



# BUILDING SHETLAND'S ENERGY FUTURE







### About SSE Renewables

SSE Renewables is a developer and operator of renewable energy across the UK and Ireland, with a portfolio of around 4GW of onshore wind, offshore wind and hydro. Part of the FTSE-listed SSE plc, its strategy is to drive the transition to a net zero future through the world class development, construction and operation of renewable energy assets.

SSE Renewables owns nearly 2GW of operational onshore wind capacity with over 1GW under development. SSE Renewables also has the largest offshore wind development pipeline in the UK and Ireland at over 6GW, of which around 3GW is in construction or consented.



### About Viking Wind Farm

Viking Energy Wind Farm (VEWF) is a 103-turbine onshore wind farm set around the central Mainland of Shetland. The £580m project is owned by SSE Renewables and construction began last year.



TRANSMISSION

### About SSEN Transmission

SSEN Transmission, operating under licence as Scottish Hydro Electric Transmission, owns, operates and develops the high voltage electricity transmission network in the north of Scotland. Its network consists of underground and subsea cables, overhead lines on wooden poles and steel towers, and electricity substations, extending over a quarter of the UK's land mass crossing some of its most challenging terrain.

SSEN Transmission powers the communities its network serves by providing a safe and reliable supply of electricity, taking the electricity from generators and transporting it at high voltages over long distances through the transmission network for onwards distribution to homes and businesses in villages, towns and cities.

We are committed to inclusive stakeholder engagement, and conduct this at an 'Accomplished' level as assessed by AccountAbility, the international consulting and standards firm.

### Keeping in touch

We are keen to hear your feedback, so if you have any questions about the newsletter or the works currently underway please contact:

SSEN Transmission Community Liaison Manager [Sharon.Powell@sse.com](mailto:Sharon.Powell@sse.com) / 07918 305099

Viking Wind Farm Community Engagement Manager [Julie.Graham2@sse.com](mailto:Julie.Graham2@sse.com) / 07586 282236

To find out more about the projects and to register for updates please visit:

[www.ssen-transmission.co.uk/projects/Shetland/](http://www.ssen-transmission.co.uk/projects/Shetland/)  
[www.vikingenergy.co.uk/](http://www.vikingenergy.co.uk/)

Cover: Quarff



# VIKING ENERGY WIND FARM



A turbine foundation anchor cage under construction near Dury, South Nesting, in preparation for concrete pouring. At the time of writing, around 80 bases have been poured and all remaining concrete pours will be in the South Nesting section of the site.

## CONSTRUCTION UPDATE

Shetland's summer of '22 has been pretty forgettable from a weather perspective. Whilst the rest of the country has appeared to bask in hot sunshine every day, often coping with the effects of heatwaves and drought in certain places, Shetland has often felt like it was sitting in a mass of cold damp steam emerging from the hot kettle further south! Despite that relatively cold, wet and sometimes windy Shetland summer, huge progress has continued on constructing the Viking Energy Wind Farm (VEWF).

At the time of writing, around 80 out of the 103 turbine foundations have had concrete poured, with around a dozen more bases at different stages of preparation for further pours. All the remaining pours will be in the South Nesting section of the site, with the turbine bases on Mid Kame, West of Kergord and in North Nesting all

now having been successfully completed. All 103 turbine bases and adjacent crane pads are now at different stages of completion.

As we saw in the last edition of the project newsletter, each base is excavated down to the rock sub-formation; levelled and tested for its load bearing capacity; has ducting left in place for electrical cabling to each turbine; and has a flat layer of "blinding" concrete applied to create a stable working platform. This prepared platform is then ready for a central steel anchor cage with over 200 anchor bolts to be craned into place, with 105 tonnes of steel rebar then hand tied (over around 4-5 days) before temporary shutters are applied and the concrete is poured.

Each turbine base requires 700 "cube" of concrete weighing around 1700 tonnes. The concrete comes from the two concrete batching plants at Scar Quilse at



the north end of the Lang Kames. The concrete mixer trucks handle batches of around 8 "cube" of concrete with pouring taking place in a single day. The concrete is left to cure for the requisite time before the foundations are backfilled, with the additional aggregate material adding considerable further weight to what is a gravity base i.e. the turbines, to be bolted to the foundations, are essentially held in place by gravity.

Delivery of turbine components to Shetland will begin in January of 2023. The turbine towers come in four sections weighing 75 tonnes; 67 tonnes; 57 tonnes; and 44 tonnes, respectively. The nacelle, which houses the generator, weighs around 67 tonnes. There are three blades for each turbine, which are approximately 60m long and which weigh 16 tonnes each. The drive trains (i.e. the gearbox and generator) weigh around 66 tonnes and, finally, the hub, which the blades are attached to, weighs nearly 33 tonnes. The tower sections will be arriving from Spain, the nacelles/hubs/drive trains from China and the blades are being produced in Italy. VEWf's turbine supplier, Vestas, has just been on site carrying out a dry run to understand the layout of the wind farm site, on the ground, and to ensure smooth access for the components arriving from early next year. All components will be shipped to the Greenhead Base in Lerwick and delivered to site to a detailed plan agreed with Police Scotland and the SIC as the local Roads Authority. Vestas has already had a dry run for the

trailers carrying the ca 60m blades from Lerwick Port to the wind farm. No issues were found, other than a few minor adjustments to signs at the junction near the Weighbridge Café at Gremista in Lerwick.

The construction phase of VEWf has been a major success in engaging local suppliers. Direct construction spend in the local community now stands at over £26m with over fifty-five local contractors and businesses still engaged in the civil construction phase of the wind farm. Vestas remains equally keen to maximise local input during turbine erection and through the twenty-five year operational phase of the wind farm, for which it retains contracted responsibility. Vestas has been engaging, one to one, with local suppliers for some months now.

