and management.

MarramWind will implement a robust Project Management System to oversee all aspects of construction. This system will ensure clear communication, coordination, and scheduling among all contractors, minimising disruption and ensuring the efficient and timely completion of the onshore infrastructure. We are committed to engaging with stakeholders throughout the construction process, providing regular updates and addressing concerns as they arise.

A final project design will be presented to stakeholders in 2025 before submitting our planning applications to Aberdeenshire Council and the Marine Directorate. This will have followed the two rounds of statutory consultation we have held in 2024 which presented our proposals at early stages in the development process. We value stakeholder feedback and have used this to refine our project design. Presenting a completed project plan at consultation would have limited how much of our design stakeholders could influence.

Typical HDD rig

MarramWind in Operation

MarramWind is expected to begin generating electricity in the 2030s, with electrification in line with the relevant grid connection agreements up to the maximum grid connection capacity limit of 3GW.

Operational maintenance

When MarramWind is in operation, periodic testing of the onshore cables is likely to be carried out. This will require access to the link boxes along the cable route, which will involve attendance by light vehicles. The vehicles will gain access using existing field accesses.

The onshore substation is unlikely to be permanently staffed, although some maintenance and operational visits will be required. Infrequently, equipment may need to be maintained or replaced and HGVs may be used.

For the offshore elements of MarramWind, maintenance requirements will depend on the infrastructure used, depending on the type of wind turbine, floating platforms, electrical transmission infrastructure, and final layout of the windfarm.

Maintenance will typically be undertaken via a Service Operation Vessel. Helicopters or other specialised vessels may also be used where necessary to prevent damage to equipment, prevent and repair corrosion, and carry out all necessary repairs to maintain safe operation of the windfarm. For major component repair, it may be necessary to tow turbines to port, although technologies are being developed to prevent the need for this.

Approach to decommissioning

Decommissioning MarramWind is anticipated to involve the removal of all offshore infrastructure above the seabed. The cables could be removed or left in place to minimise environmental effects and offshore navigational safety risks associated with their removal. The onshore substation is likely to be removed and the site then reinstated.

We will develop the project in a sustainable manner and will consider both operation and decommissioning during design and development. The decommissioning works are likely to be undertaken in reverse of the construction process of MarramWind. A decommissioning programme will be developed to define the decommissioning methodologies that might be used. It will be updated prior to construction and updated during the operational phase of the project to account for any changes to industry best practice, relevant legislation and policy, or developments in technology.

For illustrative purposes only. The turbines used on MarramWind will have a different appearance at the water's surface.

Benefits and Opportunities

MarramWind presents an opportunity to generate social, economic, and environmental value. ScottishPower and Shell are dedicated to delivering wider benefits, and leaving a positive legacy, particularly for communities in North-East Scotland.

We are developing several programmes to help maximise economic and social benefits, including working closely with other offshore wind developers and public sector partners to support the growth of Scotland's offshore wind industry. These will be over and above the programmes Shell and SPR already support.

Industry and Supply Chain

Scotland is a pioneer in floating wind, having delivered the world's first floating offshore windfarm, Hywind Scotland, and running the world's largest floating wind leasing round, ScotWind. We are committed to helping Scotland and the UK capitalise on this market-leading position, including sourcing key products and services from Scottish and UK companies, as outlined in the MarramWind Supply Chain Development Statement.

The project is currently set to spend most of its early project development expenditure within Scotland and the UK, having awarded key contracts to UK-registered and Scottish companies.

MarramWind will also create opportunities for new companies in the supply chain market, which will be an important area of focus for our planned £25m Offshore Wind Stimulus Fund.

