

A sustainable now

Offshore Wind





Pursuing winds of change



A sustainable now

Offshore wind is an important chess piece in the evolving energy transition and synergy between traditional oil and gas, and newer renewable energy sources. This synergy is important in the ongoing task of providing energy to the world, whilst ensuring that we take the necessary steps now, for a more sustainable future.

Glamox's goal is to partner with you, providing the best lighting solutions, from first consultation, to long after installation. Our team are at the ready to help you plan, design and execute your lighting solutions – with a focus on sustainability, human centric lighting, and integrated light management systems.

The offshore wind industry is set to increase the number of wind farms to 900 globally, by 2030. With this inevitable and dramatic increase, Glamox can be trusted as your partner in supplying solutions for all of

your technical lighting needs - We are the trusted and preferred one-stop-shop for marine and offshore environments.

Whether your vessel or offshore installation will be exposed to the softest breeze or the harshest storm, our quality solutions can be counted on to stand both the test of time, and exposure from the elements.

At Glamox we have generations of experience within offshore and marine environments, where our team are well versed in all matters of illumination and the applicable global regulations for your installations. Whether it be the turbine transition piece, the entire lighting solution for a vessel, or a substation, you will find all of your technical lighting solutions, for all applications within offshore wind with Glamox. **We create light for a better life.**



Generations of experience

With origins from Nordic coastal towns, the Glamox team are a global collection of experienced and invested individuals. Wanting the best for their customers, they understand their challenges, benefits and concerns, and know the best solutions for good light in marine environments.

They have a vested interest in current and relevant marine and offshore topics, trends and technology, where research and development are at the core of this. This experience spans more than 75 years of tried, tested and proven application in harsh and demanding environments for sea faring vessels within Fishing,

Naval, Cruise, Ferry, Tankers, Freight and Aquaculture and so much more - where Glamox's offshore Oil and Gas experience spans many decades. Glamox has been the leading, trusted and preferred supplier of lighting to the marine and offshore industries, where we have the generations of experience that you need.



Change is coming

The World is going through an unprecedented energy crisis. Coupled with global Net Zero goals, this has pushed governments and industries to delve faster into developing renewable sources of energy. Yards and owners are turning to wind, hydrogen, battery, biofuels and vessel design technologies to not only save on energy consumption but reduce their overall carbon footprint.

At Glamox, our team are pushing the boundaries of what we have done in the past and forging the road ahead for greater sustainable lighting solutions, to achieve a more sustainable now.

One way in which Glamox are leading the charge is with the RoHS Directive. This directive prohibits the manufacturing and sale of a range of now redundant fluorescent

tubes, including the widely used T8 and T5 tubes which will be prohibited in Europe from September, 2023. As a consequence, most manufacturers of fluorescent tubes will reduce the production and availability of fluorescent tubes also outside of Europe which means it will be harder to get hold of spare tubes. Most LED-tubes on the market are not marine approved and are strictly prohibited in EX-luminaries. Installing LED-tubes is often time consuming since it usually requires installation of new lamp holders and the need of bypassing the original ballast. The Glamox MIR LED-Kits require no tools and can be installed in under 2 minutes. Glamox LED kits come with a 5 year warranty and are the fastest, safest and the most cost-effective way to upgrade your fluorescent luminaries.

Read more on how Glamox can help you comply with the new regulations.

EU timetable of restrictions on mercury lamps for general lighting



Lighting product	Date of Restriction & Relevant Legislation
CFL - i	1 September 2021 - Ecodesign
CFL - ni	25 February 2023 - RoHS
Long-life CFL	25 August 2023 - RoHS
T2	1 September 2021 - Ecodesign
T5	25 August 2023 - RoHS
T8	25 August 2023 - RoHS
T12	1 September 2021 - Ecodesign
Long-life LFL	25 February 2023 - RoHS



Source: Lighting Europe

/ Fixed and floating turbines

Offshore wind turbines –both fixed and floating, are subject to harsher environments such as sea water and corrosion, as well as a higher-than-average wind speed, than land-based turbines. To counter this, Glamox have designed lighting solutions which can withstand saltwater corrosion, shock and vibration and a wide range of temperatures.

