№ 5 | 2023 September | October

www.shipandoffshore.net

Energy at Sea included

Ship&Offshore

THE INTERNATIONAL PUBLICATION FOR OFFSHORE & MARINE TECHNOLOGY

Ship&Offshore

THE INTERNATIONAL PUBLICATION FOR OFFSHORE & MARINE TECHNOLOGY

The well-established Ship and Offshore Repair Journal and the Ship Repair Newsletter find a new home at DVV Media Group Hamburg

Starting with the November / December issue of Ship&Offshore - just in time for Europort - we are paying special attention to the topics of repair, maintenance, conversion and retrofitting with the new Ship and Offshore Repair Journal Supplement

You will soon find more information at
www.shipandoffshore.net/repair

Kathrin Lau
Editor in Chief
kathrin.lau@dvvmedia.com

From junior partner to forerunner?

With Kormarine in Busan, Europort in Rotterdam and Marintec in Shanghai, the last quarter of this year sees three major maritime events, two of them in the Asian hemisphere. Typical for a non-SMM year, the maritime calendar includes multiple smaller events rather than one big one.

Will there be big announcements and innovations to be expected at the show? Probably not. Will they offer the perfect platform to recap the past few months and continue to address both the challenges in our industry and ways of tackling growing geo-political tensions? Absolutely.

In particular, the discussions and the need to find suitable pathways in this context naturally continue to be about the protectionism in China's shipbuilding industry and the country's threatening behaviour towards Taiwan, the United States and thus also the NATO. The question of possible alternatives, not only in shipbuilding but of course also in the supply chain, takes on an important role here.

What about Japan, South Korea, India? Will there be sufficient capacity, attractive prices and sufficient know-how?

Admittedly, we may have neglected the Kormarine exhibition in Busan, South Korea, in recent years. Of course, shipbuilding in South Korea has always been widely covered, but mostly only in relation to current orders, often coming from Europe. Interest in the event from our readership, however, had seemed to have waned somewhat. But that is now picking up speed again.

Notable changes are taking place in the country, not least in terms of diversification in the construction of different types of vessels. The expansion of offshore wind energy – in Europe, the United States and Asia – and the necessary assets is also leading to a focus on offshore ships in South Korea.

Interestingly, for the first time in five months, South Korea won most newbuilding orders in July, leaving China – which is certainly still leading the general order book in the long run – in second place. While this is certainly not the wind of change yet, it may show that China's pioneering role should not be taken for granted.

Most German and European suppliers agree, however, that they will not give up the Chinese market. They will, however, focus more on other Asian building nations and also local options.

Price, capacity and know-how – these are the determining factors for international shipbuilding – leaving competition-distorting subsidies out of the equation for once. In fact, prices in China have risen sharply and the country's shipbuilding capacity is largely booked. According to recent reports, huge volumes of new orders have taken up slots in both Chinese and South Korean shipyards.

Whether the expansion of offshore wind energy will turn the tide is questionable. Firstly, there is still some space available at Chinese shipyards; and secondly, the country's builders have repeatedly proven that they are also capable of building more sophisticated types of ships – with European cooperation if necessary.

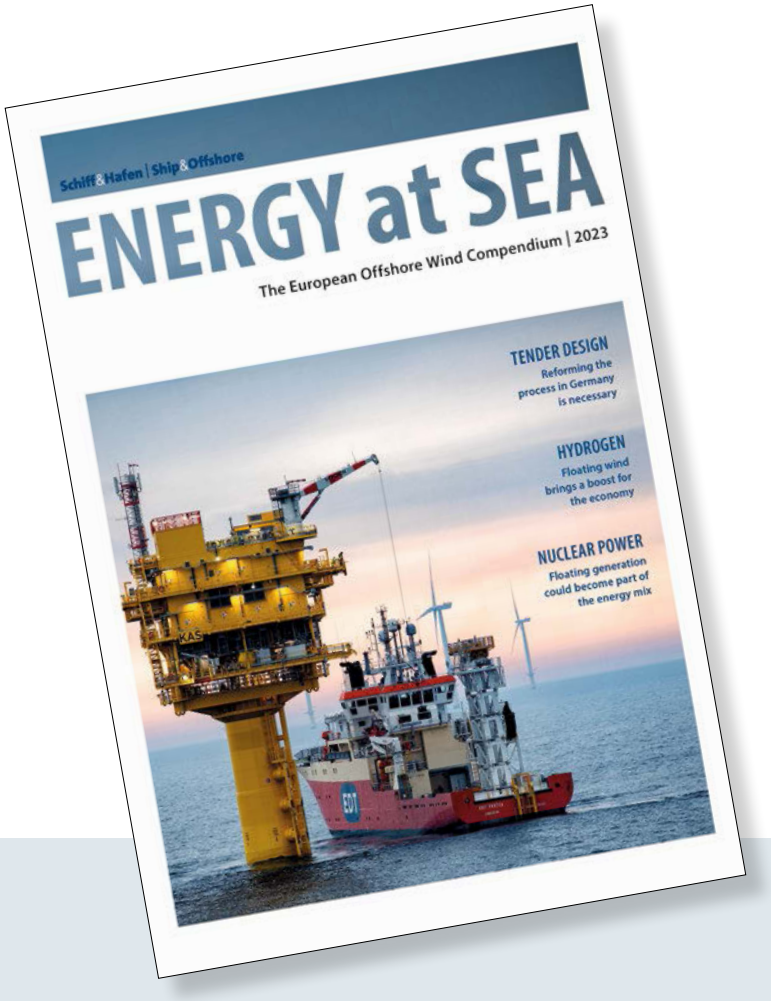
This has been evident in the case of cruise ship construction, for example, with Italian builder Fincantieri. How much other shipbuilding nations – with South Korea being in a good position – will profit from this remains to be seen.

Nevertheless, it is at least conceivable that China's policy, and the possible enforcement of sanctions in the future – even if it is unclear what form these might take – would require a general rethink; not only but also in the maritime business.

Shipbuilding & Equipment

Shipbuilding & Equipment

Offshore & Marine Technology



Energy at Sea

In order to mitigate climate change and achieve a self-sufficient energy supply in Europe, the expansion of renewable energies – especially offshore – is indispensable.

In the second edition of our special publication **Energy at Sea**, we present the current status of relevant projects in Germany and Europe, including wind, wave and nuclear power generation.

The supplement starts on page 27

Ship Operation

Regulars

Les Alizés loading monopiles in Eemshaven

Source: Jan De Nul

First assignment in German North Sea

Les Alizés | In late summer, Jan De Nul's latest heavy-lift vessel, *Les Alizés*, began installation work on the first of 107 monopile foundations for the construction of Ørsted's *Gode Wind 3* and Borkum *Riffgrund 3* wind farms in German waters.

The vessel, built at the China Merchants Heavy Industry Haimen shipyard, had arrived at the Dutch port of Eemshaven at the end of June after its maiden voyage from Asia. The first of the wind turbine monopile foundations were then loaded. The new vessel will also install one offshore substation foundation.

The crane vessel will also ship the associated topsides for the 253-MW *Gode Wind 3* farm and 913-MW *Borkum Riffgrund 3* facilities. Both wind farms will use 11-MW Siemens Gamesa turbines. Once completed, they will produce enough electricity for about 1.2 million homes in Germany.

Commenting on the project, Ørsted's managing director in Germany, Jörg Kubitza, said: "With the installation of the foundations for our two new projects this year, we are laying the groundwork for additional, large-scale renewable energy at sea. And thus further establish offshore wind power as a pillar of the energy transition. I am pleased that we have now reached the next milestone. In addition to the required capacities that will have to be installed in the coming decades, our projects also exemplify how offshore wind power can be built out in a value-creating and competitive manner in Germany – if the right framework conditions are in place."

Peter De Pooter, manager Offshore Renewables at Jan De Nul Group, commented on the new ship's deployment and that of the recently delivered *Voltaire*, one of the largest jack-up installation vessels, which is now working on the UK's *Dogger Bank* wind farm.

Earlier in summer, Jan De Nul's *Voltaire*, said to be the largest jack-up installation vessel ever built, arrived in the port of Able Seaton, UK. Since then, the ship has been undertaking final preparations for its very first assignment: the construction of the *Dogger Bank* wind farm phases *A*, *B* and *C*.

The *Scholle* will support Bohlen & Doyen in its offshore business

Multi Cat delivered in record time

Scholle | Damen has delivered a Multi Cat 1908 SD to energy infrastructure company, Bohlen & Doyen Bau GmbH, just one month after contract signing. The 19.4m-long *Scholle* will fulfil a wide variety of support tasks in Germany's coastal waters for transmission system operator, TenneT, working on the company's offshore grid connection systems in the North Sea.

The *Scholle* will push and pull barges, supply fuel and water, transport equipment and personnel to and from working areas, and undertake lifting operations.

Investors gear up for floating wind

Norway | Swiss construction company, Implenia, has agreed with NorSea, a privately owned industrial group majority owned by Wilh. Wilhemsen, to become equal minority shareholders in WindWorks Jelsa, an industrial plant on Norway's west coast, with holdings of about 41% each. Implenia focuses on large, complex infrastructure and specialises in renewable energy.

WindWorks Jelsa was set up in 2020 on Norway's west coast by NorSea, Suldal municipality, Ryfylke IKS, with Norsk Stein as a partner.

The project will be developed in stages between now and 2032, the companies said, and will result in a production and assembly area of 800,000m^2. It will include warehouses, workshops, purpose-designed launching systems, and heavy-load quays.

Visualisation of the future production and assembly facility in Jelsa, Norway

Electric short-sea cargo ships ordered in China

Joint forces | Netherlands-based ÈTA Shipping and Mercuria, a Cypriot-domiciled Swiss energy and commodity trader, have joined forces to order six, option ten, short-sea general cargo vessels at Taizhou Sanfu Ship Engineering Co Ltd in China.

The 7,400dwt ÈTA 6700 ships have been designed without a main engine, but will instead use an electric motor to drive the propeller. The ships' generators can be fuelled by conventional or low-carbon fuels.

It will also be possible to connect any sustainable power source in the future, such as batteries or fuel cells running on hydrogen, for example, or green methanol or ammonia. The power arrangement will give the ships a service speed of 10.5 knots when fully laden.

ÈTA Shipping will hold a small stake in the owning company, Mare Balticum BV, a subsidiary of Mercuria. With a high level of automation, the ships will be safely operated with a crew of four instead of six, the companies said.

The first vessel is due for delivery in the second quarter of 2025.

Co-founder of ÈTA Shipping, Sam Gombra, explained: "The modular design of the vessels allows for an easy replacement of a power source, which can be anything as long as it produces electricity. We estimate that it will take less than a day to remove the existing power generation system and replace it, fully or partially, without the need for a shipyard. The ÈTA 6700's efficient design has been achieved without compromising speed or cargo carrying capacity, and at a comparable newbuild cost versus conventional vessels."

Rendering of the ÈTA 6700 design Source: ÈTA Shipping

'Next shipyard chapter' begins at Meyer Wismar

Symbolic key | Insolvency administrator of the MV Werften Group, Dr Christoph Morgen, has passed the symbolic key of the Wismar shipyard to Bernard Meyer of Meyer Wismar. "With the handover of the shipyard to Meyer Wismar, we're now marking the beginning of the next shipyard chapter," he declared.

The shipyard has been owned by Thyssenkrupp Marine Systems since June last year. It has now been leased back to the insolvency administrator and subleased to Meyer Werft for the completion of the cruise ship under construction in the dock hall.

Morgan explained that over the past year, arrangements had been made for the three shipyards in Eastern Germany that had been owned by MV Werften, the Hong Kong-German shipbuilding subsidiary of Genting Hong Kong.

The symbolic hand-over of the keys in the shipbuilding hall

Illustration of the design for BYD Auto Source: Deltamarin

Deltamarin clinches design deals

PCTCs | Deltamarin has won a series of ship design contracts for pure car and truck carriers (PCTCs) from three separate ship owning groups. Up to 16 vessels could now be built to the company's designs, all of them in Chinese shipyards.

China's largest electric car manufacturer, BYD Auto, has ordered four Deltamarin-designed PCTCs of 9,200 car-equivalent-unit (CEU) capacity at China Merchants Industry. The ships, to be powered by LNG, have been designed specifically for BYD trades. Deliveries will start in 2025.

Swiss-based Sallaum Lines, which runs a fleet of eight vessels on trades from Europe and the United States to Africa, has ordered four, option two, 7,400-CEU ships from China Merchants Jinling Shipyard (Nanjing). Concept designs for these LNG-powered vessels were developed by Deltamarin earlier this year. The first vessel is due for delivery in 2026.

Deltamarin has also drawn up designs for two, including an option of four, 9,300-CEU methanol-fuelled PCTCs to be built at China Merchants Heavy Industry (Jiangsu) for China Merchants Energy Shipping. The first of these ships is scheduled for delivery in 2026.

Fuel cell tug design moves to next stage

Source: Svitzer

A rendering of the design for the new methanol hybrid fuel cell tug

MHFC | The second design phase of a methanol hybrid fuel cell (MHFC) tug being developed by A.P. Møller-Mærsk subsidiary, Svitzer, and naval architects, Robert Allan Ltd., has now begun. Following technical studies to establish the feasibility of this type of vessel in typical tug operations, the next stage of development will involve the design of the vessel, scope considerations for vessel construction, and equipment selection.

The tug is intended to start operating in the Swedish Port of Gothenburg during the second half of 2025. Methanol is the port's low-carbon alternative fuel of choice.

The tug's design will be undertaken jointly by the two companies, using a Svitzer TRAnsverse tug as the basis. However, Svitzer will look for other partners to work on certain aspects of the tugs' specification, such as batteries and fuel cell systems, and to support construction once the vessel's design has been completed.

The use of a fuel cell setup combined with batteries will provide longer endurance and fewer operational constraints compared with a purely battery-powered vessel. Secondary generators, fuelled by methanol, will provide back-up power without the need for a secondary fuel. Such a tug, running on green methanol, would cut annual CO_2 emissions by about 1,300 tonnes, the companies said, compared with similar-sized vessels operating on conventional fuels.

Japanese utility joins DemoSATH

Floating wind | Kansai Electric Power Corporation (KEPCO) has become a strategic partner and co-investor in Saitec Offshore Technologies' floating wind project, DemoSATH. The Japanese power company is the second utility to join, following the commitment by Essen-based multinational energy company RWE through its subsidiary RWE Offshore Wind in 2020.

Hailing the new partnership as a significant milestone for the project, Saitec Offshore's chief commercial officer, Immanuel Capano, said: "KEPCO's vast experience and considerable resources amplify our capabilities, bring a new level of expertise to our collective efforts. This partnership symbolises not just an alliance, but a shared vision for the immense potential of floating wind energy."

All electric ferry "a game-changer"

Battery supply | Corvus Energy, Wärtsilä, and Incat have released details of what they claim will be the world's first zero-emission, electric, lightweight RoPax ferry. The 130m-long catamaran is currently under construction at Incat in Tasmania, Australia. Due for delivery in 2025, the vessel will have 40 MWh of energy storage, four times more than any current installation, the companies said in a statement.

The catamaran vessel, being built for South American ferry company, Buquebus, will be deployed on a 45-nautical mile route across the River Plate between Argentina and Uruguay. Powered by eight water jets, it will have capacity for 2,100 passengers and crew, as well as 225 cars.

Corvus Energy's lightweight Dolphin NextGen Energy Storage System is a major advance on existing battery systems due to its low weight, high volumetric density, and operating flexibility, the company claimed. The batteries, which will be delivered to the shipyard at the end of 2024, will not be arranged in racks, but in four separate battery rooms on board the ferry.

Wärtsilä will supply its proprietary energy management system, the power conversion system, the DC shore-charging system, the 40-MWh battery modules, the DC hub, the eight electric motors, eight axial flow WXJ1100 water jets, and the ProTouch propulsion control system. Commenting on the scope of supply, Roger Holm, president of Wärtsilä's Marine Power business, said: "The overall high-efficiency of this next-generation ferry represents a game-changing advance in catamaran design. We are proud to have contributed our strong know-how in integrating our ship electrification solutions and propulsion equipment.

Tasmanian shipbuilder Incat has the electric ship under construction for South American customer, Buquebus Source: Incat

Incat Founder, Robert Clifford, added, "This worldwide interest in Incat's capabilities to deliver electric ships is a great opportunity for Tasmania and we expect this interest to magnify. We are already increasing our workforce and have just finalised plans for the recruitment of at least another 200 employees over the next twelve months with the expectation that our workforce will more than double in coming years".

The chemical tanker with bound4blue suction sails Source: Odfjell

Wind-assisted propulsion planned

Chemical tanker | Norway's Odfjell is to install an eSAIL® from Spanish wind sail company, bound4blue, on board one of its chemical tankers. The tanker company's move, with installation of the suction sail likely in 2024, will be the first time that this technology has been deployed on a tanker. The Norwegian company's partnership with bound4blue was supported by a study carried out by SSPA Maritime Center, a Swedish ship testing and research facility. The SSPA assessed various wind-assisted propulsion systems for the Odfjell fleet.

Shipowning: Greeks slip to second position behind China

Clarksons Research | After ten years in the lead, Greek owners have slipped into second place behind China in the global shipowning league table. Measured in gross tons (gt), the two countries are almost equal but China leads with 249.2 million gt against Greece's 249.0 million gt, according to latest figures released by Clarksons Research in its latest edition of the World Fleet Register.

Greece still leads in deadweight terms but Clarkson's valuation of its fleet, at USD 163 billion, is significantly lower than that of China. The Asian country's fleet is estimated to be worth USD 180 billion. In tonnage terms, the two countries are followed by Japan (181 million gt), South Korea (66 million gt), and the United States (also 66 million gt). Germany now lies in seventh place.

There is a marked difference between the make-up of the two leading nations' fleets. In China, the largest owners are state companies such as China Cosco and China Merchants. In Greece, it is privately owned companies, often family controlled, such as Angelicoussis, Dynacom, Cardiff, Navios, Star Bulk, Costamare, Alpha, Thenamaris, Capital, Minerva, and Tsakos, Clarkson said.

China's fleet comes nowhere close to its import and export volumes, however.

Finnlines takes delivery of hybrid RoPax

Finnsirius | China Merchants Jinling Shipyard has handed over the first of two ice-class RoPax ferries, *Finnsirius*, to Helsinki-based Finnlines. Together with its sister ship, *Finncanopus*, due for delivery by the end of this year, the vessel will operate on the route between Nantaali in Finland, Långnäs in the Åland Islands, and Sweden's Kapellskär.

The new ships are part of Finnlines' EUR 500 million Green Newbuilding Programme for both RoRo and RoPax ships. The air-lubricated vessels will have battery packs, exhaust gas abatement, waste heat recovery, ballast water treatment, and auto-mooring systems.

Finnlines' president and CEO, Tom Pippingsköld, said: "Finnlines' Green Newbuilding Programme has been a massive investment which will benefit our freight customers and private passengers. Smooth freight traffic in the Baltic Sea is the backbone of the region's economies and national security of supply."

Source: Finnlines Plc

The first of two new RoPax ferries, *Finnsirius*, has been delivered

The Combi Freighter (CF) 3850 is a recently redesigned general cargo vessel with a deadweight of 3,850 tonnes Source: Damen

Damen wins Combi Freighter contract

CF 3850s | Damen Shipyards has signed a deal with Turkey's Feyz Group for three Damen Combi Freighter 3850s. The flexible general cargo ships, with a deadweight of 3,850 tonnes, will be built at the Damen Yichang Shipyard in China.

The recently redesigned CF 3850s have a length of 89.7m and a 12.5m beam. The tank top is designed for cargoes of up to 15 tonnes per m^2, and the ships have capacity for 108 containers in the hold and 64 on deck. Movable bulkheads enable partial tween-deck flexibility and facilitate a wide range of cargo options.

Damen claims that the hydrodynamic properties of the CF 3850's hull reduce resistance and power requirements compared with similar vessels.

The 1,104-kW engine is fuel-efficient but still allows speeds of more than ten knots in headwinds when fully loaded, the company said in a statement.

The present and future of South Korean shipbuilding

South Korea's shipbuilding industry is vivid, yet China remains the biggest competitor Source: Hyundai

DIVERSIFICATION South Korea's shipbuilding heavyweights hold more than a third of the world's shipbuilding contracts. Second only to China, measured in tonnage, the country's yards are in full swing of building assets for the rapidly expanding offshore wind sector while focusing on sustainable future propulsion systems, writes freelance journalist, Charlie Bartlett.

Today, Korean shipbuilders hold 34% of the world's orderbook which, by value, is the third largest. Chinese yards, in number one, and Japanese builders, with fewer ships on order, hold contracts which, on average, are worth more.

Although Korean yards are building some of the world's most sophisticated merchant ships, they also continue to turn out large numbers of standard design bulk carriers and tankers. Over the last five years South Korea's orderbook has hovered at between 65 and 75% that of China's.

Like other shipbuilding nations, compared with the contracting deluge of 2021-22, South Korea's order intake has taken a hit this year as large numbers of container ships hit the water. But it has not suffered as much as others yet, with 9.8 million dwt on order as of end June, according to Clarksons Research, around 26% down from the same period in 2022.

