



Solid as a rock

by Przemysław Myszka

Although we had to jam another corona year into the Baltic world of transport & logistics, which particularly crossed the ferry & cruise sector, 2021 wasn't lean on the whole. Several themes recurred over the past 12 months, most notably decarbonisation in various forms: alternative fuels, onshore power supply, and offshore wind energy, to name but a few. Port development also kept strong. The seaports of Esbjerg and Gothenburg can reasonably be named as the two most active, with notable mentions of Gdynia and Tallinn for opening brand-new and modern facilities (the latter of a ferry and the former of a cruise terminal). Interestingly, the logistics warehousing industry also took a hefty bite of worthwhile news, especially across Sweden. Traditionally, liquefied natural gas (LNG) and its environmentally-friendlier version (bioLNG) made advances in the regional field. To top it all with shipping, what is said to be the world's northernmost regular passenger service, Wasaline's Umeå-Vaasa route, welcomed (in the teeth of a COVID stumbling) *Aurora Botnia*. This made-in-Finland spick-and-span ferry has indisputably made crossing the Kvarken an even more unique experience. The Baltic transport & logistics industry continued to catch the wave in 2021 – or more precisely wind, as the region's Norsepower carried on developing its increasingly popular auxiliary wind propulsion system.

DECARBONISATION / FUELS & POWER SOURCES

Starting chronologically, in mid-January, **Alfa Laval**, **DTU Energy**, **Haldor Topsøe**, **Svitzer**, and the **Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping** launched a project to accelerate the development of the solid oxide fuel cell (SOFC) technology for marine applications. The SOFC4Maritime project, funded through a grant from the **Danish Energy Technology Development and Demonstration Program**, targets optimal utilisation of future green fuels via the application of SOFCs for power production on board vessels. The research will have ammonia-based SOFCs as its starting point. “By electrochemically converting fuel into electricity, SOFCs can potentially produce power with higher efficiency than internal combustion engines running on the same fuel – without creating polluting emissions or particulates. Ammonia-based SOFCs are especially attractive, since ammonia can be produced in large scale using renewable electricity and no biomass resource,” the parties said. Alfa Laval will head the development

initiative. Haldor Topsøe will provide the underlying SOFC stack technology, while DTU Energy will support system layout and component testing. Svitzer will bring a ship-owner perspective, and the Mærsk McKinney Møller Center for Zero Carbon Shipping will ensure a broad industry overview, end-to-end analysis of various energy pathways, and detailed techno-economic analysis. “We are proud to contribute with our competences within SOFC technology and ammonia as a marine fuel in order to reduce carbon emissions from shipping. This is an urgent goal in combatting climate change,” **Kim Grøn Knudsen**, Chief Strategy & Innovation Officer, Haldor Topsøe, commented.

In February 2021, just over the Baltic border, the Canadian-Norwegian **Corvus Energy** and **Toyota** partnered to develop and produce sustainable, large-scale, and modularised proton exchange membrane (PEM) fuel cell systems for the international marine market. The initiative is backed by **Equinor**, **Norled**, **Wilhelmsen**, **LMG Marin**, **NCE**

Maritime CleanTech, and the **University of South-Eastern Norway**. The project also received €5.2m from **Innovation Norway**. Production will be located in Bergen, with Toyota as the mass-produced fuel cell technology supplier. According to the schedule, the first marine fuel cell system will be showcased on a vessel in 2023. The product will be marine-certified and available for commercial delivery from 2024. Corvus’ new dedicated fuel cell division will design and certify the marine fuel cell system using Toyota’s fuel cell technology as a building block for larger systems. Furthermore, a specific marine control system uniting the battery and fuel cell operation will be developed for integration with power management systems from a range of system integrators.