The design life of an offshore wind turbine is approximately 25 years. The trend for a longer design life on all wind turbines is due to the maturing of the wind energy industry – asset owners now expect to operate wind farms for longer periods without the technology becoming obsolete or unsupported by suppliers. Extreme loads due to storms, abnormal events

and faults during operation can also be critical. Typically, an offshore wind turbine will turn for over 90% of the time. With long system lifetime and comprehensive experience in marine and offshore environments, Glamox luminaires are designed to achieve the intended lifetime of the wind turbines.

We've thought of all the details:

- We provide lighting for the tower internals, allowing safe access for maintenance and service personnel, as well as providing a clear and safe means of transferring hand tools and components to the nacelle.
- We have luminaires which can be fitted to all ladders, platforms and handrails.
- We offer a wide range of mounting options to suit any installation.
- Exit lights for installation at doorways.
- Emergency Lighting in order to maintain safety in the event, of a loss of grid power.
- All our recommended products are marine certified and quality-approved.



Product range

Typical Applications

- Crew access.
- Inside landing platform.
- Internal turbine.
- Doorways.
- Walkways, stairways and ladders.
- Turbine identification board.

Success stories



/ Substations and topsides

Product range

This is where all the energy produced by the wind turbines is brought together and converted by transformers to a high voltage transmission. This is necessary to ensure that as little energy as possible is lost during transmission over long distances to the next grid node.

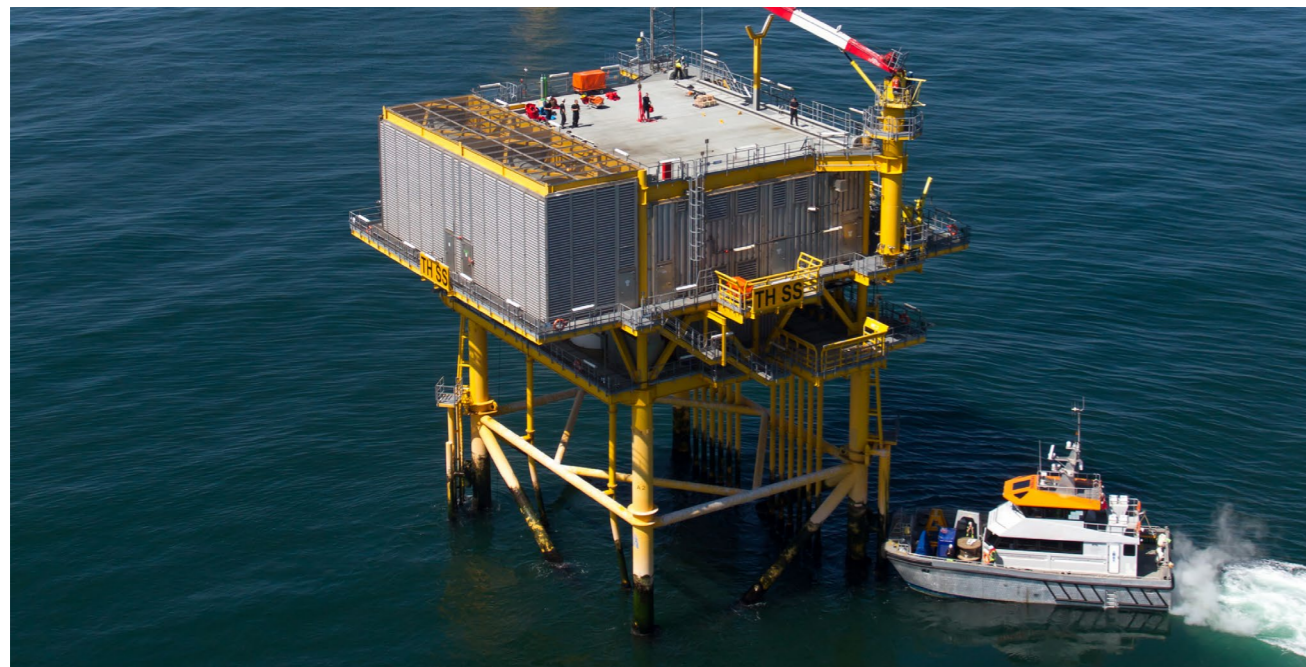
If a technical fault occurs on the substation platform, all wind turbines in the offshore wind farm will fail to function. This means that maintenance and repair services must meet extremely meticulous and high-quality standards.

With decades of experience in the offshore and marine industries, Glamox can give you a one-stop-shop selection of technical luminaires.

