About
SP Energy Networks

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We all expect electricity to be available at the flick of a switch, 24 hours a day.

In southern and central Scotland, the job of making sure this happens belongs to SP Energy Networks. In fact we have a statutory duty to do it.

SP Energy Networks operates, maintains and develops the network of cables, overhead lines and substations which transport electricity to homes, schools and businesses in our local communities, and onwards to where it's needed further afield.

The high-voltage electricity transmission network, is managed by SP Transmission plc, a wholly-owned subsidiary of SP Energy Networks.

We take electricity generated from wind farms, power stations and imports, and transport it through our transmission network – over 3700 km of overhead lines, over 600 km of underground cables and more than 150 substations – to our local distribution networks, where the voltage is reduced for use in homes and businesses.

Electricity in our changing world

SP Energy Networks

The UK and Scottish Governments are committed to increasing the use of renewable energy and have targets to achieve net-zero greenhouse gas emission by 2045 in Scotland and 2050 in the UK.

As the country shifts away from traditional forms of fuel to heat homes, charge vehicles and power businesses, there is greater need for clean electricity.

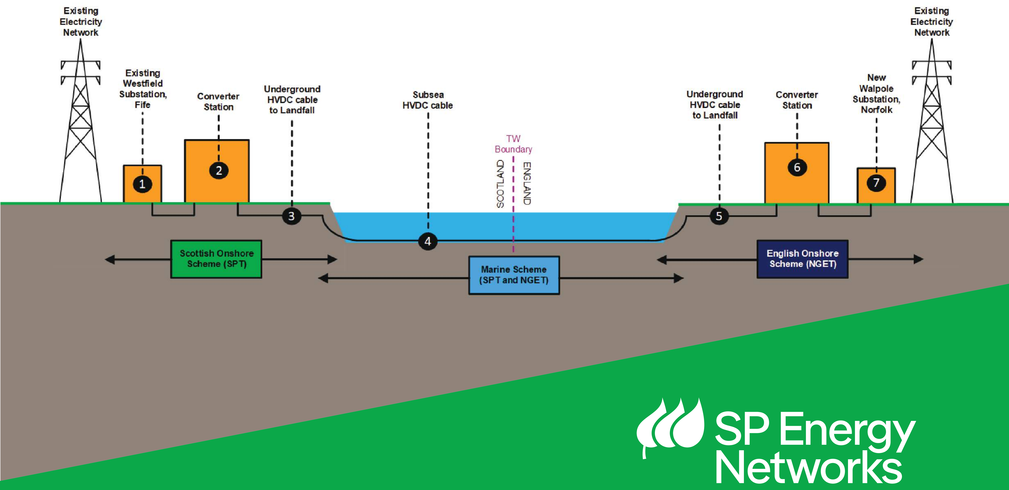
By the end of this decade, the UK Government also aims for every home in the country to be powered by offshore wind and has set a 50GW offshore wind connections target by the early 2030s.

Much of the new offshore and onshore wind is in or around Scotland, and the existing electricity network does not have enough capacity to transmit all the additional clean, green energy from where it's produced to where it's needed.

Eastern Green Link 4 (EGL4) is being developed in partnership between SP Energy Networks and National Grid Electricity Transmission and is one of four similar projects that will significantly increase the capacity of the electricity network between Scotland and England. EGL1 and EGL2 have already been consented and are moving towards construction, and EGL3 and EGL4 (this project) are in the development and assessment stage.

Western Link, a similar project linking Hunterston on the west coast of Scotland with Connahs Quay in North Wales, is already in operation.

Eastern Green Link 4 (EGL4): what's involved



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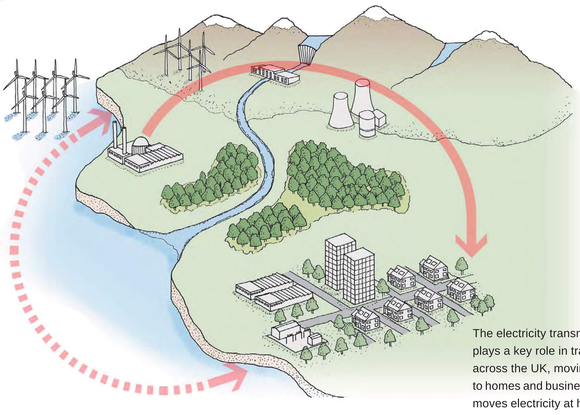
EGL4 is a new High Voltage Direct Current (HVDC) electrical link that will connect Fife in Scotland with Norfolk in England. It will be able to transmit up to 2GW of clean, green renewable energy – enough to power around 1.5 million homes.