Also in February last year, the **Port of Gothenburg**, **Stena Line**, and the **Volvo** and **Scania** groups teamed up, launching the **Tranzero Initiative** to speed up the transition to fossil-free fuels in the transport sector. Specifically, the parties target road transportation to and from the Swedish seaport that generates 55kt of carbon emissions per year. The **Gothenburg Port Authority’s** (GPA) aim is to cut the seaport’s emissions by 70% by 2030. To that end, GPA will set up the necessary infrastructure to provide heavy-duty vehicles and vessels with fossil-free energy sources, such as electric power, hydrotreated vegetable oil (HVO), biogas, or hydrogen gas. A market study is being carried out to assess what will work best in the long run. “No single organisation or individual holds the key to meeting the challenges ahead of us. Collaboration is crucial and we are pleased to bring on board two of the world’s largest truck manufacturers and the world’s largest ferry company. With our collective expertise, breadth, and market presence we can make a real difference,” **Elvir Dzanic**, Chief Executive, GPA, underlined. According to the port authority, “The transition to fossil-free transport to and from the port will need government support for companies that need to upgrade their fleets, for example designated grants, subsidised charging points, and fossil-free fuels.” Dzanic commented in this regard, “We have had a long-standing exchange of views and ideas with the government regarding the challenges we are facing, and our goals are the same. The transport sector needs to move away from its reliance on fossil fuels and with the Tranzero Initiative we are taking a monumental step forward.” Having mentioned Volvo, in October 2021, the Danish shipping & logistics company



Photo: DFDS



Photo: Wallenius Wilhelmsen



Photo: Elonroad

DFDS ordered 100 heavy-duty electric lorries from the Swedish manufacturer, set for delivery in 2022-2023. The 44t of carrying capacity (gross combination weight) FM Electric model can travel up to 300 km when fully charged. The e-trucks will help DFDS cut its carbon footprint by 45% by 2030. "This is a major milestone in our commitment to fossil-free transportation and I am very proud of the partnership we have with DFDS. Together we are showing the world that electrified heavy truck transport is a viable solution already today. I believe this will encourage many more customers to confidently take the first step in their own electrification journey," **Roger Alm**, President, **Volvo Trucks**, commented.

Going back to last year's February, **Wallenius Wilhelmsen** moved forward with its wind-powered ship, re-named *Orcelle Wind* (ex-*Oceanbird*). The company is conducting a comprehensive viability assessment to have a design ready by mid-2022 (the original concept was developed with the help of **Wallenius Marine**, **SSPA**, and the **KTH Royal Institute of Technology**); it will be used to contract a shipyard which, in turn, will deliver the vessel in 2025. *Orcelle Wind* will be a pure car & truck carrier, 220 m-long, 40 m-wide, and able to carry 7,000 vehicles (incl. heavy machinery as well as break-bulk). She will primarily be propelled by wind, harvested using telescopic sails. **Wallenius Wilhelmsen** speaks of a sailing

speed of 10-12 knots under sail, increased with a supplemental power system if need be. "Since 2008, we have been able to our reduce CO₂ intensity by 33%, which is a significant step. But the journey towards zero emissions requires great strides forward. We believe *Orcelle Wind* is one of them," **Craig Jasienski**, CEO, **Wallenius Wilhelmsen**, underlined.

At the beginning of March 2021, the **Power-to-Ammonia** project kicked off. DFDS, **Arla**, **Maersk**, **Danish Crown**, and **DLG** partnered to increase the availability of green ammonia as an alternative fuel (specifically, as an energy carrier in SOFC). The 50kt of yearly production capacity facility will be based in **Esbjerg** and is expected to become operational in 2026. "Vessels are designed and built for today's fuelling and a green fossil alternative for vessels does not currently exist. That's why we're partnering in projects like Power-to-Ammonia. The ability to establish a vision of an industrial-scale sustainable fuel production facility is due to the power of partnerships," **Torben Carlsen**, CEO, DFDS, highlighted.