Cabling work to connect the sixteen different turbine arrays back to the VEWf substation at Upper Kergord is now taking place in all sections of the site. There are also trenches being dug "cross-country" to shorten routes back to the substation at Upper Kergord, some of which will also help to minimise any disruption to the main A970 road from the cabling work. Backfilling of the cable trenches is most advanced on Mid Kame, but once the 220 km of internal cabling is deployed, final landscaping/verge reinstatement, road capping and permanent drainage can be finalised. As was emphasised in the last newsletter update, this will greatly



VEWF's turbine supplier, Vestas, recently supervised a "dry-run" on site ahead of turbine component deliveries beginning in January next year. This photo shows one of the specialised trailers, which will deliver turbine blades, heading into the east of the site.



Start of cable deployment Mid Kame. Backfilling of cable trenches on Mid Kame has now begun.

reduce the movement of heavy plant over 70km of wind farm tracks, allowing them to have their final running surfaces put in place to ensure that everything is ready for the turbine components to be delivered throughout 2023.

RJ McLeod still have about 200 workers on site. When SSE staff, supervisory contractors and workers building the wind farm substation at Upper Kergord are added to these, the total number of staff remains at around 300. Of these, roughly 100 are local (or locally based) and 200 are travelling rotationally. As the civil construction works start to tail off, RJ McLeod's workforce will start to reduce accordingly, but will begin to be replaced by Vestas and its sub-contracted turbine erection teams, and related supervisory staff, in the early months of 2023.

VEWF's final two grid transformers are expected to have arrived via Lerwick in early September. Careful planning remains in place to minimise disruption to other road users and to ensure a smooth and successful transfer of these substantial bits of kit.

As the bulk of the civil engineering works on the ground move towards their final phases, everything



VEWF Substation is located on the left of this picture.

remains on programme and on budget for first export of electricity to be phased through 2024. High quality verge reinstatement and wider peat restoration efforts continue in parallel and the quality, skill and pride going into that work, right across the wider wind farm site, is obvious for all to see.



# SHETLAND'S CLEAN ENERGY FUTURE

It is a well-known fact that carbon and oxygen, and the carbon cycle, are of core importance for all for life on earth. When we discuss carbon emissions, we are talking about Carbon Dioxide (CO<sub>2</sub>), this is also known as a greenhouse gas, a major contributor to global warming.

In the 2022 IPCC (Physical Science Basis) report it is concluded that: "It is indisputable that human activities are causing climate change and human influence is making extreme climate events, including heatwaves, heavy rainfall, and droughts, more frequent and severe. Human activities have warmed the planet at a rate not seen in the last 2000 years and we are on course to reaching global warming of 1.5°C in the next two decades".

Shetland produces approximately 650,000 tonnes of CO<sub>2</sub> every year which is the equivalent of 2.6 million flights between Shetland and Aberdeen and, per person in Shetland, that is over 3 times the Scottish average according to research published by the ORION clean energy project.

So where does it all come from? Most people would automatically think from oil and gas production, and they would be right. 230,000 tonnes of CO<sub>2</sub> come from Shetland's oil and gas terminals each year. A further 180,000 tonnes comes from Shetland's thermal power stations, and our marine sector contributes 102,036 tonnes. Industry is now recognising the levels

of CO<sub>2</sub> it produces is impacting the climate crisis and is responding by increasing its efforts to decarbonise. (Decarbonisation is the reduction of carbon dioxide emissions, including using lower carbon power generation to achieve a lower output of greenhouse gasses into the atmosphere). Many oil and gas majors have significant investments in offshore wind projects, and some are acquiring electric vehicle-charging networks and stakes in solar energy. Big business is now continually looking to improve its green credentials and do its bit as we head to Carbon Net Zero.

But it is not only industry that impacts Shetland's CO<sub>2</sub> production. Travel too has a major impact with vehicles, aviation, mainland and local ferries contributing over 137,000 tonnes per annum. Light vehicles surprisingly produce more CO<sub>2</sub> than aviation!

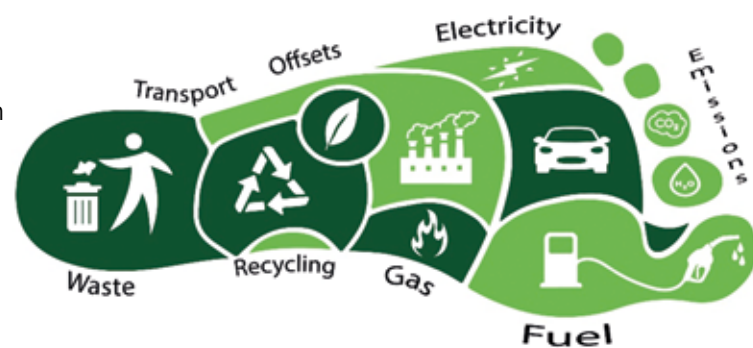
The UK Government policy on decarbonisation includes the ten-point plan which would deliver a reduction in emissions of 180 million tonnes between 2023 and 2032. The Scottish Government aims for the country to be 'net-zero' of all greenhouse gases by 2045. So, can we reduce our carbon footprint here in Shetland and help with the global crisis we are facing? Yes, we can; by adjusting our lifestyles just a little bit we can have a major impact.

\*Figures provided by – ORION Clean Energy Project [www.orioncleanenergy.com](http://www.orioncleanenergy.com)

# VIKING'S CARBON PAYBACK

When complete in 2024, Viking Wind Farm will be the UK's most productive onshore wind farm in terms of annual electricity output, while saving around 0.5 million tonnes of CO<sub>2</sub> emissions each year. The wind farm has an expected carbon payback over its full lifecycle of less than two years (calculated at 1.65 years).<sup>^</sup>

Viking Wind Farm will be capable of producing enough energy to power the equivalent of almost half a million UK homes, including every home in Shetland\*.



