

Offshore Wind and Renewable Energy

Annex A: Detailed Information on Skills Needs Assessment



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National Picture

The Invest 2035 strategy positions Clean Energy Industries as a critical growth sector, with an ambition to double business investment to over £30 billion annually by 2035. This national ambition is viewed as a generational industrial opportunity to secure higher levels of domestic supply chain content and create high-quality jobs, aligning regional execution with the 2024 Offshore Wind Industrial Growth Plan (IGP). The UK Government's Clean Power Action Plan (CPAP) sets an ambitious target of 43–50 GW of offshore wind by 2030. A significant milestone in this plan occurred in March 2026, when The Crown Estate announced its intention to launch Leasing Round 6 in early 2027, unlocking approximately 6 GW of capacity in the North East Area of Opportunity.

A vital delivery tool is the "Energy Skills Passport," launched in January 2025 to help workers from carbon-intensive sectors such as oil and gas transition into clean energy. Developed through a collaboration between Renewable UK, Offshore Energies UK (OEUK), and the UK and Scottish Governments, this digital platform is a transformative intervention for workforce mobility, allowing professionals to showcase verified qualifications and identify training gaps. Research commissioned by OEUK indicates that nearly 90% of workers in the oil and gas sector possess skills that are directly transferable to offshore wind. By 2030, it is projected that over 100,000 people will be working in the UK's offshore wind industry, with £20 million in funding allocated for bespoke retraining to support this transition.

The Specific sector in the North East

The region's heritage in the maritime and energy sectors provides a foundational strength for the current green revolution. The North East's involvement in offshore renewables dates back over two decades, starting with the installation of the UK's first demonstration offshore wind farm in December 2000 off the Northumberland coast at Blyth. This landmark project featured two 2 MW Vestas turbines, which were, at the time, the largest installed offshore in the world. These turbines, situated less than 2 km from shore on monopile foundations drilled into rock reefs, proved the feasibility of harnessing the North Sea for commercial power. This pioneering legacy has established a regional vision to make green energy "the new coal mining and shipbuilding", aiming to double the green energy workforce to 50,000 by 2035 and secure £3 billion in private investment. This growth is anchored by the £160 million North East Investment Zone, which focuses on the River Tyne Economic Corridor and Energy Central in Blyth.

The North East is the UK's Offshore Green Energy Hub. The transition from fossil fuels to renewables offers a generational opportunity to reindustrialise the coast, repurposing the region's deep-water ports and engineering heritage for the green energy revolution. In the national context, the region is poised to be the most active for offshore wind development through the 2030s, with almost half of all potential leasing for the next decade identified by The Crown Estate within the North East Area of Opportunity. This sector is not only a driver of GVA but also a critical component of the UK's energy security strategy. The regional sector strategy prioritises two market-facing growth plays: becoming an "End-to-End Electrical Systems Powerhouse" and a "Deepwater Vanguard" for the UK.

The region is home to the UK's most advanced offshore wind industrial cluster, accounting for 9% of the UK's offshore wind businesses. This cluster forms a "Composite Port System" across four rivers, offering more than 8,000 metres of quayside, making it the most capable offshore wind logistics footprint in Europe. The North East currently hosts 1,105 renewable energy companies employing 27,549 staff. Of these, 53.6% are micro and small businesses (with fewer than 10 employees), 19.1% are SMEs (with fewer than 50 employees), 14.6% are medium-sized businesses (between 50 and 249 employees), while the remaining 12.8% are large organisations.

Regional workforce growth is projected at 4.1% annually, reaching 34,200 by 2030 (currently 27,549).

Unlike traditional manufacturing, this sector attracts a younger demographic, with 9.3% of the workforce aged 16–24 and 19.7% aged 25–34. However, the sector faces a significant challenge in ethnic minority representation and a gender gap, with only 15% of the workforce and 15% of directors being female. Addressing these disparities is essential; the region is scaling initiatives like the "Women in Engineering" scholarship to broaden the talent pool.