Also in March of last year, the **IVL Swedish Environmental Research Institute**, **Sintef**, the **University of Iceland**, **Stena Rederi**, and **Powercell Sweden** initiated the **HOPE – Hydrogen Fuel Cells Solutions in Shipping in Relation to Other Low Carbon Options** project. The initiative concerns a study on how hydrogen and fuel cells stack up against

other alternative fuels for sea shipping. To that end, HOPE will develop and evaluate a concept design of a short sea shipping vessel that uses hydrogen and fuel cells for propulsion. The initiative will also scrutinise the driving forces and barriers for constructing such a ship in the Nordic region, plus how operating such a vessel will impact greenhouse gas emissions and air pollution. "There is a number of different possibilities such as electrification, wind, bio- and electrofuels. The shipping industry is very much interested in new solutions, and hydrogen and fuel cells are a very hot topic now," **Julia Hansson**, Researcher and Consultant, the **IVL Swedish Environmental Research Institute**, commented. **Per Wimby**, Project Leader at **Stena Rederi**, added, "For us it is crucially important that different alternative fuels are thoroughly studied in order to make sure they are sustainable, cost-effective, and can be really used in practice. Hydrogen can be a very interesting option for our ships that sail between Nordic countries." The HOPE project is financed through a cooperation programme set up by the **Norwegian Nordic Energy Research**, the **Danish Energy Technology Development and Demonstration Program**, **Business Finland**, the **Swedish Transport Administration**, the **Research Council of Norway**, the **Icelandic Centre for Research**, as well as through in-kind contributions from partaking companies.

Staying in March 2021, the Swedish **Alfa Laval** also announced it will scrutinise alternative marine fuels. The company's Test & Training Centre in the Danish Aalborg began looking into methanol and biofuels made from waste in spring 2021. Alfa Laval said it will investigate the fuels' decarbonisation potential and what measures will have to be taken to adapt and develop equipment for the vessel engine rooms. "A number of fuel pathways are on the table in the transition towards zero carbon shipping, but the knowledge about their impact on marine equipment solutions is limited. We want to extend that knowledge through testing," **Sameer Kalra**, President Marine Division, Alfa Laval, underlined. Working together with **MAN Energy Solutions** and other partners (the **Danish Technological Institute**, **Technical University of Denmark**, and the biofuel producer **Nordic Green**), Alfa Laval explored the possibility of running the centre's four-stroke, 2.0 MW diesel engine on methanol – without modifications or another pilot fuel. Once the fuel arrived, the first task was to determine how to handle it at scale. Because methanol is a liquid at room temperature, it can be stored in unpressurised tanks. However, a low flash-point of 7°C makes methanol highly volatile – despite the challenge of igniting it through compression. After working out the handling practicalities, broader tests of methanol in the unmodified engine commenced in April 2021. "At present, combusting methanol requires a pilot ignition with fuel oil. This necessitates two fuel lines and different types of fuel tanks on board. If methanol from renewable sources could be burned directly in standard compression engines, it would offer a shortcut to carbon-neutral shipping," **Lars Skytte Jørgensen**, VP Technology Development, **Alfa Laval Marine Division**, explained. "Since ships have a lifetime of 20 years or more, zero-emission vessels must begin entering the global fleet by 2030 for a 50% reduction to be achieved by 2050. It is predicted that in 2023 the world's first carbon neutral liner vessel will be launched and that methanol-fuelled vessel will be ready for delivery in two years' time," Alfa Laval predicted. In April 2021, the Finnish shipping line **Meriaura** informed it will develop a carbon-neutral domestic traffic vessel. The Turku-based shipowner wants to create a hybrid ship to serve lake, canal, and sea feeder traffic while being 100% climate-neutral thanks to sailing on sustainably produced bio-oil and electricity stored in batteries. Once constructed, the vessel will be tested in Lake Saimaa (the Saimaa canal