A recent report in Reuters showed the extent of container vessel orders with which these yards are currently grappling. The roster of container vessels still to be delivered – even though scores of them hit the water every month – is now so vast that they are precluding other vessel types.

In a recent report, Oslo-based analyst Xeneta found that container lines were struggling to keep rates high, thanks largely to this deluge, highlighting the industry's efforts to finesse higher rates through General Rate Increases (GRIs), without the fundamentals to back them up. "2023 has seen the container shipping industry striving to overcome the 'double whammy' of declining volumes and escalating overcapacity, leading to lower rates and lost revenues," Xeneta said. "As such GRIs have been deployed in an attempt to jump-start rates growth, but looking at key Far East export corridors, have so far failed to make the desired, lasting impact."

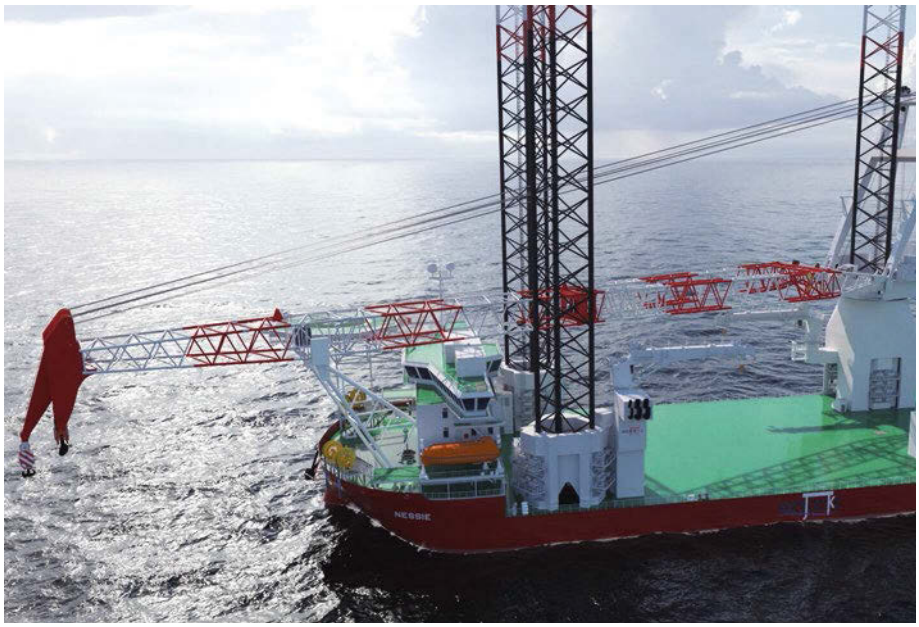
Yard space is still so full with container newbuildings that Korea Shipbuilding & Offshore Engineering (KSOE) and other

yards have been unable to meet recent demand for LNG carriers – something of a Korean speciality. With European countries such as Germany importing huge quantities of LNG, replacing Asia as its main market, such vessels are extremely profitable for the shipyards that are capable of building LNG carriers at present.

But the Reuters report found that KSOE would be unlikely to have slots available to build these before 2025. "A huge volume of newbuild orders have taken up slots in Chinese and South Korean shipyards," said K.W. Kim, Hyundai Heavy Industries senior VP.

But apart from a seismic increase in container vessels, the big winner in terms of fleet additions this year is expected to be offshore vessels – but not the conventional ones. Clarksons' 'other' offshore vessel category is expected to grow by 4.1%, which reflects the growing popularity of offshore wind vessels, including service and operation vessels (SOVs) and wind turbine installation vessels (WTIVs). Clarksons expects around USD 8 billion to be spent on new offshore wind vessels this year.

In an exciting turn of events for South Korea's WTIV builders, the Government pledged in 2021 to build 20 GW of offshore wind power by 2034. That commitment has been brought forward, with the country now targeting between 18 and 20 GW of offshore turbine capacity by 2030. There is particular reason for South Korea to consider offshore wind, the Government says. It is a small, densely urbanised country with coast on three sides, and little space for onshore turbines.



The WTIV *Nessie* will be delivered in 2024 Source: Eneti

This means that new deliveries will have plenty of domestic work, even if global demand for WTIV were not already soaring. Expected by many to be a limiting factor in the number of offshore wind farm installations that can ultimately take place over the next decade, Clarksons expects that around USD 21 billion will have been spent on WTIVs by the end of 2028.

One such vessel, a newbuild WTIV called *Nessie*, is under construction at Daewoo Shipbuilding and Marine Engineering (DSME) for Eneti, the Lauro-owned company which used to be Scorpio Bulkers, and will shortly become Cadeler. That vessel, costing USD 330 million, is set to be delivered at end 2024.

As has by now been established as customary for these vessels, it has already fixed a contract. "Securing this charter for our first newbuilding WTIV… reflects the improving fundamentals of the installation market and the expanding capability of our fleet," Emanuele Lauro said in December. "With open vessel capacity, we are well-positioned to contract the fleet in a tightening market and a rising rate environment."

The WTIVs are quickly gaining status as the Formula One of maritime technology, with Daewoo compatriot Samsung Heavy

Industries (SHI) devising a new design featuring a solid oxide fuel cell (SOFC), which would effectively double the efficiency of the WTIV's LNG fuel. Instead of combustion, the fuel cell allows the methane's energy content to be extracted like a gaseous battery, meaning that the Carnot principle – the physics equation that limits the efficiency when turning heat into power – can be effectively sidestepped.

Although current generation fuel cells can increase efficiency over engines by around half again, it is thought that in due course, they could triple it, getting close to 90% of the energy from fuel. This would not negate the use of fossil fuels particularly, but it would certainly reduce consumption.

Meanwhile, additional technologies like on-board batteries can compensate for moment-to-moment changes in electricity load, which fuel cells – slow to ramp up and down – do not handle particularly well. This is essential for functions such as dynamic positioning, which has a high and extremely variable power consumption.

With WTIVs getting to work right out of the gate, there is abundant opportunity for South Korean shipyards to capitalise on their reputation for proficiency in complex and technologically advanced shipbuilding. But they will have to be quick.

They face competition from China Merchants Heavy and CIMC Yantai Raffles shipyards, where WTIV-building prospects are buoyed up by that country's own sudden and vast commitment to offshore wind turbines. What is more, many of the more advanced ship designers, such as Norway's Ulstein, are, through gritted teeth, sharing their latest ideas with the Chinese as well.

The new offshore

In an effort not to be outflanked, Hyundai Mipo Dockyard has signed an agreement with Korean Register to develop a design for another type of vessel, the wind farm commissioning service operation vessel (CSOV). Unlike CSOVs, the use case for WTIVs is somewhat short-lived.

The supply of WTIVs under construction for the upcoming boom in offshore wind could prove to be a bottleneck, according to some analysts. Once this is overcome, however, and wind farms have passed the point of critical mass, they will face a buyer's market much more like that of today's offshore support vessels and platform supply vessels.

A CSOV, however, will be in use for the entire life of a wind farm. This means that there is virtually no future for a CSOV powered simply by fossil fuel. The vessels that are under construction today must now be built ready for one or more new fuels, or the retrofit of main propulsion units.

Today's wind farms unavoidably have a carbon cost and will do until such time as all mining and steel production is completely decarbonised. But with this in mind, wind farm developers and their regulators will be far less likely to tolerate generating an operational carbon footprint, as well.

Fortunately, it is widely understood that for CSOVs, which attend turbines on long permanent standby shifts, it makes sense for the vessels to plug directly into turbines to charge batteries, which would form the backbone of their operation. For example, the CSOVs at Hyundai Mipo Dockyard, like many others, will feature a hybrid electric propulsion system, with the capacity to run engines to supply additional electrical power in dynamic positioning mode – the most power-hungry of any form of operation.

Although it will initially rely on domestic customers, Korean Register is assisting the design project with the express intention of ramping up production with export in mind. Hyundai Mipo approaches a crowded field, but this is exactly what South Korea's shipyards are good at; achieving a balance between series production of relatively standard vessel production in China, and the niche, technologically advanced but extremely costly vessels built in Europe.

"When this technology development is completed, it is expected that not only will it be possible to operate and maintain domestic offshore wind farms that are being promoted in the future with domestic technology, but it will also be able to occupy an advantageous position in the global CSOV building market, where demand is increasing in the future," said a statement from Hyundai Mipo.

Fuel switching

In a portentous development, KSOE acquired a 35% stake in STX Heavy Industries, paying USD 65.1 million to previous owner Pine Tree Partners. The result will be a consolidated Korean engine manufacturing giant, perhaps exactly what is needed to take on the fraught environment of new experimental ship fuels.

Of these, the headline recent order is that of Maersk, which close to the end of last year ordered six 17,000 TEU methanol-fuelled vessels at Hyundai Heavy Industries (HHI). The unconventional vessels, by now famous for their unique layout with superstructure and accommodation up front, are set to deliver in 2025.

For shipyards that have been building many vessels powered by LNG, methanol might be something of a respite. While it contains less energy and therefore needs larger fuel tanks, its storage requirements are comparatively straightforward, with no need for refrigeration or pressurisation.

The orders appear to have started a trend. Monthly methanol ship orders have almost entirely exceeded those of LNG this year, prompting speculation that LNG is finally relinquishing 'green' status. Divisions of Hyundai are also making investments in methanol fuel, alongside Thailand's PTT Exploration and Production (PTTEP), and European Energy, which operates widely in the Americas.

In another development, Hyundai Engineering and Construction is working on a design for a carbon capture device which would capture 90% of CO_2 from an inflow of exhaust gas. Hyundai Oilbank, meanwhile, is seeking to use captured carbon to make construction materials like cement.

Recognising South Korean yards' track record in complex fuel arrangements, Danaos, the Greek owner of various CMA-CGM-chartered ships, split an order for ten methanol-powered container ships between China and South Korea in April last year, with four of them under construction at Daehan Shipbuilding. In June, it placed an order for an additional two, and though the yards were not disclosed, it could very well have been South Korean builders that won the deal.

Methanol appears the latest battleground in the competition between Far-East shipyards. In February, a 54-vessel order at HD Korea Shipbuilding & Offshore Engineering contained 18 methanol-powered ships. Hyundai HI, Hyundai Samho, HJ Shipbuilding & Construction (formerly Hanjin HI) have also won large numbers of methanol ship orders this year.

"We will continue to drive efforts to support the global community's broader transition to carbon neutrality while at the same time strengthening our fundamental level of future capability in the face of increasingly fierce competition in the global market," said Kim Kyung Bae, president and CEO of HMM, one of the companies involved in methanol ship orders.

Ship cyber resilience technology certified

DESIGN VERIFICATION | Korean Register (KR) has granted Approval in Principle (AiP) to K Shipbuilding and ForceTEC for a newly designed ship cyber resilience setup developed in line with the International Association of Classification Societies' (IACS) Unified Requirement (UR) E26. The AiP is the result of a joint research project between KR, K Shipbuilding (formerly STX Offshore & Shipbuilding), and ForceTEC designed to apply and validate ship cyber resilience principles and demonstrate a proactive response to new cyber requirements.

IACS UR E26, first introduced in April 2022, will become mandatory for all new vessels ordered from January 2024. Ship cyber resilience is based on a series of measures to reduce cyber accidents and mitigate their impact on a ships' computer systems, designed to ensure safe navigation and protect the environment.

K Shipbuilding and ForceTEC therefore designed a ship's navigational communication system and engine control system, both of which incorporate cyber resilience measures. The companies established a response system by formulating a basic design and test methodology within a cyber risk management framework. KR has subsequently issued the AiP.

The classification society's Kim Daeheon, executive vice president of its R&D Division, said: "The results of this successful joint research with K shipbuilding served as an opportunity to prove KR's excellent cyber resilience design verification and on-site inspection technology. We will further strengthen our capabilities in cyber resilience technology."

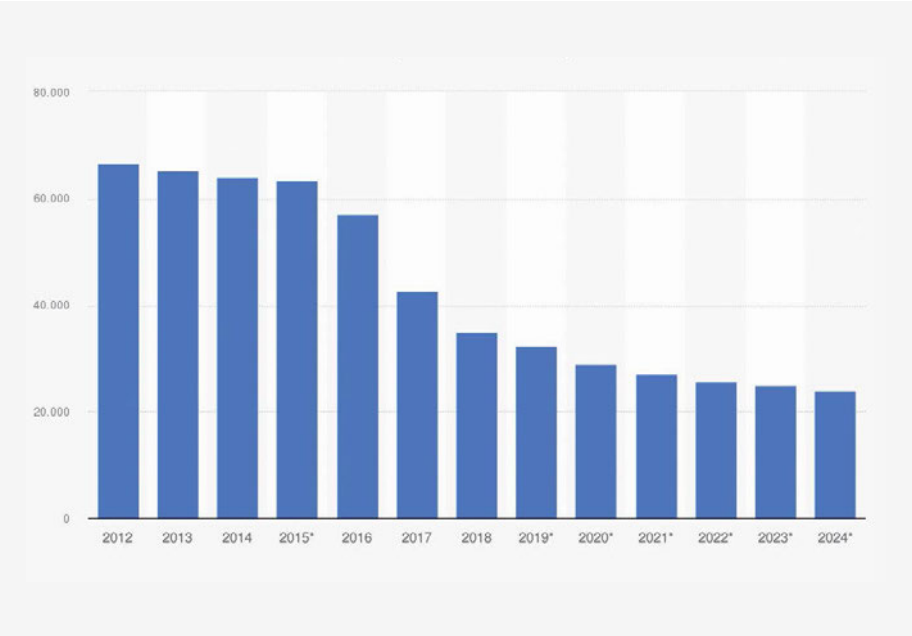
Koh Taehyun, K Shipbuilding CTO, commented: "Certification of cyber resilience technology that meets the IACS rules is an important step to demonstrate the technology and reliability of K Shipbuilding. Being the first mid-sized shipbuilder in the world certified in this technology, we will provide safety-centred smart green vessels."

ForceTEC's president and CEO, Kim Sangyong, stated: "I am delighted that ForceTEC is conducting joint research with K shipbuilding and KR and is recognised for our technology at the initial stage of starting the maritime cybersecurity business. We will continuously invest in research and development to improve our technologies and contribute to the development of the maritime security industry."

From left, KOH Taehyun, K Shipbuilding; KIM Daeheon, KR; and Kim Sangyong, ForceTEC

Source: Korean Register

South Korea and Europe combine expertise



Shipbuilding industry turnover in South Korea from 2012 to 2018 and forecast to 2024 (in billions of EUR)
Source: KOSIS, Statista 2023

COOPERATION | While South Korea remains the second-biggest nation when it comes to newbuilding orders worldwide (2022: 13,958,000 cgt compared with China: 16,730,000 cgt) and thus a main competitor for European shipbuilding business, the country does seek cooperation with Europe in other parts of the business.

One recent initiative is an agreement between South Korea and Greece to develop technologies jointly to modernise existing ships into environmentally friendly vessels. Under the agreement, the two countries will carry out projects to develop technologies and design propulsion systems and shipbuilding techniques to rebuild existing ships with environmentally friendly propulsion. These include fuels such as liquefied natural gas, liquefied petroleum gas, methanol, and other clean energy sources, according to the Korean Ministry of Trade, Industry and Energy. STX Engine Co and several other South Korean companies will work with Greek companies Hydrus, Onex, and others, and the South Korean Government will invest around USD 3 million in the projects by 2026. The move came after the International Maritime Organization (IMO) set a goal of reducing greenhouse gas emissions in the shipping sector by 50% by 2050 compared with 2008 levels. "South Korea secures advanced technologies in shipbuilding and engineering, and Greece owns the largest number of vessels in the world. This cooperation will present a new business model," said South Korean Deputy Minister of Trade, Industry and Energy, Jang Young-jin. Greek shipping companies are among the most important customers for South Korean yards.

Horizon Europe: formal negotiations

Earlier this year, the European Commission and South Korea showed their commitment to deepen collaboration in research and innovation to tackle global challenges by launching negotiations on Korea's association to Horizon Europe, the EU's Framework Programme for research and innovation, which also includes maritime initiatives.

As part of this, HD Korea Shipbuilding & Offshore Engineering (HD KSOE) will be working with European partners on a large-scale liquefied hydrogen cargo tank with a capacity of 160,000m^3.

Ammonia fuel supply system awarded AiP

SHI | An ammonia fuel supply system developed by Samsung Heavy Industries (SHI) has been awarded Approval in Principle (AiP) by ClassNK. This means that SHI's conceptual design, which has been developed based on part C of ClassNK's 'Guidelines for Ships Using Alternative Fuels', meets the classification society's requirements.

The latest development follows successful land-based tests of ammonia as a marine fuel in Japan. A consortium consisting of ClassNK, IHI Power Systems, Japan Engine Corp, Nihon Shipyard Co., and NYK Line, undertook the test earlier this year on a four-stroke marine engine designed for coastal vessels and tugs.

Ammonia has both pros and cons. It contains no carbon, has a relatively high power-to-fuel-to-power (PFP) efficiency, and a wide distribution network that is already in place. The fuel also has a high octane rating and a limited risk of explosion. But it is highly toxic to humans and marine life.

SHI's head of Shipbuilding Sales Engineering Team, Dong-Joo Kim, said: "We are happy to collaborate with ClassNK in this important design development and believe this AiP award demonstrates SHI's readiness for the new ammonia shipping market that is coming from global decarbonisation demands."

Masaki Matsunaga, director of Plan Approval and Technical Solution Division at the classification society, commented: "It is a great honour to be involved in the SHI's initiatives to expand industry options for greener shipping by conducting safety assessment on its ammonia fuel supply system, which has resulted in AiP. ClassNK remain committed to supporting to realise innovative solutions for decarbonisation of shipping."

THREE INTRINSIC VALUES: ACCURACY, RELIABILITY AND EASE OF USE.

THE 6X®. OUT NOW!

Admittedly, at first glance, you can't tell what's inside the new VEGAPULS 6X radar sensor: A high-precision level instrument that doesn't care if its measuring liquids or bulk solids. Only its colour gives you a hint that it's going to be great to use.

VEGA. HOME OF VALUES.

www.vega.com/radar

VEGA

Meyer Werft delivers *Silver Nova*

The cruise vessel *Silver Nova* has now been delivered Source: Meyer Werft

SILVERSEA CRUISES | Meyer Werft has delivered the 728-passenger cruise vessel, *Silver Nova*, to Monaco-based Silversea Cruises, a Royal Caribbean Group subsidiary. The handover of the 243m-long cruise vessel took place in Eemshaven and follows extensive tests of the ship's innovative features during sea trials. They include a combination of LNG-powered propulsion, a fuel cell system, and batteries.

The fuel cell setup will supplement the LNG engines and will later supply the entire hotel operation, according to a statement from the shipbuilder. Meanwhile, the batteries will increase efficiency by absorbing peak loads. A newly developed Micro Auto Gasification System (MAGS) will convert waste on board into thermal energy, thereby raising energy efficiency still further.

Jan Meyer, managing director of Meyer Werft, commented: "We are very pleased to once again deliver a ship that will set new standards on the way to climate-neutral cruising. With the propulsion systems, a combination of LNG, fuel cell system and batteries, the ship has the best possible measures to reduce emissions."

The ship has the largest choice of bars, restaurants, and lounges in ultra-luxury cruising, according to the statement. It has some of the most spacious suites at sea, an asymmetrical design and a horizontal layout. The 364 suites are available across 13 categories and include premium suites located aft.

NCL welcomes new flagship

PRIMA CLASS | Italian shipbuilder Fincantieri has delivered the *Norwegian Viva*, the second ship of Norwegian Cruise Line's (NCL) Prima class. The 143 535-gt newbuilding is 294 m long and can accommodate up to 3,100 passengers. Four more ships of the Prima class are to follow by 2028. The 19th ship of the NCL fleet will be officially christened on November 28th in Miami.

The cruise ship will then homeport in San Juan, Puerto Rico, and sail the Caribbean from December 2023 to March 2024, with calls in Tortola, British Virgin Islands, St. John's, Antigua, Bridgetown, Barbados, Castries, St. Lucia, Philipsburg, St. Maarten and St. Thomas, US Virgin Islands. "Building ships as outstanding as the Prima class is only possible in partnership with an incredible shipyard like Fincantieri," said David J. Herrera, president of Norwegian Cruise Line. "We are proud to play this role for the innovative Prima Class and look forward to continuing our partnership in the coming years with the next four highly anticipated Prima Class ships," added Pierroberto Folgiero, CEO of Fincantieri.

The cruise ship *Norwegian Viva* is 294 m long and can accommodate up to 3,100 passengers Source: Norwegian Cruise Line

Abeking & Rasmussen launches its largest-ever yacht

LIVA° | North German shipbuilder, Abeking & Rasmussen, has launched a new superyacht, the 118.2m-long *Liva°*. Its sleek black hull stands as a symbol of sophistication and elegance on the water, the shipbuilder declared. Its diesel-electric propulsion, designed for quiet operation, consists of two 2,200-kW electric propulsion motors from Ramme Electric Machines GmbH.