All electrical products are potential emitters of electromagnetic waves. Our luminaires are tested according to both EN-55015 and EN-61547.

We have a range of fittings that meet the requirements of the following applications:

- Linears installed on handrails.
- Floodlights for escape to sea.
- Floodlight to illuminate the substation identification plate and work/lay down areas.
- Emergency lighting is needed to maintain safety and in the event of a loss of grid power.
- All our recommended products are marine-certified and quality-approved.



Ex lighting is best suited to rooms such as battery rooms, paint rooms, and helicopter fuel rooms.

Typical Applications

- Crew access.
- Work platform.
- Davit crane.
- Winch platform.Controls.
- Walkways, stairways and ladders.
- Turbine identification board.
- LQ.
- Helideck.
- Controls.
- Containers, cabins, LQ(linears, E20).
- Battery rooms.
- Switchgear rooms.

Success stories





Product range

/ Vessels

Offshore wind vessels provide the transportation of service technicians and crews, foundations, building materials, turbines and substations, out to sea. They facilitate not only transportation, but also installation. Such humongous elements such as rotors, turbine towers, substations, cables and foundations are typically built onshore and transported to the site where they are installed.

At Glamox we have generations of experience within offshore and marine environments, where our team are well versed in all matters of vessel illumination, from new builds and conversions, to refits and upgrades. Here are some of the vessel types which typically service the offshore wind industry:

Wind Turbine Installation Vessels

WTIVs are typically self-propelled jack-up units equipped with large cranes (typically between 300-3,000t swl) for the installation of offshore wind turbines. While a few semi-submersible units are in operation, WTIVs commonly feature 4 support legs that can be raised or lowered, alongside large deck areas for the storage and transport of turbine and foundation components.

Wind Farm Construction Vessels

There are several subcategories in the WFCV such as CLV (Cable Lay Vessel), Dredger Vessel, Heavy Lift, Crane and Transportation Vessel as well as Survey Vessels and different type of Dredger Vessels.

Walk to work Vessels (SOV/CSOV/ISV/CSV...)

W2W vessels are service and support vessels equipped with a motion-compensated "walk-to-work" gangways for access to wind turbines or oil and gas platforms. SOV (Service Operation Vessel), CSOV (Construction Service Operation Vessel), ISV (Installation Support Vessel) and CSV (Construction Support Vessel)s are a subcategory of W2W vessels specially designed for offshore wind. W2W vessels are commonly Multi-Purpose Support Vessels from the oil and gas sector. The conversion of these vessels is non-intensive and requires only the addition of the gangway and some structural support.

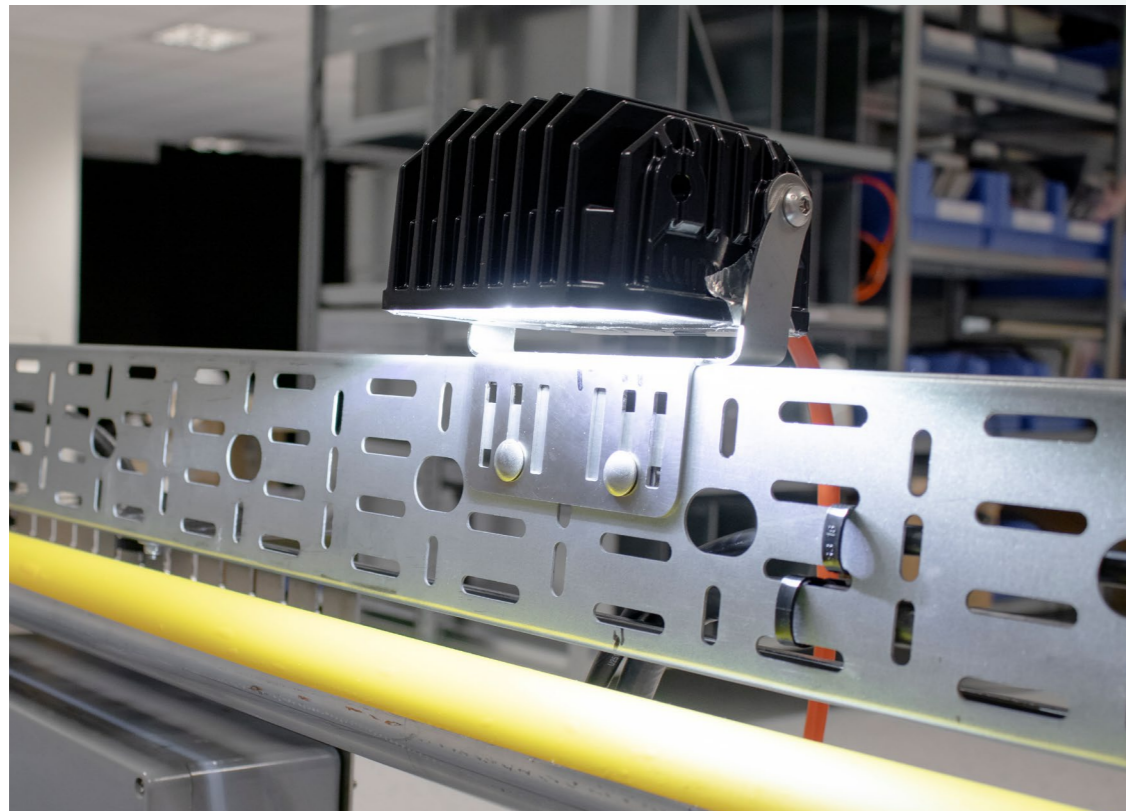
Crew Transfer Vessel (CTV)