Photo: Liebherr

locks are being extended, and the size of the new concept vessel corresponds to the new Saimaa dimensions: 93 m-long ships carrying up to 3,500t vs the current 82.5 m). "Lake Saimaa is a perfect pilot area for our concept. The region's strong and progressive industry needs a clear transport route, which will be made possible by the extension of the canal locks. In the future's competition, a cost-effective and environmentally friendly transport chain is needed to ensure the vitality of the Saimaa region [the canal is the only water connection between the lake and the Gulf of Finland]," **Jussi Mälikä**, President, the Meriaura Group, commented. In mid-May 2021, the **Port of Helsingborg** partnered with the Swedish **Elonroad** to test a new electric road system. The solution, trialled since last year's autumn, sees

the port's two e-vehicles charged from a power strip in the road, whether they are parked or on the move. Approximately ten metres long, the power strips are glued to the asphalt and connected to a power source. Since it involves conductive charging, i.e. physical contact between the vehicle and power strip/rail, the cars have sliding contacts that automatically fold down to touch both the positive and negative terminals to transfer the energy and charge the vehicle. According to the parties, conductive charging can transfer high power, up to 300kW per vehicle, with 97.5% efficiency. **Öresundskraft** is also involved in the project; the municipal energy company wants to gain insights into the new technology and how electrifying the transport sector will impact the energy system. "Testing

this new electric road system is another step on our journey towards becoming Sweden's most sustainable port. The technology has been tested on public roads, but using it in a port environment to create continuous flows is something entirely new. Perhaps in the future, we could have these power strips by our container cranes and charge the terminal tractors while they wait for the next container," **Christina Argelius**, Chief Technology Officer, the Port of Helsingborg, commented. **Karin Ebbinghaus**, CEO, Elonroad, added to this, "An electric road system means better air quality and reduced noise pollution. Our joint initiative with the Port of Helsingborg [...] is primarily focused on port environments and industrial applications. But we also intend to demonstrate how it can be applied throughout the transport sector in the long term, where the same solution can be used both in a port and the city centre." Last for March 2021 was news that the **Port of Tallinn** went 'e-green.' The Estonian port entered into a renewable energy purchase agreement with **Eesti Energia** and now consumes only green electricity produced in the country. According to the deal, Eesti Energia supplied the Port of Tallinn with 10 GWh of renewable electricity during 2021 for the port's use. As a result, emitting almost 7,000t of CO₂ was avoided. Leading up to the agreement, the Port of Tallinn invested in measures aimed at electrifying port operations. Those included the installation of onshore power supply facilities (across five piers in the Old City Harbour, a carbon reduction of

100t/month) as well as retrofitting the port's subsidiary **TS Laevad's Tõll** into a hybrid passenger ship, making it possible to partly run on electricity on the Virtsu-Kuivastu route (the operator plans to introduce the hybrid technology also on other ferries).

In May 2021, the **Port of Södertälje** took hold of a brand-new LHM 420 mobile harbour crane – and **Liebherr's** very first to run on fossil-free, renewable diesel. The 124t of lifting capacity machinery, used for handling containers and project cargo, runs on the HVO100 renewable diesel made from HVO or organic fats. The Swedish seaport has been using HVO100 to run its vehicles, machinery, and cranes since 2016. According to the port authority, Södertälje is the first port in Sweden that switched to fossil-free fuels. However, the new crane only uses its diesel engine to move around the terminal. Once in position, Södertälje's LHM 420 runs the electric motor for cargo handling operations. "Up to 30% of the electricity we consume comes from our own photovoltaic system, which is on the roof of one of our warehouses. The rest is green electricity from sun, wind, and water," **Robert Tingvall**, CEO, the Port of Södertälje, highlighted.

