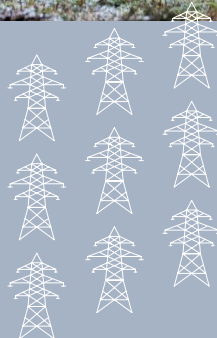
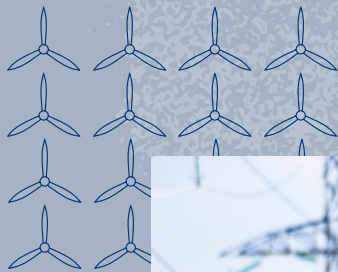
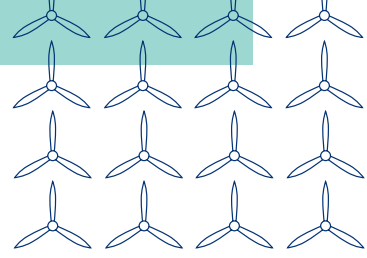


SSEN Transmission's Pathway to 2030 projects

Why are these projects needed and how has this need been assessed





Introduction

SSEN Transmission’s Pathway to 2030 projects are part of a major upgrade of the electricity transmission network across Great Britain (GB) that are required to help deliver UK and Scottish Government climate change and energy security targets. In simple terms, these projects are required to connect homegrown, low carbon renewable electricity generation and transport that power to areas of demand across the country, building a cleaner, more secure and affordable energy system for homes and businesses across Great Britain.

This paper sets out some of the policies and targets that have been set by the UK and Scottish Government that are driving the need for investment in new clean power and the electricity transmission network that is required to enable this. It also explains the electricity network planning processes that have established the need for these Pathway to 2030 network reinforcements.

