

Gone with the wind

The size of components both for onshore and offshore wind farms is increasing, creating very different challenges for the companies tasked with transporting them.

CHRISTIAN SHELTON reports

As increasing numbers of governments around the world look to alternative forms of energy generation to help address climate change, the wind power sector is booming – both onshore and offshore. The two environments, however, are very different propositions for companies tasked with transporting the various wind turbine components as efficiently and economically as possible.

Onshore wind power transport

According to Peter Libert, area sales manager at international heavy transport and lifting specialist Sarens, “onshore wind power transport has existed for around the last 30 years and is a relatively stable industry.” This is reflected in the wide range of specialist equipment that manufacturers have developed to serve this sector. For example, German heavy-duty road haulage and oversized cargo transportation specialist Goldhofer Aktiengesellschaft (Goldhofer) makes an arsenal of specialist machinery designed specifically to transport each element of a wind turbine. This includes: its FTV 300 rotor blade transport device for the transportation of rotor blades; its Super Lift fourfold extendable flatbed semitrailer for



Goldhofer's FTV 300 mounted on a PST/SL-E 8 self-propelled module

transporting long rotor blades; its RA4 tower adapter for transporting heavy tower sections (up to 180 tonnes); a range of low loaders with various axle systems for transporting nacelles; and a range of drop-deck vehicles for transporting turbine hubs designed to comply with regulations for maximum load height (which is 4.2 metres in most countries).

Goldhofer is not the only heavy transport equipment manufacturer to have such an extensive range. For example, another German company, Scheuerle Fahrzeugfabrik (Scheuerle), along with its Tii Group partner companies Nicolas, Kamag and Tiiger, offer

a portfolio that incorporates: tower adapters and supporting tips for wind tower transport; telescopic trailers for rotor blade transport; and modular self-propelled or towed platform trailers for transporting nacelles.

Most recently it was a Scheurle SPMT job that made the headlines with a high-profile move in Saudi Arabia - transporting three 58-m-long rotor blades for the Gulf Haulage Heavy Lift Company (GHHL) using 36 SPMT axle lines. According to Scheuerle, GHHL opted to use the SPMT because of their manoeuvrability, as the route to the installation site passed through an oil refinery which required careful negotiation. Scheuerle claims its comprehensive range of electronic SPMT steering programs made this possible. The company says it expects to transport more rotor blades for GHHL as, by 2023, Saudi Arabia aims to produce 9,500 megawatts of wind and solar power.

Canadian specialized semi-trailer manufacturer, Temisko, has just developed a new blade trailer that it claims “was created with growth in mind”. Temisko says it can transport the current blade sizes of



36 axle lines of Scheurle SPMT were used to move three 58 metre long rotor blades for the Gulf Haulage Heavy Lift Company (GHHL) in Saudi Arabia

Sarens used SPMT to transport 900 tonne tripod jacket foundations for steel construction company Lemants

set of standards we should be able to improve safety significantly," Splinter urges.

Offshore transport

The offshore environment, due to its intrinsic nature, does not suffer with the same restrictions or problems imposed by the infrastructure found onshore and the trend both towards bigger turbines and bigger wind farms continues unabated. "Many wind turbine factories are located near harbours or quays so the wind turbine's dimensions are potentially unlimited," qualifies Libert. "The weight and dimensions of components have grown over the last ten years, and will continue growing over the next ten years."

As offshore wind farms can be located away from where people live, even out of sight from land, the turbines also tend to be much greater in number than their land-based brethren. This significance of this? Well, it is all about logistics, as Libert explains, "Logistics is key in order to successfully transport all the components for offshore wind farms – particularly organising everything so that it arrives at the right time. »



203 feet (62 metres); however, the trailer has been designed to be easily upgraded to accommodate longer blades with the addition of a fifth beam – which extends the trailer's length to 218 ft (66 m). Even with the fifth beam added the trailer can close up to a length of 53 ft (16 m). The blade trailer also has a steering angle up to 46 degrees.