The vessel also has two 2,240-kW Caterpillar main generators and three 599-kW Caterpillar auxiliaries supplied by Zeppelin Power Systems. Four Voith thrusters enhance manoeuvrability, and four SKF stabilisers ensure good seakeeping and maximum comfort for passengers and crew.

The yacht's Neptune Lounge has an underwater window measuring 3.4m by 1.3m, enabling guests to view the world below sea level. The 12m x 3m swimming pool on the main deck can be elevated to a higher level, creating an illusion reminiscent of the sea's surface, the yacht builder claimed in a statement.

The *Liva°* is the largest superyacht A&R has built to date Source: A&R

Matthias Hellmann, Abeking & Rasmussen CEO, commented: "The delivery of this magnificent superyacht marks a defining moment for our company and I can confidently say: we have once again succeeded in building an exceptional yacht. By upholding our values of innovation, quality, and client satisfaction, we have created a yacht that sets new industry standards and delights our discerning clientele."

Accelerating digital transformation of shipyards

TECHNOLOGY QUALIFICATION Use of new approaches requires shipbuilders, end users, and classification societies to be satisfied that risks are understood and managed, writes Gareth Burton, VP, Global Technology, ABS

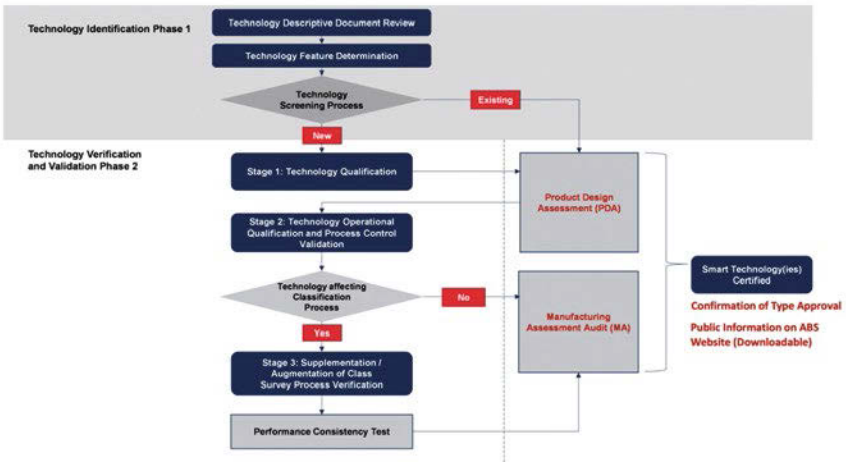


Figure 1: The confirmation of type-approval process Source: ABS

The use of new technologies is driving shipyard production into new, exciting, and sometimes unfamiliar frontiers, expanding across the use of technologies such as augmented reality, virtual reality, 3D plan review, simulation and modelling, digital twins, and other tools. The increasing application of such digital processes, including the certification of new technologies, must be supported by class.

The need to drive safety and quality as part of this technological revolution creates a demand among vessel designers and shipyards for validation and certification of digital processes. It also enables classification societies and yards to coordinate their workstreams more efficiently, potentially changing the physical touchpoints during construction and providing the standards for data flows that support digital class and remote technology during a vessel's operational life.

The qualification of technology during construction builds a set of standards and a framework that allows class to collect more of the key data that promotes not just next-level efficiency but safety too. Fundamental to this approach is class guidance, which introduces the process of recognising shipyards utilising and incorporating smart technologies in their operational processes.

Examples include the pioneering work by ABS and Seatrium integrating smart functions into the world's first smart LNG bunkering vessel, *FueLNG Bellina*, equipped with Seatrium's proprietary AssetCare Digital Solution. The same philosophy powers a joint development project between ABS and Nakilat-Keppel Offshore & Marine Ltd examining how remote monitoring of vessels in service can be applied to surveys and inspections in the shipyard.

To help more shipyards understand how to embrace smart technologies, the ABS Guide, Smart Technologies for Shipyards, lays out a Smart Technology Certification Framework. It provides guidelines for shipyards to demonstrate the integration of qualified smart technology into their operational processes.

Qualification process overview

One of the challenges faced by industries undergoing digital transformation is that technologies often develop faster than the codes or regulations that govern them. In many cases, new technologies have little or no precedent in their target application and may drastically alter the way a certain process or activity has been carried out for decades. The lack of service history and successful real-world demonstrations raises questions about the technology's readiness, maturity, and safety.

The qualification process addresses these concerns by showing to potential end-users (and the industry as a whole) that all risks associated with the specific technology's implementation have been systematically reviewed, and its maturity has been verified. ABS' technology qualification process, included in the Smart Technology Guidance, confirms the ability of a new or existing technology to perform its intended functions in accordance with defined performance requirements. The process starts with a comprehensive description of the technology to be qualified, followed by a screening of the technology to reveal the new or novel features that the qualification should focus on.

The process is divided into five sequential stages that progressively qualify the technology from feasible to operational stages. These stages span feasibility, concept verification, prototype validation, system integration and operations.

The qualification activities within each stage revolve around risk assessments and engineering evaluations that build upon each other to determine if the technology provides acceptable levels of safety in line with current shipyard industry practice. The qualification efforts by all stakeholders, such as the vendor, system integrator, and end user, are recognised and captured at each stage within the qualification process.

Upon completion, eligible technologies can be type-approved by ABS to limit repeated evaluations of identical designs. When all engineering evaluations are complete, a product design assessment (PDA) can be issued prior to further consideration for type approval.

The certification framework

The confirmation of type-approval process shown in Figure 1 demonstrates that

all software, related hardware quality assurance, and control systems incorporated into the technology have been reviewed for compliance with one or more ABS rules or guides, statutory, industrial, or manufacturer's standards, or other criteria acceptable to ABS.

Technology qualification is just the first phase in the overall certification process. The second phase is technology operational qualification and process control validation, equivalent to design validation and quality management assessment, the issuance of a manufacturing assessment (MA), and type-approval certification for the technology used for non-class-related activities.

For shipyard technologies that will be used for non-class-related activities, upon successful completion of the first and second phases, the technology is eligible for a confirmation of type-approval – Tier III. This certificate is available when a valid PDA – Tier II and a valid MA – Tier III remain current. The type-approval certifies that the implementation of the technology complies with a recognised standard, at least the ISO 9000 series or equivalent. Equivalency will ultimately be determined by ABS on a case-by-case basis.

For shipyard technologies that will be used as part of the classification process to supplement, augment, or complement tasks that are related to or affecting the classification process in ship construction, repair, or commissioning activities, for example, an additional step/third stage is required, known as the Supplementation/Augmentation of Class Survey Process. The purpose of this stage is to make sure that the qualified process using the technology can produce results that are the same or better than the traditional process or approach.

Accelerating the transition to smart shipyards

Digitalisation of shipyards continues to accelerate as builders seek to capitalise on technologies that can help them improve design and fabrication and enhance operational health and safety. The implementation of these smart technologies can enable new and more efficient ways of working, provided that the risks they present can be identified and mitigated.

Qualification and/or certification of technologies by an independent third party has played an important role in the digital transformation of other industries, including the shipping and offshore sectors. It demonstrates a level of feasibility and maturity in order to gain a competitive advantage with customers, partners, and other stakeholders. Additionally, it provides regulatory agencies with confidence that any hazards and/or risks associated with the introduction of the proposed technology have been systematically reviewed, and that appropriate mitigation measures have been put in place. This combination of technology assessment and regulatory oversight provides tangible dividends for shipyards keen to improve their performance, and shipowners looking to manage the safety of transition technologies.

It is clear that new technologies and the increased use of data can support sustainability as well as create efficiencies. They can also help class and owner optimise the survey process – during construction and subsequently in operation – leveraging technology beyond asset production and in support of the classification process.

Research project to develop retrofit systems

CLINER-ECO | MAN Energy Solutions is to begin developing retrofit systems for medium-speed engines together with energy conversion specialist, WTZ Roßlau gGmbH, and Technischen Universität Darmstadt. The three-year project, called CliNeR-Eco, started at the beginning of the year and is being funded by the German Federal Ministry for Economic Affairs and Climate Action.

The partners are aiming to develop concepts for diverse medium-speed ship engines that will enable widescale retrofitting at reasonable economic and technical costs, MAN explained. The partners are focusing on methanol as a climate-neutral fuel when produced from green hydrogen. It is hoped that progress in this endeavour could generate other developmental projects for series production. MAN is planning the first retrofit project on a MAN 48/60 engine with a functional test engine scheduled for testing in 2024.

Development of retrofit technologies will enable shipowners to be offered options to comply with future emission targets. These will be introduced by the IMO and the European Union with requirements becoming steadily stricter from 2025 onwards. Ultimately, the goal is climate-neutral shipping.

MAN Energy Solutions' head of R&D Four-Stroke Engines, Dr Alexander Knafl, explained: "MAN Energy Solutions is pursuing this project in close alignment with its own strategy for developing sustainable technologies and welcomes the opportunity to work with external research partners. For us, the path to the decarbonisation of the maritime economy begins with the switch to climate-neutral fuels. In this context, methanol is an excellent candidate as it is climate-neutral when produced from green hydrogen."

The engine firm's head of Combustion Development, R&D Four-Stroke Engines, Christian Kunkel, said: "Electrification of the maritime industry is only possible in niche segments but not in so-called 'long-distance shipping'. Energy sources such as carbon-neutral methanol and ammonia will therefore play a prominent role in the maritime sector in the future. Methanol is an ideal fuel for converting engines on existing ships and methanol tanks can usually be integrated into existing ship designs without too much trouble, while engine conversion costs can be kept within reasonable limits.

"Thus, with climate-neutral methanol production," he continued, "the climate effect of the maritime industry can be improved very quickly while dispensing with the need for newbuilding construction. This is a crucial point as ship lifespans can last several decades in some cases and newbuildings demand a lot of resources."

Dr Christian Reiser, WTZ Roßlau gGmbH CEO, said: "Together with our partners, we are pleased to launch this ambitious project for CO_2 reduction in shipping. The development of a retrofit-capable, methanol combustion process presents us with exciting challenges, which we will solve together in this strong alliance."

Head of the Department of Simulation of Reactive Thermo-Fluid Systems at Technischen Universität Darmstadt, Prof Dr Christian Hasse, noted that carbon-neutral and carbon-free fuels play a prominent role in the university's current research. Methanol as a fuel for retrofitting marine engines is a key focus.

"The investigation of mixtures is, scientifically, highly exciting and directly related to the technical solution we will eventually develop," he declared. "Ultimately, we will gain new insights into the dynamics of flow, injection and their interaction with the combustion chamber walls by combining high-resolution simulations and optical measurement techniques. This transfer of basic research into practical application is a strength of engineering research."

Wind assistance for bulker on long-term charter

WINGSAIL | Antwerp-based NYK Bulkship (Atlantic) NV (NBAtlantic), an NYK Group subsidiary, is to install a Ventofoil wind-assisted propulsion unit on board a bulk carrier fixed on a long-term charter to Cargill International SA, Switzerland. This is the first time that a unit of this type has been installed on a NYK Group ship.

The Ventofoil, from Econowind BV, a Netherlands-based wingsail producer, will reduce the bulk carrier's fuel consumption and cut its greenhouse gas (GHG) emissions. Together, NBAtlantic and the ship's charterer will collect data on fuel savings, together with details of prevailing meteorological and ocean conditions.

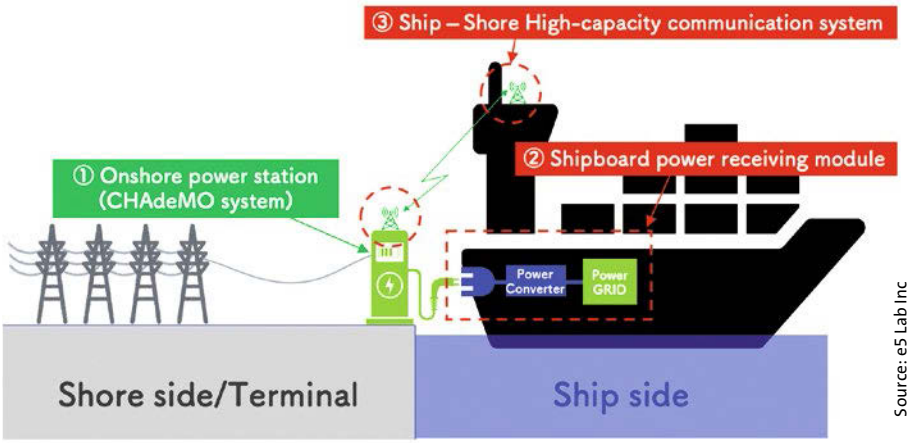
The Ventofoil is mounted on a 20-foot flatrack container without walls and has a 16m vertical wing that acts as a sail. The system creates thrust from the pressure difference on each side of the wing. The unit takes in wind through a suction port and creates more thrust by amplifying the pressure difference. The setup, which Econowind says is easy to install and relocate, is smaller than other similar systems and can be kept more out of the way during cargo handling.

Econowind claims that the wingsail not only saves fuel, but also helps to increase sailing speeds. It should also improve the ship's Energy Efficiency Existing Ship Index (EEXI) and, perhaps more importantly, its Carbon Intensity Indicator (CII), a measure that is set to tighten steadily over the second half of this decade.

In March this year, the NYK Group issued a medium-term management plan – 'Sail Green, Drive Transformations 2026 – A Passion for Planetary Wellbeing'. It aims to promote growth strategies with environmental, social, governance issues as a central theme. The Sail Green initiative emphasises NYK's efforts to reduce GHG emissions in its transport operations and contribute to the ecofriendly supply chain of customers, regardless of transport mode.

The Japanese company has a long-term target of achieving net-zero greenhouse gas emissions from its oceangoing operations by 2050. NYK Group will use knowledge gained from this project to promote initiatives relating to various energy-saving technologies, including wind power.

The Ventofoil wind-assisted propulsion unit will be installed on board a NYK bulk carrier



Source: e5 Lab Inc

Configuration image of standard universal zero emission charger system for ships

Japanese Council to focus on shore-ship power supplies

ZERO EMISSIONS | Seven Japanese organisations have agreed to develop and promote the widespread use by ships of shore power in the country's ports. e5 Lab Inc, Marindows Inc, e-Mobility Power Inc, The Japan Ship Technology Research Association, Mitsubishi Shipbuilding Co Ltd, and Development Bank of Japan Inc, have set up the Promotion Council for Zero Emission Chargers for Ships.

The initiative is part of Japan's ambitious decarbonisation targets. The country has declared carbon neutrality by 2050 and is aiming to reduce emissions by 46% by 2030 compared with 2013 levels, and aim for even further reductions to 50%.

Japanese ports are not only essential import and export links in the supply chain but are also at the heart of coastal industrial zones where power plants, steel works, chemical industries, and others, are responsible for about 60% of the country's CO_2 emissions, the Council members said in a statement. Meanwhile, about 40% of CO_2 emissions in ports come from diesel generators on docked ships. Other harmful emissions are also generated including NOx, SOx, particulate matter, noise and vibration.

The Council members stated: "It is demanded to stop harmful emissions from docked ships at the source through the development of onshore power infrastructure, leading to improvements in global and local environments. The Council, in line with the government's policy and as a world-first initiative involving the member companies, has recognised the effectiveness of zero-emission chargers (onshore power) for ships to promote decarbonisation in maritime and port areas and the expansion of renewable energy use and has united in purpose."

In the first phase of the project, prototype standardised universal zero emission chargers for ships will be installed in Hanshin Port and Keihin Port which the Council describes as international strategic ports where domestic and foreign freight and ships are concentrated. This process will then be extended to other ports, fishing ports, the country's marinas, and overseas. The port departments of the cities of Kobe and Yokohama are participating in the Council as observers.

Specifically, the Council members plan to develop a standard universal zero-emission charger system for ships consisting of:

- Onshore power station (standardised charger and billing system);
- Shipboard power receiving module (standardised and modularised hardware and software;
- High-capacity communication between ship and shore (standardised communication system within the port).

The first phase will also involve a series of other initiatives. These will include surveys and recommendations on standards and rules, promoting collaboration between participating companies and their mutual utilisation of zero-emission chargers, cost reductions through joint procurement, and public relations and promotional activities.

The 90m-long cargo vessel *Bente* was converted into a TSHD

Source for both images: Van Koeveringe Kunststoffen

Improving the efficiency of sand mining in the North Sea

PLASTIC PIPING While converting a cargo vessel into a trailing suction hopper dredger (TSHD), a Dutch sand-mining company required extensive piping for the dredging system. To ensure efficiency, longevity, and cost-efficiency under the challenging conditions at sea, the decision was made to install a prefabricated system made of high-density polyethylene (HDPE).

Sand is an essential raw material for many industries and is used in applications such as concrete and asphalt production. Therefore, companies like Van Ouwerkerk have specialised in mining sand from various North Sea extraction sites. To make the process as efficient as possible, the company uses ships with specialised technology to dredge the seabed before washing and sifting the sand and transporting it to customers in cargo barges, ready to use.

After acquiring the *Bente*, a cargo vessel with a length of 90m, Van Ouwerkerk commissioned its conversion into the trailing suction hopper dredger (TSHD) *Zeeburg*. Extensive work was necessary, including hull modifications, enlarging the aft accommodation, and most importantly, installing the necessary dredging equipment.

During the project, the company Van Koeveringe Kunststoffen was contracted to provide piping for the dredging system and decided to implement high-density polyethylene (HDPE) for the new jet lines. These are used to inject water into the sand in order to loosen it prior to mining, a process that is also necessary to transfer the sand later from the ship's hold to an inland barge.

In total, Van Koeveringe Kunststoffen installed about 750m of HDPE pipes from Swiss flow solutions provider GF Piping Systems that covered dimensions from d63 to d355. Polyethylene was selected as material for the application as it is corrosion-free as well as UV, weather, and abrasion-resistant. In addition, HDPE is suitable for temperature ranges between -50°C and 60°C and has a service life of about 25 years.

After equipping more than 20 ships with solutions from GF Piping Systems, Van Koeveringe Kunststoffen was able to pre-

In order to speed up the installation, many pipe sections were prefabricated and custom-made to meet the needs of the customer

fabricate various pipe sections, including custom parts for the tight spaces on board, thereby speeding up the installation process and addressing the individual needs of the customer. Once the pipes were successfully connected to the necessary pumps and incorporated into the dredging system as well as the hold, the jet lines became operational.

Thanks to the use of HDPE, the system now provides a number of important benefits for the sand mining company Van Ouwerkerk BV. As jet lines are constantly in contact with sea water, the plastic pipes provide corrosion and temperature resistance, allowing the *Zeeburg* to mine sand and seashells at a depth of 30m with a dredging system that is lightweight, long-lasting, and cost-effective. Throughout the project, GF Piping Systems supported Van Koeveringe Kunststoffen with technical expertise in matters including bracket spacing and certification requirements.

New filter system improves ballast water efficiency

MANTA | Wärtsilä Water and Waste's Aquarius UV ballast water management system is to have a completely new filter system, Manta, developed by the company's partner FilterSafe. The Manta filter has a OneMotion scanner that cleans the screen effectively in a single rotation, even with dirty water, and has shown in tests that it exceeds IMO filtration standards by a factor of 22 without any reduction in flow rate.

The Manta filter, type-approved by Bureau Veritas, has undergone organic load tests at the DHI test facilities in Denmark. The results demonstrated a 99.96% removal rate of all organisms over 50 microns.

Leif Abildgaard, sales director at Wärtsilä Water and Waste, declared: "This takes BWMS filtration to the next level and will be an important addition to the Aquarius UV system. The impressive test results validate the effectiveness of the Manta filter, which will add considerable value to our customers' operations."

To meet UV secondary treatment requirements, the Wärtsilä Aquarius UV system, the first to have the new filter, will have a Manta unit with a 25-micron smart weave screen. The non-pleated screen prevents sediment from becoming trapped, and there is no cake build-up across the screen. Each cleaning cycle brings the screen back to 100% cleanliness, Wärtsilä said.

Class and IMO equivalency testing is currently being finalised, and the US Coast Guard is now allowing the filter to be used in ballast water management systems already authorised by them.

The Aquarius system with a Manta filter

Source: Wärtsilä Corporation

Ammonia-based HVAC system approved

AIP | A new ammonia-based marine heating ventilation air conditioning (HVAC) system developed by HD Hyundai Heavy Industries (HHI) has received Approval in Principle (AiP) from ABS. The system has been developed by HHI in response to requests from shipowners for systems using ammonia, a no-carbon refrigerant with zero ozone depletion potential and a Global Warming Potential of zero, as gauged by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). Panos Koutsourakis, ABS vice president, Global Sustainability, commented: "This is an exciting development from HHI for the maritime industry's decarbonisation quest to find sustainable solutions. ABS has always been a safety pioneer, so we are well-placed to tackle the challenges on board and ashore presented by ammonia's toxicity and flammability. ABS is committed to leading the industry in supporting ammonia's safe adoption at sea."

