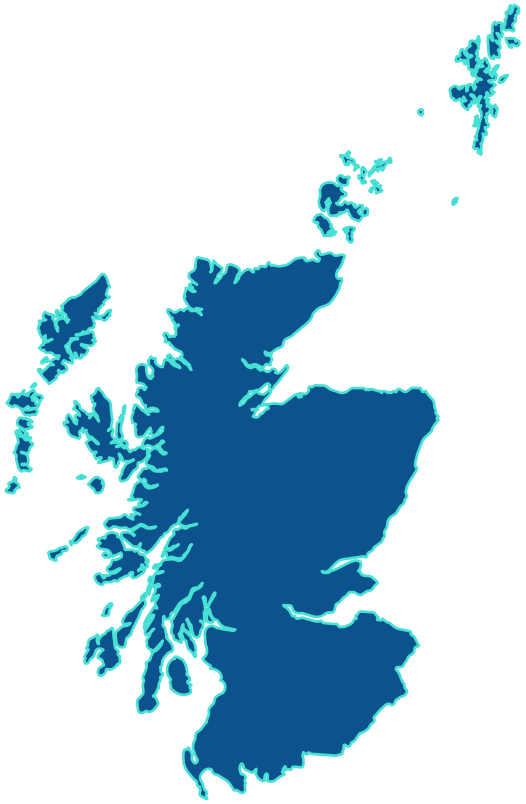
Scotland-wide Grid Upgrade (SSEN Transmission & SP Energy Networks)

CASE STUDY

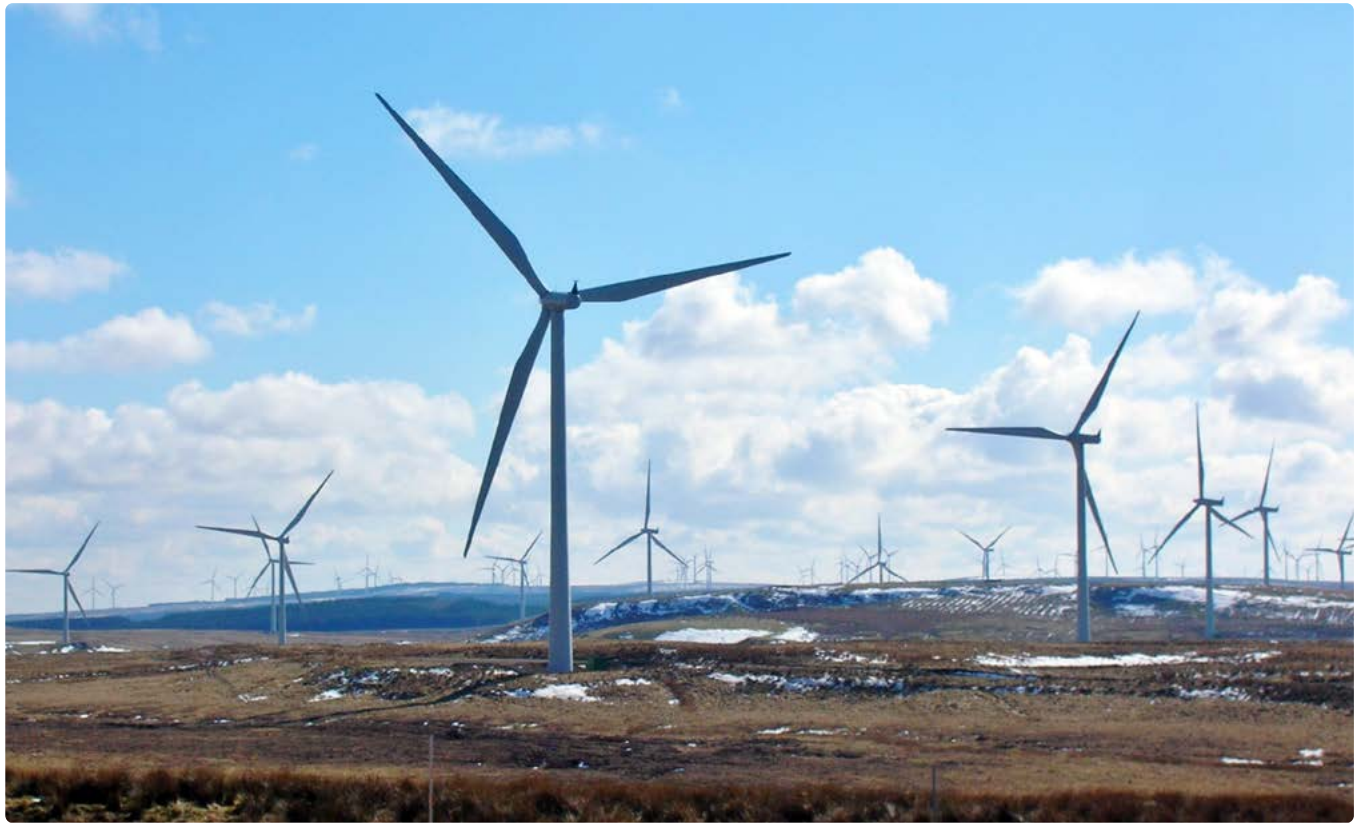
Strategic transmission reinforcements enabling net-zero and unlocking offshore wind.