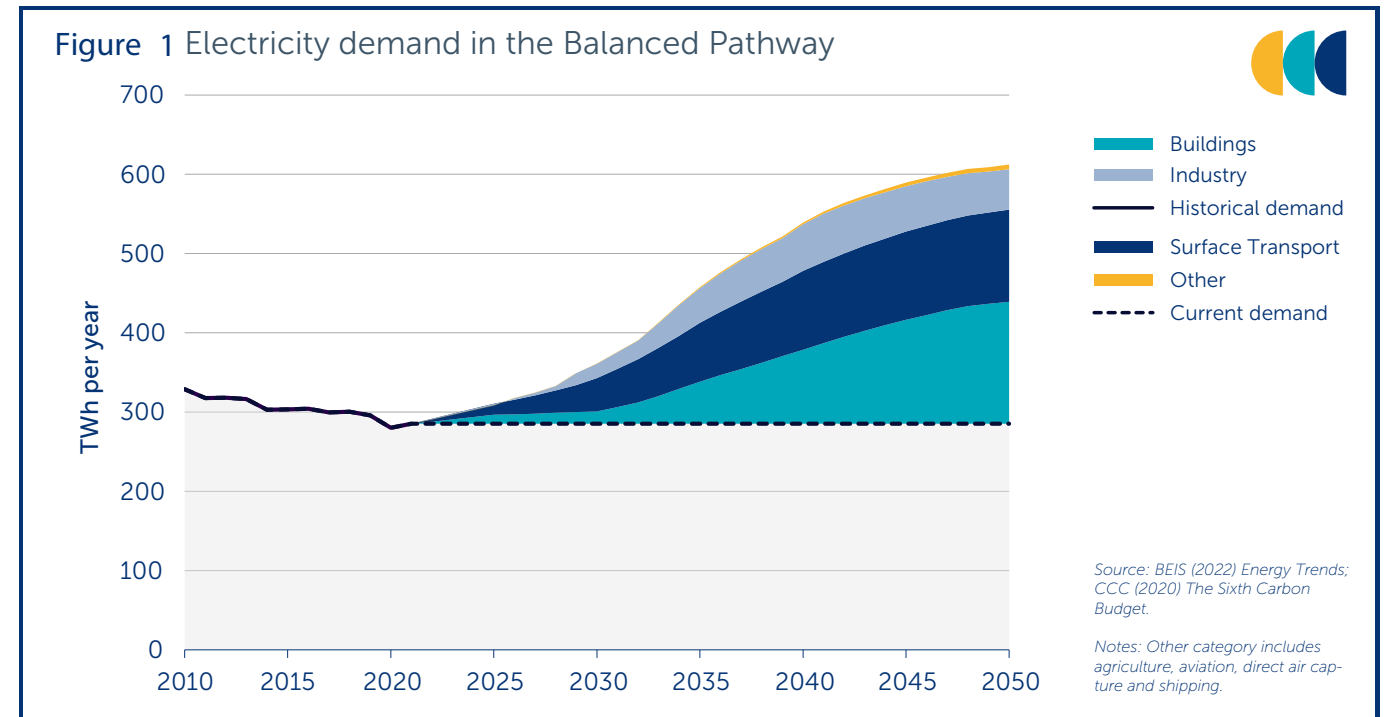


Net zero and renewable targets



The UK and Scottish Government have committed to deliver net zero emissions by 2050 and 2045 respectively.

To put into context the scale of the challenge in delivering these legally binding net zero targets, the Climate Change Committee - an independent, statutory body which advises the UK and devolved governments on their emissions reduction targets - forecast in its 'Delivering a reliable decarbonised power system' report¹, that electricity demand will double by 2050.



This is as a result of forecast changes in electricity use across the UK, for example, through the electrification of transport and heating.

Meeting these net zero targets and associated increases in electricity demand will require significant and unprecedented investment in new low carbon electricity generation and the enabling electricity network infrastructure across GB that is required to connect and transport this power from generation source to areas of demand across the country. Further investment is also required to replace the generation capacity lost due to the planned closure of fossil fuel powered electricity generation power stations.

To maintain progress towards delivering these net zero commitments, the UK and Scottish Government have also set a number of interim targets. This includes the UK Government’s target of 50GW of offshore wind by 2030 and a target to fully decarbonise the electricity system by 2035.

Draft Energy Strategy and Just Transition Plan – delivering a fair and secure zero carbon energy system for Scotland



January 2023



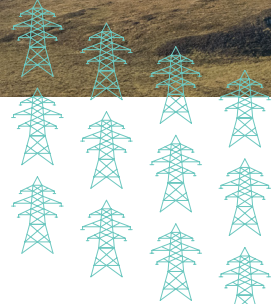
The Scottish Government, in its Draft Energy Strategy and Just Transition Plan², has set a new target for an additional 20GW of new low carbon renewable electricity generation by 2030, including 12GW of new onshore wind. The Scottish Government has also consulted on increasing its current offshore wind target of 11GW by 2030, with its final Energy Strategy and Just Transition expected by summer 2024.

Energy Security

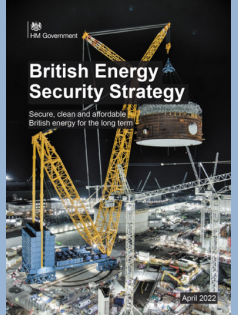
As well as delivering net zero and renewable targets, there is also a requirement to secure the country's future security of supply and reduce our dependence on volatile and often expensive global wholesale energy markets.

The British Energy Security Strategy

In April 2022, the UK Government published its British Energy Security Strategy (BESS)³. This set out the UK Government's plans to secure the country's future energy independence by reducing dependence on, and price exposure to, volatile global wholesale gas markets. This will be achieved by accelerating the deployment of homegrown and affordable low carbon electricity generation, together with accelerating the enabling electricity network infrastructure required to connect and transport this power.



There is currently around 14GW of offshore wind across the UK and in Scotland, there is currently around 13GW of low carbon renewable generation. To meet the UK Government's 2030 offshore wind target, we need to more than treble what is currently connected and to meet the Scottish Government's 2030 renewable target, we need to more than double what is currently connected. With the current electricity transmission system already at full capacity in many places across GB, particularly throughout the north of Scotland, over £10bn in new electricity transmission network infrastructure, in the north of Scotland alone, is required to deliver these Government targets.