<sup>^</sup>Most productive UK onshore wind farm based on projected total generation output by Viking Wind Farm of 1,796.35 GWh per annum and a comparison with the leading UK operational and in construction wind farms.  
\*475,099 homes powered per annum based on annual GB average domestic household consumption base of 3.781MWh published by the Department of Business, Energy and Industrial Strategy (BEIS) as of November 2018, and projected total generation output by Viking Wind Farm of 1,796.35 GWh per annum.



Oyster Catcher - Shalder.

# PRIORITISING BIRDS

Another breeding bird season is now behind the project and our ornithologists are compiling their data. At the onset of the breeding season almost all tracks had at least been partially created, meaning that construction was not progressing into previously undisturbed areas. Our feathered friends are mostly smart enough to identify a potential hindrance to their breeding pattern and so with tracks formed and plenty of activity on them, in the main, they naturally avoided construction areas.

Some species though have more tolerance than others. Think about the starlings nesting in your car or in the eaves of your house and their tolerance to your presence and activity. The same is true for other breeds. In 2021 a black-back gull nested around 50m from a track in construction which meant we initially halted works and, when safe to do so, proceeded cautiously. In 2022 the pair returned to the same location but found an additional nearby hole in the ground, in the form of an open turbine base. This left us with a dilemma as the base was scheduled to have concrete poured, a process that once started cannot be stopped. As the bird had already shown a level of tolerance by nesting there, the team mimicked concrete pouring activities to test for any reaction under an ornithological watching brief. The birds showed no reaction and so the decision was taken to pour the base with similar controls and monitoring in place. The result was a successful pour and, more

importantly, the birds successfully raised a brood and fledged soon afterwards.

Other species are less tolerant though, e.g. Red-throated Divers. As waterfowl, the nesting areas of these birds can be predicted. These birds react to humans, especially ones in hi-vis clothing, but less so to traffic and moving plant (including lifting movements). Therefore, protecting the birds' line of sight to pedestrian-based activities was highlighted as a necessity. To that end, a series of 2m high mesh screens were installed to disguise human movements and allow the birds to go about their natural business, unhindered. Watching briefs were carried out at the onset of works in these areas, and throughout, to ensure the birds were not disturbed. The result was a successful breeding season, with particular success noted on a lochan which had historically failed to support a breeding pair. In addition, the impact on works was so minimal that the programme was not affected. Plans are already being made to similarly protect breeding birds during turbine erection in 2023.

On a sadder note, the impact of avian bird flu on some species was notable, especially Bonxies. The data produced from the formal surveys will provide a clearer understanding of that impact, and the data will be supplied to external bodies for inclusion in wider assessments.





Works are monitored by the ECoWs to ensure that disturbance does not occur.

## ENVIRONMENT NEWS / FOCUS

The Viking Energy Wind Farm is spread across the central uplands of the Mainland of Shetland. Pre-construction ornithological surveys identified various constraints including the presence of a number of small lochans which support ideal habitats for Red-throated Divers; a Schedule 1 species given special protected status under The Wildlife and Country Act. This means that measures must be taken to eliminate disturbance during the breeding season.

Using topographical survey data, the team were able to ascertain the potential line of sight from the divers perspective toward work locations and through this we identified 6 locations where physical human activity is within potential disturbance zones and in the line of sight of divers on the lochans.

These line of sight models allowed us to predict what a nesting bird would see and thus allowed us to consider screening against that line of sight. In two locations we used existing stone material to create a 2m bund on the edge of hardstandings to block the line of sight. In 4 other locations we have created screens using scaffolding (or herras) fencing and debris netting to create 2m high screens. These allow operatives to carry on working, out of clear sight of the divers and so allow works to progress.



Using a drone we were able to test the effectiveness of the screens prior to the return of the Divers.

## PEAT BLOG - SAC VISIT TO VEFWF

The VEFWF Environmental Team were recently visited by staff from SAC Consulting Solutions (SAC) who are in the process of creating promotional episodes for the Farm Advisory Service (FAS) TV on rural life including entrepreneurial enterprises such as the Shetland Rural Experience and Shetland Peatland Restoration.

On this visit, Graham Fraser of SAC Lerwick was accompanied by the FAS film maker, Robbie Paton, and by David Murray and Steven Johnson of Shetland Peatland Restoration (SPR). Through the involvement of SAC in the Shetland Windfarm Environmental Advisory Group (SWEAG), Graham is well versed in the work being carried out to restore over 260Ha of degraded and eroded peatland, bare in many areas, and so seek to arrest the resultant loss of carbon dioxide to the atmosphere.

The VEFWF peatland restoration programme involves the identification of 32 individual areas which require various intervention techniques to seek to restore them to an active peatland habitat. A total of 60Ha of bare peatland, within the 32 areas to varying degrees, require the redeposition of peat to address historic erosion and to bring them back to ground levels in keeping with surroundings. This is termed by the project as Phase 1. Once established, these areas will be tied into the surrounding topography and hydrology using traditional restoration techniques (termed Phase 2) and, once completed, each area will be monitored for 25 years to evaluate the potential creation of blanket bog in the longer-term. In total, the 32 areas equate to 260Ha.

SPR have been involved previously in the project, assisting in the restoration of two areas on Mid Kame Ridge and come with a wealth of local experience and knowledge in peatland restoration. This experience is of great benefit to the project and to that end VEFWF has secured their services for ongoing restoration work. Under the direction of the newly appointed Habitat Management Plan Officer (Shetland Amenity Trust), SPR



Shetland Peat Restoration being interviewed by SAC.

will assist in the completion of the Phase 1 works and progress each area into Phase 2.

SAC carried out filming in one of the completed areas on Mid Kame Ridge (ref photo) and in an area in North Nesting where works had reached the stage where Phase 1 is complete and the Phase 2 scope will be established incorporating traditional restoration techniques. While much work is still required in many areas, the quality of work carried out on those which have progressed has received many compliments from those who have seen it.