Speaking on behalf of HD Hyundai Heavy Industries, head of the ship design office, Hwan-Sik Lee, said: "We will continue to make efforts to realise maritime carbon neutrality by strengthening the eco-friendliness of not only the propulsion device but also the overall ship."

ABS used its marine vessel rules to carry out technical suitability reviews and risk assessments of designs, materials, fire and personnel safety equipment, piping, electrical, and operation tests.

New features drive high filtration system orders

ENGINEBOLL® 6.49 | Boll & Kirch Filterbau GmbH from Kerpen in North Rhine-Westphalia has launched engineBoll® 6.49, a new filtration system for two-stroke engines. The automatic filter consists of two chambers with two backwash mechanisms. In the event of a malfunction in one of the filter chambers, the second one can completely take over the filtration process without switching over from the outside. According to the manufacturer, this guarantees continuous cleaning of the servo oil and loss-free operation in the oil circulation system. In addition, the engineBoll® 6.49 filter has a fineness of 6 micrometres and is easy to install due to its compact design. The product development was implemented in partnership with MAN Energy Solutions and tested by the French research institute IFTS (Institut de la Filtration et des Techniques Séparatives).

The recently launched filter system has a series of new features, and key benefits of the new filtration system include:

- continuous cleaning of servo oil;
- zero loss in the oil circulation system;
- a two-chamber arrangement with back flushing mechanisms;
- automatic takeover between the two chambers in the event of a malfunction;
- no manual intervention required;
- compact, weight-reduced and developed together with MAN Energy Solutions.

Torstein Vogel, vice president of Sales at Boll & Kirch Filterbau, said: "We are dedicated to developing and building the best engine filtration systems for the marine industry. More than 1,000 worldwide orders for the new, innovative engineBoll 6.49 engine filtration system impressively underline that with this design we have successfully introduced an international new standard in filtration technology for two-stroke engines. From our point of view, the engineBoll 6.49 has the best filtration technology for servo-oil maintenance for ME [electronically controlled] engines released by MAN."

Boll & Kirch Filterbau GmbH Germany, based in Kerpen/North Rhine-Westphalia, manufactures and specialises in liquid and gas filtration. The company is certified according to industry standards and recognised by leading classification societies.

Source: Boll & Kirch Filterbau GmbH

Visualisation of the new engineBoll® 6.49 engine filtration system

Thomas Vonach (left) and Dr Carlos Esteban

Source: subdron

Underwater inspection firm completes pre-seed funding round

STRUCTURAL INTEGRITY | Autonomous underwater navigation and data processing start-up, subdron GmbH has completed a pre-seed funding round, raising EUR 1.3 million from three investment groups. xista science ventures, a fund focusing on scientific progress, and Faber, with its Ocean/Climate Fund, led the capital-raising exercise, with participation from Saber GmbH, a private equity firm.

Autonomous underwater vehicles (AUVs) are increasingly used to inspect underwater infrastructure, port facilities, and ships' hulls. The technology has the potential to support shipping's decarbonisation process and cut maintenance and monitoring costs by as much as 50%, subdron claims.

The new capital will support the continuing development of the company's technology, which aims to improve the performance of AUVs by using artificial intelligence. Meanwhile, other developing technologies, including advanced sensor systems and innovative algorithms, will enable AUVs to operate more quickly, more accurately, and with less human intervention.

Specifically, the new money will facilitate the opening of a subsidiary in Porto, Portugal. Having part of the team and facilities in a coastal city with access to a relevant port like Leixões will be important for the company's network, enabling collaboration with local marine robotic centres, subdron said. It will also provide a suitable location for the initial commercialisation of its services.

Thomas Vonach, founder and CEO of subdron, commented: "We are thrilled to announce the successful completion of our pre-seed funding round. This substantial investment will fuel our mission to revolutionise the underwater inspection industry and bring about transformative changes that enhance efficiency, reduce costs, and improve the overall sustainability of underwater infrastructure management."

Speaking for xista science ventures, Dr Bernhard Petermeier, said: "We are impressed by the groundbreaking technology and vision of subdron GmbH. Their innovative approach to underwater inspections has the potential to revolutionise various industries, from maritime and shipping to energy and environmental monitoring. We are proud to support their mission and look forward to seeing their autonomous vehicles make a significant impact to decarbonise a traditional labour- and carbon-intensive industry."

Representing Faber, Dr Carlos Esteban stated: "Even though it is more efficient than terrestrial or air transport, maritime transport is responsible for about 3% of the global CO_2 emissions. Biofouling of the ship's hull can significantly increase fuel consumption and CO_2 emissions. So cheaper, faster, and more accurate biofouling data, as the subdron system will provide, would lead to optimised hull cleaning plans, resulting in both fuel consumption and CO_2 emissions savings."

Schiff&Hafen | Ship&Offshore

ENERGY at SEA

The European Offshore Wind Compendium | 2023

TENDER DESIGN

Reforming the process in Germany is necessary

HYDROGEN

Floating wind brings a boost for the economy

NUCLEAR POWER

Floating generation could become part of the energy mix

Switch on the energy transition

You have a background in high voltage electricity and you love working in heights where others' knees go soft? As a high voltage technician, you have one of the most extraordinary jobs in the world. At one of the top three market leader for wind energy you will be responsible for installing state-of-the-art offshore wind turbines around the globe.

You will be working in offshore rotations around the globe and will be part of a small team in a large company. We will provide you with extensive safety training and industry leading tools.

Check our current vacancies
and find more information at:
www.siemensgamesa.com/career

SIEMENS Gamesa
RENEWABLE ENERGY

European action

Kathrin Lau
Editor in Chief
Schiff&Hafen | Ship&Offshore

This is the second issue of the special publication Energy at Sea, which we launched in 2022 right on time for the WindEnergy show in Hamburg. The attentive reader may have noticed that we have changed the subtitle from German to European Compendium for the Offshore Wind Industry. This has of course been decided for a good reason. With our international publications, we show time and again what know how and innovative strength is demonstrated by German companies in the maritime industry. Which is very relevant and important.

However, to be able to defy the continuing (unfair) competition from Asia, we need to join forces with other European nations. This has been an issue in German and European shipbuilding for a long time; satisfactory solutions have unfortunately been lacking so far.

But it is precisely here that the expansion targets of offshore wind energy in Europe but also overseas in the United States and Asia, offer enormous potential. If wise decisions are made – especially by politicians – and the right course is set, the local value chain will sustainably benefit. The sheer volume of assets that are needed in the coming years is vast. Especially in terms of service and supply vessels.

Our neighbouring countries show an impressive and lucrative range of offshore energy projects; projects from which German companies can learn or participate, too. And of course, we don't want to deprive our readers of this.

What's more, the variety of ventures happening offshore has grown once again over the past twelve months: that much is certain. And while we are indeed still predominately focusing on offshore wind energy, the expansion targets and the required assets to reach them, this is by no means the only source of energy that can be harvested on or from the sea.

We are confident that the 2023 edition of Energy at Sea will provide a good overview of current developments, trends, and future prospects. ≈

Content

Source for both images: German Offshore Wind Energy Foundation

Modified tender design puts strain on supply chain

EXPANSION TARGETS Germany has ambitious targets when it comes to the expansion of offshore wind energy. However, bureaucratic hurdles, lack of funding, and an inappropriate tender design can jeopardise not only the creation of national value but also the achievement of the goals, writes Karina Würtz, managing director of the Stiftung Offshore-Windenergie (German Offshore Wind Energy Foundation).

According to the evaluation of the consulting company Deutsche WindGuard, 24 new offshore wind turbines went into operation in Germany in the first half of 2023. The total capacity of these turbines amounts to 229 megawatts (MW). In total, 1,563 offshore wind turbines with a total volume of around 8.4 gigawatts (GW) are in operation in the German North and Baltic Seas to date (see graphic). But at least 22 GW more offshore wind capacity will be installed by 2030, according to Germany's political targets.

As was mentioned in this publication one year ago, by January 1st, 2023, the amendment to the Wind Energy at Sea Act (Windenergie-auf-See-Gesetz – WindSeeG) came into force with a modified tender design. In June 2023, the first tender round comprising four areas of an equivalent of 7 GW took place; 6 GW in the German North Sea and 1 GW in the Baltic Sea. None of these areas had been centrally pre-investigated, meaning that the necessary preliminary investigations, such as ground surveys or environmental assessments, will be carried out by and at the risk of the successful bidders. As this article is being written, auctions are underway for four centrally pre-investigated areas with a total capacity of 1.8 GW, where the preliminary investigations were commissioned by the Federal Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie, BSH). The results will be handed over to the successful bidders of the auction in return for payment of the incurred costs. And next year, another 8 to 9 GW of offshore wind power is to be put out to tender, again comprising both non-centrally and centrally pre-surveyed areas.

Coming back to the most recent auction results for the four sites that received several zero-cent bids. A dynamic bidding process was used for the first time in German offshore auction design, with the bidder most prepared to pay for the right to build and operate being awarded the contract. An unexpectedly lengthy tender duration already gave a hint towards the expensive outcome: finally, after twelve workdays, the German Grid Authority, responsible for the tender procedure, announced the winners.

As a result of the tender design, just two winners emerged, both of them big oil. Two sites went to bp (N-.1 zone in the German North Sea (2 GW) with a bid value of 1.83 million EUR/MW and N-12.2 in the German North Sea (2 GW) with a bid value of 1.56 million EUR/MW) and two sites to Total Energies (N-12.1 in the German North Sea with 2 GW and a bid value of 1.875 mil-

lion EUR/MW and O-2.2 in the German Baltic Sea with 1 GW and a bid value of 2.07 million EUR/MW) for a total of EUR 12.6 billion.

This result gives several pointers: (a) it shows the high appeal of the German offshore market; (b) a stable market with interesting long-term perspectives, political support, and a grid connection paid for by the public; (c) the widespread concern that the tender design would foster just another "race to the bottom", with a tendency towards very few bidders, hence oligopolistic structures and consequential pressure on an already suffering supply chain, turned into reality. There are other examples of offshore wind auctions that raised record fees, such as the New York Bight offshore wind auction. Therefore, it was to be expected that a small number of financially and equity-strong companies would be successful with very high bids. Equally, it can be expected that few winners for large sites will translate into high pressure on the industrial chain. Something that causes concern in the industry is that the outcome of these negative bidding auctions will encourage governments to keep that mechanism for future auctions, with the short-term financial and political gains being too attractive to consider reforms towards a more sustainable tender design that fosters diversity of players over oligopolistic negotiation playgrounds.

How should such a more sustainable tender be designed? Amongst other things, the industry suggested limiting the bid amount, strengthening so-called "qualitative criteria" to differentiate bids and promote innovation, and limiting the quantity per bidder to preserve the diversity of players. If the current bidding design remains in place, there is a risk of an oligopoly in the German offshore wind market, in which the financially strong giants outdo smaller companies – probably resulting in a loss of player diversity in the industry, and massive pressure on value chains as well as electricity prices.

As the author postulated last year in the first edition of "Energy at Sea", Germany has a massive supply chain challenge that can only be overcome if the right industrial policy incentives are put in place. At the moment, there is a lack of everything: converter platforms, foundations, turbines, ships for construction, maintenance and service. And there is also a huge shortage of capacity in the ports. The industry also urgently needs qualified, skilled personnel.

Beyond that, there is yet another risk looming on the horizon. In order to maintain social support for the energy transition, at least some of the manyfold political objectives associated with the transition should include value- and job-creation in Europe. Rising populist party movements that endanger exactly that political support can already be observed in many German regions, particularly in the East.

That should raise a strong argument in favour of conscious industrial politics, but so far there seem to be no observable signs of proactive will to shape our industrial policy basis. There is a widespread and genuine belief in the invisible hand of the markets, without recognising that liberal markets work best when there is a level playing field. Germany does not have this, given widespread subsidies in shipbuilding, for example, or steel foundation production in other regions of the world, notably China, and market transitions take time.

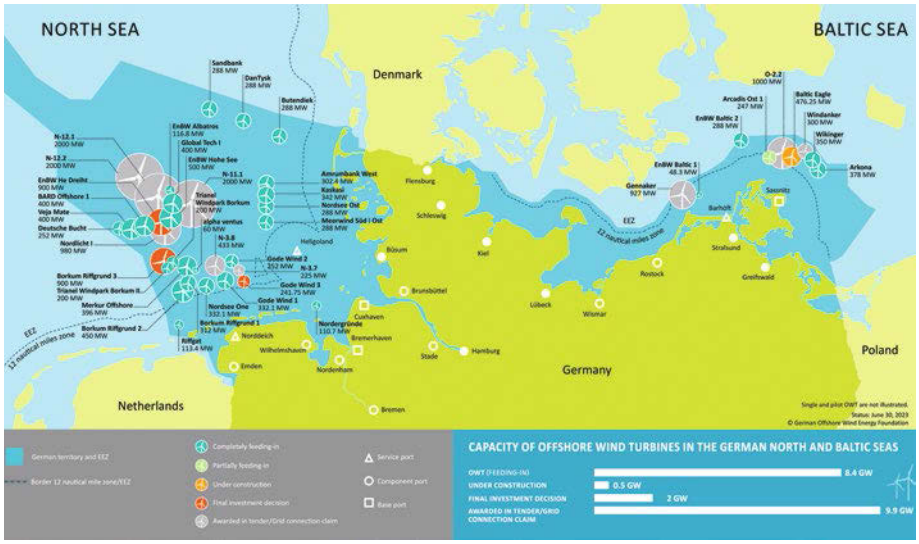
Given the country's 2030 offshore wind targets, this is one of the major challenges. A new heavy-load quayside takes at least five years to build, the same as a new foundation production site.

Recommendation

In order to overcome obstacles and tackle the current challenges, the German Offshore Wind Energy Foundation recommends the following steps: first, reform the tender design for upcoming auctions as elaborated in the first part of this article; and second, defeat the time challenge. Helping the industry overcome the first major obstacle to investing in new production capacity of all kinds needed for the offshore-based energy transition: financing.

Public finance support does not necessarily come along with increased public spending, as governmental bond provision should, on average, be a net-zero mechanism. And the provision of public bonds would help the supply chain to put together a private finance package for investments in additional production sites, and could significantly speed up the whole process.

Knowing the major challenge of securing a political consensus in the current German governmental coalition, it is questionable if these two tasks outlined above can still be achieved by the current coalition. However, the alternative would be waiting for the "invisible hand". But by the time this hand finally appears, it will likely be Chinese, as could be observed in recent deals for offshore wind turbine foundation provisions. ≈



Overview map of offshore wind energy in Germany

Necessary measures to strengthen the contribution of national shipbuilding

PAPER In December 2022, the German Shipbuilding and Ocean Industries Association (VSM - Verband für Schiffbau und Meerestechnik e.V.) published a paper containing the requirements necessary to strengthen the contribution of the German shipbuilding industry in the development of offshore wind energy. This was undertaken at the request of the Federal Minister for Economic Affairs and Climate Protection, Dr Robert Habeck.

Under the title "Shipbuilding for Offshore Wind Energy", important stakeholders from the offshore wind energy and shipbuilding sector were brought together by the German Shipbuilding and Ocean Industries Association (VSM – Verband für Schiffbau und Meerestechnik e.V.) to formulate concrete requirements in a policy action paper. The initiative was in direct response to a request by the Federal Minister of Economics, Dr Robert Habeck.

The conclusions were handed over to the Minister before the turn of the year and published in the context of the joint Nordenham Declaration in late May. This called for a focus on the build-up of domestic industry capacity, adequate finance instruments and measures to secure skilled labour for the domestic offshore industry. The paper addressed various concrete measures to be decided and implemented politically.

The German shipbuilding industry wants to make its contribution to the easing of crucial bottlenecks that could hinder fast expansion of the offshore wind industry in the European domestic market. At the same time, this is expected to add value at specialised domestic industrial facilities and expand the maritime industry sector's know-how and jobs.

In addition, important capabilities will be maintained by German industry in the internal market. These are essential for the resilience and security of the European economy.

VSM's CEO, Dr Reinhard Lüken, commented: "The implementation of expansion targets all over the world is also a race for industry capacity, in which it is particularly important who gets off the blocks quickly. We're ready, but we can only get going if the orders are finally placed."

Currently, capacities in the value chain are not yet sufficiently available to supply the large number of different ship types and large platforms needed to meet the politically defined goals, he continued. However, this bottleneck can be significantly reduced in the short term by German shipbuilding locations with the right framework conditions. This promising market also offers the opportunity to strengthen Germany as a shipbuilding location and reduce new international dependencies.

The 28-page paper formulates the following measures to achieve the goals.

Pilot projects

Clear, reliable signals to the market are needed quickly to develop real impetus and progress. These can best be conveyed through the completion of successful pilot projects. This requires pragmatic intervention to remove any obstacles that currently stand in the way of such initiatives. A particularly prominent example is the discussion about the Warnemünde site. Allocating available shipyard capacity to non-maritime purposes would call into question the commitment of German politicians to the offshore expansion goals.

Fresh momentum would also result from other projects that are already well developed and have been under discussion for some time. These include commissioning of the planned test centre, IFAM, near Helgoland and the planned test field in the Baltic Sea. Other projects aim to improve mobile phone coverage in the German Bay and progress on developing a feeder construction dock at a German shipyard.

Such initiatives could noticeably underpin positive market perceptions. However, to make rapid progress here, interdepartmental coordination must be significantly strengthened, for example through active coordination by the Chancellery.

Improving industrial policy and the regulatory framework

The specific, appropriate tendering criteria for critical infrastructure must target and incentivise the production of all strategically relevant vessels and equipment. This would strengthen the systemically relevant contribution of the shipbuilding industry in the context of the expansion of offshore wind energy as well as participation within the European internal market. Exceptions should only be allowed if all suitable production capacities in the European internal market are fully stretched.

Production locations where there are safety or security concerns should be excluded without exception. The CO_2 footprint as a qualitative tending feature for ships and converter platforms as well as foundations or, in the medium to long term, the use of "green" steel could be effective and WTO-compliant instruments.

Local value-added requirements already established in other EU member states can also serve as possible solutions. Market access conditions defined appropriately protect against distortions of competition, ensure a level playing field and provide a necessary hedge for the targeted investments.

Financing instruments

Lack of or inadequate financing instruments including guarantees has been a well-known hurdle for the shipbuilding industry for many years. Therefore, the removal of sector restrictions related to shipbuilding in the

Federal Government's large-scale guarantee programme would be an important and easy to implement first step.

Similarly, the scope of the German Hermes instrument needs to be adjusted, as it so far does not consider offshore installations and ships operating in Germany's exclusive economic zone (EEZ) as eligible for domestic investors, whereas, other European export credit agencies in Belgium, Netherlands, Denmark and Norway, for example, are increasingly involved in the financing of domestic projects.

In addition to the known instruments, the development of new solutions for Germany, should also be tackled. There are numerous examples of interesting schemes in other shipbuilding nations which have been in operation successfully for decades, especially for their respective domestic markets.

Incentives for long-term partnerships

The necessary expansion of shipyard capacity requires viable investment calculations. Long-term contractual relationships and long-running framework contracts based on partnerships could make a decisive contribution to laying the foundations for this. Various models might be appropriate, including:

- Long-term guarantees for purchases to secure availability. These are already used today in the offshore market, but so far do not extend to large-scale floating equipment. Where developers already have long-term planning certainty, as is the case with grid connections, corresponding purchase commitments could be agreed for longer periods.
- In tenders for offshore wind farms, contractually secured access to sufficient production capacity in the internal market for ships and equipment for the construction and operation of the wind farms should be firmly anchored as qualitative award criteria. These capacity reservations also extend to relevant service providers and subcontractors.

Supporting infrastructure measures

Expansion and upgrades at shipyard sites include significant infrastructure adjustments, which are essential especially for the upstream and downstream logistics of shipyard production. The availability of financial support under relevant instruments will facilitate and accelerate the planning and implementation process. Tax incentives should also be considered. Additional land development is essential in the context of port logistics but may also become necessary for shipyard sites. The VSM expressly supports the demands for additional, suitable port sites.

Acceleration of approval procedures

Many projects will have to be carried out in parallel if the planned expansion goals are to be met within the tight timeframe. Approval procedures must therefore be carried out quickly within the applicable legal framework. For this purpose, the authorities involved need to be strengthened in terms of personnel.

This applies to approval procedures for the construction of wind farms as well as for infrastructure development requirements at shipyards, for example. Likewise, permits for federal and state measures such as roads and fairways should be processed more quickly.

Innovation programme

Construction, maintenance, repowering and dismantling of offshore wind farms have specific requirements that are different to those of traditional offshore markets. Nevertheless, due to corresponding availability, vessels from the existing oil and gas support fleet are mostly in operation.

The volatility of the offshore wind energy market to date has prompted owners to order less efficient but more versatile vessels. A market for consistently optimised vessels for different applications in the offshore wind energy sector has hardly developed so far.

Corresponding reference products that prove their superior performance criteria in operation could also trigger considerable potential on export markets. A specific funding instrument for the construction and operation of corresponding demonstrators could contribute significantly to the necessary increase in efficiency.