The region has cultivated a specialised ecosystem including major manufacturers of cables, foundations, and substructures, alongside energy technology leaders. The synergy between this sector and the region's advanced manufacturing base creates a unique competitive advantage in the production and testing of advanced turbine technologies. This is exemplified by the collaboration between Smulders and Siemens Energy on the Tyne, where 250 local workers recently outfitted an Offshore Transformer Module (OTM) and its jacket foundation.

The robustness of the North East cluster is defined by major suppliers anchoring their operations in the region and driving large-scale apprenticeship programs:

Smulders Projects UK (Wallsend): a major production facility in Wallsend, producing the group's largest steel structures, including transition pieces and substation jackets. The company employs over 500 people and has a strong commitment to local skills, utilising an 18-month traineeship model where graduates rotate through departments like engineering, purchasing, and production. Smulders works closely with Newcastle College, having recently utilised welding bootcamps to recruit trainee welders directly from the local community.

JDR Cable Systems (Hartlepool and Cambois): specialises in subsea cable manufacture and is significantly expanding its regional footprint with a new £130 million production facility in Cambois, near Blyth. This expansion safeguards 270 existing roles in Hartlepool while creating 170 new high-skilled jobs. JDR offers extensive apprenticeship opportunities, including a new "Apprentice Process Engineer" route in Blyth to support its state-of-the-art manufacturing environment. Their graduate programs also collaborate with IMechE to support professional chartership.

The flagship project portfolio includes:

Dogger Bank Wind Farm (A, B and C): This 3.6 GW project, a joint venture between SSE, Equinor, and Vårgrønn, will be the world's largest offshore wind farm. The project utilises Able Seaton Port in Hartlepool for turbine pre-assembly, a process that has supported 120 skilled port jobs. Once operational in 2026/27, its state-of-the-art O&M base at the Port of Tyne will support approximately 400 long-term, high-skilled roles.

Dogger Bank South (DBS): RWE and Masdar are jointly developing the Dogger Bank South projects (DBS East and DBS West), representing a 3 GW combined capacity. Located over 100 km off the north-east coast, these projects secured Contracts for Difference (CfDs) in early 2026 and are anticipated to power 3 million homes upon commissioning in 2031/32.

RWE Sofia Offshore Wind Farm is constructing the 1.4 GW Sofia wind farm on Dogger Bank, 195 km off the North East coast. The project represents a multi-billion-pound investment and will power 1.2 million homes. RWE has selected the Port of Blyth as the construction base for Sofia, constructing a dedicated management centre for vessels and logistics. The project supports up to 2,000 jobs during peak construction.

Norfolk Offshore Wind Zone: Following the acquisition of three projects from Vattenfall, RWE is also developing the 4.2 GW Norfolk Offshore Wind Zone. While the sites are off the Norfolk coast, they utilise the North East's specialised supply chain and project management expertise developed in the regional cluster.

Emerging Seabed Leasing Pipeline: Recent Crown Estate plans for Offshore Wind Leasing Round 6 indicate around 6GW or more of additional offshore wind capacity, predominantly off the North East coast of England, reinforcing the region's long-term role in offshore wind deployment, supply chain growth, and associated technical skills demand.

Sector definition Priority SIC Codes: Electric power generation, transmission and distribution (35.1), electrical installation (43.2), engineering activities and related technical consultancy (71.12), repair and maintenance of ships and boats (33.15), and service activities incidental to water transportation (52.22). The sector is defined by high-growth industrial classifications including Energy Storage (0013) and Offshore Wind maintenance (001110).

RTIC: 001101 Companies generating energy from organic materials, such as biomass and biofuels; 001103 Companies generating energy from hydrogen, contributing to sustainable power solutions and carbon-neutral practices; 001104 Companies generating energy from hydropower (flowing water); 001105 Companies generating energy from nuclear sources; 001106 Companies generating energy from sustainable heat sources, such as solar, geothermal, or biomass; 001107 Companies generating energy from solar sources; 001109 Companies using onshore wind to produce electricity; 001110 Companies using offshore wind to produce electricity and companies engaged in the maintenance of offshore wind facilities; 001111 Companies using nuclear fusion to produce electricity; 0012 Energy Management; 0013 Energy Storage; 0055 Net Zero.

