



Built to stand tall: the steel behind offshore wind towers



As offshore wind turbines become larger and more powerful, attention often turns to the foundations hidden below the waterline. Yet above the surface, another steel structure plays an equally visible and essential role: the tower. It carries the nacelle, supports the rotor, absorbs dynamic loads and connects the turbine system to the foundation below. For NLMK DanSteel, offshore towers are not a side story in the energy transition. They are part of a long industrial journey that has linked the Danish heavy plate producer to wind energy for decades.

'We were here even before the wind started blowing,' says Pavel Koliada, Wind Segment Senior Commercial Manager at NLMK DanSteel. The phrase is delivered with a smile, but it says a lot about DanSteel's place in wind energy: the company has followed the industry's development for decades, from earlier turbine generations to today's larger offshore structures.

From early onshore projects to today's offshore wind structures, NLMK DanSteel has supplied plates for a sector where scale, reliability and delivery precision matter. Wind is written into DanSteel's industrial genes: the Danish mill has grown alongside the sector over several decades, building experience in maritime applications, heavy structures, and wind energy, while continuously shaping its capabilities to meet the needs of large-scale renewable infrastructure.

This long-standing involvement has also included prototype developments for larger turbine concepts, giving DanSteel early insight

into the industrial requirements that later became standard in offshore wind production.

Offshore towers: visible, essential and steel-intensive

The tower is the vertical backbone of the turbine. On a modern 15 MW offshore turbine, the tower alone can represent around 750 to 800 tonnes of steel. It is a large, well-balanced engineered structure, manufactured from heavy plates that must be carefully heated to a temperature range of 1100 to 1200 °C, hot rolled, heat treated when needed, cold formed, fine welded, coated, transported and assembled with a high degree of industrial discipline.

Unlike foundations, whose technical characteristics vary significantly depending on water depth, seabed conditions and project location, offshore towers are generally more standardised. Yet standardisation does not mean simplicity. Tower fabricators work to tight schedules, with large components, demanding dimensional requirements and production lines that depend on a steady flow of suitable plates.

The current generation of offshore towers is largely based on established structural steel qualities, typically CE marked EN 10025-2,-3 S355 grades such as J0, J2, K2, N supplied in as-rolled (+AR), normalised rolled (+NR) or furnace normalised (+N) delivery conditions depending on project requirements and regional regulations. This stability is positive

for the supply chain. It allows producers and fabricators to focus on what matters most in serial production: repeatability, consistent quality, suitable dimensions, reliable logistics and the ability to support industrial rhythm.

For NLMK DanSteel, this is where the opportunity lies. The company is not positioning tower plates as a laboratory product. It sees them as a rigorous, well-mastered industrial product, produced daily in a mill where wind has become part of the operating culture.

Full-length plates: reducing complexity for fabricators

One key advantage in offshore towers is NLMK DanSteel's ability to supply long plates directly suited to tower production. New offshore tower designs can require plates up to around 26 metres in length, with a maximum plate weight of up to 30 tonnes. DanSteel's capability to deliver full-length plates in the relevant thickness and width range offers a concrete benefit to tower fabricators.

For many fabricators, joint welding of shorter plates is a capacity-consuming step. It adds handling, planning, production time and inspection requirements before the plate can move into the main tower manufacturing process. When a plate can be taken directly

from delivery into production, the fabricator gains simplicity, time and operational flexibility.

'In most cases, tower fabricators prefer to receive the plate in full length,' says Kolieda. 'It allows them to avoid an additional joint-welding step and move the plate directly into industrial production flow.'

This is a practical value proposition. It is not only about producing steel to specification. It is about understanding how that steel will be used once it reaches the fabrication yard. In offshore wind, where production schedules are closely linked to project milestones, removing unnecessary intermediate operations can support smoother manufacturing and more predictable execution.

NLMK DanSteel's mill configuration, combined with its logistics set-up, is central to this offer. The company can supply plates in long formats and deliver them to fabricators across key European offshore tower regions, including Spain, Scandinavia, Poland and the UK. Its own harbour adds flexibility for large-format deliveries and supports transport solutions that would be more difficult for mills without direct maritime access.

A dimensional range beyond standard tower requirements

Another strength of NLMK DanSteel's offer is its broad dimensional capability. For standard structural steels such as S355, typically used



in wind towers, the mill can supply plates from 5 mm to 256 mm in thickness, with widths up to 4000 mm. For offshore tower applications, these figures are significant because they go well beyond the usual dimensional needs of most tower fabricators.

