

The silent precision behind the energy transition

The rise of wind energy across Europe and beyond is undeniable. Where wind turbines were once modest structures, today's installations soar above the horizon, with rotor blades longer than an Airbus A380 and nacelles weighing hundreds of tons. This scale-up is no mere trend; it is a necessary step to achieve the capacity required for the energy transition. Behind these impressive numbers lies a less visible yet crucial element: the lifting operations that connect every component of this infrastructure, from the factory floor to the end user.

Examining the full wind energy chain, it becomes clear that lifting and rigging repeatedly form the indispensable link that enables progress. Whether it is installing offshore monopiles, transporting transformers and cable modules to onshore substations, or replacing a damaged turbine blade in the middle of the sea, success depends on the correct configuration of spreader beams, frames, slings and shackles. Not as a side condition, but as a central factor in every project's success.

Offshore challenges: gravity, sea conditions and tight weather windows

At sea, the technical and logistical demands of the sector come sharply into focus. Installing a 90-meter monopile or a jacket foundation weighing thousands of tons requires not only high capacity cranes but also rigging solutions that reliably and safely distribute loads. When a nacelle of 300 tons or more is lifted onto a tower, millimeter precision is essential to prevent damage to both components and lifting equipment.

Moreover, offshore projects operate within narrow 'weather windows', where wind, wave height, currents and visibility must all fall within strict limits. A missing or uncertified spreader can derail an entire installation schedule, potentially costing millions in delays.

Because Safe Lifting Europe continuously executes projects across Europe, the company can act as a rental partner to fully facilitate the lifting process and support the client at every stage of the project, quickly relocating equipment between project sites after inspection and logistical coordination. This flexibility is often critical when rapid response is required.

A striking example occurred in early 2024 during the installation of a jacket foundation for a new offshore wind farm in the German

Bight. A sudden storm threatened to halt lifting operations for several days. Within a short time, Safe Lifting Europe delivered additional long-span spreader beams and high-capacity shackles from a nearby project site in the Netherlands.

After swift inspection and transport, the equipment was immediately deployed, enabling the installation to be completed safely before the worsening weather. This intervention saved the client several days of delay and substantial costs.

Onshore links: ports, cables and substations

While offshore installations often receive the spotlight, an equally complex series of lifting operations occurs onshore. Ports act as logistical hubs: rotor blades exceeding 100 meters are unloaded and temporarily stored, tower sections are assembled, and complete modules for offshore substations are prepared for transport. Each of these steps involves multiple critical lifts.

The energy generated offshore also follows a complex path. Subsea cable reels weighing tens of tons are unloaded, reloaded and lifted during grid connection. Transformers and E-houses, with delicate internal components, must be precisely positioned. Selecting the right lifting gear and configuration is critical: a misaligned sling angle, an improperly chosen frame or an uncertified sling can result in damage, delays or hazardous conditions.

High capacity synthetic slings are increasingly used in these lifts. They are lighter than steel, easier to handle and reduce the risk of damage to sensitive surfaces such as cable sheaths or coated steel structures. At the same time, they require careful maintenance, UV protection and regular inspections, areas where specialised rental partners make a key difference.

Practical example: European transport chain under pressure

A recent project illustrates the complexity and versatility of lifting work in wind energy. Large electrical modules essential for distributing offshore-generated energy were produced in Eastern Europe and transported via inland waterways and road to a North Sea port.

The challenge began at the factory, where the modules needed to be safely loaded using modular spreader frames designed for their weight, dimensions and load distribution. During port transfer, the schedule was threatened by approaching bad weather.

By coordinating with ongoing projects in the region, Safe Lifting Europe was able, after inspection, to quickly release additional rigging equipment and transport it to the site. This allowed the project team to expedite operations and safely bring all modules ashore on time.

After assembly, the lifting plan was adjusted again: the modular nature of the lifting systems enabled configurations to be reassembled without delay, perfectly matching the changed module dimensions. The project demonstrates how a flexible partner, actively managing equipment across Europe, can fully support the client throughout the lifting process from start to finish.

Technological advancements: modular, lightweight and digital

The growth of the wind energy sector drives continuous innovation in lifting technology. Modular spreader beams and frames allow a single system to accommodate a wide range of configurations, from broad jacket bases to narrow tower sections. Interchangeable end pieces and adjustable lengths enable teams to switch quickly between project phases without transporting new equipment.



High-modulus polyethylene (HMPE) slings increasingly replace traditional steel cables. They are lighter, safer, and more corrosion-resistant, while reducing fuel consumption and CO₂ emissions during transport.

Digital load monitoring and real-time sensor technology are standard for critical lifts. Load cells, angle and tension sensors and motion compensation allow teams to precisely track load distribution, a crucial factor for installations from floating platforms or jack-up vessels.

Lifecycle management and traceability have become indispensable. Each lifting component, from sling to shackle, has a unique ID with production data, test certificates and inspection history. Safe Lifting Europe manages this digitally, scheduling preventive re-inspections so no component is used beyond its safe lifespan.

Maintenance, replacement and lifecycle management

Wind farms have a lifespan of 20 to 25 years, during which countless maintenance and replacement operations occur. From replacing a blade after lightning damage to lifting a generator or yaw system, every intervention requires controlled lifts with certified equipment.

Onshore, the chain continues to evolve. Substations are expanded, cable routes renewed, and new control modules installed. Every operation requires reliable lifting configurations, often in confined spaces within existing installations. Partners who provide not only equipment but also maintenance, re-certification and technical support are indispensable for ensuring grid continuity.



Safe Lifting Europe: reliability, expertise and partnership

As a rental and long-term lease partner for heavy lifting and securing equipment, Safe Lifting Europe positions itself as the connecting link in complex lifting operations. Its strengths include:

- Proactive engineering support: early involvement to align lifting configurations with design, load distribution, and installation environment.
- Operational presence across Europe: thanks to ongoing projects in multiple

countries, Safe Lifting Europe can fully facilitate the lifting process and support clients at every project stage, relocating equipment between sites after inspection and logistical coordination.

- Certification and quality assurance: every component is regularly tested, re-inspected and fully traceable according to international standards (EN, DNV, ISO).
- Flexibility under pressure: in situations with sudden weather changes or revised project requirements, equipment can be deployed or adjusted without delay.
- Sustainability and innovation: through reuse, recycling, and the adoption of lighter synthetic materials, Safe Lifting Europe actively contributes to the sector's sustainability goals.

The invisible backbone of the energy transition

Wind energy is often depicted in megawatts, rotor diameters and tower heights. Yet behind these impressive statistics lies an invisible backbone: lifting operations that quietly ensure everything falls into place. From foundations embedded deep in the seabed to the E-houses where energy enters the grid, lifting is repeatedly the critical factor for project success.

The sector's future points to even larger turbines, floating installations in deep water, and more complex onshore connections. As a result, lifting requirements will continue to grow: higher capacities, faster mobilisation, increased digitalisation and a stronger focus on circular use.

Partners who not only follow these developments but actively support them will play a decisive role in the pace and scale of the energy transition.

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