The episodes will be available on the Scotland Farm Advisory Service YouTube [www.youtube.com/c/FASScot](http://www.youtube.com/c/FASScot), with the specific episode on peatland restoration to follow and the piece on the Shetland Rural Experience available at FAS TV: S2 E9 [www.youtube.com/watch?v=TzrkdZ-by4E](http://www.youtube.com/watch?v=TzrkdZ-by4E).







## SUBSTATION SWITCHGEAR & WELFARE BUILDINGS

### Viking Substation

The Viking Energy Wind Farm (VEWF) Substation comprises of a 33kV Switchgear building, four Grid Transformer buildings, an Operations building and all associated electrical cabling, plant and equipment. This article provides a short overview of the substation site and the electrical equipment being installed there.

### 33kV Switchgear building

The High Voltage cabling from the wind turbine arrays arrive and terminate at the 33kV Switchgear building. The switchgear is composed of electrical disconnect switches and circuit breakers used to control, protect and isolate the electrical equipment.

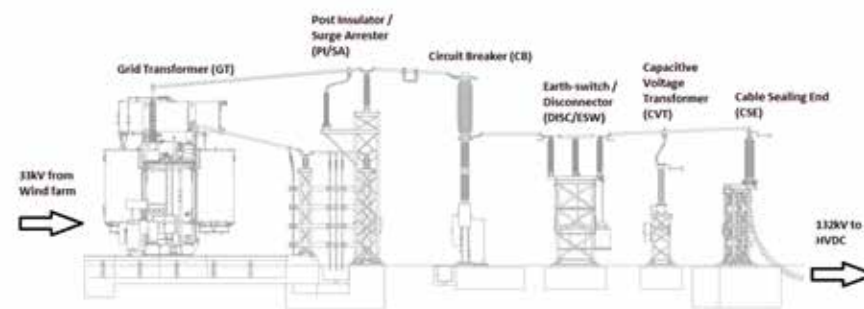
From the switchgear, the cables will then run to each of the four Grid Transformers (GTs) housed in separate halls.

### Grid Transformers (GT)

Step-up transformer which increases the voltage from 33kV to 132kV.

### Post Insulator (PI) / Surge Arrester (SA)

Post insulators are used in HV power stations and substations to insulate



Grid Transformer Halls: Indicative summary of the electrical equipment in each of the GT Halls:

and protect transformers, switchgear, and other related components.

Surge arresters are used to protect electrical power transmission and distribution system equipment from over-voltages caused by external or internal events.

### Circuit breaker (CB)

A circuit breaker is an electrical safety device designed to protect an electrical circuit from damage caused by an overcurrent or short circuit.

### Earth-switch / Disconnect (DISC/ESW)

Earthing switches are mechanical switching devices used for earthing parts of a circuit. They are typically applied in combination with a

disconnecting switch to prevent closing under voltage.

### Capacitive Voltage Transformer (CVT)

The Capacitive Voltage Transformer is a step-down transformer, which converts high voltage (HV) to low voltage (LV) to provide easily measurable values used for metering, protection and control of the HV system.

### Cable Sealing End (CSE)

The Cable Sealing End is the cable joint/termination point.

### Operations building

The Operations building is the main office, store and welfare for the SSE Renewables site management team.

## LAUNCH OF OUR FREE STEM EDUCATIONAL RESOURCE FOR PRIMARY SCHOOLS IN SHETLAND

We have recently launched a new, free, Science, Technology, Engineering and Mathematics (STEM) interactive educational online resource for children aged 3 – 8 years old, aimed at nursery and primary schools across Shetland. We worked with teachers in Shetland to develop an engaging and fun educational resource.

This bespoke resource was created in conjunction with educational experts, the National Schools Partnership. Vailla's Windy Day follows the adventures of Vailla, a 7-year-old girl from Shetland as she learns about electricity and wind power, meeting lots of colourful characters along the way and features the voices of local children. The voice over was undertaken by a Shetland school teacher, Annette Gear from Mid Yell Junior High School, who said: "The bairns were very enthusiastic about recording the place names, and then really enjoyed identifying their voices when we tried out the resource."

Feedback from piloting these resources has been extremely positive – children love and relate to the character of Vailla and teachers have found the resource extremely useful.

Representative from the National Schools Partnership, Louise Weisbloom said: "It has been wonderful to develop Vailla's Windy Day with SSE Renewables and local teachers in Shetland and encourages exploration of key STEM concepts and careers."

"The resource is typical of our award-winning work and links Education Scotland's Curriculum for Excellence key science learning objectives with the science of wind power and renewable energy."

"We hope that children in Shetland will enjoy following Vailla's adventures and have fun while they are learning."

As well as the opportunity to learn about wind energy, schools in Shetland who use the resource are invited to enter a poster competition to win an anemometer, so they can continue to track the effects of the wind in Shetland.

Teachers and parents can download the resources at [nationalschoolspartnership.com/vailas-windy-day](https://nationalschoolspartnership.com/vailas-windy-day).







Julie Graham from VEWf presents a cheque to Whitedale FC for training tops.

## COMMUNITY ENGAGEMENT

### WHITEDALE FOOTBALL CLUB

SSE Renewables and Viking Energy Wind Farm have a commitment to supporting a diverse range of community projects in Shetland and recently donated £2,500 to Whitedale Football Club to fund 43 training tops for the senior team.

The cheque was presented to Whitedale FC by Julie

Graham of SSE Renewables. Craig Nicolson, Manager of Whitedale Football Club, said: "Whitedale are absolutely delighted to be proudly showing off their new kit wear which was provided by SSE Renewables. Over 40 tops have been rolled out to the senior team, providing a modern, professional image. A massive thanks to SSE Renewables for their generosity and support."

### VIKING SEA ANGLING FESTIVAL

This year's Viking Festival took place at Scalloway boating Club in mid August. This Sea Angling competition saw 29 anglers take part over 4 days. SSE Renewables supported the event with prizes for participants.