EGL4 is made up of three parts:

- A 500km subsea HVDC cable between Kinghorn, Fife, and South Humber, Lincolnshire
- A 14km underground cable from Kinghorn to a new converter station at Westfield, near Ballingry, Fife
- A 100km underground cable from South Humber to a new converter station near Walpole, Norfolk

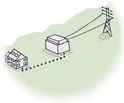
What is HVDC and why do we use it?

Over the coming decade renewable energy will continue to make a major contribution to the UK energy mix. In addition, other new generation will be developed as ageing power stations reach the end of their operational lives.



The electricity transmission network plays a key role in transmitting electricity across the UK, moving it from generators to homes and businesses. The network moves electricity at high voltages from generators such as power stations or wind farms to towns and cities.

Subsea HVDC technology has a number of advantages when transmitting electricity in large volumes – it is particularly effective at the long distance transmission of large volumes of electricity.



In everyday life we use Alternating Current (AC) electricity, which can have its voltage increased or decreased using transformers, making it safe to use in our homes, schools, businesses, and hospitals.

But to transmit large volumes of electricity over long distances it is more efficient to use High Voltage Direct Current (HVDC), which operates at a fixed voltage, requires fewer conductors (cables or wires) and incurs less power loss than AC networks.

AC electricity is converted into HVDC electricity using specialised equipment at a converter station. The HVDC electricity can then be transmitted over long distances – hundreds of kilometres – via underground and subsea cables to a second converter station, where it is converted back to AC to flow into the local electricity network.

By doing this, projects like EGL4 can remove ‘bottlenecks’ on the existing transmission network while reducing the need for more onshore overhead or underground power lines and associated infrastructure.

Westfield converter station

Existing converter station at Blyth, Northumberland

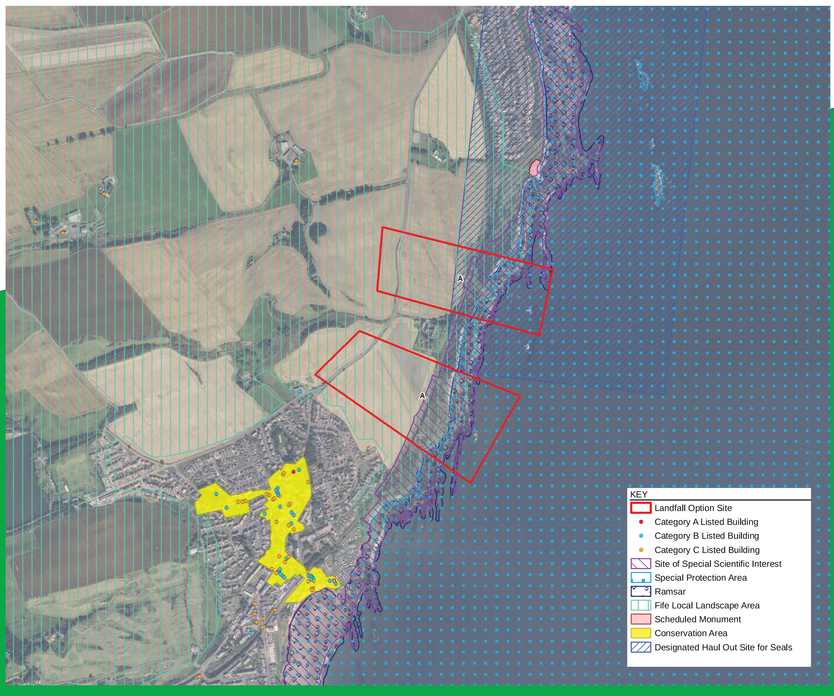
Computer visualisation of proposed Westfield converter station

Converter stations are needed at each end of an HVDC link to change the DC electricity to and from AC electricity, so it's safe to use in our homes and businesses.

The converter station will be made up of large warehouse-type buildings and outside electrical equipment. The total converter station footprint will be approximately 250m x 350m in size with buildings up to 28.5m in height, to accommodate the equipment needed. We will also need temporary construction and parking areas, and underground cables to connect the converter station to the existing substation. Our plans will include landscaping and tree-planting to help screen the site, reduce its visual effects and increase biodiversity.