Also in May last year, the Danish energy company **Ørsted** began the construction works of the renewable hydrogen production facility H2RES in Copenhagen. Situated on the company's premises on Avedøre Holme, H2RES will have a capacity of 2.0 MW. The project will investigate how to combine an electrolyser with the

fluctuating power supply from offshore wind, using Ørsted's two 3.6 MW turbines at the site. The facility will produce up to 1,000 kg of renewable hydrogen a day to fuel zero-emission road transport in the Greater Copenhagen area and on the island of Zealand. According to the plan, the facility was to produce its first hydrogen in late 2021. "In less than three years, Ørsted has, with partners, established nine renewable hydrogen projects in Denmark, Germany, the Netherlands, and the United Kingdom so far, spanning from demonstration projects like H2RES to industrial-scale visions like the potentially 1,300 MW 'Green Fuels for Denmark' project," the company said. **Anders Nordstrøm**, VP and Head of Ørsted's hydrogen and power-to-x activities, added, "H2RES will be a small, but very important first step in realising Ørsted's large ambitions for renewable hydrogen, which has fast proven itself as a centrepiece in the green transformation of the European economy to net-zero emissions by 2050." He furthered, "At Ørsted, we believe that renewable hydrogen can become an industrial stronghold of several European economies, including Denmark, while also contributing significantly to bringing down emissions from the hard-to-abate sectors in transport and industry." The Energy Technology Development and Demonstration Program, under the **Danish Energy Agency**, awarded DKK34.6m (around €4.65m) to Ørsted for developing the H2RES project together with the company's partners: **Everfuel Europe**,



Photo: Stena Line

NEL Hydrogen, Green Hydrogen Systems, DSV, Hydrogen Denmark, and Energinet Ecosystemsvar.

In mid-June 2021, the Danish **Vordingborg Biofuel** announced its DKK2.0b (approx. €270m) plans to erect in the **Port of Vordingborg** a renewables-powered biomethanol and e-methanol production plant. The company will use straws from wheat grain fields, pressed into briquettes, to make the fuel. During a biofermentation process, the briquettes will be converted partly into biogas and in part into biofertiliser (the latter for use in agriculture). The biogas will then be converted to liquid biomethanol using surplus power from renewable energy sources. Estimates speak of a 300kt/year production capacity once operations kick off in 2024. “Vordingborg Biofuel is seriously putting action behind the ambitions that Vordingborg Municipality will be Denmark’s future center for green transformation with the plan to establish one of the world’s largest biomethanol factories at the Port of Vordingborg. We are in full swing to develop the Baltic Sea Offshore Hub at Klintholm Harbour as a center for wind energy, and now the Port of Vordingborg is coming as a center for green fuels. It is a big step in the right direction,” **Bolette Christensen**, Director, **Vordingborg Erhverv** (a local business promotion organisation), said.

Also in the middle of June last year, **Bornholm Bunker Hub** announced it would investigate the potential of establishing a green maritime fuel bunkering station on the Danish island of Bornholm. The consortium’s founding parties (Ørsted, **Molslinjen**, Haldor Topsoe, the **Bunker Holding Group**, **Wärtsilä**, **Ramboll**, **Bureau Veritas**, and the **Port of Rønne**)

will carry out a feasibility study to set out the financial potential for supplying sustainable fuels, produced using offshore wind energy, in the Baltic Sea. The project will investigate how local power-to-x can support the need for sustainable fuels for the more than 60k ships that pass Bornholm every year. The project will also answer whether it is appropriate to produce green ammonia locally or if it should be imported. “We see great potential in utilising Bornholm as an energy island to meet the Danish government’s ambitious goal of reducing CO₂ emissions [-70% by 2030 vs the 1990 level]. Denmark has a unique opportunity to create an industrial position of strength within the production of sustainable fuels for heavy transport and to create jobs in the process. Bornholm’s strategic location makes it also ideal as a hub for green energy solutions, and we look forward to exploring the potential for delivering sustainable fuels for shipping from Bornholm,” Ørsted’s Anders Nordstrøm said. **Cato Esperø**, Wärtsilä’s Sales Director in Norway, added, “We see the Bornholm Bunker Hub initiative as very interesting in terms of our ongoing development of multi-fuel engines and testing future clean fuels for shipping.” **Gijsbert de Jong**, Marine Chief Executive Nordics at **Bureau Veritas Marine & Offshore**, also commented, “At Bureau Veritas, we will support this exciting project by providing technical and regulatory expertise for the safe storage and handling of alternative green fuels, and by addressing the certification of these fuels to their origins.”