VEWF's David McGinty at the Viking Sea Angling Festival which VEWf was please to support.



## VIKING PARISH CUP FINAL

The Viking Parish Cup reached an exciting conclusion with Cunningsburgh putting in an outstanding performance and going on to lift the trophy.

SSE Renewables and Viking Energy Wind Farm supported the cup competition by helping the 11 teams participating to access the benefits of membership of the Scottish Football Association.

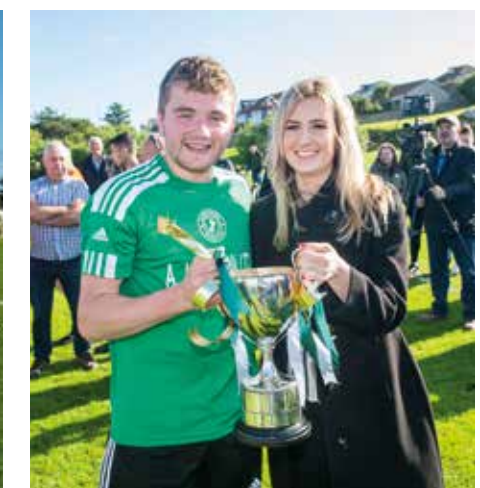
The trophy was presented by Andrea Laurenson of VEWf who are proud to sponsor the Viking Parish Cup.

Iain Smith, President of the Parish Cup Football Association said: "The Viking Parish Cup is all about bringing communities together. This was a great occasion and so many people turned out to watch. The support from SSE Renewables and Viking Energy Wind Farm has been a great help in moving the event forward and supporting not only current players but the young stars of the future."

For more information about our Viking Wind Farm project go to [vikingenergy.co.uk](http://vikingenergy.co.uk).



Cunningsburgh FC with the Viking Parish Cup.



Andrea Laurenson of VEWf presents the winning captain James Farmer with the Viking Parish Cup.

## SHETLAND COMMUNITY BENEFIT FUND

The Shetland Community Benefit Fund has been up and running for 18 months and through the Viking Community Fund Advanced Grant Scheme (AGS) has committed almost half a million pounds in support for local projects. As of July 31st £470,543.83 has been committed to 224 projects covering all of Shetland, from Fair Isle to Unst.

Early in the project, an additional £200k was advanced on the main Shetland Community Benefit Fund to the MRI Scanner Appeal.

The Viking Energy Wind Farm (VEWF) is committed to the Scottish Government Good Practice Principles for Community Benefit. As part of this approach IBP Strategy and Research have been hired by Shetland Community



Benefit Fund to complete an independent programme of community consultation for the Viking Community Fund.

The first stage of the consultation was a stakeholder and literature review and will be published in the September issue of 'Shetland Today.' The document sets out Shetland's significant strengths as a place, and as a collection of communities, and identifies the challenges they also face. The document sets a number of questions which will form the basis of the Islands wide consultation which will take place over the autumn and winter, including a survey which will be sent to every Shetland household.

A full list of the grants awarded under the scheme and how to apply for a grant are available at [www.scbf.org.uk/ags](http://www.scbf.org.uk/ags)



# KERGORD HVDC CIVIL WORKS UPDATE

Over the summer months, works have continued at a rapid pace at Kergord HVDC Converter Station. The works remain on programme and the contractor is continuing with the ongoing internal fit-out of building services in the HVDC buildings.

A number of these key areas within the buildings have been passed over to Hitachi Energy, who have commenced with the installation of the HVDC equipment. In addition to works within the building, external civils works are continuing including installation of the earth grid (which is required to dissipate the flow of current into the ground if a fault occurs), trough lids and CCTV cabinet and mast bases.

Works have also recommenced on the permanent watercourses around the perimeter of the site. It is important that these works are completed prior to the winter months when ground conditions are likely to deteriorate.

Furthermore, the installation of ducts for communication cables and the water main has been ongoing in the period. Whilst these items are regarded as a minor element of the works, these essential utility connections are critical to the operation of the building.

As we move into the winter period, the focus will be to



Northern watercourse construction.

complete much of the remaining external civils works and internal fit-out of buildings services.

#### Lookahead:

- External Civils (Earthing, Troughs, Roads/Kerbs and Watercourses)
- Internal fit-out completion for Hitachi Energy to complete installation of key HVDC equipment
- Continue with remaining utility connections (Comms and Water Supply)



HVDC reactors installed in the main building.



Example of a transformer mounted on rails, ready to be skidded into its final position.

# HITACHI TRANSFORMER UPDATE

In June, the transformers arrived on site as detailed in previous newsletters. These have now been skidded into place (as illustrated in photo above). The skidding process consists of the transformers being jacked up and put on rails so that they can be slid into their final position.

The cooling banks and the transformer enclosure have now been completed as seen on the right.

These transformer units weigh approximately 168 tonnes each and are vital components in the operation of Kergord Substation which will play a vital role in the Shetland HVDC link.

#### General Install:

Good progress is being made with the install of HVDC Valves and Reactors. Pictured on the left are the reactors at Kergord. The valves, often being referred to as the heart of the converter, will make possible the conversion from AC to DC that is pivotal to the Shetland HVDC link. The reactors are used to filter any disturbances to ensure that the power supplied to the consumer is of good quality.

#### Look ahead:

- Cable Installation
- Continued installation of key HVDC equipment
- Control panel installation



Completed transformer enclosures with cooling fans visible.

The commissioning teams, have now been established and planning for the testing and commissioning of the HVDC Converter Station has now commenced.

Over the coming months there will be further progress made across all the buildings on site as progress on the Shetland HVDC link continues. The site will remain busy with the building of enclosures, securing of connections and other works necessary for ensuring that this project is delivered in a safe and timely manner.



## 1 AC SUBSTATION

The 132kV Substation external and internal works are progressing well and on schedule. External works are on track to receive the first two layers of road surfacing by week ending 11th September with the final wearing course being carried out at a later date. Siemens Energy have made considerable progress within the building with the installation of circa 52 Control Panels along with the cable installation works progressing to each room.