LOCATION: Scotland-wide

STATUS: Current

ENERGY TRANSITION | PRIORITISING PLACE | DEMAND DYNAMICS



Summary

The Scotland-wide Grid Upgrade is a coordinated programme of transmission upgrades led by SSEN Transmission and SP Energy Networks is underway to connect and move rapidly growing renewable generation, particularly ScotWind and other offshore wind, across Scotland and into GB demand centres. The programme implements the National Energy System Operator's (NESO) Holistic Network Design (HND) "Pathway to 2030" and develops follow-on Beyond 2030 plans, with delivery accelerated under Ofgem's Accelerated Strategic Transmission Investment (ASTI) framework. The programme is identified as National Development 3 in the National Planning Framework 4. It is politically prioritised by the UK Government's Clean Power 2030 mission and National Wealth Fund financing.

Background

The ScotWind leasing round has awarded up to 27.6GW across 20 projects (many of them floating), with additional capacity progressing through the INTOG (Innovation and Targeted Oil & Gas) leasing round; meanwhile, the UK's national ambition is to reach up to 50GW of offshore wind by 2030, which makes timely transmission reinforcement the key enabling constraint for delivery.

Strategy

NESO's HND sets out the network required for 2030, while the Beyond 2030 report outlines additional reinforcements through the next decade and informs the forthcoming Centralised Strategic Network Plan (CSNP). This plan-led, whole-system approach coordinates onshore and offshore reinforcements to support delivery of the UK's 50GW offshore-wind ambition by 2030.

National planning certainty is strengthened by NPF4 National Development 3, which establishes the principle of need for strategic electricity-transmission infrastructure across Scotland.

Investment

Major Transmission Owner (TO) programmes are underway. SSEN Transmission plans to invest £29bn over the next five years to 2030 mostly on Pathway to 2030 projects.

Regulatory acceleration is being provided by Ofgem's Accelerated Strategic Transmission Investment (ASTI) framework, which fast-tracks assessment and funding for strategic projects identified via HND/NOA; Ofgem's decisions and guidance confirm the "needs case" for projects aligned with the HND Pathway to 2030 plans.

Public capital crowd-in has begun: the UK National Wealth Fund is lending £600m to ScottishPower/ Iberdrola to accelerate seven transmission upgrades, including the Eastern Green Links, all explicitly aligned with the Clean Power 2030 mission.

Policy alignment is clear in the UK Clean Power 2030 Action Plan, whose technical annex notes that NESO estimates roughly £10bn per year of transmission investment is required on average between 2025-2030, within a broader system investment requirement of around £40bn annually.

Delivery

A coordinated, programmatic build-out is now underway, sequencing multiple circuits, substations, reinforcements, and inter-regional HVDC links across Great Britain (e.g. the Eastern Green Links). Delivery is being driven by the ASTI and HND plans through to 2030.

Projects are now advancing into the construction phase. For example, the Skye Reinforcement – a near 100 mile upgrade replacing a constrained line to enable new connections – received Scottish Government consent in June 2025. Supply chain development is ongoing, with new manufacturing capacity planned at sites such as Port of Nigg.

Grid expansion is also mobilising supply chains in the UK. Sumitomo Electric has begun building an HVDC subsea cable factory at the Port of Nigg, anchored by projects such as Shetland 2 and future HVDC links, thereby increasing domestic cable capacity for UK transmission and offshore-wind integration.

Delivery

There is a defined chain of responsibilities from strategy to delivery. The National Energy System Operator (NESO) sets out the strategic network designs (including the Holistic Network Design, Beyond 2030 and the developing Centralised Strategic Network Plan). Ofgem regulates and determines allowed revenues and funding routes through the RIIO-T price control and the Accelerated Strategic Transmission Investment (ASTI) framework. Transmission Owners (TOs), principally SSEN Transmission and SP Transmission, are responsible for the delivery of consented projects.

In March-April 2025 the UK Government issued guidance on transmission community-benefit funds. In response, TOs (including SSEN Transmission) have established dedicated funds that apply standardised contribution formulas (for example, £200,000 per kilometre of new overhead line and £530,000 per substation). Programme documentation indicates that cumulative benefits could exceed £100m over time; actual out-turns will depend on the scale and timing of the delivered portfolio and final regulatory approvals.