Westfield is the starting point for EGL4 because it is a strong point on our existing transmission network which is closest to the Fife coast. The Westfield substation is currently a 275kV substation but will be rebuilt in the future as a 400kV substation. We need to have suitable network connectivity at the substation to provide the strongest support for the HVDC link. Westfield substation is the only substation in this area that provides this level of network connectivity and security, with four circuit infeeds to provide the resilience needed to keep the electricity moving.

Kinghorn landfall point



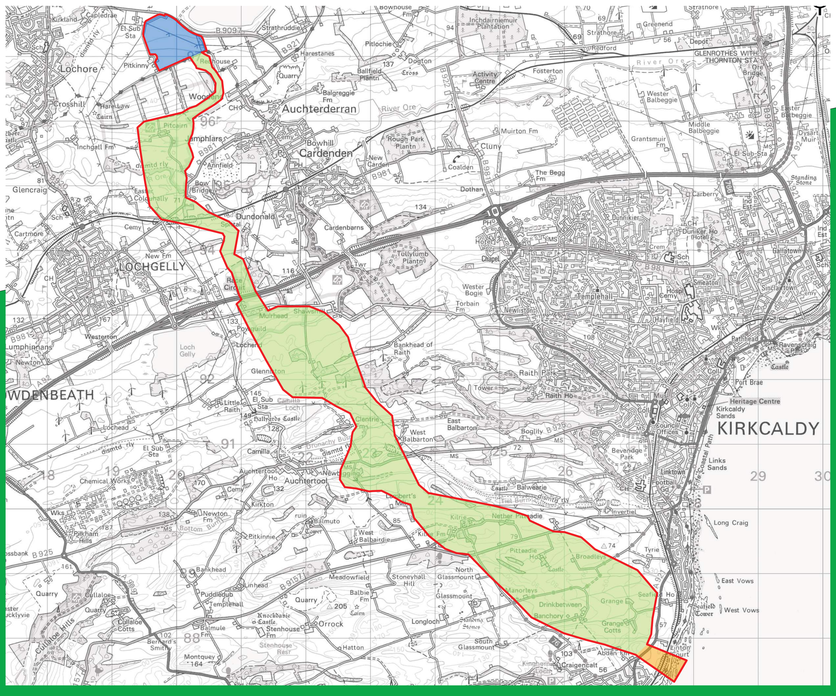
We are proposing to bring the subsea cables ashore at Kinghorn, south of Kirkcaldy, where they will be joined to underground cables in a buried pit. Once installation is complete, the ground will be reinstated and no permanent above-ground infrastructure will be visible.

We selected Kinghorn as the landfall site after careful appraisal of a number of potential options along the Fife coast, including at Largo Bay and Buckhaven. Bringing the cables ashore at Kinghorn allows a shorter onshore cable route to Westfield (around 14km from Kinghorn compared to around 29km from Largo Bay) and avoids centres of population, thereby minimising disturbance to local communities and the environment.

The subsea cables will be installed at the landfall site below ground using Horizontal Directional Drilling (HDD). This is a trenchless technology that reduces excavation to minimise any impact on the sensitive coastal environment and protected sites, and avoiding disturbance to the seal haul-out area to the north.

Example of an HDD site for a cable landfall point

Underground cable route

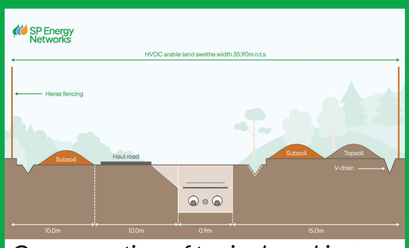


We have identified a swathe of land between the converter station site at Westfield and the landfall point at Kinghorn within which underground cables could be installed.

We will need a ‘working width’ of approximately 40 metres within this swathe, and we are consulting local people on where within the swathe this should go to help shape our ongoing design and assessment.

Our preferred route is approximately 14km in length, running mainly through rural areas to the south of the A92, and on the margins of scattered settlements to the north of the A92.