ScottishPower and Shell have undertaken a range of activities to engage the supply chain and support the development of Scotland's offshore wind industry, including:

- running a supply chain opportunities event in Peterhead in November 2023 with the DeepWind cluster (the largest offshore wind representative body in Europe);
- meeting supply chain companies at national and regional industry conferences;
- launching the enhanced MarramWind Supplier Interest Portal in July 2024, used to help companies target future events, activities and contract opportunities;
- providing ongoing support to Scotland's Strategic Investment Model, which seeks to build the case for investment in vital new supply chain facilities and port infrastructure;
- supporting the development of a new Scottish Offshore Wind Energy Council study into the socioeconomic opportunities from Scottish offshore wind;
- engaging with Scotland's enterprise agencies; and
- continued engagement with public and private sector partners to explore opportunities to support the growth of Scotland's offshore wind industry.

MarramWind was pleased to deliver the MarramWind Supply Chain Opportunities event in Peterhead in November 2023.

Employment and skills

The growth of Scottish offshore wind will create opportunities for people entering the workforce or pursuing a new career, particularly those from the oil and gas sector. MarramWind will increase demand for local labour when the opportunities from MarramWind are better known.

To help local communities take advantage of these opportunities, we will continue working with education facilities to support Science, Technology, Engineering and Maths (STEM) subjects to encourage interest from young people. We are exploring opportunities to support STEM and skills outreach activities, focussed on raising awareness of future offshore wind career opportunities within North-East Scotland. These will build and expand upon our ongoing support for the National Energy Skills Accelerator. Our renewed focus was informed by feedback to our first round of public consultation, where jobs and skills creation was the second highest priority when asked how the project could leave a positive legacy for the area.

Community Benefit Fund

ScottishPower and Shell take pride in being part of the communities surrounding our energy projects and we want the communities in North-East Scotland to benefit from a future powered by renewable energy. Feedback received during our first round of statutory consultation ranked the creation of a Community Benefit Fund as the most important opportunity to support community projects and groups in the local area. Over the coming months and years, we will work with stakeholders to determine how such benefits will be delivered.

Listening to your feedback - renumeration considerations

You said...	Our response…
"...remuneration should be provided as a part of any agreement with residents who are affected by the substation/ general works."	Our priority for the design of MarramWind's onshore infrastructure will be to avoid adverse effects as much as possible. Direct financial remuneration would occur where the project is seeking to purchase land or use land for the onshore infrastructure.

Listening to your feedback - benefits and opportunities

You said...	Our response…
"...a scholarship should be created for local high schools e.g. Mintlaw/Peterhead."	It is important for us that local communities to MarramWind see benefits from the project. One of these will be the jobs created during construction and operation. Therefore, we are committed to working with education institutions to provide support to learn about STEM subjects, and to highlight career opportunities created by MarramWind. We are exploring a range of ways to do this and will consider scholarships.
"...local communities should benefit from cheaper electricity and roads and associated infrastructure should be upgraded."	The ability to deliver cheaper electricity from MarramWind to local communities would be dependent on us entering into an agreement with an energy utility who could develop and run an appropriate community energy tariff. We have not yet completed detailed plans for how we will sell the electricity generated by MarramWind. We would seek to minimise effects of vehicle traffic by using temporary access roads. However, there may be a requirement to improve local road infrastructure to make it suitable for our works vehicles. Any upgrades to local roads would be agreed with the local authority.

