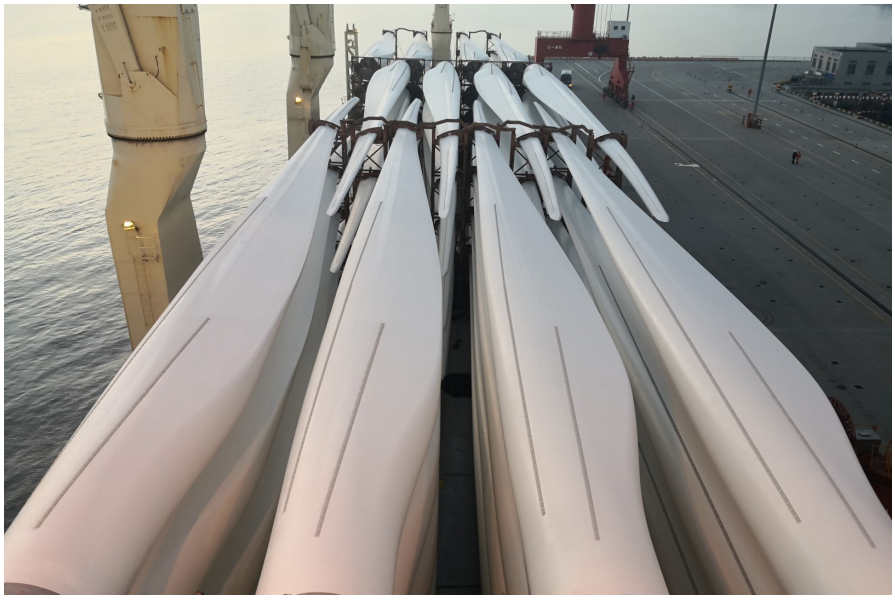
Optimizing logistics for wind components

The concept ‘vessel intake’ is at the forefront of windmill component design, and it will make possible more profitable logistics projects when different variables are considered under a collaborative approach.

The wind industry is facing a never-ending pressure on costs. All industry players, including first and second-tier suppliers, are developing different initiatives around cost reduction. As it happens today, logistics could be the last barrier in the automotive, or the food & beverage industries, but to overcome such a barrier, it is essential to implement a new and different approach.

Reducing logistics costs is something that almost all companies aim to do, and we all know that simply lowering costs is not a good long-term strategy. So what do we have left?

We need initiatives that bring a broader and more efficient strategic vision of the entire logistics chain. We should bear in mind that the transport of this type of component not only includes sea transport, but also land transport, different storage facilities, and all the necessary operations.



At this moment, in the current market, there are different initiatives to seek productive improvements, but only on a few occasions are the logistics considered. So, in general terms, logistics projects that have not been planned in advance can bring operational, or cost surprises. For this reason, it is necessary to design a logistics strategy and a proper action plan that can be incorporated into the whole process. So, with that aim in mind, a collaborative approach involving key third parties is an essential factor.

Don't forget that transporting cargo from one point to another is quite easy. The added value will be, for example, in providing a well-planned logistical process, so that the cargo arrives at the destination such a way as to make the construction of the farm easier, or software solutions to provide the location of the cargo in warehouses and traceability

How much wind cargo can fit on a vessel to be transported?

The manufacturing volume of wind turbines has grown a lot globally over the last years, and all these components need to be transported from and to different locations on the planet, sometimes in extremely remote places. For that reason, cargo intake has always been an obvious issue, and it depends on the size and configuration of the multipurpose vessel used and also on the size and configuration of the increasingly bulky wind components.

One of today's challenges is that manufacturers are looking for turbines that produce more and more energy, and there are two options: taller wind turbines that reach higher wind quotas, or larger blades that collect more wind. Both options make the components increasingly larger.

Manufacturers are moving on very fast in this regard, and this aspect makes it very difficult for vessels to adapt their capacity for the new cargo dimensions. So, vessels are gradually losing cargo capacity, and increasing the size of the vessels is very complicated and expensive. That said, the most viable option is to organise the available space to allow more and more components to be stacked high and with less distance between them.

Let's look at how to maximize the height and width of the cargo vessel capacity

The most basic option would be to use the height and width of the vessels to stack the cargo in the right position and, therefore maximize their capacity. This is something that has been done successfully for years and enables the maximization of the available hold and deck spaces.