CTVs are small, high-speed craft of typically 12 to 24 passengers used to convey technicians from shore to undertake maintenance/construction work on offshore installations. CTVs are typically catamarans with overall lengths of 15-30m, and are commonly used on a daily basis at wind farms closer to shore.



Success stories





Close to our customers

Collaboration, customisation and design are an important part of what we do at Glamox. This is because we strive to partner with our customers, to co-innovate relevant, extensive, and lasting lighting solutions.

Using our existing range of products, management systems and insights, our team are ready to create solutions which suit the individual needs of your projects.

One such example of customisation is our advanced custom concept for a gangway linear. The light module was developed to meet the following three needs:

- Marine-grade technical linear – durable, bright and advanced with a wide beam angle.
- Efficient and sustainable – 80% less energy used, zero maintenance and very long lifetime.
- Installation practicality – The light modules connect to a junction box, minimizing installation time and costs.

It can be mounted on any conventional railing on vessels, substations, gangways or turbines, and provides maximum light output and coverage. The advanced custom can connect 4 modules to one junction box (where 1 module can cover up to 6 meters of railing), providing a minimum of 24 meters of coverage.



Next-level connectivity

The importance of sustainable lighting within offshore and marine environments such as wind farms or fleets of vessels is quickly becoming an obstacle where a clever solution is needed. A Glamox Light Management System (LMS) will allow you to optimise the use of artificial light where and when it is needed. Smart sensors and monitoring features allow

you to increase energy savings, extending the lighting installation's lifetime. They also reduce maintenance costs as well as the carbon footprint. Focusing on people's needs, lighting solutions can be tailored to accommodate different tasks and purposes, improve the wellbeing of occupants and compensate for lacking natural light.

You define. We connect

The benefits of a Glamox Light Management System

A light management system from Glamox is a great choice for saving energy, monitoring and reviewing your complex, large scale installations, without setting foot on-site.



Lower life-cycle costs

Glamox Light Management System (LMS) are designed to reduce your energy consumption, maintenance costs and extend the lifetime of the installation.



Easy monitoring

Monitoring one or many offshore installations or vessels is made easy with features such as access to power consumption data, overviews of maintenance and usage data, and emergency functions on lighting installations - all within reach of your fingertips.



A more productive working environment

Our Light Management Systems can improve people's lives by facilitating lighting overviews for adequate visibility. Furthermore, by implementing Human Centric Lighting solutions, you can improve on sleep, performance and general wellbeing of the people onboard.



Sustainable lighting design

Decrease your ecological footprint and increase your economic sustainability by considering product and system lifetimes, energy efficiency, and avoid over-lighting (light pollution) which can affect surrounding vessels, installations, ecosystem and human health.