Soon afterwards, also the Polish state-owned oil refiner and petrol retailer **Orlen** launched its future fuel initiative. **Hydrogen Eagle** will be a production and

distribution chain of low- and zero-emission hydrogen throughout Central Europe. The company intends to build six plants: three in Poland, two in Czechia, and one in Slovakia, with a total production capacity of 50kt by 2030. These electrolysis facilities, 250 MW combined, will be powered by renewable energy sources: solar and wind, including Orlen and **Northland Power**’s Baltic Power offshore farm (the construction works on the potentially 1.2 GW-strong project will start in 2023). The company also plans to erect hydrogen refuelling stations (for individual, public, and cargo transportation needs): 54, 26, and 22 in Poland, Slovakia, and Czechia, respectively (Orlen already operates pilot hydrogen refuelling points at its service stations in Wolfsburg and Müllheim in Germany). With the target total production capacity of over 1,000 kg per hour, the company is building three automotive-grade hydrogen production plants in Poland. In addition, Orlen wants to build three plants for converting municipal waste into low-emission hydrogen: two in Poland and one in Czechia.

June 2021 was eventful indeed: before the month-end, Stena Line shared that it tested blue methanol as a marine fuel. Within the EU backed **FReSMe** project, the Swedish ferry company ran its *Stena Germanica* ferry on recycled methanol coming from the country’s steel industry. The blue methanol used by Stena Line in the trial bunkering was produced from CO₂ recovered from the blast furnace gases from **SSAB**’s steel production in Luleå (another partner of the FReSMe project). “It is a fantastic cooperation between shipping and the steel industry, proof that together we can drastically lower our climate impact. For Stena Line, it



Photo: Port of Rønne

is a further step in our sustainability journey and in exploring future alternative ship fuels,” **Erik Lewenhaupt**, back then Stena Line’s Group Head of Sustainability, said. The dual-fuel ferry *Stena Germanica*, operating the Gothenburg-Kiel route, has been sailing on methanol since mid-2015.

July 2021 wanted to be in step with the previous month, berrying ‘green’ news bits. First, it was announced that **ForSea’s Tycho Brahe** would be fitted with the world’s largest battery pack. With the help of their technical partner **ABB**, the Helsingborg-based ferry line planned to increase the ship’s battery capacity from 4,160 to 6,400 kWh. The upgrade started in May and was completed later in 2021. Together with her sister ship *Aurora*, *Tycho Brahe* has been e-sailing between the Danish **Helsingør** and the Swedish Helsingborg since autumn 2018. According to the company, this has led to a CO₂ reduction of 37kt. A fully-automated and laser-operated robotic arm connects every time the ferries arrive in port, providing enough power to enable the 20-minute-crossing. ForSea underlines that it only uses certified green electricity. “Since the start, ForSea has proven that battery-powered operations are possible on a ferry route like ForSea’s. Today, one of our vessels – *Aurora* – already sails up to 46 departures per day on 99% electric power. Following the upgrade on board *Tycho Brahe*, at full operation both vessels will achieve a total reduction of carbon dioxide in ForSea’s fleet by 65%, a total of 23,000 tonnes,” **Kristian Durhuus**, ForSea’s CEO, underlined. He followed up by saying, “That would be an incredible result to achieve, and a powerful driver to continue our realistic dream of becoming one of the world’s most climate friendly transportation companies.” **Sami Lehtikoinen**, VP, Service, **ABB Marine & Ports**, added, “As the battery technology matures, increasing both the power capacity and lifetime, together with ForSea, we will be able to ensure that *Tycho Brahe* will continue operating sustainably for the years to come.”