The Project is on track to start receiving the first delivery of Gas Insulated Switchgear from Germany week commencing 12th September with an anticipated 14 number other loads to come onto the island over a four-week period. The planned HGV movements are not anticipated to have any impact to regular traffic.

Gas-insulated high-voltage switchgear (GIS) is a compact metal encapsulated unit consisting of many components which can be safely operated in confined spaces such

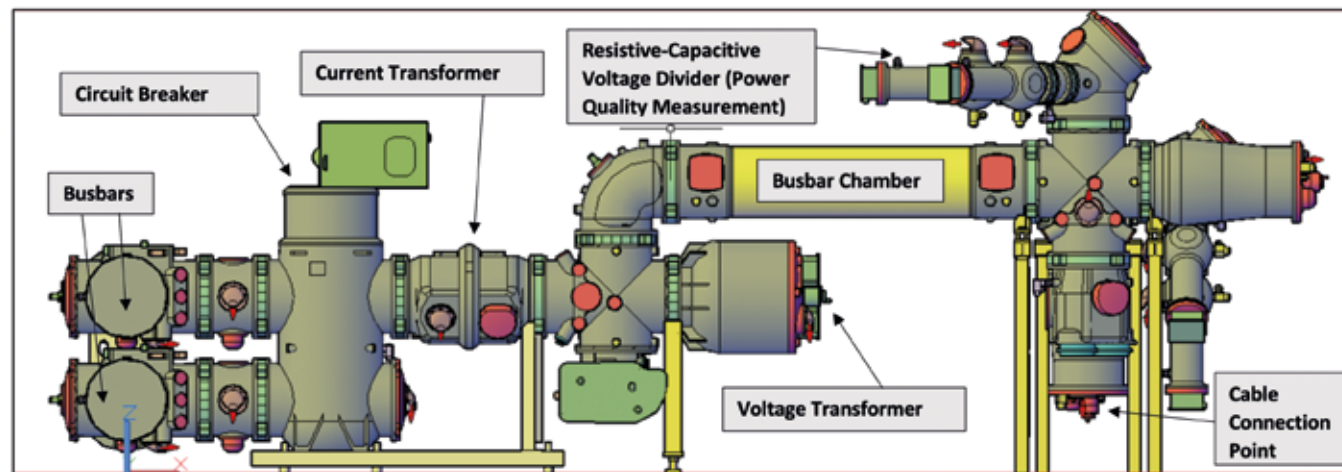


Protection & Control Panels Installed.



GIS Hall – Being Prepared for Gas Insulated Switchgear (GIS) Installation.

as our 132kV GIS Building. The GIS allows for the safe switching, separate, transform, measure and distribute electrical energy in power systems. The type of GIS being used at Kergord is Siemens 8VN1 Blue Technology which uses a Clean Air insulating gas which has no harmful effects on the environment. The below illustration shows one of the typical GIS Bays within the substation.



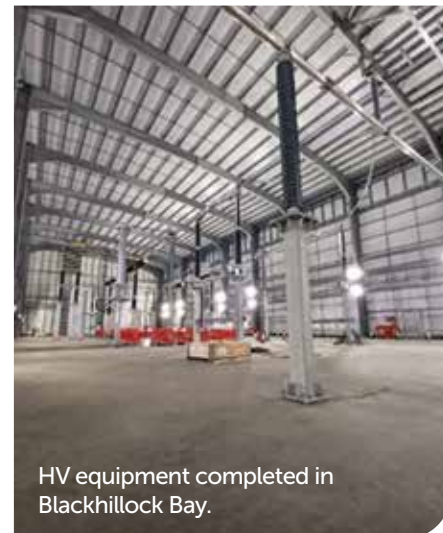
## 1 NOSS HEAD UPDATE

The Project is progressing well with the remaining civil works by BAM Nuttall and their subcontractors. The technology installation from Hitachi Energy and their subcontractors is nearing completion of the High Voltage DC equipment and work is ongoing for the cable pulling with a completion date of the middle of October. The installation of the 11kV & 33kV OHL work is making good progress with a connection date of 12 October to the 11kV distribution system.

The project will move into commissioning phase at the end of 2022 with a planned outage due to start late September with a planned outage of the existing Spittal to Blackhillock HVDC link planned for early 2023.



Completed DNO overhead lines (11kV & 33kV).



HV equipment completed in Blackhillock Bay.

## 1 LAND CABLE INSTALLATION WORKS

Cable installation works began in February and are currently 70% complete, with all cables in the A971 section now installed. The cables are pulled through the ducts using winches and then connected together by specialist jointing teams at the joint bay locations. Cable jointing works started in May and are due to be complete in late Autumn 2022. The cable jointing works in the A971 section are now complete and backfilled. All cable installation works are planned to be complete by late Autumn 2022.

The full width resurfacing of the northbound carriageway of the A971 from Scord of Sound to Stenswell commenced in August and was completed in early September 2022, 4 weeks ahead of schedule. Traffic management has now been removed. The team and contractors would like to thank the Shetland community for their continued support and patience during the installation works to date.



Resurfacing of northbound lane on the A971.





Cable pull-in rigging entering the bellmouth.

## SUBSEA WORKS

The NKT Victoria, a purpose-built cable laying vessel left Sweden in July to sail across to Noss Head to complete the first campaign of cable lay for the Shetland HVDC Project. This involved mobilisation, cable pull-in to the landfall and then cable lay away from the mainland for the first 100km of the offshore route (260km in total).