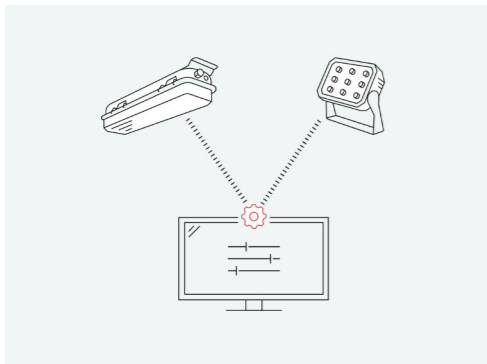
Light management systems

Our system are based on wired or wireless technology and are easy to plan, install, commission and use.



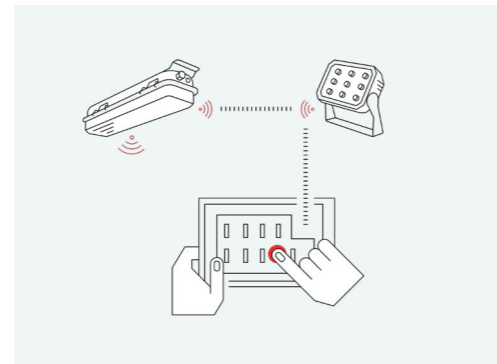
Glamox Connect

Glamox Connect is a cloud-based monitoring dashboard. It is made to manage your light installation with access to valuable data visualised in a user-friendly dashboard solution. With actionable insights you can achieve significant savings.



Ethernet2Dali (E2D)

Create advanced LMS designs, and custom user interfaces. E2D is a cabled LMS solution based on our own DALI-2 application controller named Vertex.



Glamox Wireless Radio

Easy to use wireless LMS solution designed for central monitoring. A smart and easy way to connect the complete light installation.

More information to come.





You sleep better

Improve your sleep quality by adjusting the hormone balance in your body. This is something everyone can benefit from, but it is especially important for workers working night shifts.



You perform better

Glamox HCL can improve performance by enhancing the ability to concentrate, increasing alertness and reducing fatigue, which in turn can lessen the number of errors made at work, which in turn improve the safety of workers at sea.



You feel better

Users of Glamox HCL solutions report that they feel healthier, happier and more energetic. This is because human-centric lighting stimulates the natural circadian rhythm, and hence increases your wellbeing.



Because each project is unique, we help you tailor the best approach and Human Centric Lighting solution to your specific needs. Whether your goal is to keep the workforce focused and alert with cool white light, or relaxed with warm dimmed light, or to help workers adjust their circadian rhythm by utilizing the effect of melatonin suppression. We have extensive experience in tailoring HCL solutions in cooperation with our clients, and to get the right light at the right time, we help you to choose the right luminaires, lighting design and controls system that allow you to automatically change the light setting in a light-cycle designed for your space and to achieve your lighting goals.

We can all agree that light affect us, and Human centric lighting is a field of research in rapid development. Since 2013 we have developed Human Centric Lighting solutions based on the latest research and standards available. To further improve the knowledge of how light can influence people we are collaborating with a number of external research institutions, and support and contribute to a number of studies.

Its all about creating light for a better life.

The powerful effect of light

Human Centric Lighting

All living beings have an "inner clock" called the circadian rhythm, and humans are no exception. In short, this means that we rise with the sun and go to sleep when it sets. The right light at the right time can influence everything from our sleep to how we feel and perform. That is why Human Centric Lighting (HCL) is beneficial for employees working shift and night work in the offshore and marine industry.

Humans are affected by light not only on a visual level, but also on a biological one. When installing an Human Centric Lighting solution (HCL), you reinforce your circadian rhythm, enhancing your cognitive skills and sense of wellbeing. It is also used to provide the ideal visual working conditions in challenging environments.




Our ambition is to be
a sustainability leader
in our industry.

A smarter, greener choice

Lighting contributes to 15-20% of the world's electricity consumption, and accounts for 5% of the world's greenhouse gas emissions.

At Glamox we see it as our responsibility to create lighting solutions that improve the performance and wellbeing of people. We support the sustainability ambitions of our clients by delivering energy efficient

solutions - a key focus throughout the Glamox history. By upgrading existing light installation to efficient and smart luminaires and systems you can reduce energy consumption by up to 90%.

An underwater photograph showing a large school of fish swimming in clear blue water. Sunlight rays penetrate the surface from the top left, creating a shimmering effect. The fish are densely packed in the center and spread out towards the bottom and right.

Glamox has an ambitious goal to achieve net zero by 2030.