Listening to your feedback - benefits and opportunities

You said...	Our response…
"...a windfarm fund should be created with a fee for every MW produced, and only the interest should be spent in the first five years."	We will explore a range of options for how we design and operate our Community Benefit Fund. The fund will align with best practice guidance and in support of local planning policies, but we will also seek input from stakeholders on how we design and administer the fund.
"...the Community Benefit Fund should prioritise affected communities."	As the project progresses, we will be seeking views on how our Community Benefit Fund can be designed to deliver the greatest positive and lasting benefits. Community Benefit Funds are widely used in the renewable energy industry and are not intended to compensate for any potential effects from MarramWind. Rather, it will be used to create a positive legacy and will help local communities benefit directly from opportunities created by the project.
"...local suppliers should be used during construction."	MarramWind presents opportunities for companies across the energy supply chain, including local suppliers. We have outlined our intent to use Scottish suppliers within the MarramWind Supply Chain Development Statement, which includes commitments to spend around £4.6 billion within the Scottish supply chain but an ambition to spend approximately £6.5bn. Our commitments and ambitions depend on the capability and capacity of the Scottish offshore wind supply chain to provide goods and services. The opportunities for local companies are broad and varied, but some of the larger opportunities may include the building and assembly of the infrastructure components and supporting the operations and maintenance of the windfarm when constructed. We intend to promote contract opportunities via the MarramWind website and would encourage potential suppliers to register interest via our supply chain portal at **www.marramwind.co.uk**

Stakeholder Engagement

Stakeholder engagement and consultation is a critical part of the development of MarramWind. We are committed to developing an offshore windfarm in a considered way that is sensitive to the needs and expectations of local stakeholders and communities whilst creating long-lasting benefits and opportunities on a local and national level.

From the early stages of the development of MarramWind, we have been engaging extensively with a wide range of statutory and non-statutory stakeholders across the northeast of Scotland, as well as members of the local community. The engagement activities we have undertaken to date include:

- hosting a drop-in day for the local community to learn about the project and meet the team;
- attending the Floating Offshore Wind conference in Aberdeen to build stronger coordination with other developers;
- hosting a supply chain event with the DeepWind cluster in Peterhead;
- meetings with local Councillors;
- attending a fisheries awareness day with the Scottish Fishermen's Federation;
- organising an OffshoreWind4Kids event with Clerkhill Primary School;
- engaging with Buchan Development Partnership, which is an independent, community-led initiative working with communities across Buchan; and
- supporting Aberdeenshire Council's 2040 vision business development event.

Listening to your feedback - working other developers

You said...

"...there should be greater collaboration between developers delivering local energy projects to ensure they work together and understand interfaces between projects."

Our response…

Through the Peterhead Developers Forum, we continue to meet regularly with other energy developers in the area to discuss current plans and consider opportunities where we can work together as a collective to coordinate development.

Due to a variety of factors, the pace at which each energy development progresses differs from project to project, and this poses significant challenges to coordination. However, some energy projects' plans in the Peterhead area are becoming more defined as they progress through the development phase. Where potential overlaps in proposed infrastructure are emerging, we are initiating discussions with these developers so that plans are taken forward sensitively and to ensure potential effects on the surrounding communities and environment are minimised as much as possible.

Statutory consultation 1

Between 27 May and 1 July 2024, we delivered the first round of statutory consultation for MarramWind, which included online presentations and in-person events held in Peterhead and Longside. These events, as well as a virtual exhibition space on our website, gave members of the local community and other interested stakeholders the chance to provide feedback on our proposals and influence how the project is progressed. Dedicated engagement sessions were also offered to locally elected representatives, Community Councils, landowners, and fishing stakeholders, enabling them to have direct conversations with the project team.

Staying updated

For the latest information on MarramWind or to stay up to date with future engagement events, please visit our website **www.marramwind.co.uk**, scan the QR code or follow us on X at **@MarramWind**. If you have any questions not covered in the consultation materials, you can email us at **stakeholder@marramwind.com**.

Listening to your feedback - promotion of consultations

You said...

"...there should be more formal promotion of future consultations as it was felt that key areas did not receive notice about the consultation."

Our response…

Giving stakeholders the opportunity to comment on our proposals is incredibly important to us, and we are keen to ensure everyone knows about their opportunity to provide feedback. During our first round of statutory stakeholder consultation, we undertook a promotional campaign in the run up to and during the consultation period. This went above statutory minimum requirements and included:

- a series of adverts and Notices placed in the Buchan Observer and Press & Journal in the weeks leading up to consultation launch and the events;
- digital adverts on the Buchan Observer's website;
- notifications via the MarramWind website and social media channels;
- a radio advert running for two weeks on the local radio station Original 106;
- posters displayed in local public buildings;
- emails and letters issued to statutory and non-statutory stakeholders and key community representatives including Community Councils, Councillors, MPs and MSPs; and
- a leaflet hand-delivered to over 12,000 properties within and neighbouring the project boundary.