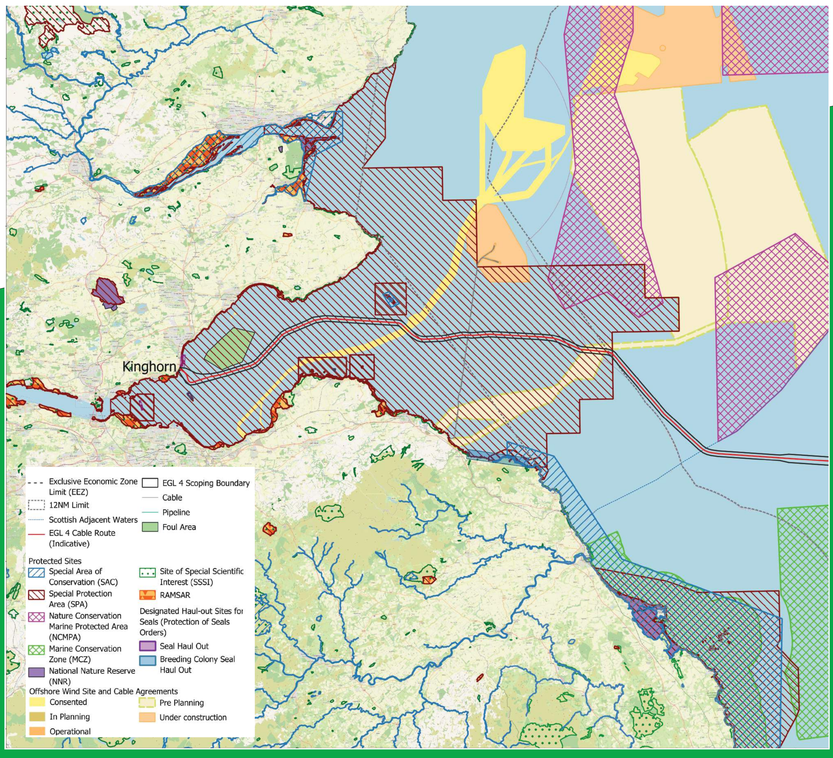
The preferred route avoids designated areas including Camilla Loch SSSI, Raith Park and Beveridge Park Garden. It will cross under the A92, the Fife Circle Railway Line and watercourses using trenchless technology (such as HDD). This trenchless technology may also be used to pass safely under other features such as large areas of woodland if we cannot route around them.



Cross-section of typical working width for HVDC cable installation

HVDC cable installation

Marine cable route



Our preferred route for the subsea cables has been developed through careful environmental and technical assessment of potential route options, in consultation with Scottish shipping and fisheries organisations and environmental bodies.

It takes into account protected and designated areas and infrastructure such as pipelines, cables, wrecks and military considerations.

The marine cables will be installed by special cable-laying vessels (pictured below). They will be buried in the sea bed or covered by rock armour throughout their length to protect them from accidental damage.

We want to hear your views!

SP Energy Networks

Our public consultation runs until Friday 10 May 2024.

SP Energy Networks attaches great importance to the effect our work may have on the environment and local communities. We want to hear what local people think about our plans, to help us develop the EGL4 project in the best way.

Please give us your views on our preferred converter station site, underground cable route, landfall point and marine cable route, and anything you would like us to take into account – such as site access – to help us develop our plans.

You can find more information, project documents and an online feedback form at our project website: www.spenergynetworks.co.uk/pages/eastern_green_link_4.aspx

You can also contact us to ask any questions or give us your comments:

Email: egl4@communityrelations.co.uk

Freephone: **0800 021 7890**

Freepost: **FREEPOST SPEN EGL4**

What happens next?

SP Energy Networks

Following this first round of consultation we will develop more detailed designs for the landfall point, converter station and cable route, including locations for access routes and working areas.

We will publish a report summarising the feedback received in this first round of consultation and how this has influenced our plans. We will then carry out a detailed Environmental Impact Assessment (EIA) and hold a second round of public consultation on the detailed designs.

SP Energy Networks will be applying to Fife Council for planning permission in principle (PiP) under the Town and Country Planning (Scotland) Act 1997 for the proposed converter station, and full planning permission for the DC underground cable from the Mean Low Water Springs (MLWS) at the landfall site to the converter station and for the AC underground cable from the converter station to Westfield Substation. The EIA Report will accompany the planning application to Fife Council.

The marine cable will be subject to a separate application to the Scottish Government's Marine Directorate – Licensing Operations Team (MD-LOT).