Priority Occupations (SOC 2020):

SOC20 unit code	SOC2020 – Priority Occupation unit label	2021-2025 monthly average actual job posting	average monthly job posting forecast by 2029	Forecasted change by 2029 in monthly job postings	Forecasted % change by 2029 in average monthly job postings
1121	Production managers and directors in manufacturing	6.15	13.24	7.09	115.28%
1122	Production managers and directors in construction	1.35	1.8	0.45	33.33%
2121	Civil engineers	3.68	4.78	1.1	29.89%
2122	Mechanical engineers	15.48	15.09	-0.39	-2.52%
2123	Electrical engineers	20.43	25.44	5.01	24.52%
2124	Electronics engineers	0.55	0.46	-0.09	-16.36%
2125	Production and process engineers	16.7	5.1	-11.6	-69.46%
2127	Engineering project managers and project engineers	3.95	14.76	10.81	273.67%
2129	Engineering professionals n.e.c.	3.28	1.55	-1.73	-52.74%
2453	Quantity surveyors	12.07	18.3	6.23	51.62%
2455	Construction project managers and related professionals	1.73	1.2	-0.53	-30.64%
3113	Engineering technicians	38.3	87.8	49.5	129.24%

3120	CAD, drawing and architectural technicians	1.73	0.96	-0.77	-44.51%
5213	Welding trades	3.13	9.23	6.1	194.89%
5221	Metal machining setters and setter-operators	0.32	3.34	3.02	943.75%
5223	Metal working production and maintenance fitters	0	0	0	0.00%
5241	Electricians and electrical fitters	41.7	87.3	45.6	109.35%
5242	Telecoms and related network installers and repairers	4.75	36.8	32.05	674.74%
5249	Electrical and electronic trades n.e.c.	0.1	0.99	0.89	890.00%
5313	Bricklayers	0.05	0.07	0.02	40.00%
5314	Roofers, roof tilers and slaters	1.02	0.51	-0.51	-50.00%
5315	Plumbers heating and ventilating installers and repairers	14.3	19	4.7	32.87%
5316	Carpenters and joiners	8.1	3	-5.1	-62.96%
5317	Glaziers, window fabricators and fitters	0.13	0.09	-0.04	-30.77%
5321	Plasterers	1.07	0.73	-0.34	-31.78%
5322	Floorers and wall tilers	1.55	1.43	-0.12	-7.74%
8114	Plastics process operatives	0	0	0	0.00%
8120	Metal working machine operatives	0	0	0	0.00%
8143	Routine inspectors and testers	3.9	6.1	2.2	56.41%
8151	Scaffolders, staggers and riggers	0.98	2.7	1.72	175.51%
8159	Construction operatives n.e.c.	0.27	0.11	-0.16	-59.26%
8160	Production, factory and assembly supervisors	3.2	4.5	1.3	40.63%

The 943% and 890% growth forecasts for metal machining and electrical trades highlight the specific high-integrity fabrication requirements of the SeAH and JDR factory expansions.