We have adopted the same approach to promoting the second round of consultation as previously undertaken, however we are using Royal Mail to deliver leaflets for this consultation and covering a wider area than before.


MarramWind
Onshore Project Overview
MarramWind
How will MarramWind

Have Your Say

Providing your feedback

Thank you for taking the time to read through our proposals. Now that you have more information on the proposed MarramWind offshore windfarm, we want you to share your feedback with us and let us know what you think. Your feedback is important to us and all feedback received will be considered. You can provide your feedback through one of the following ways:

- Online, using the feedback form on our website **www.marramwind.co.uk**.
- Email us your comments at **stakeholder@marramwind.com.**
- Fill in a paper feedback form. These will be available throughout the consultation period at our two consultation events and at Peterhead Library.
- Write to us at **FREEPOST MarramWind**.

This consultation will run from **09 October 2024 to 11:59pm 19 November 2024**. Feedback received after the deadline may not be considered. We cannot respond to every response received individually.

We believe transparency in our decision making is important and we want to ensure that local stakeholders can see how their feedback has been considered in the development of the project's final design. We will present all feedback received at this consultation and the one we delivered earlier this year, and provide information on how it was considered, in a Pre-Application Consultation Report covering both onshore and offshore elements of the project. This will be published as part of our consent application.

Comments made to us at this stage are not formal representations to the Planning Authority or the Scottish Ministers. Following the submission of our planning applications, which we intend to submit in late 2025, you will have further opportunity to make representations to Aberdeenshire Council and the Scottish Government's Marine Directorate, who will determine whether to grant planning permission and other required consents for the Project.

Finding out more

All information related to the proposals is on our website **www.marramwind.co.uk.**

If you have any questions, including requesting materials in an alternative format, you can email **stakeholder@marramwind.com**.

Consultation events

We will be holding two public consultation events during the consultation, which we welcome members of the local community and other stakeholders to attend. Members of our project team will be available to provide more information and answer any questions you may have.

The events will take place on:

- Tuesday 29 October 2024, 1pm – 7pm, Palace Hotel, Prince St, Peterhead AB42 1PL
- Wednesday 30 October 2024, 1pm – 7pm, Longside Football Club, Davidson Park/Station Rd, Peterhead AB42 4GR

Online consultation event

We will also be hosting an online presentation about our proposals. This will be another opportunity for people interested in the proposed MarramWind offshore windfarm to find out about the project. The online presentation will take place on:

- Thursday 07 November 2024, 6pm –7pm

If you would like to join, please email **stakeholder@marramwind.com**.

Next steps

The feedback received as part of this consultation will be used to further refine the project design. We will share our finalised proposals next year and will provide further information on how the feedback received at this consultation has been considered.

We will submit our consent applications in 2025 to Aberdeenshire Council and the Marine Directorate who will determine whether to grant permission for the project. During the representation period of the determination, you will have further opportunity to comment on our proposals for MarramWind.

Glossary

Accommodation platform: an offshore platform that supports living quarters for offshore personnel.

Crown Estate Scotland: manages the Scottish Crown Estate on behalf of Scottish Ministers, including most of the seabed off Scotland's coasts.

Decommissioning plan: a plan describing the removal of offshore infrastructure at the end of its useful life, plus disposal of equipment.

Digital aerial surveys: photography taken from a plane to collect data on a variety of wildlife including birds, marine mammals and fish.

Ecological: relating to the environments of living things or to the relationships between living things and their environments.

Electricity transmission: the transmission of electricity via cables from the turbines to the substations.