The scope of the innovations, the risk associated with their operation and the exploitation risk for investors are significantly higher compared to commercial shipbuilding. This should be taken into account accordingly in the funding criteria.

Securing skilled labour and training offensive

With its often family-run structure, the shipbuilding industry in Germany has a long tradition of excellent in-company training. A joint training campaign with the offshore wind industry and the hydrogen industry, supported by state investments in the training infrastructure at vocational colleges and universities, should create significant synergies.

Industry agreement

All those involved in offshore wind industry development, including maritime stakeholders, should undertake to work together and operate in a goal-oriented manner within the framework of an industry agreement to be able to support the realisation agreement of the Federal Ministry of Economics and Climate Protection, including both the necessary financing instruments and the other measures mentioned above, in the best possible way. The industry agreement should also contribute to achieving a balanced, fair distribution of risks. The additional financing instruments described above are essential components for viable successful results. ≈

Marine technology is crucial for the offshore wind industry

BLUE ECONOMY There are many good reasons why the oceans will be the next major area of business applications for the future. Innovation and investment are two sides of the same coin that drives economic activities in the oceans. To meet the growing global demand for more renewable energy, higher efficiency, resilient supply chains and other expanded commercial opportunities in a sustainable way, the development of the blue economy, especially marine technology, is crucial.

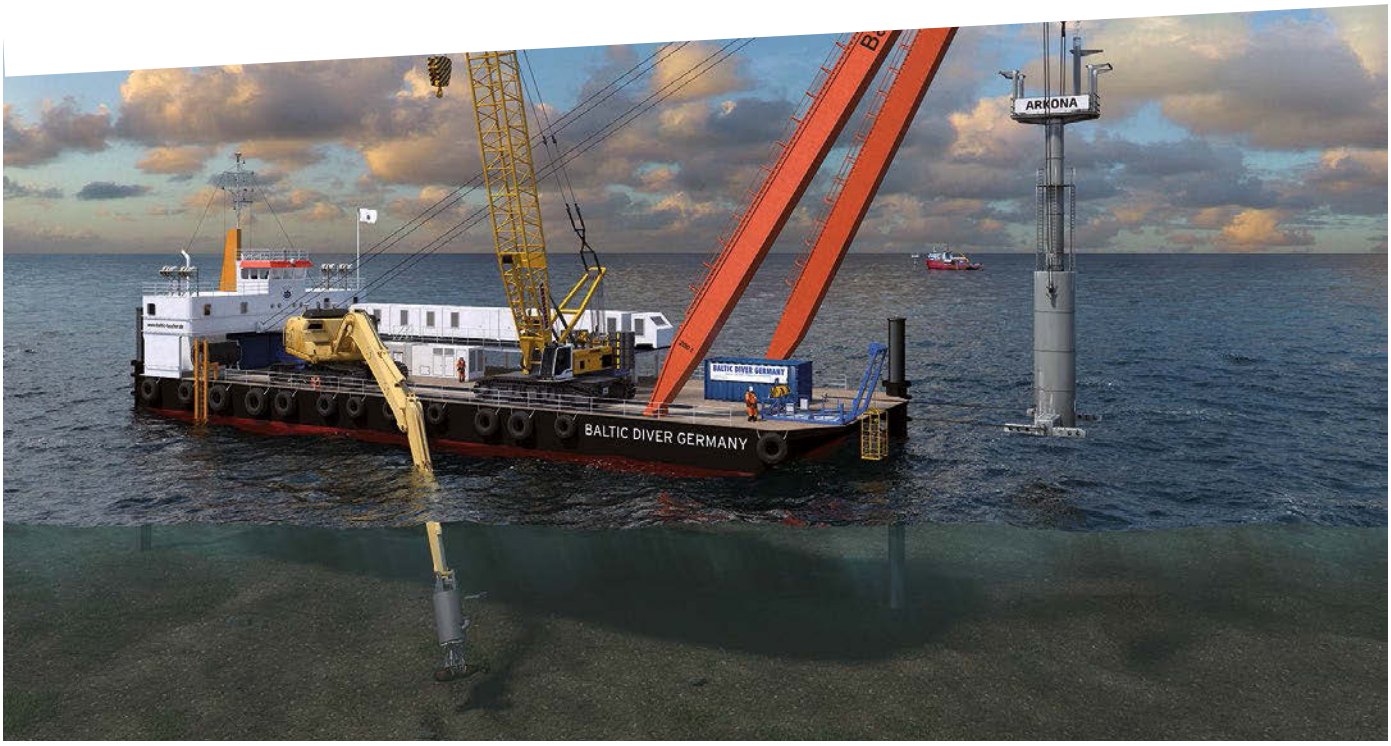
With 316 GW of installed capacity expected by the Global Wind Energy Council by 2030, offshore wind resources are imperative for the energy transition. As offshore wind farms experience more challenges related to design, fabrication, installation, operation and maintenance, and lifetime extension compared to onshore wind farms, the more integrated involvement of the marine technology industry will definitely be required. Three decades have passed since the first offshore wind farm was constructed. Today, offshore wind energy has been rapidly evolving with the aim of deploying larger wind turbines at increasing water depths and under complex external conditions. Recently, floating wind power has attracted interest as part of the exploration of deeper waters with undisturbed higher wind speeds. The installation of floating wind turbines brings additional degrees of freedom that affect the performance and safety of the turbines. Therefore, sustainable design, construction, and installation methods, hydrodynamics, aerodynamics, and controls of such structures are different from solid structures and require special attention and involvement of marine technology.

Due to the increased involvement of marine technology companies, there has been continuous progress in foundation design, control strategy, transport and installation methods, marine operations execution, computational methods, and model testing, just to name a few.

The global offshore wind market grew at almost 30% per year during the last decade, benefiting from rapid technological improvements, and much more than 100 new offshore wind projects are under active development worldwide. Europe was driving the development of the technology, led by the UK, Denmark, and Germany, but China added more capacity recently than any other country. Now the United States and other Asian markets are also becoming more involved.

However, today's offshore wind market is far from realising its full potential – with high quality resources available in most major markets, offshore wind has the potential to generate more than 400,000 TWh per year globally. That's almost 20 times the world's electricity needs of today.

The German Association for Marine Technology (GMT) is already a major contributor of a smart and sustainable energy transition toward offshore wind. Its members are heavily involved in offshore wind projects and operations, including bathymetric surveys, acquiring aero- and hydrodynamic data, design, fabrication, installation, inspection, decommissioning and repowering of offshore wind farms. Based on this, the GMT network creates continuously new opportunities to exchange and explore new horizons in research, development and business applications. ≈



Source: BALTIC Taucherei- und Bergungsbetrieb Rostock GmbH

The areas of applications for marine technology are vast

We're with you every step of the way.

We create ships for all stages of installing, connecting and operating offshore wind turbine parks. Capable, efficient and designed for lasting operability, Damen offshore wind vessels are destined to be enablers of the offshore energy transition. We deliver your wind farm handling solutions: from vessel and equipment, through training and maintenance, up to finance and resale. Our commitment to innovation, sustainability, digitisation and series building ensures low running costs, quick deliveries and low emissions as standards.

Pictured here:
Floating Offshore Wind Support Vessel

Find out more on **Damen.com**

DAMEN
OCEANS OF POSSIBILITIES

Floating wind brings the hydrogen economy a step closer

ENERGY STORAGE Hydrogen has often been mooted as one way that offshore turbines could reduce their costs and accelerate their time to market. Being functionally infinite, their energy is cheap, but it has a problem; the variability of wind means that power yield changes from moment to moment, making planning difficult, writes freelance journalist Charlie Bartlett.

One way to address the issue of unpredictable wind power is to build so many turbines that even a small amount of energy generated from the wind is enough. But this leaves the problem of a huge amount of wasted energy when the wind blows strongly, and power grids cannot cope with it.

During 2022, Scotland generated 35.3 TWh of renewable electricity, of which 27.5 TWh was onshore and offshore wind. Some 18.7 TWh of this was exported. Had Scotland had the means to store this energy, it could have powered every household in the country for three years.

However, according to International Energy Agency (IEA) numbers, around 4 TWh of mainly Scottish wind energy was 'curtailed' – wasted – over the course of 2022, thanks to weak transmission capability between Scotland and England.

Ever-present throughout the UK's buildout of on- and offshore wind has been the notion of using hydrogen electrolysis to bridge this gap. "Curtailed energy provides a potentially attractive source of electricity, which can reduce the overall cost of hydrogen production through installing electrolyser units which can utilise this power that would otherwise be curtailed," says one report by the University of Strathclyde. "The hydrogen produced can then be used for a variety of applications, including industry, heat, and transport."

Pumped storage hydropower (PSH) offers comparable efficiencies at around 80%, and the UK is planning to increase its PSH capacity from the current 2.8 GW to 7.7 GW, allowing much of this spare energy to be harnessed. But the number of suitable sites is a limiting factor.

Containing drastically more energy than a lithium-ion battery, hydrogen has been mooted as an energy storage medium for grids. But this would generate a huge requirement for new energy storage infrastructure, and hydrogen offers something the economies of Northern Europe much prefer: a tradeable commodity.

The International Renewable Energy Agency (IRENA) says that 19 exajoules (EJ) of green hydrogen – as much as 158.3 million tonnes per year – will be needed by 2050 to decarbonise energy systems completely. Making up some 43% of that demand is transport, which is a good deal more challenging to decarbonise than houses.

As the maritime industry is discovering, hydrogen is very useful from this point of view: with nitrogen added via the Haber process or carbon via CO_2 hydrogenation, it can be turned into ship fuels such as ammonia and methanol. Hydrogen could be used to replace or supplement natural gas in heating systems, provided problems with leaky pipes could be addressed. It could even be manufactured into synthetic kerosene, which could be used to power today's aircraft with zero capital investment needed from airlines. But plenty of opex.

An end to curtailment

According to various analyses, the main bottleneck for hydrogen production will be the availability of electrolysers. These share almost all their components with fuel cells – the equipment that would be used to convert hydrogen fuel into useful energy in-situ – another challenge to their manufacture. Proton exchange membrane (PEM) electrolysers – the type better suited to dealing with fluctuations in power generation like wind energy – also contain a variety of expensive metals like titanium, iridium, and platinum.

In all, just 47 GW of annual electrolyser production is likely by 2030, according to US investment bank Jefferies. But in a recent report entitled World Energy Transitions Outlook 2022, IRENA pointed out that solar installations had fallen in price by 82% between 2010 and 2019 thanks to improvements in production.

A similar cost-reduction in electrolysers is not unreasonable to expect once factories are properly tooled-up. IRENA said: "A similar decline [in cost] is expected for electrolysers in the coming decade, thanks to the large pipeline of green hydrogen projects." Research indicates that not only the proliferation of electrolysers could be better, but also their efficiency. Currently, around 80% of the energy that goes into the process is ultimately used to generate hydrogen; the rest is wasted.

But early last year, a study was conducted into a new form of 'capillary-fed' electrolysis, which proved it possible to electrolyse water into hydrogen at efficiencies of 98%. Although quite some work will be necessary before this principle could approach commercialisation, the results are promising.

For the offshore wind sector, any potential reduction in the spread of efficiencies between transmitted power for homes and businesses, and wind-to-hydrogen (or Power-to-X, to give it its trendy new moniker) is good news. A low cost-of-entry is the reason the North Sea is now so chock-full of existing and planned offshore wind farms. It benefits from a combination of shallow waters – making cheaper pile-driven turbines an option – and high winds.

Argentina, China and New Zealand are fortunate enough to be sitting on a goldmine of similarly affordable, shallow water turbine potential. Iceland, a country with all the luck in renewable energy resources, is surrounded by it.

Norway's Equinor, by now becoming famous for its brand of wind-energy Trotskyism, is exporting its offshore wind revolution worldwide, despite not much of anything happening off its own coast thanks to a continental shelf which drops abruptly into the depths, leaving little room for seabed pile turbines. The same is true off India, as well as Japan's east coast; the entire western coastline of the Americas, too, has little room for freestanding turbines, with the notable exception of Alaska, which, with its wind energy potential of 12,087 TWh/year, could power the entire continent by itself.

Their technology may be developing at breakneck pace, but typically doubling the capital cost of freestanding installations, the pressure >

© TWB II_Matthias Ibeler

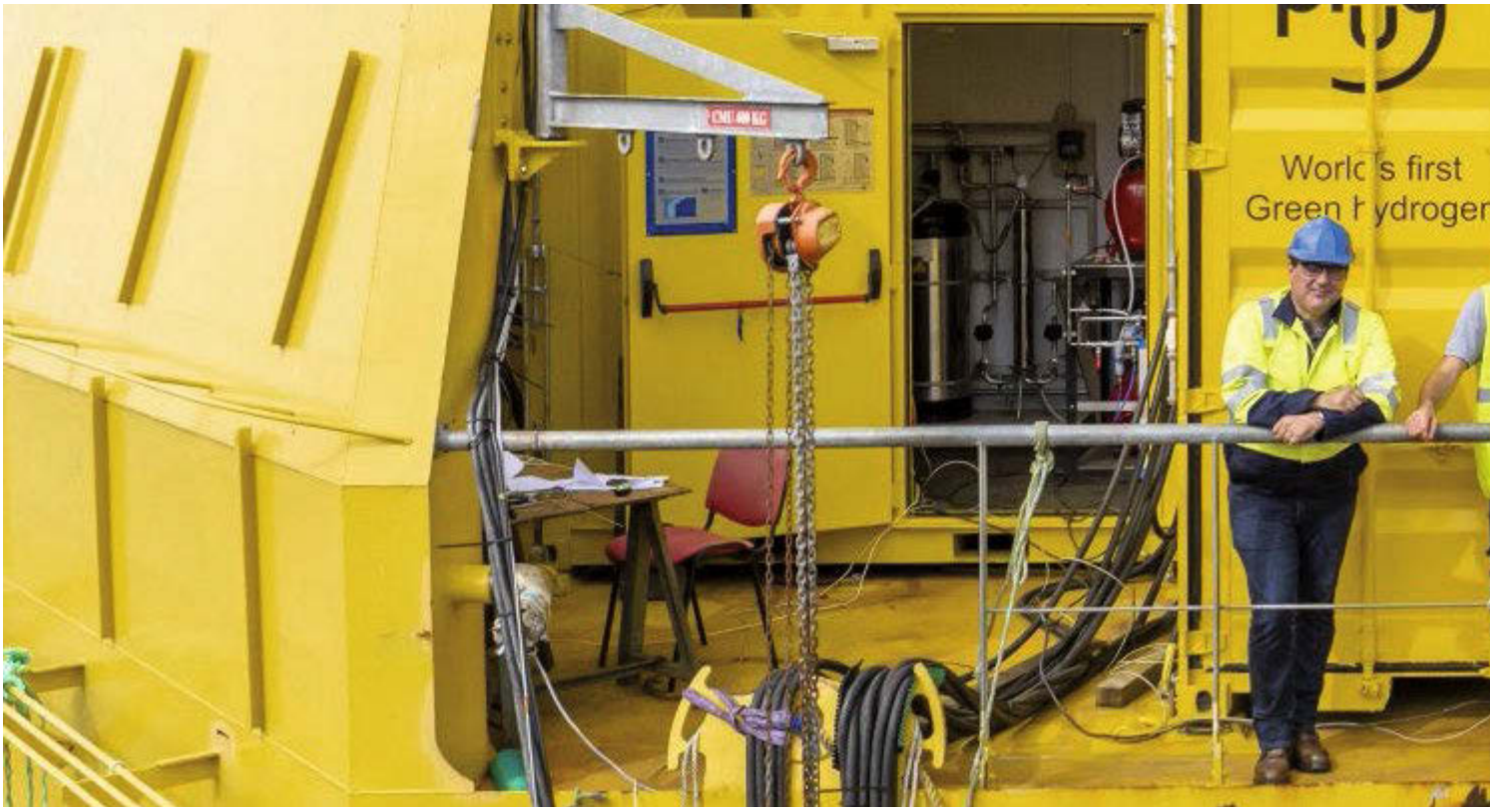
STRONG CONNECTIONS FOR A RENEWABLE FUTURE

FOUNDATION OFFSHORE WIND ENERGY

Since 2005, the German Offshore Wind Energy Foundation has established itself as a non-partisan, supra-regional and cross-sector think tank as well as an independent communication platform for the entire offshore wind energy industry. Its overall purpose is to consolidate the role of offshore wind energy in the energy mix of the future in Germany and Europe. Guided by its scientific advisory board, the foundation promotes the expansion of offshore wind energy in the interests of environmental and climate protection. The foundation's board of trustees includes key federal and state ministries for offshore wind as well as operators, manufacturers, transmission system operators, suppliers, banks, and insurance companies.

Together, we forge strong connections for a renewable future!

WWW.OFFSHORE-STIFTUNG.DE



French company Lhyfe has installed a demonstration rig that electrolyses about 400 kg of hydrogen per day

is on to find new ways to improve the profitability of floating offshore turbines. This might mean foregoing the enormous cabling infrastructure required to connect them with domestic grids.

Sharing the load

When it comes to generating hydrogen offshore, there are two schools of thought over how this should be undertaken. In one scenario, hydrogen electrolysis would act as a load-levelling mechanism to allow a better turbine capacity factor at times when grids do not require so much of it. In the UK grid, for example, demand reliably fluctuates between 30 GW during the day and 20 GW at night, meaning that this would be a good time to switch on electrolysers, and generate hydrogen using cheap wind energy.

However, this load-levelling scenario suffers from a number of drawbacks in practice. Foremost among them is that electrolysers prefer to run continuously, and do not like ramping up and down from moment to moment in the way suggested.

In a 2014 study, Novel Electrolyser Applications: Providing More Than Just Hydrogen, researchers found that a 40-kW proton exchange membrane (PEM) electrolyser took nearly seven minutes to ramp up from a cold start and one minute to turn off. The research also suggested that in doing so on a regular basis – necessary for load-following power applications – would create wear and tear on the electrolysers.

"Another important factor to consider when exploring new operating strategies is the impact on stack lifetime," the study read. "Cycling the equipment more is likely to accelerate stack degradation."

A version of this strategy would use the resulting hydrogen in-situ, with fuel cells to convert it back into electricity. This could help to stabilise the output of each wind farm, insuring against times of low wind. However, to manage this efficiently, it would require a considerable volume of local hydrogen storage capacity.

The second approach is simply to devote entire turbines to the generation of hydrogen. This certainly results in a less complicated operating profile, and the likelihood is that even a relatively calm day can still produce enough energy to keep an electrolyser ticking over.

Experimenting with this configuration is a company called Lhyfe. Located 20km off Le Croisic on France's west coast, an area with middling luck when it comes to shallow water construction areas, Lhyfe's demonstration rig, *Sealhyfe*, is constantly battered by Atlantic wind and waves.

It now electrolyses around 400kg of hydrogen per day with the help of a 1-MW plug electrolyser. It is hoped that *Sealhyfe* will yield a resilient and flexible system of decentralised hydrogen production.

In pursuit of its new endeavour, Lhyfe has initiated the Hydrogen Offshore Production for Europe (HOPE), a 10-MW project aiming to produce and transport around 4,000kg of hydrogen daily via pipeline. Having secured a EUR 20 million grant from the European Commission in late June, the project's goal is to expand and commercialise Lhyfe's decentralised hydrogen production concept.

If it works, it will demonstrate the potential for wind to be harnessed virtually anywhere – even, theoretically, in the middle of the ocean. This could generate a requirement for even more monstrous turbines than the Chinese MySE 16-260, the world's largest, with a blade-span of 260m, and an energy production capacity of 16 MW.

From the outset, Lhyfe has stated its intention to convert disused drilling rigs into hydrogen electrolysis facilities, giving them a new lease of life and overcoming some of the cost barriers to entry. It is also hoped that opening up the ability to locate wind farms well out to sea will overcome some of the popular opposition to these facilities close to coastlines. ≈

Source: Lhyfe

Floating nuclear – a catalyst for low-carbon energy

ENERGY MIX The drive for low-carbon energy and industrial-scale e-fuel production is likely to add further urgency to accelerating electricity demand. Core Power's director of Analytics, Rory Megginson, explains that as further electrification becomes increasingly urgent, floating nuclear power generation could become part of the energy mix.