Real-World Challenges for the specific sector

- **Green skills gap:** One of the biggest challenges is the scale of the workforce expansion required and the competition across sectors for access to the same workforce pool. This requires attracting new entrants at an unprecedented rate while simultaneously upskilling existing workers from other sectors. National projections indicate that each additional 10% of UK capital content yields up to 12,500 jobs, requiring the region to accelerate provider intake.
- **Skills competition:** There is intense competition for electro-mechanical skills between offshore wind, advanced manufacturing, construction, and defence sectors. This internal regional competition risks wage inflation and shortages if the overall talent pool is not expanded. Competition for talent is expected to intensify as new renewable projects expand in the region. Employers report acute shortages in high-voltage (HV) engineering and subsea electrical technicians with niche wiring skills.
- **Recruitment challenges:** Recruitment pressures are acute for specialist engineering and marine roles. Offshore wind employers report limited entry-level access due to high safety thresholds and few junior roles, making apprenticeships the primary route into the sector. Critical onshore gaps include marine operations, logistics coordination, high-voltage engineering, and safety-critical decision-making roles. Subsea engineering firms face severe shortages in electrical technicians with niche wiring skills, compounded by low transferability from other sectors and restrictions on international recruitment. Ports and logistics employers struggle to recruit harbour masters, pilots, and specialist marine engineers due to small national talent pools.
- **Inclusive workforce:** The sector must address the gender gap; women represent only 15% of the workforce, while minority groups account for only 9.1% of the total workforce. Targeted recruitment and cultural change initiatives are necessary.
- **Early-career management:** Effective people management for apprentices and early-career employees is identified as a sector-wide weakness.
- **Ageing workforce:** Across the sector, ageing workforces and the loss of long-tenured staff create single points of failure. Knowledge continuity is threatened in firms where senior experts are approaching retirement.
- **Infrastructure constraints:** While the ports are a strength, ensuring they have the capacity and grid connectivity to handle the next generation of larger turbines and floating wind platforms is a pressing logistical challenge. The 10-Year Vision and Strategy for North East England Offshore Wind identifies an urgent need for investment in craneage, laydown areas, and ground-bearing upgrades to handle XXL components.
- **Transition pathways:** A clear mechanism is required for workers in high-carbon industries (oil and gas) to transfer their skills to renewables without friction. While 90% of skills are transferable, workers still face “bridge” qualification costs.

Skills needs, current provision and demand

Employers consistently highlight gaps in both technical and soft skills. High-voltage competence, control systems, automation, power distribution, and grid-related engineering skills are in high demand.

Subsea engineering and offshore technology firms report workforces split between highly skilled engineers and specialist technicians. Across the sector, employers highlight the importance of safety-critical competence, regulatory compliance and the ability to operate in joint-venture or multi-contractor environments. They also anticipate a growing need for embedded systems, prototype engineering, and advanced software capability as electrification accelerates. Employers emphasise digital skills across all staff, including data literacy, digital workflows, tablet use and Power BI. Soft skills - communication, teamwork, leadership, emotional intelligence, and customer service are essential, particularly for younger recruits whose development was disrupted during the pandemic.

Clean energy employers across offshore wind, subsea engineering, and the wider energy transition describe a highly technical labour market shaped by long-term infrastructure commitments, ageing workforces, and rapid technological change. This necessitates a transition to "Future-Facing Manufacture," integrating robotic welding, digital twins for predictive maintenance, and AI-enabled quality control.

Offshore wind operations require predominantly Level 4+ technical roles, with small technician teams supported by larger onshore engineering and logistics functions. Specifically:

- Fabrication 4.0 Techniques: High skills demand in robotic, laser, and vacuum welding is needed to enable industrial-volume fabrication. It also requires skills for the integration of digital twins, specifically for real-time quality assurance (QA) in serial production lines.
- Offshore Substation Systems – high demand for FAT (Factory Acceptance Testing) skills and end-to-end substation system integration is identified, moving the region beyond just component manufacture.
- Deepwater & Floating Wind Specialisms: The strategy prioritises skills for floating substructures and dynamic cable installation.
- Logistics as a Service (Laas): Demand for a new class of workforce skilled in multi-port logistics coordination, shared spares management, and centralised control room operations to manage regional assets as a single system.
- Turnkey Environmental Services: A specific requirement for professionalized roles in biodiversity monitoring, marine analytics, and consenting services to accelerate project development.
- Orbital Analysts: The 10 years of strategy for Offshore Wind identifies a specific need for these hybrid roles—combining expertise in physics, data analytics, and situational awareness—to manage the next generation of floating assets.
- Advanced R&D Talent: A commitment to host five PhD-level researchers annually at the ORE Catapult, specifically aligned with regional ambitions in electrical systems and floating wind.

Training provision varies across subsectors but shares common challenges. Offshore wind employers rely on specialist providers for technical offshore training. Apprenticeship levy utilisation is inconsistent, with some employers historically underusing funds and now planning more structured investment. Curriculum alignment issues persist with sometimes a mismatch between training content and operational requirements.