UK Government British Energy Security Strategy April 2022

"This plan comes in light of rising global energy prices, provoked by surging demand after the pandemic as well as Russia's invasion of Ukraine. This will be central to weaning Britain off expensive fossil fuels, which are subject to volatile gas prices set by international markets we are unable to control, and boosting our diverse sources of homegrown energy for greater energy security in the long-term.

Accelerating our domestic supply of clean and affordable electricity also requires accelerating the connecting network infrastructure to support it."

The BESS included the UK Government's increased ambition for offshore wind of 50GW by 2030, up from its previous 40GW target. Around 11GW of this target will be met from new offshore wind in Scottish waters granted seabed leases in January 2022 by Crown Estate Scotland through the ScotWind leasing round⁴.

Pathway to 2030 Holistic Network Design

To enable the connection of the UK Government's 50GW of offshore wind by 2030 target, the independent GB Electricity System Operator, National Grid ESO (the ESO) – which is responsible for balancing electricity supply and demand across GB and oversees the coordination of electricity transmission network system planning processes - was tasked by the UK Government with developing what is known as the 'Pathway to 2030 Holistic Network Design' (the HND)⁵.



National Grid ESO Pathway to 2030 Holistic Network Design July 2022

"The Pathway to 2030 Holistic Network Design (HND) is a major step for Great Britain in delivering cheap, clean energy from offshore wind.

It sets out a single, integrated design that supports the large-scale delivery of electricity generated from offshore wind, taking power to where it's needed across Great Britain.

The HND provides a recommended offshore and onshore design for a 2030 electricity network, that facilitates the Government's ambition for 50GW of offshore wind by 2030."

The ESO's assessment also considered the proposed technology choices, which includes a combination of overhead and subsea electricity network investments. Upon completion, the HND was then endorsed by both the UK and Scottish Government as meeting the Terms of Reference for the Offshore Transmission Network Review.

The HND, which was developed in collaboration with the three GB Transmission Owners⁶, is a single, integrated coordinated plan that sets out the onshore and offshore electricity transmission infrastructure required, across GB, to deliver this UK Government target. The HND confirmed the requirement for all of SSEN Transmission's Pathway to 2030 projects.

Accelerated Strategic Transmission Investment

Following the publication of the HND, in December 2022, the independent GB energy regulator, Ofgem, approved the need for these projects as part of its Accelerated Strategic Transmission Investment (ASTI)⁷ framework decision, again as a GB-wide programme of investments. Ofgem's decision included approval for all of SSEN Transmission's Pathway to 2030 projects. It also set out the regulatory framework under which these projects will be taken forward.

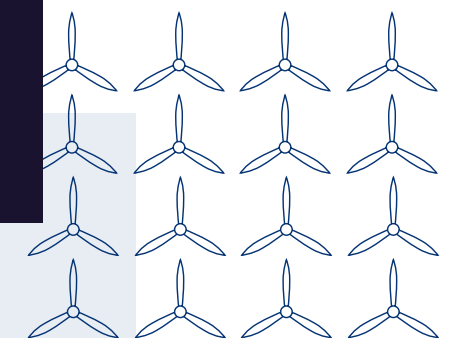


Ofgem Decision on accelerating onshore electricity transmission investment

"The British Energy Security Strategy set out the Government's ambition to connect up to 50GW of offshore generation to the electricity network by 2030. Facilitating this ambition will require significant reinforcements to the onshore electricity transmission network and a change to the current regulatory framework in order to accelerate delivery of large projects.

In August 2022 we consulted on how Ofgem could support the accelerated delivery of the strategic electricity transmission network upgrades needed to meet the Government's 2030 renewable electricity generation ambitions. This document contains our decision to introduce a new Accelerated Strategic Transmission Investment (ASTI) framework.