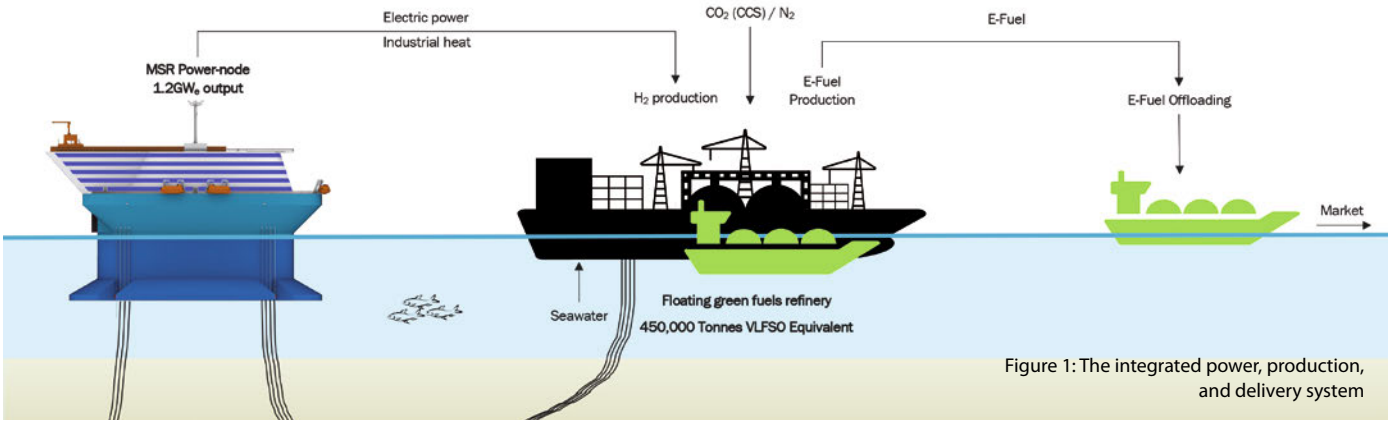


Figure 1: The integrated power, production, and delivery system

Source for all images: Core Power

The past few decades have seen a rapid expansion of global electricity demand, creating an ever-increasing strain on electricity generation capacity. Simultaneously, the sector has grown in importance as the world continues the drive towards decarbonisation, encouraging the rapid electrification of numerous end-users.

Consequently, demand has risen by 3,320 TWh over the last five years and is predicted to continue increasing by 2-4% each year, reaching a projected market value of nearly USD 2 trillion by 2030. This is because electrification will continue to be one of the first decarbonisation levers, being the most inexpensive and accessible option suitable for most sectors.

Core Power proposes the deployment of advanced floating nuclear power plants (FNPPs), combining the benefits of advanced nuclear and floating power, and offering a reliable and scalable form of dispatchable, sustainable electricity production. The next generation of advanced nuclear reactors, such as the molten salt reactor (MSR), presents a step change in nuclear safety and security while retaining the benefits from previous iterations.

The MSR is an ambient pressure reactor, vastly reducing the risks of breach and dispersion of radioactive material. Its dimensions open opportunities for modular construction in factories, offering a route to cheaper, faster and safer nuclear power.

Nuclear energy has already emerged as the only resilient, emission-free electricity source. However, progress for traditional land-based reactors has been slowed by construction overruns, complex siting issues, and capital overspending. Core Power facilities will be able to overcome these challenges, benefiting from the efficiencies of shipyard construction, faster deployment times and cost, while remaining flexible in their location.

A number of MSRs could be installed on FNPPs, with a maximum capacity of 1.2GWe when four MSRs are used, making a single unit capable of producing up to 28,800 kWh per day. This matches the scale of even the largest land-based "stick built" plants.

Despite clear operational benefits, nuclear energy has often been undervalued as an energy source owing to uncertainty around the inflated capital requirements of the technology. This is because traditional nuclear reactors have been built on a large scale with high complexity and usually not in series, ensuring they are almost always "first of a kind."

This, in turn, has meant cost and schedule overruns. However, most of these costs are not actually associated with the nuclear and turbine island. Instead, roughly 80% are accounted for by 'non-nuclear' costs, including site construction, installation, vast and often largely 'newly skilled' labour, cooling infrastructure site works, and financing costs.

This is where shipyard construction could play a game-changing role. Shipbuilding has thrived on the repetitive large-scale fabrication of complex assets, using a skilled, consistent workforce in a single place to achieve low-cost, high-productivity, and high-quality construction.

As a result, the shipbuilding industry has seen substantial productivity gains at the same time as land-based nuclear projects have struggled. However, it would be possible to repurpose and specialise certain shipyards to construct floating nuclear facilities, thus benefiting from modular factory-like construction.

The key benefit would be the increased speed of construction. Unlike "stick built" plants, where the site must first be outfitted before construction can start, a shipyard is already perfectly equipped for use, offering a factory-like environment. This means labour productivity can be maximised, helping to avoid extensive delays that have become common for terrestrial deployments.

There would also be a decoupling between plant construction and site licensing, with no need for site evaluation and preparation. These processes could commence independently and in parallel, further reducing construction time.

Studies analysing the benefits of construction in this way have found that SMRs have the potential to be significantly more cost-effective. This is because, unlike current pressurised water reactor plant construction, very high-efficiency shipyard fabrication enables many identical SMRs to be constructed in a single factory, where the effects of learning can reduce both unit cost and construction time. This learning rate is quantified as the relative reduction in construction time that accompanies the increase in the cumulative number of units.

Shipbuilding was one of the first industries with verifiable learning effects, having continuously to manage an increased volume of work in a shorter time to meet market demands. In turn, this would enable large-scale SMR fabrication, encouraging serial production and a transition from "1st" to "nth" of a kind.

Adopting this construction method would provide the economic and scheduling advantages of factory production while reducing construction costs by eliminating excavation work, resource requirements, temporary facilities, and the associated labour requirements. In turn, this could aid faster commercial deployment, something that is particularly important for highly capital-intensive projects, reducing interest on debt and lowering discount rates on capital investment.

This would bring the competitive cost levels of large ships to floating nuclear power plants. As a result, for a Core Power FNPP, manufacturing costs could be reduced by up to 50% when compared to a single large land-based facility, with the potential to exceed even this.

Therefore, the financial risk currently associated with nuclear power would be reduced, fostering wider commercial investment and closing the gap between expected and realised cost increases and the economic competitiveness of new nuclear. With marine nuclear able to offer cost-competitive, reliable electricity, a colossal growth opportunity and diversification of the offshore industry would open up.

In fact, there is a case for deployment in conjunction with the existing offshore oil and gas industry. Offshore oil extraction companies are increasingly being asked to reduce their emissions by powering facilities with electricity. However, current proposals for this rely on either the use of variable renewables paired with storage (but in practice still high use of gas-turbines), or by laying expensive subsea cables to shore.

Then the facility is only as green as the main grid, and both cases could end up with stranded assets when the facility is decommissioned. Marine nuclear power however would be able to offer reliable clean energy to these facilities while being a cost-competitive source that is flexible and can be re-located between basins.

Hydrogen and e-fuel production is another one of several areas where marine nuclear could play an important role. While many parts of the energy system will be able to electrify some sectors such as steel and cement manufacture directly, the chemical industry and much of short-sea shipping will require a source of low-carbon fuels.

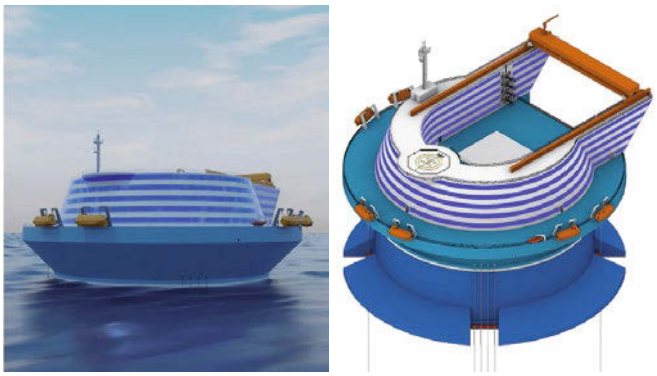


Figure 2: A Core Power floating electricity production facility

Large amounts of green electricity will be needed for the electrolysis of water to produce hydrogen. Floating nuclear can produce this electricity at a scale and cost to ensure that these fuels are not prohibitively expensive. Arrangements could even include making the fuels on co-located chemical process facilities.

Core Power is currently working on a project with Idaho National Laboratory and researchers from Massachusetts Institute of Technology on the deployment of these structures and their economic feasibility. A conceptual field layout for such a facility is shown in Figure 1. ≈

Unique wave current flume commissioned

At the opening ceremony of the centre

Source: Leibniz Universität Hannover

COASTAL RESEARCH CENTRE A new large wave current flume has been commissioned in the Coastal Research Centre, which is operated jointly by Leibniz University Hannover (LUH) and TU Braunschweig in Hannover-Marienwerder. Until now, the 40-year-old facility has only been capable of generating waves. After an investment of more than EUR 35 million, however, the expanded facility can now model the impact of offshore wind, tides, and tidal currents.

The new research infrastructure was formally commissioned recently by Robert Habeck, Federal Minister of Economic Affairs and Climate Action (BMWK), and Stephan Weil, Minister-President of Lower Saxony. Other senior members of both universities and leading researchers were present at the ceremony, where, at the push of a button, a 3m wave was generated in the 300m-long wave current flume.

The facility will open up a wide range of research opportunities relating to offshore energy development and new marine-related energy sources. The research infrastructure now includes a powerful tidal current system, a deep section for investigating foundation structures of offshore wind turbines, and a wave machine capable of generating waves up to 3m high. An important feature of the new setup will be the ability to generate waves and currents at the same time. It is thought that no other facility anywhere in the world can do this.

Speaking at the commissioning ceremony, Minister Habeck said: "Wind energy plays a crucial role in Germany's electricity supply today and will continue to do so in the future. The use of wind energy must be expanded quickly and efficiently to meet the growing demand for electricity resulting from the electrification of other sectors, such as heating buildings with heat pumps or e-mobility.

"The wave current flume in Hannover will make an important contribution by facilitating research into optimising offshore foundations," Habeck continued. "This will make the expansion of offshore wind energy even more cost-effective and reliable. For this reason, and because of the many other aspects that can be investigated via the wave current flume, the EUR 35 million in research funding provided by the BMWK is money well spent for the future."

Minister-President Weil added: "I am delighted that we now have this wave current flume in Lower Saxony, which is unique worldwide. This opens up new opportunities for research and industry to develop offshore turbines. Coastal protection, which is particularly important for Lower Saxony, can also be improved and investigated further by the simultaneous generation of waves and currents. Overall, this is a truly impressive facility. I would like to congratulate everyone involved in this process."

Prof Dr Torsten Schlumann of LUH and Prof Dr Nils Goseberg of TU Braunschweig, board members of the Coastal Research Centre, explained the significance of the new wave current flume for new research. Schlumann revealed that it will now be possible to study the simultaneous strain caused by swells and currents, and thus realistically investigate their impact on a large scale. Goseberg said that the new deep section also makes it possible to simulate the part of offshore wind turbines that is in the ground and to study the movements of the ground and the turbine that occur.

In the future, experiments will also be able to simulate steeper and higher waves, as predicted by climate change, and simulate the loads on structures. For the first time, tidal currents can be studied as they occur in the sea with the new circulating current system.

The BMWK approved the research project 'marTECH – Development of Renewable Maritime Technologies for Reliable and Sustainable Energy Supply' in 2017. The purpose was to meet the requirements of research and industry in the context of the expansion and operation of renewable energies. ≈

RWE

We produce power to keep things running. And running. And running. And running.

Cars, phones, tools – nothing runs without power. And the demand is growing.
We're shaping the green energy world of tomorrow. To keep things running.
With a clear target: to be carbon-neutral by 2040.

rwe.com

Floating wind platform now on site in Spain

DEMOSATH The 2-MW floating wind platform demonstrator, *DemoSATH*, has now been installed in open sea at the BiMEP test site, 18 km from the Port of Bilbao. The installation, in 85m-deep waters about 3 km off the coast in the Cantabrian Sea, was undertaken by the WindStaller Alliance and its *Norman Sapphire*, an anchor handler supported by local tugs.

The hook-up involved connecting six pre-laid mooring lines to the structure's single-point mooring turret. Then the dynamic and static cables and pull-in to the unit's turret were connected, enabling the export of power to the Spanish grid ashore. *DemoSATH* is expected to generate sufficient electricity for about 2,000 Spanish households per year.

Now that the unit has been installed, it will be commissioned, and electricity generation will start. During the two-years of operation at the BiMEP site, SATH technology developed for floating offshore wind by Saitec Offshore Technologies will be tested. The requirements for its operation and maintenance will also be analysed. The project will focus on metoceanic challenges in the open sea, especially under the harsh conditions that prevail in the Cantabrian Sea.

Project partners all made positive observations. Saitec Offshore Technologies' chief operations officer, David Carrascosa, commented: "This milestone in the installation of the *DemoSATH* floating offshore wind project validates the years of steady commitment, resilience, and teamwork. Along the journey, we have overcome some challenges that now serve as valuable lessons for future projects. We are proud of the achievements of our team, and the combined efforts of our collaborators. It's thrilling to witness the *DemoSATH* project set sail, playing an integral role in the progression of renewable energy."

Speaking for RWE Offshore Wind, Sven Utermöhlen, CEO, said: "The offshore installation of the *DemoSATH* project is an important milestone on our way to the commissioning of RWE's second floating demonstration project. We see great potential for floating wind farms around the world as they unlock opportunities in countries with deeper coastal waters. As a floating pioneer, the first-hand learnings from our demonstration projects are key to us optimising our upcoming commercial-scale projects and securing their safe delivery."

Kazumi Ogura, executive officer in the Renewable Energy Division of The Kansai Electric Power Co., Inc., declared: "We take great pride in our achievement of pioneering a new frontier in offshore wind power generation by installing the innovative floating wind platform demonstrator, thanks to major contribution from our partners. We will continue to prioritise safety and work together as a team to advance the pioneering *DemoSATH* project. Through *DemoSATH* project, we remain committed to continuous learning from the project and harnessing this knowledge to make progress towards achieving a zero-carbon society." ≈

Solar energy plant to be installed at offshore wind farm

A solar energy plant will be added to the *Hollandse Kust Noord* offshore wind farm

HOLLANDSE KUST NOORD Offshore solar energy developer, Oceans of Energy, has been awarded a contract to install and operate the world's first offshore solar plant at the *Hollandse Kust Noord* by CrossWind, a joint venture between Shell and Eneco. The wind farm, located 18.5 km off the Dutch coast, is due to be commissioned by the end of this year, and the solar farm is expected to become operational in 2025.

The combination of offshore wind and solar increases efficiency in various ways, the companies said. For example, it is possible to produce solar energy on sunny but less windy days, thereby raising energy production and increasing utilisation of the offshore power grid. Since the solar panels will be installed between the wind farm's turbines, the sea space will also produce more energy across its footprint.

In a statement, the partners listed three pioneering features:

- Hollandse Kust Noord will be the world's first wind farm to combine offshore battery storage and green hydrogen produced from offshore wind power on a megawatt scale;
- It will also be the first facility to commit to mature and demonstrate offshore wake control technologies such as closed-loop active wake steering in combination with active wake mixing to reduce energy losses and increase efficiency;
- It will be the first time that a solar system has been electrically connected and operated at an offshore wind farm in harsh sea conditions.

Maria Kalogera, Crosswind's Innovations Manager, commented: "Offshore floating solar is an exciting area of renewable energy development that is poised to play an important role in the energy transition. This project marks a significant milestone for our CrossWind Innovations Team as we continue to push on our commitment to create better energy solutions for the future."

Ocean of Energy founder and CEO, Allard van Hoeken, said: "We are very pleased that Crosswind and their shareholders, Shell and Eneco, have trust in Oceans of Energy for realising this first-off amazing project. We will add offshore solar to offshore wind. Our performance and our system will be crucial to the success of the innovative part of the offshore wind farm. This is a large responsibility, as *Hollandse Kust Noord* will function as an example for combined offshore wind and solar parks in the future."

When all 69 turbines are installed and connected, the wind farm will have a total installed capacity of 759 MW, generating at least 3.3 TWh of energy each year, sufficient to provide green electricity for more than one million Dutch households. Siemens Gamesa Renewable Energy is supplying the turbines, and Van Oord is supplying foundations and cables and installing the turbines on site. Meanwhile, CrossWind is cooperating with TenneT, the developer of the 'offshore power socket' that connects the wind farm to the grid. CrossWind is also in contact with relevant ministries, coastal authorities, and other stakeholders. ≈

Partners to commission newly designed wind support ships

Source: deugro

Illustration of the new larger cargo ship

CARGO FLEXIBILITY Special project freight forwarder, deugro Danmark AS and partners Siemens Gamesa and Amasus Offshore BV, have ordered two newly designed wind farm support ships, *Rotra Futura* and *Rotura Horizon*, at Jiangsu Zhenjiang Shipyard in China. The vessels, due for delivery in the spring and summer of 2025, will be deployed on a long-term charter agreed between deugro and Siemens Gamesa.

The design of the ships builds on the initial 'Rotra' concept adopted for the existing vessels, *Rotra Mare* and *Rotra Vente*. These ships have proved to be very successful over the last seven years, reducing risk, loading times, and costs, with a unique roll-on, roll-off, and gantry system for offshore wind turbine components.

The new ships will be larger, with a length of 167.6m and a beam of 26m, capable of transporting the increasing size and weight of next-generation offshore wind turbine components. The deckhouse and accommodation will be located forward to ensure maximum cargo intake with no line-of-sight issues. They will have a stern ramp and three Liebherr cranes. The gantry system will enable turbine blades to be stowed in three tiers, maximising cargo flexibility.

Meanwhile, minimising the ships' carbon footprint has been a top priority in the design phase. Energy consumption has been reduced by aerodynamic and hydrodynamic optimisation. A low-resistance hull coating will be used, and the ships will be powered by Wärtsilä diesel engines, with an estimated 15% savings in fuel consumption compared with similar engines in operation today. Hybrid propulsion, exhaust gas cleaning, and waste heat recovery systems also feature in the new ships' specifications.

Hans Henrik Groen, deugro Danmark A/S branch manager and managing director, said: "deugro Danmark A/S and its partner, Amasus Offshore, are delighted and proud to again be selected by Siemens Gamesa as the preferred supplier of a groundbreaking and trendsetting concept in the offshore wind industry. This also clearly underlines the success of the trilateral collaboration in the past and in the future. And I personally want to thank the joint project team, and their hard work that made this possible."

Siemens Gamesa's Christian Johansen, global commodity manager for Ports & Transportation in the company's offshore unit, commented: "With our record order backlog, we will be installing a significant number of wind turbines at sea globally, with increasingly larger and more complex components. With this agreement, we have taken another step towards securing our ability to execute projects safely, on time, and at the right cost level." ≈

Lithuania completes first offshore wind auction

BALTIC SEA A consortium of the Ignitis Group and OceanWinds has agreed to pay EUR 20 million in a so-called 'negative bid' to develop Lithuania's first offshore wind project, which is likely to be commissioned before 2030. The consortium has been awarded a 41-year permit.

The country has beaten its Baltic neighbours with the first successful regional auction, but other states are also planning to harness offshore wind resources before the end of the decade. Their development will help to underpin energy supplies in the Baltic region and could result in lower energy prices.

States could even become energy exporters rather than importers. Estonia, for example, is already planning to build a subsea electricity cable to export power to Germany.

Despite the apparent success of the Lithuanian auction, however, industry body Wind Europe has been critical of the auction design. The Ignitis-OceanWinds consortium's negative bid for the right to build the wind farm will need to be supplemented by at least EUR 5 million for environmental protection and a one-euro per megawatt-hour levy for the support of local communities.

The price may not be as high as some previous negative bids to build offshore plants in Germany, for example. But auctions based on the negative bidding process are not viewed favourably by Wind Europe, amongst others. "Uncapped negative bidding leads to extra costs that need to be passed on to the supply chain and consumers who are already struggling," Wind Europe said in a statement.

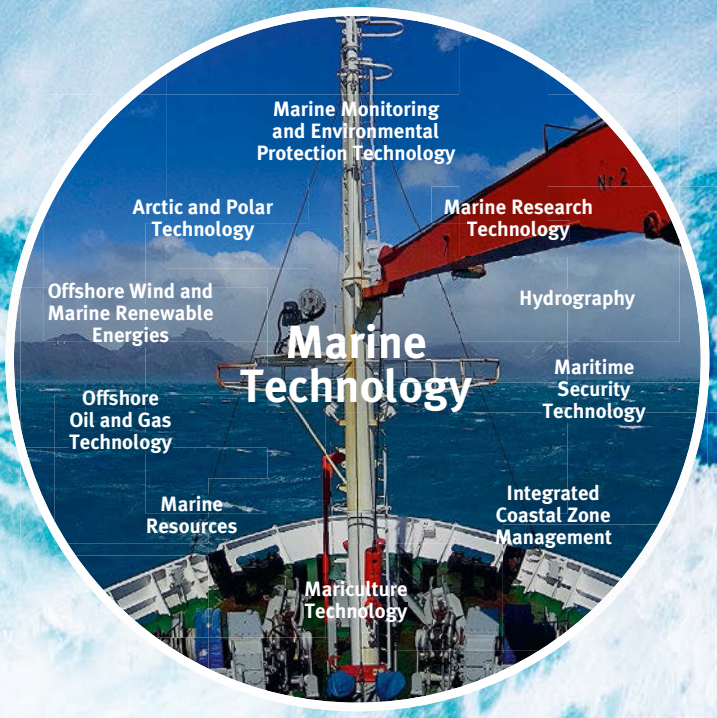
"In addition, the Government hasn't done any of the site and environmental surveys yet – something that is common in other countries," the statement continued. "This will add about two years to the project development timeline. This also meant that developers were bidding without much knowledge about important factors such as wind speeds and, therefore, potential electricity production. This decreased interest in the auction for many developers, and only two parties entered a bid."