Submarine engineering firms invest heavily in internal and external training, including HNC/HND pathways, chartership routes and continuous CPD, but find the training landscape fragmented and difficult to navigate.

10 Years of Strategy for the North East Offshore Wind introduces a more interventionist Action Agenda called "Equip the Workforce," which proposes the creation of a Workforce Observatory for real-time demand signalling and "Site Adjacent Skills Hubs" that mandatorily integrate simulators and digital twins.

Engagement with Education and Talent Pipelines is extensive across the sector, spanning primary outreach, secondary careers activity, FE partnerships and university collaboration. Van Oord and Equinor are leading best practices through new employability programmes and Apprenticeship Levy transfers targeted at local SMEs.

Offshore wind employers fund substantial STEM engagement programmes, including school visits, base tours, SEND inclusion and early years STEM.

Universities play a major role in research partnerships, data sharing and PhD collaboration. FE engagement is mixed: some colleges maintain strong relationships, while others are less responsive despite being apprenticeship providers. Submarine engineering firms engage widely with schools, colleges and universities but describe the regional outreach system as fragmented, with overlapping initiatives and limited coordination.

The education pathway for this sector is considered the same as that for the Advanced Manufacturing sector, dominated by L2/L3 Engineering and anchored by the Energy Central Campus (Blyth). Future skills planning focuses on Phase 2 (Energy Central Institute) to deliver research-led technical skills from L4 to PhD level. Training in manufacturing technologies at Levels 2 and 3 remains the highest national priority for maintaining a technician pipeline. The "Energy Skills Passport" is the primary mechanism for recognising and accrediting prior learning. The key pathways that have historically fed into key sector occupations are listed below:

- Engineering L2 – L6+
- Building and construction L2 – L6+
- Architecture L2 – L6+
- Building and planning L2 – L6+

- Manufacturing technologies & maintenance L2 – L3
- Transportation operations L2 – L3

What's currently happening in the region

- **Energy Campus Wallsend (Newcastle College):** The Newcastle College Energy Academy is undergoing an £8.48 million expansion to become a dedicated Energy Campus. Supported by the North East Combined Authority, this project will double the facility's floorspace and triple its student capacity to over 1,000 learners per year. The campus provides world-class facilities, including Immersive Hybrid Reality (iHR) training systems, autonomous inspection robots, and industrial drones. It delivers a full range of qualifications, from T-Levels and apprenticeships to Higher Technical Qualifications (HTQs).
- **Energy Central Campus (Blyth):** A transformational cluster delivered in two phases, the Energy Central Learning Hub at the Port of Blyth (vocational) and the upcoming Energy Central Institute (Level 4 to PhD) in Blyth town centre. The Institute will act as a collaborative hub between North East universities and industry focusing on higher-level R&D and deepwater technologies.
- **Offshore Renewable Energy (ORE) Catapult:** Located at Blyth, it serves as a global centre for testing and validating new technologies, anchoring R&D and providing a unique testing ground for next-generation turbines. The site is currently undergoing an £85.6 million UKRI transformation to expand its blade test hall for blades up to 150m and upgrade its drive train rig to 23MW by 2028.
- **Dogger Bank Wind Farm:** This 3.6 GW project has supported 1,500 jobs locally and is currently under construction. It will be the world's largest offshore wind farm once fully operational in 2026/27. Once operational, its state-of-the-art Operations and Maintenance (O&M) Base at the Port of Tyne will support approximately 400 long-term, high-skilled roles over its 35-year lifetime. Skills investment: the project partners, SSE, Equinor, and Vårgrønn, have committed £26 million to local community funds, specifically targeting STEM scholarships and education.
- **Port Decarbonisation:** North East ports are actively deploying electrification, hydrogen, and e-fuels to decarbonise maritime operations, positioning themselves as green maritime hubs.
- **Additional flagship investment includes** 230-acre Tyne Clean Energy Park at the Port of Tyne; 47-acre Battleship Wharf at the Port of Blyth and 60-acre combined Swans and Neptune Energy Parks at Shepherd Offshore on the River Tyne. Investment in these facilities is being complemented through significant investment into skills, innovation and finance, while The Crown Estate has identified the opportunity for a huge offshore wind leasing round off our coast.
- **Innovation Leadership:** The region is leading in offshore energy innovation, particularly in robotics, wind farm design optimisation, and ecological protection. This mindset is scaled through the TIGGOR programme, supporting SMEs like Osbit and Kinewell to move from prototype to production.
- **Strategic Partnerships:** The North East Strategic Energy Board has been established to ensure future energy needs are met and to maximise the opportunities arising from the region's clean energy abundance. This is complemented by the North East Ports Partnership and a landmark MOU between regional ports and Newcastle Airport to boost regional growth.