This significant milestone follows on from the recent successful clearance of boulders along the proposed route of the Shetland HVDC link and the work to create a clear corridor in preparation for the cable installation. Now the cable is in place on the seabed, it is being trenched into position using the Grand Canyon III, a multi-role construction support vessel with a specialist subsea jet trencher, which will ensure the cables are buried to the correct depth. Rock placement will also take place at some sections to ensure the cables are

protected where trenching is not possible. The NKT Victoria will lay the cables in three campaigns – the first, as noted, is now complete. The second campaign is expected to begin in March 2023 and will involve another 57km of cable from Weisdale Voe on Shetland heading south. The third campaign will take place later in 2023, which will complete the link between the first and second campaigns in the North Sea to join all three subsea HVDC link.

Following on from the cable installation at Noss Head, there was a very successful scope of work to install a cable protection system away from the HDDs and along the cable route until the two cables met. This has been completed and is now ready for the rock installation due to start in September.



Example of cable lay.



Cable Protection System (CPS) across the Horse Mussel Bed.

## ENVIRONMENT

### Kergord Biodiversity

SSEN Transmission have ambitious biodiversity targets for all projects gaining consent after April 2020 to achieve no net loss in biodiversity as measured by our own Scotland-specific toolkit which is based on the Natural England biodiversity metric. Although the Kergord site was given planning before that date it was decided to ensure that the project achieved the biodiversity target.

The first step in the process is to measure the biodiversity baseline of the site which was made up of mainly grassland habitats of poor biodiversity with smaller areas of higher condition acid grassland and poor quality modified bog. Whilst the majority of the habitat of the almost 14 ha site was to be disturbed by the planned works, a number of opportunities were identified to increase the value of the habitats around the substation. To mitigate for the losses in the poor quality grassland, the area of acid grassland is to be increased almost threefold using a specific designed seed mix suitable for the conditions in the locality. There will also be areas of tree and scrub planting that will not only screen the site but also increase the diversity of habitats. A pond and almost 1km of water course will also be created or realigned all with the aim of improving biodiversity.

With these habitat enhancements the site should be more attractive for birds for not only foraging but also nesting in the woodland and scrub areas. The increased area of acid grassland with the increased numbers of wild flowers will encourage greater number of pollinators and other invertebrates. This in turn could support increased numbers of predators such as bats who will be able to feed on the insects and other invertebrates attracted to the grassland and also the new waterbodies such as the pond and burn. Otters, which are present in Weisdale Burn, may also visit to feed on the amphibians associated with the watercourses.

When all of these habitat enhancements were calculated in our Biodiversity Net Gain toolkit we estimate that there is a potential gain in biodiversity of over 50% in terms of habitat type and condition. As with the Natural England toolkit any gains to species abundance would be over and above those improvements. To ensure that the designed in biodiversity is delivered we have a long term management habitat in place which includes requirements for monitoring the results of which will not only allowing tracking of the progress of the habitats but also inform future management of the site.



Aerial view of Kergord September 2022.



# PUBLIC SAFETY

At SSE, safety is the most important part of all projects. Like all construction sites, there are many hazards on worksites which can make them dangerous places to be, not only for the work force but for members of the public too. While the site is in operation, hazards such as moving vehicles, working at height, power tools and lifting activities are all assessed and mitigated. These risks may seem obvious however even at night when the work force is not onsite, numerous hazards are present. These includes slips and trips, falls from height or into excavation or even unauthorised use of equipment.

Each year in the UK, members of the public, both children and adults are killed or seriously injured after gaining access to construction sites.

SSE and their Contract Partners are legally responsible for ensuring the safety of their own teams and members of the public. They work together to identify and secure site perimeters and place signage to warn



Examples of typical safety signage

against unauthorised access. This not only applies to the main Kergord HVDC Converter Station site but also to the SSEN Transmission teams along the cable route and the SSE Renewables teams constructing the wind turbines.

It is vital that members of the public respect the fencing, barriers and signage put in place to help keep themselves and others safe.

# RNLI IN ACTION

When the Guard Vessel, the GV Reaper joined the Shetland HVDC Link Project this Summer, it's main duty, along with the team guard vessels, was to protect the subsea cable from damage from marine users/vessels. However, around lunchtime on the 2nd of August, when the vessel received a distress call over the radio from the Coast Guard to say that a paddle boarder was in trouble off the coast of Wick.



Due to the vessel crew's quick reactions, they were able to use the vessels heightened vantage point to locate the paddle boarder and assist the Royal National Lifeboat Institution (RNLI) with the rescue.

Thankfully, despite being exhausted from battling the rough seas, the paddle boarder was safely recovered to the RNLI lifeboat without injury and the crew of the GV Reaper returned to look after our cable which will soon be protected within a trench and by carefully placed rock.

Despite being an isolated event to our team in SSE, the RNLI were called upon to rescue over 340 paddle boarders in 2020. The risks associated with taking to the open water cannot be underestimated and the RNLI guidance should be followed:

- Plan ahead. Check the weather forecast and tell others of your whereabouts
- Buddy up and take part with others
- Don the correct safety equipment: life jacket or

- buoyancy aid and harness and leash
- Have means of raising the alarm in emergencies such as a mobile phone in a waterproof pouch.

For more information on water safety, visit [www.RNLI.org/safety/respect-the-water](http://www.RNLI.org/safety/respect-the-water)

The SSE team would like to thank the crew of the GV Reaper and the RNLI and remind everyone to take care when in and around open water.

# FOCUS ON: SHETLAND CLIMATE WEEK



In September, the Shetland Islands Council Climate Change Programme teams will host the first Shetland Climate Week, which will run from 24 September – 3 October and corresponds with Scotland's Climate Week. The week will include a wide range of in-person activities and online learning resources across a variety of climate change topics.

The purpose of these events is to take the global climate change challenges and issues, and contextualise them for Shetland. The week aims to promote some best practices and organisations undertaking work relating to climate change, and allowing the public to look into different sectors to see how they are addressing different parts of the climate crisis as well as adapting to the changing climate. The week will also highlight what individuals can do to reduce their own carbon footprint, and that of their community.