Energy security: Having a reliable and diverse supply of energy to meet demands.

Environmental Impact Assessment (EIA): the evaluation of how the planned project might affect the natural surroundings, living organisms, and people throughout its construction, operation, and eventual decommissioning.

Floating unit: a floating structure on which the wind turbine is installed, providing it with buoyancy and stability.

Gigawatt: a gigawatt (GW) is a unit of power equal to one billion watts. It is a measure of the rate at which energy is generated or consumed per unit of time.

Habitat: the natural environment in which an animal or plant usually lives.

High Voltage Alternating Current (HVAC): a type of high voltage electrical current, in which the direction of the flow of charge changes back and forth at regular intervals or cycles, in the UK it works at 50 cycles per second. The majority of the UK electricity grid is HVAC.

High Voltage Direct Current (HVDC): a high voltage electrical current that flows in the same direction.

Holistic Network Design (HND): a coordinated network design exercise completed by the National Grid Electricity System Operator (NGESO) that provides a recommended offshore and onshore design for connection of offshore wind projects to the UK electricity network. This is an NGESO process that has been established to facilitate the UK Government's ambition for 50GW of offshore wind by 2030.

Horizontal Directional Drilling (HDD): a trenchless method of installing underground cables using a drill.

Intertidal zone: the area where the sea meets the land between high and low tides.

Landfall: the point at which the cables transferring power from an offshore windfarm reach the shore.

Life cycle: the sequence of phases through which a project progresses. It includes initiation, planning, execution, and closure.

Marine Directorate: responsible for the integrated management of Scotland's seas on behalf of the Scottish Government.

Mean high water springs (MHWS): the average tidal height throughout the year of two successive high waters during those periods of 24 hours when the range of the tide is at its greatest.

Mean low water springs (MLWS): the average tidal height throughout the year of two successive low waters during those periods of 24 hours when the range of the tide is at its least.

Net zero emissions: a position where total greenhouse gas emissions would be equal to the emissions removed from the atmosphere, with the aim of limiting global warming and resultant climate change.

Offshore cables: these are electrical power cables that are installed offshore, buried in or laid on the seabed between the wind turbines, and then run the electrical power cables from the wind turbines to the offshore substation and from there to the landfall(s).

Offshore platform: a concrete, steel or hybrid substructure that is fixed to the seabed and supports offshore infrastructure above the sea surface.

Offshore substation: an offshore platform containing electrical equipment that collects energy generated from wind turbines and prepares it for transmission to shore via cables.

Onshore substation: the substation on land that connects the power transmitted from the offshore substation to the national grid. The onshore substation may change the electricty voltage to the voltage level required for the national grid connection.

Renewable electricity: also known as green electricity or clean electricity, it is electrical power generated from renewable energy sources such as wind, hydro or solar.

Scoping Report: a document that sets out the project's understanding of consenting requirements and what the project intends the Enviromental Impact Assessment report to cover.

ScotWind leasing process: process led by Crown Estate Scotland to enable developers to apply for seabed rights to plan and build windfarms in Scottish waters.

Socio-economic benefits: benefits can include job creation, local investment, and reduced carbon emissions, which contribute to economic growth and environmental improvement.

Supply chain: the network of companies and activities involved in producing and delivering everything needed for the windfarm, from manufacturing the wind turbines and cables to construction and maintenance.

Supply chain stimulus fund: helps to stimulate economic growth and job creation within the supply chain by encouraging investment and development.

Transformer: an item of electrical equipment, contained in a substation that is used to change the voltage for power transmission and distribution at different levels.

Switchgear: the electrical equipment used in substations to manage and control the flow of electricity.

Wind turbines: the infrastructure that collects the wind energy and converts it into electricity for connection to the power networks. Each wind turbine consists of a number of blades that connect to a rotor hub, which rotates an electrical generator.

For illustrative purposes only. The turbines used on MarramWind will have a different appearance at the water's surface.