Investment analysis calculator

Our investment analysis calculator calculates the repayment time when investing in an LED installation versus an installation with conventional light sources.

The repayment time is calculated by dividing the difference in the operational costs by the difference in investments. This can be understood as the number of years you need to “earn back” your initial investment. The calculator also provides energy savings figures (in percentage) by choosing the LED alternative.

Net zero by 2030 Aspirations

Glamox has an ambitious goal to achieve net zero by 2030. Here are some of the steps going forward to help us along our way:

- Increasing circularity within the design and manufacturing processes
- Use of 100% renewable energy in all manufacturing plants
- Screening suppliers to evaluate environmental, social and governance policies
- Eliminating non recyclable products from packaging
- Zero waste to landfill
- The most energy efficient lighting solutions
- Long product lifetime through high quality
- Environmentally conscious material choices
- Repairable and recyclability
- Modularity

References

Newbuild C-490 Owner: Edda Wind Application: CSOV	Discoverer Owner: Northern Offshore Services Application: CTV	CFXD Phase 2 Owner/Operator: CIP Country: Taiwan Application: Turbines	Vesterhav South and North Owner/Operator: Vattenfall Country: Denmark Application: Transition piece
Newbuild C-491 Owner: Edda Wind Application: CSOV	Dispatcher Owner: Northern Offshore Services Application: CTV	Triton Knoll Owner/Operator: Innogy / Triton Knoll Offshore Wind Farm Ltd Country: UK Application: Turbines	Hollandse Kust Owner/Operator: TenneT Country: Netherlands Application: Transition pieces
Newbuild C- 492 Owner: Edda Wind Application: CSOV	Doer Owner: Northern Offshore Services Application: CTV	Yunlin Windfarm Phase 1 Owner/Operator: WDP Country: Taiwan Application: Turbine	Vesterhav Owner/Operator: Vattenfall Country: Denmark Application: Transition pieces
Njord Owner: ESVAGT Application: SOV	Energizer Owner: Northern Offshore Services Application: CTV	BorWin 3 Owner/Operator: TenneT Country: Germany Application: Turbines	Moray East Owner/Operator: JV Companies Country: UK Application: Offshore substation
Froude Owner: ESVAGT Application: SOV	Master Owner: Northern Offshore Services Application: CTV	Northwester 2 Owner/Operator: Northwester NV / Parkwind NV Country: Belgium Application: Foundations	BorWin 3 Owner/Operator: TenneT Country: Germany Application: Offshore substation
Faraday Owner: ESVAGT Application: SOV	Traveller Owner: Northern Offshore Services Application: CTV	Courseulles-sur-Mer Owner: Turbine Transfers Ltd Country: France Application: Foundation	Hohe See Owner/Operator: TenneT Country: Germany Application: Offshore substation
Seacat Endeavour Owner: Seacat Services Application: CTV	Producer Owner: Northern Offshore Services Application: CTV	Wiking Owner/Operator: Iberdrola Country: Germany Application: Foundation	DolWin Beta/DolWin 2 Owner/Operator: Equinor Country: Germany Application: Offshore substation
Seacat Defender Owner: Seacat Services Application: CTV	Cemlyn Bay Owner: Turbine Transfers Ltd Application: CTV	East Anglia Owner/Operator: Iberdrola Country: UK Application: Foundation	DolWin 3 Owner/Operator: TenneT Country: Germany Application: Offshore substation
Seacat Scepter Owner: Seacat Services Application: OESV	X-Class Owner: Cadeler Country: Denmark Application: Wind Turbine Installation Vessel	EWDC Aberdeen Owner/Operator: Vattenfall Country: UK Application: Foundation	DolWin 5 Owner/Operator: TenneT Country: Germany Application: Offshore substation
Seacat Enterprise Owner: Seacat Services Application: CSV	Green Jade Owner: CDWE Country: Taiwan Application: Wind Turbine Installation Vessel	Equinor/SSE/ENI Owner/Operator: Equinor/SSE/Eni Country: UK Application: Topside	Hornsea I Owner/Operator: Ørsted Country: UK Application: Offshore substation
Seacat Intrepid -CSV Owner: Seacat Services Application: CSV	IWS Skywalker Owner: Integrated Wind Solutions Country: Norway Application: CSOV	Moray East Owner/Operator: JV Companies Country: UK Application: Topside	Hohe See and Albatros Owner/Operator: EnBW Country: Germany Application: Offshore substation