Safety concerns

The reason why Temisko has designed such a trailer is in response to the ever-growing size of wind turbines. And, on land, this increase in size is starting to cause problems as Sander Splinter, managing director of heavy lift specialist Mammoet Europe and president of ESTA's crane section, explains: "Safety during the transportation and erection

of onshore wind turbines is a growing concern. Quite simply, there are too many accidents and near misses. There have long been problems with poor quality access roads and hardstands on site but these issues are becoming more pressing as we see the development of bigger wind turbines. What is more, the increasing hub heights require longer and longer crane booms. And longer booms have limited workability in windy conditions." As a result, the International Crane Stakeholder Alliance (ICSA) - whose members include ESTA, FEM, AEM, CICA and the SC&RA - has created a new working group which is expected to discuss the issue further at the World Crane and Transport Summit in the Netherlands in November. "By all of us agreeing and adhering to a uniform



YOUR ROPE IS
OUR PASSION

More than a rope.

Get to know our committed team members, and they will work hard to realise your challenges with passion, competence and dedicated service – with over 60 years' experience to call upon.

Call direct for assistance:



CASAR Drahtseilwerk Saar GmbH | Casarstr. 1 | 66459 Kirkel | GERMANY | Phone: +49 6841 8091-333 | E-Mail: info.casar@wirecworldgroup.com | Website: www.casar.de

The Port of Longview, in Washington State on the west coast of the USA, took an innovative approach to unloading wind energy blades. Using its two Liebherr mobile harbour cranes in tandem, wind turbine blades were discharged directly from the vessel to rail cars. This, the port said, provided both time efficiencies and cost savings to its customer. The 160 foot (49 metre) blades, manufactured by Vestas, were discharged to flat-bed rail cars adjacent the vessel, moving along the port's on-dock rail system. Each blade required two railcars which then transported them to a wind farm in Illinois.



Any inefficiencies in the logistics process (assembling, storing and loading the wind power components) becomes multiplied by the number of turbines. This can make a big difference between profit or loss on your project." This is because production is slower than installation, so the entire process needs to be carefully controlled, Libert stresses.

Another point of difference with onshore turbines is that offshore wind turbines require foundations, as Libert explains: "Offshore wind turbines come in two parts: the wind turbine elements (tower, nacelle, and the blade) and the foundations - which are bigger and heavier than the wind turbine elements." The foundations come in two

types: jackets or monopiles. For transporting the jackets there are two main options. "First, SPMT can be used to move them to and from storage onto the installation vessel," Libert says. "Alternatively, a crane could be used." In the UK Sarens is working with Belgian steel construction company Lemants, which makes offshore wind turbine jacket foundations. Here Lemants is using a SGC120 (SGC stands for Sarens Giant Crane) to help with both the construction of the jacket foundations and with the storage logistics before they are shipped offshore.

"A second type of foundation is the monopile," continues Libert, "which is the most common foundation type." It is

essentially a big tube that is hammered into the seabed. It will penetrate the seabed whereas a jacket will stand on the seabed. A jacket receives its stability from its wide stance whereas a monopile receives its stability from penetrating (up to 20 metres into) the seabed. Thus monopiles are heavier and higher than jackets.

"The heaviest monopile weighs 1,300 tonnes," Libert says, "and monopile production companies tell us that soon they will weigh in excess of 2,500 tonnes." Sarens says this is no problem, as it is experienced in lifting and moving even heavier weights in the past for the nuclear, oil, and gas industries using a combination of SPMT and cranes. It does, however, illustrate the unrestrained nature of offshore wind power.

"The evolution of offshore wind turbines is a never-ending story," concludes Libert. "First there were 5 megawatt turbines. Now there is a prototype for a 9 megawatt turbine. And Siemens has said it will develop a 13 to 15 megawatt turbine. And even bigger turbines than that will surely come."

Just how far this evolution will continue remains to be seen, yet one thing is certain: companies involved in all aspects of heavy transport will continue to innovate and adapt to meet the challenges ahead. ■

BUILDING TOMORROW

 **MORROW**
USA • CANADA • MEXICO • AUSTRALIA • NEW ZEALAND

Morrow Equipment Company, LLC
+1 503.585.5721
www.morrow.com, info@morrow.com