This range gives customers flexibility. It means that DanSteel can cover the full range of typical tower plate requirements while also offering a reserve of capability for larger, heavier or more demanding projects. In practical terms, this allows fabricators to work with a supplier that is not operating at the edge of its dimensional envelope for standard tower applications.

The ability to produce wide plates is also part of this strength. While offshore towers generally do not require the extreme widths associated with certain foundation components, having access to plates up to 4000 mm wide means the company can serve both tower and foundation-related requirements within the broader offshore wind structure.

Production built around large-scale wind needs

NLMK DanSteel's position in offshore wind is supported by long-term investment in its industrial assets. While very thick plates and advanced thermomechanical routes are particularly important for foundations and XXL monopiles, the same industrial base also supports tower customers by giving them access to a heavy plate producer with broad project experience.

This combination matters because offshore wind should be considered as a full structure. Above the waterline, the tower carries the turbine. Below the waterline, the foundation anchors it to the seabed. DanSteel's capabilities are relevant across both areas, giving the company a wider view of offshore wind requirements.

'When we talk about offshore wind, we are not only talking about towers,' says Kolieda. 'There is also the structure below the sea. DanSteel can support the offshore wind solution from foundation to tower.'

This 'top-to-bottom' capability strengthens the company's role as a heavy-plate partner in the sector, linking tower and foundation expertise within a single industrial platform.

Reliability as a service, not only a product

For tower fabricators, reliability is not an abstract claim. It is measured in the ability to receive the right plates, in the right dimensions, with the right documentation and at the right moment in the production sequence. A tower fabrication yard is a high-throughput environment. Material flow matters.

NLMK DanSteel's customer support approach is built around this reality. The company combines commercial follow-up, technical support and logistics coordination to help customers manage projects efficiently. When questions arise, the proximity of experienced



teams and the ability to respond quickly are part of the service.

Eugene Goli-Oglu, Head of Product Development, Technology and Technical Sales Support at NLMK DanSteel, describes this as an important part of the company's value. 'Reliability and consistently high quality are probably the best words to describe the offer,' he says. 'This product type is well mastered, but the technical, commercial and logistical services around it are forming the main business core now.'

That service mindset is particularly relevant in offshore towers, where fabricators may not always need the most advanced grade, but they do need a supplier that can deliver consistently and understand the industrial consequences of each plate. A tower plate may be a standardised product in metallurgical terms, but at project scale it becomes part of a much larger production system.

Supporting the next step in low carbon offshore structures

Offshore wind is one of the pillars of the energy transition, and the steel used in its structures is increasingly part of the sustainability discussion. Today, the market is still developing its approach to lower-carbon steel solutions, with interest depending on project owners, tender conditions and broader decarbonisation strategies. NLMK DanSteel is preparing for that direction.

Through NLMK Europe's wider industrial footprint, the company has the potential to offer lower-carbon steel solutions for wind applications when projects require them. This includes EAF-based production routes at NLMK Verona, which open possibilities for lower-emission heavy plates for offshore towers and foundations.

The message is clear: as customer demand evolves, NLMK DanSteel intends to be ready.

The priority remains to combine performance, reliability and project suitability with a credible path towards lower-carbon supply.

Dedicated support for offshore wind projects

NLMK DanSteel sees offshore wind as a partnership market, where the right technical and commercial support can make a tangible difference from the early discussion stage to project execution. The company's dedicated wind team works closely with fabricators, OEM-related supply chains and project stakeholders to understand project requirements, discuss dimensional possibilities and support customers in selecting the right heavy plate solution for towers and foundations.

This support is also practical. Customers and industry partners can contact NLMK DanSteel's wind specialists, Morten Rix Henriksen and Pavel Kolieda, to discuss future projects, explore the mill's capabilities, or, ideally, arrange a visit to see first-hand how heavy plates are produced for large offshore structures.

As turbines stand taller and offshore projects continue to scale, towers will remain one of the most visible symbols of renewable energy. Behind each tower is a chain of industrial decisions, from steelmaking and rolling to logistics, fabrication and installation. NLMK DanSteel's role is to make that chain stronger, simpler and more reliable.

With decades of wind experience, Danish industrial roots and the capability to supply long, heavy and consistent plates, NLMK DanSteel is well positioned to support the next generation of offshore towers and the structures that make them stand.

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