Seacat Mischief -OESV Owner: Seacat Services Application: OESV	Gale Owner/Operator: Norwind Offshore Country: Norway Application: CSOV Vessels	Hollandse Kust Alpha Owner/Operator: TenneT Country: Netherlands Application: Topside	DoggerBank A Owner/Operator: Equinor Country: UK Application: Offshore substation
Seacat Weatherly Owner: Seacat Services Application: CTV	Rem Energy Owner: REM offshore Country: Norway Application: CSOV	Saint-Brieuc Owner/Operator: Iberdrola Country: France Application: Topside	Dogger Bank B Owner/Operator: Equinor Country: UK Application: Offshore substation
Seacat Volunteer- CTV Owner: Seacat Services Application: CTV	Seacat Columbia Owner/Operator: Seacat Services Country: UK Application: Crew Transfer Vessel	Hollandse Kust Beta Owner/Operator: TenneT Country: Netherlands Application: Topside	Dogger Bank C Owner/Operator: Equinor Country: UK Application: Offshore substation
Bibby Wavemaster 1 Owner: Bibby Marine Services Application: SOV	HST Ella Owner/Operator: HST Country: UK Application: Crew Transfer Vessel	Equinor/SSE/ENI Owner/Operator: Equinor Country: UK Application: Topside	Sunrise Wind Owner/Operator: Ørsted/Eversource Country: USA Application: Offshore substation
Iceni Valour Owner: Turner Iceni Application: CTV	Gode Wind 3 Owner/Operator: Ørsted Country: Germany Application: Turbines	Yunlin Windfarm Phase 2 Owner/Operator: WPD Country: Taiwan Application: Transition pieces	Revolution Owner/Operator: Ørsted/Eversource Country: USA Application: Offshore substation
Iceni Defender Owner: Turner Iceni Application: CTV	Borkum Riffgrund Owner/Operator: Ørsted Country: Germany Application: Turbines	Dogger Bank A Owner/Operator: Equinor Country: UK Application: Transition pieces	Saint-Brieuc Owner/Operator: Iberdrola Country: France Application: Offshore substation
Tornado Owner: CWIND Application: CTV	Greater Changua Owner/Operator: Ørsted Country: Taiwan Application: Turbines	Hohe See Owner/Operator: EnBW Country: Germany Application: Transition pieces	Zhong Neng Windfarm Owner/Operator: CIP Country: Taiwan Application: Transition pieces
Wind Forces II Owner: Ftisia Offshore Application: CTV	Gwent Y Mor Owner/Operator: NPower Country: UK Application: Turbines	Zhong Neng Offshore wind Farm Owner/Operator: China Steel Corporation (CSC) and Copenhagen Infrastructure Partners (CIP) Country: Taiwan Application: Turbines	
Achiever Owner: Northern Offshore Services Application: CTV	Sheringham Shoal Owner/Operator: Equinor Country: UK Application: Turbines		
Rescuer Owner: Northern Offshore Services Application: Multipurpose -Ambulance vessel	Merkur Owner/Operator: APG Country: Germany Application: Turbines		
Accomplisher Owner: Northern Offshore Services Application: CTV	Gwynt O Mor Owner/Operator: RWE Country: Wales Application: Turbines		
Advancer Owner: Northern Offshore Services Application: CTV	Hywind Tampen Owner/Operator: Equinor Country: Norway Application: Floating turbines		
Arriver Owner: Northern Offshore Services Application: CTV			
Attender Owner: Northern Offshore Services Application: CTV			
Defender Owner: Northern Offshore Services Application: CTV			
Developer Owner: Northern Offshore Services Application: CTV			

The Glamox Group

Glamox is a Norwegian industrial group that develops, manufactures and distributes professional lighting solutions for the global market.

Quality brands and solutions

The Group owns a range of quality lighting brands including Glamox, Aqua Signal, Luxo, Norselight, LINKSrechts and Küttel. Glamox is committed to meeting customer needs and expectations by providing quality products and solutions, service and support.

Technology and expertise

Our products and solutions are developed and tested by our engineers at our own research and testing facilities, and manufactured and certified in accordance with all relevant quality and environmental standards. They are based on the latest technology and expertise – and generations of experience.

For more info, see www.glamox.com