What needs to be retained

- **Cluster Approach:** The collaborative cluster model involving Energy Coast has been effective in the region and should be retained and strengthened to present a unified front to international investors.
- **R&D Integration:** The strong links between industry and the region's universities and the Offshore Renewable Energy (ORE) Catapult are vital for maintaining a technological edge and must be protected. Specifically, research in power electronics (Durham), marine robotics (Newcastle), and composite materials (Northumbria) must remain industry embedded.
- **Skills Bootcamps:** Flexible, short-term training interventions like Skills Bootcamps have proven effective in rapidly reskilling to deploy staff into roles and should be continued and expanded. Smulders has successfully utilized this model to recruit trainee welders directly from the local community.

What changes are needed

- **Pipeline Coordination:** A more coordinated regional approach to pipeline visibility is needed. Supply chain companies require clearer sight of future projects to invest in skills and capacity with confidence.
- **Formalised transition pathways:** Clearer, formalised pathways are needed for workers transitioning from high-carbon and/or other relevant sectors. This involves mapping competencies and creating "bridge" qualifications that recognise prior learning and, therefore, reduce delivery time and training costs. Bootcamps have also been recognised as a powerful model to upskill and reskill the workforce. The Energy Skills Passport will be fully integrated into regional career services, alongside £20 million of new funding for bespoke retraining.
- **High-voltage skills investment:** Specific investment is required in high-voltage training facilities to support skills delivery and meet the growing demand for grid connection and transmission skills, which are currently a bottleneck. This includes expanding open-access HVDC/cables test capacity and launching "Logistics as a Service" models. Action Agendas for Implementation (Pathway to 2035):
 - **Power the Future:** Own the offshore power cable and electrical systems value chain.
 - **Build at Scale:** Enable industrial-volume fabrication through "Fabrication 4.0."
 - **Think Below the Surface:** Anchor UK leadership in subsea, survey, and digital marine systems.
 - **Four Rivers, One Mission:** Build a coordinated port and logistics system.

- Equip the Workforce: Build modular, place-based learning systems.
- Back the Builders: Unlock capital for growth via Parental Guarantees.
- Compete Globally: Export North East capability via bundled offers.
- Robotic Maintenance: Introduce specialised modules for "Remote Monitoring" and "Drone-based Inspection" to prepare the 400 long-term technicians at the Dogger Bank O&M base for automated turbine maintenance.
- Automated Production Skills: Develop new occupational profiles for "Automated Welding" to support the regional manufacture of floating wind structures, addressing the acute shortage of traditional welders.

Potential benefits

This sector is a high-potential growth sector that will not only deliver tens of thousands of high-quality, long-term jobs but will also ensure that the North East secures a strong position in UK energy security, increasing domestic capacity. It offers a pathway to economic revitalisation for coastal communities that have historically suffered from industrial decline, transforming them into hubs of the green economy. The successful industrialisation of the North East is forecast to double green jobs to 50,000 and attract £3 billion in private investment by 2035.

The North East has successfully leveraged its industrial heritage and world-class ports to become the heart of the UK's green economy. By aligning mega-projects like Dogger Bank with integrated educational infrastructure like the Energy Campus Wallsend and Energy Central Campus Blyth, the region is securing its status as a global leader in the offshore transition. Ultimately, the 10-year vision aims to generate an extra £1.3 billion in annual GVA by 2030, ensuring that the North East's leadership defines the future of the UK's offshore wind economy.