We set out the initial list of ASTI projects, our decision on exempting strategic projects from competition, the new process for assessing and funding ASTI projects and the range of measures we are introducing to protect consumers against additional risks that changing the process brings."



Further background to GB electricity transmission network system planning processes

In this section, we further explain the system planning processes, overseen by the independent ESO, which establish the need for new electricity transmission network infrastructure. These processes involve extensive analysis and power system studies to establish both the drivers for network investments and the identification of which network upgrades should be taken forward publication.

Future Energy Scenarios

This considers future electricity trends, set out annually in the ESO's Future Energy Scenarios (FES)⁸ publication. The FES sets out scenarios for future electricity generation and demand, broken down regionally across GB, and considers all energy technologies.

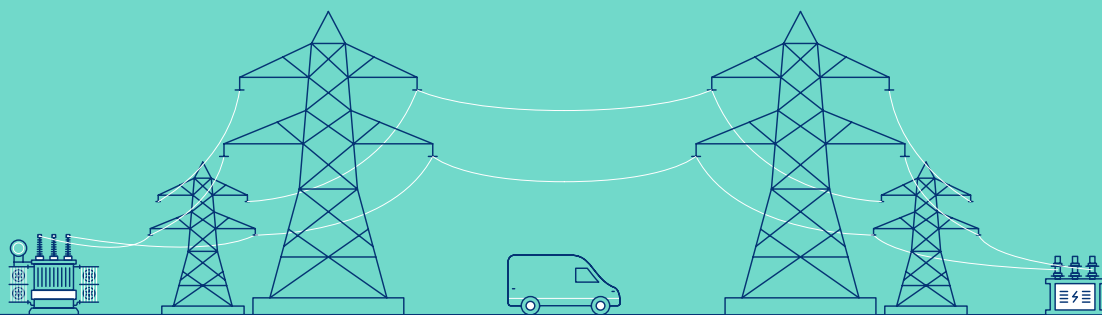
Electricity Ten Year Statement

The outputs from the FES are then considered against the existing electricity network, including planned reinforcements, to identify both generation and demand constraints on pre-defined electricity transmission system boundaries. This process, the Electricity Ten Year Statement (ETYS)⁹, is important to identify where there are 'bottlenecks' on the transmission system that require intervention to address those constraints that would otherwise prevent the transportation of electricity generation to meet local and wider demands.

Where such a bottleneck exists, the ESO is required to intervene to balance the system by reducing generator output behind the bottleneck and increasing it on the other side. The costs incurred in doing this are ultimately passed to electricity consumers.

Networks Options Assessment

To address those bottlenecks, the three GB electricity Transmission Owners submit a range of potential network reinforcements designed to alleviate such constraints to the ESO. This involves multiple options, often to address the same network constraints, which are then analysed and assessed on a GB wide basis to establish which reinforcement investments are deemed economical and required. This process, known as the Networks Options Assessment (NOA)¹⁰, makes recommendations as to which investments Transmission Owners should take forward to alleviate current and forecast constraints across those pre-defined transmission system boundaries. This includes the proposed technology solution, for example, overhead line or subsea link. The outcome of the 2022 NOA refresh has informed the strategic network reinforcements set out in the ESO's Pathway to 2030 Holistic Network Design.



Conclusion

In conclusion, the need for SSEN Transmission's Pathway to 2030 electricity transmission network reinforcements, which form part of a major upgrade of the electricity transmission system across Great Britain, are underpinned by UK and Scottish Government energy policies and associated targets.

The independent ESO has assessed the need for these projects as required and made recommendations that they proceed, including the proposed technology choice, through its Pathway to 2030 Holistic Network Design. And the independent GB energy regulator, Ofgem, has approved the regulatory need for these projects through its Accelerated Strategic Transmission Investment (ASTI) framework.

For SSEN Transmission, the need for these reinforcements is clear. What we need to do now is develop this critical national infrastructure as sensitively as possible, in a way which seeks to minimise and mitigate community and environmental impacts and maximise local and national economic opportunities and jobs