Links to the full agenda and webpage content will be available online in the coming weeks. For more information about Climate Change in Shetland and the SIC Climate Change Programme, please see the new SIC webpage at [www.shetland.gov.uk/climate-change](http://www.shetland.gov.uk/climate-change).

### SSEN will be participating in:

- **Shetland Energy Showcase** (Saturday 24th Sept & Saturday 1st Oct) – These events have the ambition to provide information and resources to create understanding of energy in the context of Climate Change & net zero targets. This event is a collaboration between the SIC and the ORION Clean Energy Project. SSEN Transmission are hosting a stall

at both events and will be there in person to share more on the role of transmission in supporting the transition Net Zero in the UK, and more specifically the role of Shetland and our work on the Islands as part of that. We will have representatives from our Customer, Sustainability and Community Liaison teams there to talk to members of the public throughout the events so if you'd like to learn more come visit us at Lerwick Town Hall on 24th September or Brae Hall 1st October.

- **Peatland & Biodiversity Day** (Sunday 2nd Oct) – Francis Williams, Environmental Net Gain Manager for SSEN Transmission, will be attending the Biodiversity Day of Shetland Climate Week to provide an overview of SSEN Transmission's business target for no net loss in biodiversity on new developments and provide examples of how this has been implemented both on Shetland and mainland Scotland. This includes examples of pollinator habitat creation, woodland planting and peatland restoration. SSEN Transmission's ambitions for marine habitat enhancement and support for marine conservation initiatives will also be highlighted.

We are all looking forward to being a part of Shetland Climate week and looking forward to meeting everyone attending each event, and answering any questions people may have.

SSE Renewables will be participating in the Youth Day on Tuesday 27th and the Energy Showcase on Saturday 1st October at Brae.

## Sustainability Strategy

In 2019, we launched our Sustainability Strategy with the objective of enabling the transition to a low carbon economy, and we set achieving Leadership in Sustainability as a critical part of this approach. This means being a trusted partner of the communities we work alongside and co-operating to realise long term benefits for society, economy and the environment.

We know that without the continued support of the communities in which our assets are located, we wouldn't be the business we are today or become the business we want to be in the future. It is because of this that we are now reviewing and refreshing this strategy to ensure it remains fit for purpose, meets the requirements of our customers, and continues to

provide clarity and impetus for Scotland's transition to Net Zero.

Given the importance we place upon working with communities across Scotland, we want to offer the opportunity to feed into the strategy review process. Feedback will be essential in understanding where our communities feel our level of ambition is, where it could be and what other things you feel we should be considering.

We would really appreciate any and all feedback, so if you would like to be involved please fill in this survey to provide feedback on our approach and areas of focus. Alternatively if you'd like to get in touch with the team directly please contact our Sustainability Manager, Alison Fulford [alison.fulford@sse.com](mailto:alison.fulford@sse.com).



# SHETLAND RENEWABLE CONNECTIONS

## KERGORD TO YELL

### Ground Investigation works

The remaining ground investigation works are scheduled to be completed in October around Cull Ness, these were temporarily paused to take into account a number of breeding birds and otter holts within the agreed work exclusion zones, the works are expected to take 6 weeks. The project team alongside NatureScot and the appointed contractor (BAM) worked together to identify an appropriate time window and are now in the process of securing the relevant licence required to complete the works.

### Planning update

Teams continue to progress towards finalising the alignment between Kergord and the proposed landfall at Cull Ness for the overhead line, which will facilitate the connection between the Shetland mainland and the proposed wind farm on Yell. This follows on from a public consultation that was held in September 2021. The connection to Yell will include the installation of a subsea cable between Cull Ness and Burravoe and a land connection between Burravoe and a switching station in South Yell.

Ground investigation works.



### Gremista Grid Supply Point (GSP)

Current key activities on the GSP project are focused on walk over surveys starting in September 2022 by the appointed contractors to review both the Overhead Lines (NorPower) and cable (OMSI) routes. Surveys have taken place during August for the undergrounding of the 33kv distribution infrastructure between Veensgarth and Sandwater.

The GSP which connects Kergord to Gremista via a 132kV transmission circuit will play a critical role in Shetland's future security of supply by connecting Shetland to the GB energy system for the first time, enabling the supply of clean power to homes and businesses, even at times when local generation on Shetland's electricity distribution network does not meet demand. In recent weeks enabling works have been ongoing at the GSP site which include undergrounding and diverting existing overhead lines. This is to facilitate future ground works.

Our proposals have been carefully developed to minimise the impact on Shetland homes, businesses and the local landscape as we have sought to balance a range of economic, environmental and technical factors. We look forward to the outcome of our Section 37 application, supporting this process and remaining committed to working closely with Shetland Islands Council, the local community and wider stakeholders to deliver this critical infrastructure to support and secure Shetland's future energy needs.

## SSE Supply Chain Webinar

Shetland Grid Supply Point  
Substation Project  
Tuesday 11th October  
2022 – 10:00 am

Join this webinar for a fantastic opportunity to hear more about SSEN Grid Supply Point Substation and the subsequent construction, operational and maintenance activities post construction.

The Grid Supply Point Substation forms part of the infrastructure investment which will ultimately connect Shetland to the newly installed 600MW interconnector. SSEN will outline the scope requirements for the project and give the local supply chain the opportunity to ask questions to our panel.

We will share contact details during the webinar for further engagement.

### Target Companies:

- Logistics
- Lifting Services
- Heavy Transport
- Storage and warehousing
- Civils contractors
- Plant Hire
- Building contractors
- Waste Management
- Facilities Management

Registration details will be shared in the link below shortly:  
Registration URL

<https://attendee.gotowebinar.com/register/1180241495436129803>







Image: Lower Voe

To find out more about the projects and to register for updates please visit:  
[www.ssen-transmission.co.uk/projects/Shetland/](http://www.ssen-transmission.co.uk/projects/Shetland/)  
[www.vikingenergy.co.uk/](http://www.vikingenergy.co.uk/)