Lithuania is hoping to stage another offshore tender later this year. This time, a contract for difference (CfD) structure will be used across a price range that has already been set. Developers will be able to bid between EUR 64.31 and EUR 107.81 per megawatt-hour. Wind Europe believes that a CfD structure provides a more stable structure for offshore developments in the future.

Gary Dickson, WindEurope CEO, commented: "It's good to see Lithuania taking its first steps on offshore. It'll help reduce their energy imports. And it'll bring wider economic benefits, including to local communities. But this tender could have been structured better. Negative bidding is not the way forward. It's good that the next auction in September uses CfDs. This will generate more interest from other offshore wind developers." ≈

GMT

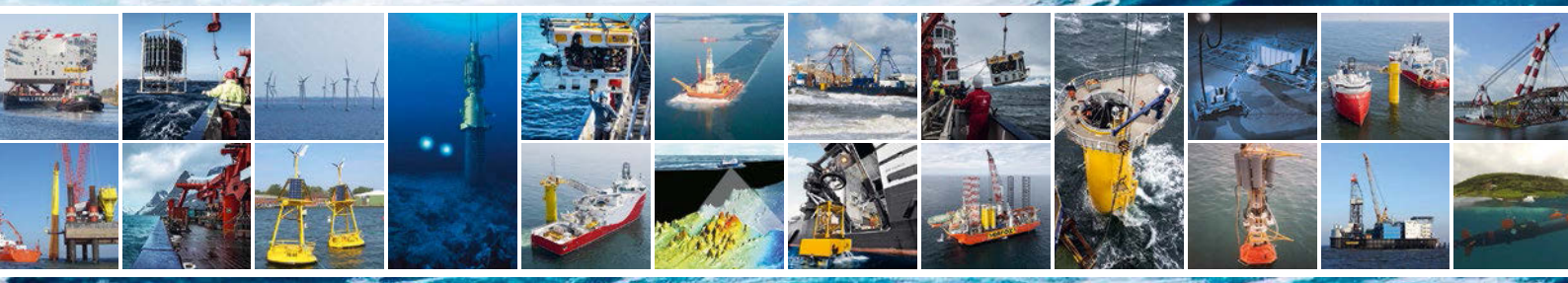
German Association for Marine Technology



Bundled competence in marine technology for exploration, protection and sustainable use of the oceans

Benefit from the network!

- Marine technologies for future needs
- Cooperation between business and science
- A unique network in marine engineering



www.marine-technology.eu

Floating ammonia plant takes next step

AIP An industrial-scale concept for a floating green ammonia plant developed by Netherlands-based SwitchH2 BV and Norway's BW Offshore has been awarded Approval in Principle (AiP) by classification society DNV.

The concept, known as NH3 FPSO, will be developed by converting an existing very large crude carrier or building a new one. The unit will receive green energy from a wind farm, produce hydrogen by the electrolysis of seawater, and generate nitrogen from an air separation unit.

The hydrogen and ammonia will then be combined in an ammonia synthesis unit. When condensed, the ammonia will be stored as a liquid in the hull of the unit before being transferred to ammonia shuttle carriers. A floating hose will be used to pump ammonia from the stern of the NH3 FPSO to a midship manifold on board the ammonia carrier. Although the unit will be permanently moored, it will be possible to relocate it if necessary, the partners said.

Conn Fagan, DNV's vice president, Business Development for Floating Production, said: "The AiP covers all aspects of the integrated vessel concept, including structural integrity, mooring, ammonia production, ammonia storage, and cargo handling. We are pleased to see such developments, both with regard to the use of renewable energy and as a contribution to emission reduction across many potential applications in different industry sectors."

SwitchH2 board member, Bob Rietveldt, commented: "We are delighted we have been awarded the AiP from DNV for our concept, and we look forward to working with DNV in the next stages of the project."

Speaking for BW Offshore, senior vice president, Project Development, Fredrik Savio, said: "At BW Offshore, we leverage our offshore experience to support and expedite the energy transition by engineering next generation floating production solutions. Achieving this AiP is an important milestone and an encouraging step towards a cleaner energy mix." ≈

MSS and GustoMSC to design next-gen WIV

EUROPEAN MARKET Maersk Supply Service (MSS) and GustoMSC have entered into an agreement to design a new generation of wind installation vessels (WIV) aimed at Europe's rapidly expanding offshore wind sector. The new design will be based on the same patent and characteristics of the feeder concept, developed for the US market, the companies said.

The patented design will focus on maximising uptime. The jack-up WIV will remain on station at the wind farm, supplied by tugs and barges transporting components such as turbine towers, nacelles, and blades from supply bases ashore. The arrangement will be less prone to weather delays, enabling continuous installations throughout the year, contributing to a lower levelised cost of energy. The partners expect the supply system to be 30% more efficient in terms of vessel uptime compared with conventional jack-up vessels.

MSS chief commercial officer, Jonas Munch Agerskov, commented: "Europe is an attractive market for offshore wind, and we believe that our concept is also suitable for this region. As the Wind Installation Vessel itself does not sail into ports, this can solve some of the bottlenecks we currently see in Europe, where only a few ports are large enough to handle the growing wind turbine sizes. We look forward to collaborating with GustoMSC on getting this new basic design ready."

Speaking for GustoMSC, Nils van Nood, managing director, said: "At GustoMSC, a subsidiary of NOV, we look forward to working with the Maersk Supply Service team on a next generation wind turbine installation jack-up for the international market. Having a decades-long history of working together, both companies will combine their years of offshore experience and design know-how in this collaboration. Against the backdrop of growing turbine sizes, we jointly aim to further improve installation efficiencies and development economics in the bottom-fixed offshore wind market." ≈

Source: MSS

Maersk Supply Service and GustoMSC expect to conclude the basic design process later this year

the power to control

bachmann.

Shaping the future securely, with a view of what's to come.

Windenergy 5.0 – Our Competence. Our Responsibility.

Wind Turbine Automation
More than 140,000 wind turbines automated

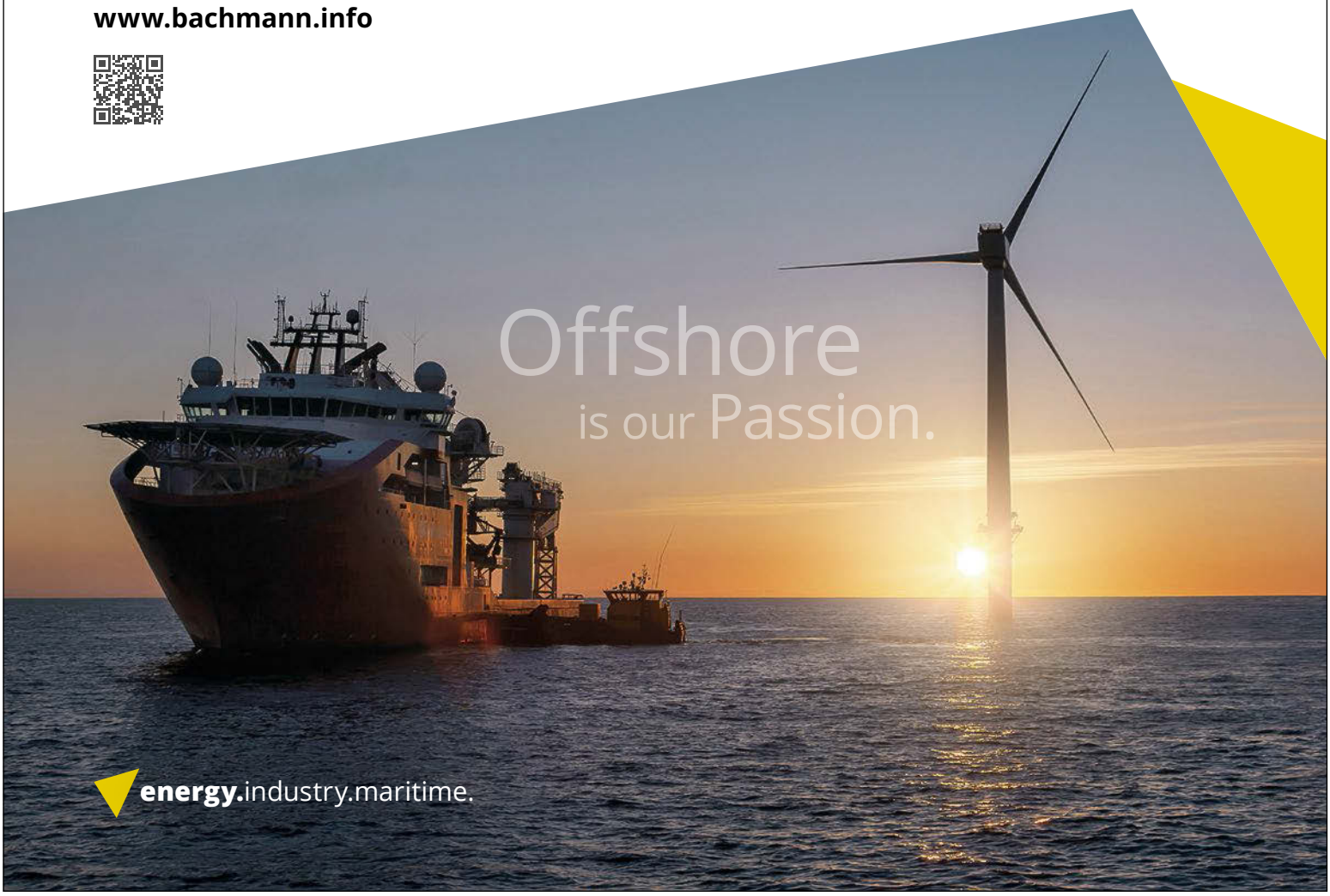
Condition Monitoring
Comprehensive protection for your operating assets

Retrofit
Extend turbine lifecycles

Grid Protection and Control
Safe, fast and stable power management

Windpower SCADA
Access protection and operation control

www.bachmann.info



New contracts cover the global offshore vessel market, with a particular emphasis on markets in Brazil, Norway, and the UK

Source: Miros

Real-time sea state data raises uptime

WAVESYSTEM | Ocean surface specialist, Miros, has secured a series of new contracts for its 'sea state as a service' software so far this year. The company's WaveSystem is designed to support offshore activity in various sectors, including cable and pipe lay, offshore installations, new floating production storage and offloading (FPSO) projects, and drillship activities.

The sea-state-as-a-service setup monitors vessel stability during heading-sensitive operations, helping to boost uptime and productivity. New contracts cover the global offshore vessel market, with a particular emphasis on markets in Brazil, Norway, and the UK's Continental Shelf, the company said. Several existing contracts have also been extended with vessel operators using Miros Cloud, Data Connector, RangeFinder, and Wavex®.

The Miros WaveSystem provides real-time sea state data, combining directional measurements from Miros Wavex with motion-compensated wave measurements and draught data from Miros RangeFinder. The real-time data, tailored to suit the requirements of operators by WaveSystem, provides greater operational awareness and enables better decision-making as a result of more information on the surrounding environment, prevailing weather conditions, and possible weather windows.

Under the business model, clients take out a subscription for the service, but Miros continues to own the hardware. This means that customers do not take on the risks associated with owning, operating, and maintaining equipment while projects are in progress.

Miros vice president Offshore Solutions, Andrew Wallace, said: "We are very proud of all the new contract wins in the first half of the year. It's great to see our ever-evolving technology gaining momentum across such a wide range of offshore vessel operations, and this clearly demonstrates the requirement for reliable and robust ocean insights. With the precision, reliability, and robustness of Miros' sea condition measurements, complemented by our convenient as-a-service subscription model, clients experience remarkable enhancements in their operations."

He continued: "This, in turn, results in reduced energy consumption and improved efficiencies, contributing to the achievement of broader industry objectives. This aspect holds immense significance for stakeholders in both the maritime and energy sectors. We eagerly anticipate witnessing the profound impact of our high-quality solutions and supporting applications as they pave the way towards a sustainable market."

Ship&Offshore Buyer's Guide

The Buyer's Guide serves as market review and source of supply listing. Clearly arranged according to references, you find the offers of international shipbuilding and supporting industry in the following 17 columns.

2 Propulsion plants

2.01 Engines

MARIDIS
Maridis GmbH, Friedrich-Barnewitz-Straße 4c
18119 Rostock, Germany
Phone: +49 381 77 89 38 80
spareparts@maridis.de • www.maridis.de

MarParts: Spare Parts & Components for Main & Auxiliary Engines

2.02 Gears

REINTJES GmbH
REINTJES POWERTRAIN SOLUTIONS
Eugen-Reintjes-Str. 7
D-31785 Hameln
Tel. +49 (0)5151 104-0
Fax +49 (0)5151 104-300
info@reintjes-gears.de • www.reintjes-gears.com

Propulsion systems with power ratings from 250 up to 30,000 kW

2.03 Couplings + brakes

R+W
A POPPE + POTTHOFF COMPANY

R+W Antriebselemente GmbH
Hattsteinstraße 4
63939 Wörth am Main / Germany
Fon: +49 (0)9372-9864-0
Fax: +49 (0)9372-9864-20
email: info@rw-kupplungen.de
www.rw-kupplungen.de

Couplings, seawater resistent

2.04 Shaft + shaft systems

Piening Propeller

Am Altendeich 83 • D-25348 Glückstadt
Tel. +49(0)4124 91 68-0 • Fax +49(0)4124) 37 16
e-mail: pein@piening-propeller.de
Internet: www.piening-propeller.de

Fixed and Controlable Pitch Propellers, Shaft Gears, Gearboxes

2.05 Propellers

Piening Propeller

Am Altendeich 83 • D-25348 Glückstadt
Tel. +49(0)4124 91 68-0 • Fax +49(0)4124) 37 16
e-mail: pein@piening-propeller.de
Internet: www.piening-propeller.de

Fixed and Controlable Pitch Propellers, Shaft Gears, Gearboxes

2.13 Service + spare parts

MARK VAN SCHAICK MARINE SERVICES
Nieuwe Waterwegstraat 7
3115 HE Schiedam, Netherlands
Harbourno. 535
Port of Rotterdam
Tel. +31-10-4090599
Fax +31-10-4090590
info@markvanschaick.nl • www.markvanschaick.com

Crankshaftrepair (max. length 12m), Repair of Engine- and Industrial parts, Connectingrods and Camshafts, In Situ Machining, Laser Cladding

3 Engine components

3.05 Starters

DÜSTERLOH Fluidtechnik GmbH
Abteilung Pneumatik Starter
Im Vogelsang 105
D-45527 Hattingen
DÜSTERLOH Fluidtechnik
Tel. +49 2324 709 - 0 • Fax +49 2324 709 -110
E-mail: info@duesterloh.de • www.duesterloh.de

Air Starters for Diesel and Gas Engines up to 9.000 kW

3.07 Filters

BOLLFILTER Protection Systems

Boll & Kirch Filterbau GmbH
Siemensstraße 10-14 • 50170 D-Kerpen
Tel.: +49 2273 562-0 • Fax: +49 2273 562-223
E-Mail: info@bollfilter.com • www.bollfilter.com

Applied filtration technology for marine engines and maritime water management

HYDAC
HYDAC INTERNATIONAL GMBH
Industriestraße • D-66280 Sulzbach/Saar
Telefon +49 (0) 6897 509-01
Fax +49 (0) 6897 509-454
E-Mail: info@hydac.com • www.hydac.com

Fluid management for heavy diesel engines

3.10 Injection systems

WOODWARD L'orange

Porschestrasse 8 • 70435 Stuttgart
Tel. +49 711 8 26 09 - 0
sales@lorange.com • www.lorange.com

Engine components and control systems for large engines from 1,000 to 40,000 kW

5 Ships' equipment

5.06 Furniture + interior fittings

PFLEIDERER

Pfleiderer Deutschland GmbH
Tel.: +49 (0) 91 81 / 28 480
E-Mail: info@pfleiderer.com
Internet: www.pfleiderer.com

Wood-based materials for decorative ship interior fitting

5.07 Ship's doors + windows

PODSZUCK®
Steel Doors - Fire Doors - Ship Doors
Established in 1919

Podszuck® GmbH
Klausdorfer Weg 163 • 24148 Kiel • Germany
Tel. +49 (0) 431 6 6111-0 • Fax +49 (0) 431 6 6111-28
E-mail: info@podszuck.eu • www.podszuck.eu

A-, B-, C- and H-class doors

5.11 Ballast water management

BOLLFILTER Protection Systems

Boll & Kirch Filterbau GmbH
Siemensstraße 10-14 • 50170 D-Kerpen
Tel.: +49 2273 562-0 • Fax: +49 2273 562-223
E-Mail: info@bollfilter.com • www.bollfilter.com

Applied filtration technology for marine engines and maritime water management

HYDAC
HYDAC INTERNATIONAL GMBH
Industriestraße • D-66280 Sulzbach/Saar
Telefon +49 (0) 6897 509-01
Fax +49 (0) 6897 509-454
E-Mail: info@hydac.com • www.hydac.com

Ballast Water Management

5.16 Refuelling Systems

Alfons Haar Maschinenbau GmbH & Co. KG
Fangdieckstraße 67
D-22547 Hamburg
Tel. +49 (40) 83391-0
Fax +49 (40) 844910
Sales@alfons-haar.de
Alfons Haar
www.alfons-haar.de

On board helicopter and boat refuelling systems for aviation fuel, petrol and diesel

6 Hydraulic + pneumatic

6.01 Pumps

Behrens Pumpen
von-Thünen-Str. 7
D-28307 Bremen
Tel. +49 421 486 81-0 • Fax +49 421 486 81-11
e-mail: info@behrenspumpen.de
Internet: www.behrenspumpen.de
Ship Centrifugal Pumps

beinlich pump systems
Beinlich Pumpen GmbH
Gewerbestraße 29 • 58285 Gevelsberg
Phone +49 (0) 2332/55860
www.beinlich-pumps.com
Gear pumps for lubricants, oils and fuels

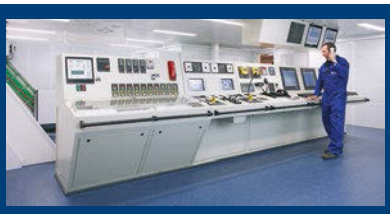
KRACHT
KRACHT GmbH
Gewerbestr. 20 • D-58791 Werdohl
Tel. +49(0)2392.935 0 • Fax +49(0)2392.935 209
info@kracht.eu • www.kracht.eu
Lubricating oil gear pumps and fuel gear pumps

Körting
THE EJECTOR COMPANY
sales@koerting.de
+49 511 2129-446
KOERTING.DE
Bilge and ballast ejectors/eductors

Leistritz
Screw pumps & systems
Leistritz Pumpen GmbH | Markgrafenstr. 36-39
90459 Nuremberg | Germany | P +49 911 43060
pumps@leistritz.com | pumps.leistritz.com

6.02 Compressors

Sauer Compressors
J.P. Sauer & Sohn Maschinenbau GmbH
Brauner Berg 15, 24159 Kiel/Germany
PHONE +49 431 3940-0
FAX +49 431 3940-24
E-MAIL info@sauercompressors.de
www.sauercompressors.com
Air- and water-cooled compressors, air receivers, compressed air dryers and accessories



8 Measurement + control devices

8.01 Engine control systems

AVAT Automation GmbH
Derendinger Straße 40
D-72072 Tübingen
Tel: +49 7071 97 35-0
Fax: +49 7071 97 35-55
e-mail: info@avat.de
www.avat.de
Gas & Dual-Fuel Engine Control Systems, Cylinder Pressure & Knock Monitoring, NOx Estimator

8.02 Pressure monitoring

MARIDIS
Maridis GmbH, Friedrich-Barnewitz-Straße 4c
18119 Rostock, Germany
Phone: +49 381 77 89 38 80
maridis@maridis.de • www.maridis.de
MarPrime: Performance/Pressure/ Power Measurement & Reporting

VEGA Grieshaber KG
Am Hohenstein 113
D-77761 Schiltach
Tel. +49 7836 50-0
E-Mail: info.de@vega.com • www.vega.com
Pressure and differential pressure transmitters

8.04 Level measurement systems

Barksdale
CONTROL PRODUCTS
Barksdale GmbH
Dorn-Assenheimer Strasse 27 • D-61203 Reichelsheim
Tel: +49 (0) 6035-949- 0 • Fax: +49 (0) 6035-949-111
e-mail: info@barksdale.de • **www.barksdale.de**
Sensors & Switches to control Pressure, Temperature, Level, Flow

VEGA Grieshaber KG
Am Hohenstein 113
D-77761 Schiltach
Tel. +49 7836 50-0
E-Mail: info.de@vega.com • www.vega.com
Level sensors for all solids & liquids

8.05 Flow measurement

KRACHT
KRACHT GmbH
Gewerbestr. 20 • D-58791 Werdohl
Tel. +49(0)2392.935 0 • Fax +49(0)2392.935 209
info@kracht.eu • www.kracht.eu
high-precision gear and screw type flow meters, fuel consumption measurement, valve position indicators

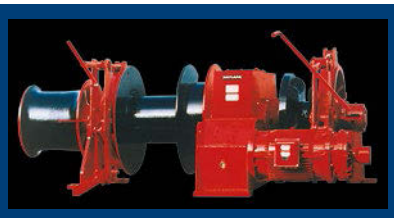
VSE flow®
VSE Volumentechnik GmbH
Hönnestraße 49 • D-58809 Neuenrade
Phone +49 (0) 2394/6 16 30
info@vse-flow.com • **www.vse-flow.com**
Fuel and lube oil consumption measurement Bunker flow meters for HFO, water and MGO

8.09 Test kits

Martechnic GmbH
Adlerhorst 4
D-22459 Hamburg
Tel. +49 (0)40 85 31 28-0
Fax +49 (0)40 85 31 28-16
E-mail: info@martechnic.com
Internet: www.martechnic.com
Test kits, autom. monitoring systems, sampling devices, ultrasonic cleaning

8.13 Measurement + control devices

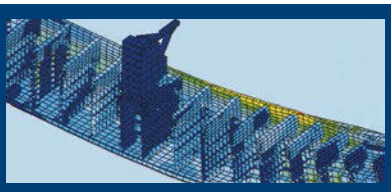
JUMO GmbH & Co. KG
Moritz-Juchheim-Straße 1
D-36039 Fulda
Ansprechpartner: Michael Brosig
Telefon +49 661 6003-2788
www.jumo.net
michael.brosig@jumo.net
Measurement + Control Devices



11 Deck equipment

11.01 Cranes

Global Davit GmbH
Graf-Zeppelin-Ring 2
D-27211 Bassum
Tel. +49 (0)4241 93 35 0
Fax +49 (0)4241 93 35 25
e-mail: info@global-davit.de
Internet: www.global-davit.de
Survival- and Deck Equipment



12 Construction + consulting

12.01 Consulting engineers

SDC
Naval architects
Marine engineers
Ship Design & Consult

info@shipdesign.de · www.shipdesign.de · Hamburg

Design – Construction – Consultancy
Stability calculation – Project management

S.M.I.L.E.