Stacking the blades on top of each other is a good way to make the most of space, but we have to go further. Kaleido Tech has designed a safe stacking system that makes it possible to stack at heights, thus compacting the total volume of the load and reducing the horizontal distance between pieces, thanks to the verticalization of the lashing angles.

The next step is to integrate this optic from manufacturing engineering, not only for vessels but also for special trucks and

operations. This new approach requires an exhaustive engineering study to bring bold structure frames and the necessary cargo securing plan: lashing and welding.

But what about the width? The use of specially designed spacers can minimize the distance between the components, as long as they comply with the manufacturers handling guidelines.

The use of frames could also allow shorter bars to be used instead of traditional chains, thus reducing the number of necessary anchors.

Thinking outside the box means finding alternative transportation options such as railway, ro-ro or container vessels. The last two cannot substitute for breakbulk carriers, which ship an important part of wind components volumes worldwide, but they could be used to complement breakbulk services and performance.

The importance of the right design and materials for stacking frames, cargo handling and the lashing plan.

All the points outlined above should be discussed at the very beginning of the component design and in collaboration with critical third parties. Different aspects such as the stacking frame design and its materials, the expected cargo handling, and the needed lashing plan could also help to achieve some cost savings.

The key is to have a stacking frame lifecycle, reverse logistics, inland and sea-transport adaptability, and cargo handling standards that are easy to understand and can be adapted by transport operators.

Concepts related to frame design, such as 'universal' or 'multimodal' have a high impact, but are complex to deal with. Reducing the kind of frames per WTG components, or even the kind of frames regardless of the way of transportation, is a difficult challenge but it makes the difference.

Although health and safety must always be considered when dealing with cargo handling instructions, other aspects should also be taken into account. These include, for instance, fast loading and discharging ratios, standard ancillary equipment and processes, and providing stevedores with standard processes to increase productivity.

Simple safety improvements such as high-density Magnet Foams® instead of other options could be easily deployed worldwide. This protection system was originally designed to avoid tower section damage and improve stevedores and components safety, but also to make better stowage, not only for the closest sections loaded together, but also for fixing any other components to the vessel's bulkhead and stowing any cargo against it.

Including these solutions in cargo handling manuals could ensure a universal implementation of a safer and quicker way of protecting wind tower sections during operations.

Cargo lashing, or sea fastening on board are frequently forgotten steps during the transport process. Sometimes welders have to work in extremely difficult circumstances, or in tight spaces, and the lashing plan is conditioned to a stowage plan affecting the vessel intake. Inadequate materials and the need for extra-space are common issues, so there is room for improvement with the implementation of a global and open approach.

Magnet Foam, a safety system to protect tower sections.

Think bigger: what could an open ecosystem bring to the table?

Engineering and innovation are already part of the logistics world. The power of collaboration between different specialized teams has no limits when it comes to seeking improvement. To that aim, an open innovation strategy could be an excellent initiative.

Introducing a smart logistics approach into the engineering process could lead to outstanding results and have a high economic impact. In doing so, it is essential to consider this approach from the beginning and enable the collaboration between different company units and teams worldwide, as well as third parties, with a clear methodology, plan, and objective in mind.

A global and open approach to logistics is the next barrier in the wind industry's productivity. The short-term economic impact could be great.

Conclusion

It is necessary to establish new ideas, different from the traditional ones. In this respect, innovation plays a powerful role in improving the existing ones.

The objective is to bring vessel intake past the current point, focusing not only on space optimization but also on the use of proper materials, new devices, lashing plans, cargo handling, safety standards, and, why not, digitization. Initiatives that added to each other can achieve great benefits.

All the options mentioned were born from an engineering and smart perspective and after years of experience. Kaleido Logistics is not only a forwarder, but also a company that is highly specialized in the transportation of wind components. Having its own technical office, it has become a preferred partner when applying engineering knowledge to this kind of logistics projects. In 2019, Kaleido (Logistics) transported more than 2,600 wind components using this approach.

So, to sum up, is it possible to be more efficient in the transport of this type of cargo? The answer is YES, it is already happening, and it is helping to bring not only economic benefits but also safer and more efficient logistic operations. Let's go for it!

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