S.M.I.L.E. Engineering GmbH
www.smileengineering.de
info@smileengineering.de

+49 (0) 431 210 80 0
Winkel 2 - 24226 Heikendorf

Finite Element Simulation – CFD – Structural Strength – Explicit Dynamics
Basic and detailed design – Outfitting – CAD/CAM – Technical documentation

terra.blue - Dr. Walter L. Kuehnlein
Hamburg: +49+40+2546 9970
Houston +1-713-930 2650
wk@terra.blue • www.terra.blue

Advice, concepts and concept/design reviews for offshore systems in ice and/or open waters

14 Alarm + safety equipment

14.01 Lifeboats + davits

Global Davit GmbH
Graf-Zeppelin-Ring 2
D-27211 Bassum
Tel. +49 (0)4241 93 35 0
Fax +49 (0)4241 93 35 25
e-mail: info@global-davit.de
Internet: www.global-davit.de

Survival- and Deck Equipment

16 Offshore + ocean technology

16.07 Arctic + polar technology

terra.blue - Dr. Walter L. Kuehnlein
Hamburg: +49+40+2546 9970
Houston +1-713-930 2650
wk@terra.blue • www.terra.blue

Advice, concepts and concept/design reviews for offshore systems in ice and/or open waters

17 Maritime services

17.06 Professional Commercial Diver

Hydrex NV
Haven 29
2030 Antwerp / Belgium
Tel. +32 3 213 53 00
Fax +32 3 213 53 21
e-mail: hydrex@hydrex.be
www.hydrex.be

HYDREX UNDERWATER TECHNOLOGY

Hydrex provides fast on site repair solutions to underwater problems encountered by ships.

17.10 Consulting

Deutscher Wetterdienst
Bernhard-Nocht-Str. 76
D-20359 Hamburg
Tel: +49 (0) 69 8062 - 6181
E-Mail: seeschifffahrt@dwd.de
Internet: www.dwd.de/seeschifffahrt

DWD

– Maritime weather briefing –
Weather forecasts on board

18 Buyer's Guide Information

Buyer's Guide

The **Buyer's Guide** provides a market overview and an index of supply sources. Every entry in the **Buyer's Guide** includes your company logo (4 colour), address and communications data plus a concise description of products or services offered.

For further information please contact:
Markus Wenzel
Phone: +49/40/23714 - 117
e-mail: markus.wenzel@dvvmedia.com

Publishing

	Schiff&Hafen	Ship&Offshore	Select
Target regions	Central Europe	Worldwide	China, GreenTech, SmartShip
Issues	January / February – March – May – July / August – September – November –	January / February – March / April – May / June – July / August – September / October – November / December –	– – – SmartShip – – – – – GreenTech – China

Price per keyword per issue

	Size I H 30 / B 58 mm	Size II H 40 / B 58 mm
1 Keyword	€ 95,–	€ 125,–
2 Keywords	each € 90,–	each € 120,–
3 Keywords	each € 85,–	each € 115,–
4 Keywords	each € 80,–	each € 110,–
5 Keywords	each € 75,–	each € 105,–
from 6 Keywords	each € 70,–	each € 100,–

Minimum time span for your booking is one year in one target region. Each target region can be booked individually. For bookings in several regions, we offer the following rebate off the total price:

Two target regions/year: 10%
Three target regions/year: 20%

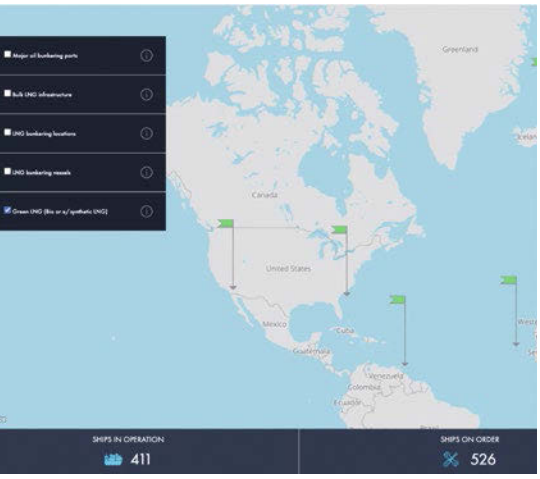
Buyer's Guide Premium online entry + **Buyer's Guide print entry**

Buyer's Guide Online

The premium online entry, including an active link, logo and email, is free of charge for all customers of the Buyer's Guide print issue.

Close to 70 ports now supply green LNG

UPDATE | Bio-LNG, a green fuel produced from organic household and industrial waste, manure, and sewage sludge, is now available in almost 70 ports, according to the latest update from SEA-LNG in its online Bunker Navigator tool.



Screenshot of the SEA-LNG Bunker Navigator Source: SEA-LNG

Northern Europe has the largest number of ports providing bio-LNG as fuel, but it is also available in major bunkering hubs on the US east coast, Rotterdam and Singapore.

Bio-LNG is made from biomethane, of which about 30 million tonnes is produced each year, or about 10% of shipping's total annual energy demand, SEA-LNG said. Since the fuel is produced from organic waste, it does not compete with the production of food, fibre, or fodder, as set out in regulations such as the EU's RED II and the Renewable Fuel Standards in the United States.

There are currently some 355 ships, excluding LNG carriers, which can use bio-LNG as a drop-in fuel without modification. SEA-LNG estimates that the fuel can reduce greenhouse gas emissions by up to 80% compared with marine diesel on a well-to-wake basis and can be transported, stored, and bunkered using existing LNG infrastructure. Last year, analysis by Singapore's Nanyang Technological University's Maritime Energy and Sustainable Development Centre of Excellence (MESD) concluded that there is huge potential to expand biomethane production, perhaps by 20 times current production levels by mid-century. Taking into account competition from other sectors, MESD forecast that bio-LNG could be available in sufficient quantities to decarbonise around 13% of the global fleet by 2050.

SEA-LNG's general manager, Adi Aggarwal, commented on the latest Bunker Navigator update. "The fact that bio-LNG is commercially available now and being used as a drop-in marine fuel by operators in Europe, North America, and Asia demonstrates the sustained contribution that the LNG pathway can make to decarbonising our industry, starting today. Climate change is a stock and flow problem; the longer our industry waits to start using low-carbon fuels, the tougher the decarbonisation challenge will be."

UAE and DNV to set up Maritime Decarbonization Centre

MoU | The United Arab Emirates (UAE) and Foundation Det Norske Veritas (DNV) have signed a Memorandum of Understanding (MoU) to collaborate on establishing a new UAE Maritime Decarbonization Centre by the beginning of next year. The MoU was signed by H.E. Suhail Al Mazrouei, UAE Minister of Energy and Infrastructure, and Knut Ørbeck-Nilssen, DNV Maritime CEO, at the IMO headquarters in London.

The Centre will work on connecting stakeholders from across the maritime industry and beyond, the partners said, to become a driving force for reducing greenhouse gas emissions globally.

H.E. Suhail Al Mazrouei commented: "The establishment of the UAE Maritime Decarbonization Centre reflects our unwavering commitment to addressing climate change and promoting sustainable practices within the maritime industry. By collaborating with DNV, we aim to leverage their expertise and global network to drive innovation and accelerate the adoption of decarbonisation technologies. The Centre will play a pivotal role in advancing our national and regional sustainability goals while contributing to global efforts in combating climate change."

Speaking for DNV, Ørbeck-Nilssen said: "We are very pleased to collaborate with the UAE's Ministry of Energy and Infrastructure to establish the Maritime Decarbonization Centre. Initiatives like the Centre are essential as we look to accelerate towards a decarbonised future. We need to build via cooperation, foster innovation, and scale local strengths into global leadership. With its strategic location and strong support from industry leaders, the Centre is poised to become a hub for maritime decarbonisation efforts."

President and CEO of the Foundation Det Norske Veritas and DNV, Remi Eriksen, said: "The Foundation Det Norske Veritas is driven by a desire to help society tackle major global transformations. The recent IMO decision to greatly strengthen international shipping's emissions targets will spur the maritime industry to accelerate its transition."

"At DNV, we deeply believe that cross-industry collaboration is vital to realising this goal," he continued, "and are working to share our deep and broad industry expertise through maritime decarbonisation centres in key regions of the world. The founding of the UAE Decarbonization Centre, in cooperation with the Ministry, is another significant milestone for the industry, and we look forward to welcoming new partners in the future," he added.

CAPTN project takes major step forward

MV WAVELAB | The commissioning of a Shore Control Centre at Anschütz will now enable the real-time tracking of research platform *MV Wavelab* as part of the Clean Autonomous Public Transportation Network (CAPTN) project on the Kiel Fjord.

The CAPTN initiative aims to connect the east and west banks of the Kiel Fjord with autonomous, low-emission passenger ferries. Funded by the German Federal Ministry for Digitalisation and Transport, a range of companies and universities are involved in researching and developing the necessary technologies.

The *MV Wavelab*'s sensors and navigation systems can now be accessed remotely, and the vessel's steering and propulsion systems can be controlled at a distance. The project partners are now creating a digital twin in the control centre, where all the data from the autonomous vessel's sensors and systems will be stored.

Daniel Sommerstedt, project manager for CAPTN at Anschütz, commented: "We are pleased that with the commissioning of the Shore Control Centre at Anschütz, we are now taking a big step towards autonomous as well as semi-autonomous driving tests in the digital field in Kiel."

The research platform *MV Wavelab* can now be remotely monitored Source: Anschütz

The large volume of data that is exchanged in real time between ship and shore requires a powerful communications setup on both the Fjord and on shore. The system architecture is based on a 5G mobile network and a high-performance WiFi-6 network provided by Addix GmbH.

Sommerstedt explained: "In the shore control centre, we have the possibility to feed a lot of new data into our bridge platform, process it, and then visualise it in an overall maritime picture. One of the goals of the next research stage is to find out what information needs to be presented to users and in which way, so that they can monitor and remotely control the *Wavelab* safely and efficiently."

Partners in the project include Addix GmbH, AVL Deutschland, City of Kiel, HH Vision, Kiel University, Port of Kiel GmbH, Schlepp- und Fährgesellschaft Kiel mbH, Wissenschaftszentrum Kiel GmbH, and WTD 71.

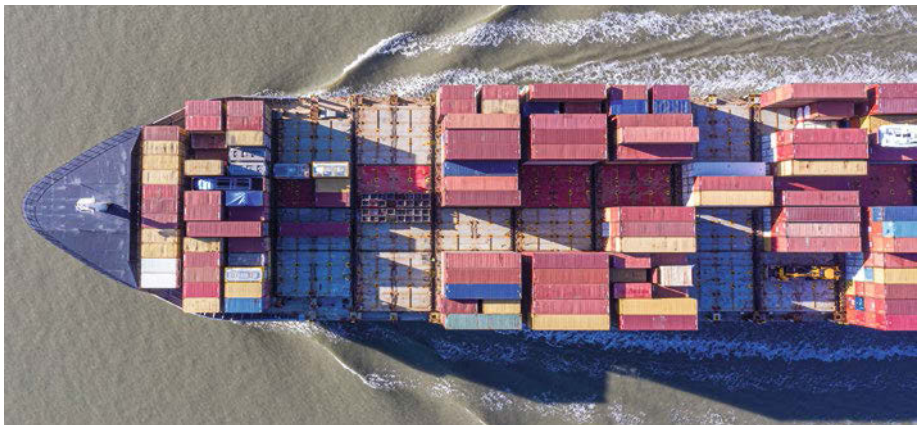
Supporting maintenance and compliance requirements

COMMUNICATION PACKAGE | Buxtehude-based Niederelbe Schiffahrtsgesellschaft (NSB Group) is to use a Telemar communications package to support maintenance and compliance requirements on board half of its managed vessels. NSB currently has about 50 vessels under management and about 1,700 personnel at sea.

The contract has been signed following a period of testing and evaluation during which Telemar engineers worked closely with a NSB team to assess the shipping company's requirements. The two-year deal will involve Telemar's shore-based team supporting shipboard maintenance, including remote service coordination for troubleshooting and diagnostics.

Specific components are covered. They include the annual radio survey, bi-annual magnetic compass calibration, annual voyage data recorder performance test and certificate of compliance, single gyro compass overhaul, annual radar inspection, radar magnetron replacement, and maintenance of search and rescue radar transponders, emergency position-indicating radio beacons, global maritime distress and safety systems, handheld radios, and voyage data recorder beacons.

The communications company will provide its Telemar World Service 4.0 system, a web-based tool for managing service-due dates, increasing awareness, and optimising vessel availability. The strategy will also provide NSB Group with more predictability in its vessel operations. The equipment included in the contract supports both navigational safety and more uptime. This means that performance data can be shared in close to real time if necessary.



The deal will see a shore-based team supporting shipboard maintenance Source: Telemar

Selvam Panneer, chief operating officer of NSB Group, commented: "The goal of NSB Group is to ensure the best ship management experience for our customers at a worldwide scale, constantly improving our services to the evolving needs of our clients. Maintaining our required level of vessel availability means knowing that our assets are in optimum condition and in full compliance, thanks to comprehensive cover from Telemar."

Telemar Group CEO, Mike Bauwens, said: "Telemar's services are designed to support vessel operators and managers in markets that are complex and highly demanding, with no margin for error. Working closely with NSB Group has enabled us to develop a programme that will keep NSB's vessels competitive and compliant – today and tomorrow."

In addition to its ship management services, NSB also undertakes ship construction supervision and is currently overseeing eleven newbuilding projects in China.

Liquefaction expertise for energy transition project

FEED | Wärtsilä has been contracted to provide the front-end engineering design (FEED) for the liquefaction and storage of liquefied synthetic methane (LSM). It is planned that the Power-to-X facility will be built by Koppö Energia Oy, a joint venture between Germany's Prime Green Energy Infrastructure Fund and CPC Finland Oy, in Kristinestad.

The plant, with a capacity of 200 MW, will convert green electricity into hydrogen and sustainable LSM. The Koppö Energy Cluster will provide up to 500 MW of wind energy and 100 MW of photovoltaic sustainable power for the plant's operation.

Koppö Energia board member, Thomas Zirngibl, explained: "We conducted a diligent selection process before awarding the FEED agreements for our energy transition project. Wärtsilä Gas Solutions is globally recognised as a leader in advanced liquefaction and storage solutions, and their expertise in this field will be an important contribution to the success of the project.

Speaking for Wärtsilä Gas Solutions, Trond Inge Flønes, Sales and Business Development manager, said: "Wärtsilä is committed to decarbonising energy production, so we are naturally proud and pleased to have been selected to participate in this important project. As the energy transition progresses, we expect green hydrogen to play an increasingly relevant part. Our company is also heavily involved in the research and development of alternative sustainable fuels, and we see Power-to-X technologies playing a growing role in the energy transition towards a future where renewable energy becomes increasingly important."

The green hydrogen produced in Kristinestad will be converted into LSM to be used as a sustainable fuel for heavy transport. The investment decision for the plant is expected to be made at the beginning of 2024.

Ship&Offshore

THE INTERNATIONAL PUBLICATION FOR OFFSHORE & MARINE TECHNOLOGY

www.shipandoffshore.net
www.schiffundhafen.de
www.dvvmedia.com

› IMPRINT

PUBLISHER
DVV Media Group GmbH
Postbox 10 16 09, DE-20010 Hamburg
Heidenkampsweg 73-79, DE-20097 Hamburg
+49 40 23714 - 100

MANAGING DIRECTOR
Martin Weber

PUBLISHING DIRECTOR
Manuel Bosch
manuel.bosch@dvvmedia.com

EDITORIAL STAFF
Editor-in-Chief
Kathrin Lau
+49 40 23714 237 | kathrin.lau@dvvmedia.com
Offshore Advisor
Dr.-Ing. Walter Kuehnlein
+49 40 2261 4633 | walter@kuehnlein.me

ADVERTISING
Advertising Director
Markus Wenzel
+49 40 23714 117 | markus.wenzel@dvvmedia.com
Advertising Sales
Jan-Michael Jasper
+49 40 23714 248 | jan-michael.jasper@dvvmedia.com
Jörg Rösch
+49 40 23714 283 | joerg.roesch@dvvmedia.com

Technical Department
Vera Hermanns
+49 40 23714 293 | vera.hermanns@dvvmedia.com

Advertising rate card:
No 15 valid from January, the 1st, 2023

ADVERTISING REPRESENTATIVES
Germany, Austria, Switzerland
Gerald Ulbricht
+49 6195 9769734 | Mobile +49 170 3859573
gerald.ulbricht@dvvmedia.com
Scandinavia
Örn Marketing AB
+46 411 18400 | marine.marketing@orn.nu
UK, Ireland, BeNeLux, UAE, Oman, Bahrain, Saudi Arabia, Kuwait
Richard Johnson
+44 1603 417765 | Mobile +44 7565 010217
richard.johnson.extern@dvvmedia.com
Singapore/Indonesia/Vietnam
Marimark Pte Ltd., John Bodill
+65 6719 8022 | john.bodill@marimark.com.sg
China
Nana Wang
Cssc_704@cssmc.cn

SUBSCRIPTION/DISTRIBUTION
Director Sales + Marketing
Markus Kukuk
+49 40 23714 291 | markus.kukuk@dvvmedia.com
Readers'/Subscribers' Service
+49 40 23714 260 | service@shipandoffshore.net

SUBSCRIPTION TERMS
Subscriptions may be terminated at the end of any subscription period.
Ordering a subscription first applies to the agreed-upon period (term of contract).
The subscription contract can be terminated in writing at the end of the base period.
If there has been no termination at that time, the contract is extended and can be terminated at the end of the new base period.
The publishers accept no liability if it is not possible to publish the magazine due to force majeure or any other cause beyond their control.

ANNUAL SUBSCRIPTION RATES
Abonnement
Germany EUR 157.00 (plus 7% VAT) per year | outside Germany EUR 195.00 per year;
Single copy
EUR 32.00 (incl. VAT).
GMT members receive the magazine within their membership.

PRINTING HOUSE
Silber Druck OHG, Lohfelden

ISSN: 2191-0057

MEMBER

Deutsche Fachpresse

SHIP&OFFSHORE IS OFFICIAL ORGAN OF THE ASSOCIATIONS:

GMT
German Association for Marine Technology

FSM
Forschungsvereinigung Schiffbau und Meerestechnik e.V

› ADVERTISERS

Ship&Offshore

Energy at Sea

OMAE 2024
SINGAPORE

omae2024.com • #omae2024

43rd International Conference on Ocean, Offshore and Arctic Engineering

Singapore EXPO, Singapore

June 9–14, 2024

OOAE

ASME

Abstract Submission Deadline:
October 26, 2023

Keep an eye on the **shipbuilding market!**

Schiff&Hafen | Ship&Offshore Subscribers receive a **10 % discount**!*

Even more professional information – on the **New Ships** website!

New Ships

*After the trial period, the discount with the discount code **Maritime23** applies exclusively to orders by new customers for the first reference year. Thereafter the regular annual price will apply.

www.new-ships.net/subscribers-discount