Staying in Denmark, the **Port of Hirtshals** expressed its ambition of becoming a green hydrogen hub. To that end, the Danish seaport signed a memorandum of understanding with the Norwegian **Gen2 Energy** to locally produce green hydrogen and take care of imports from Norway. The agreement also covers the set up of a container factory in Hirtshals for exporting hydrogen, thus demonstrating the security of supply. The parties intend to use electricity generated by wind farms to produce hydrogen. “We are proud that Gen2 Energy



has chosen the Port of Hirtshals as a hub for their logistics activities and transport of green hydrogen, and it will undoubtedly boost our position as an important player in green port development,” **Steen Harding Hintze**, Development Director of the Port of Hirtshals’ green development company **Greenport North** (launched in September 2021), commented. He added, “At the same time, it gives our existing customers new, green opportunities and leads the way for new companies – especially in the green segment.”

Before long, Gothenburg, within the mentioned Tranzero Initiative, said it would house the Nordics’ first future fuels station. The open-access facility, which the Norwegian **Circle K** will run, will provide heavy-duty vehicles with charging points and hydrogen gas and bio-based liquid fuel pumps. The station, located at Vädermotet, will start in 2022 by offering ten charging points, with a maximum power capacity of 350 kW-1.0 MW (when fully developed). The 720 kg (15 trucks/day) of capacity hydrogen gas pump will be put in place in 2023/24. “We have highlighted flows that are particularly suited to the transition process. These are mainly flows that are highly repetitive, involve short distances, and include overnight parking at a depot. By the first half of 2022, we will see electrically powered transport flows in the port area,” GPA’s Elvir Dzanic explained. He also highlighted, “In the immediate future there will be a series of incentives at the terminals to promote fossil-free transport, and also measures where hauliers, forwarders, goods owners, as well as the government and the region are important partners.

We have established a fruitful dialogue with all parties concerned regarding their roles.” The ‘decarbonisation’ summer of 2021 ended modestly yet laudably, first with the ‘plug in’ of **Kiel’s** new photovoltaic system. The German seaport installed nearly 300 panels across the gangway roof of its Ostseekai cruise terminal. Each module is 335 W, so the output of the entire set-up is almost 100 kWp, thus making it possible to generate up to 90,000 kWh per year. The port plans to consume around 80% of the generated electricity for its needs, powering the nearby onshore power supply facility and the terminal’s LED façade. The remaining portion will be fed to the grid. Together with the existing photovoltaic systems in the Ostuferhafen, the Port of Kiel already generates about 300,000 kWh/year of electricity from solar energy.

Second, Tallinn expressed its intention of establishing a green infrastructure hub. The Estonian seaport and its partners want to contribute to Estonia’s climate neutrality by creating infrastructure that would support the uptake of renewables, including wind energy and green hydrogen. Specifically, the Paldiski LNG terminal will house a hydrogen import & export facility with a 25k m³ storage (planned in cooperation with **Alexela**). Tallinn also wants its Paldiski harbour to become a service base for offshore wind farms, with wind energy used for producing hydrogen. Bunkering hydrogen or other green fuels will be possible at another of Tallinn’s harbours, Muuga. The port is also looking into using hydrogen for electricity generation for ships at berth. Tallinn also entered into a co-op with the **Port of Hamburg** to jointly develop a hydrogen

infrastructure value chain. Lastly, together with the Dutch Embassy and **Flux**, the Port of Tallinn conducted a study on the possibilities of using green hydrogen in the port sector. “The European Green Deal, ambitious climate goals and hydrogen strategy create a very good opportunity to build climate-friendly green infrastructure in Estonia with the support of the European Union. This would contribute to full transformation of the transport sector on the one hand and give a further boost to the renewable energy sector on the other hand, which will provide an incentive to produce green hydrogen, especially in the situations where there is a lot of cheap electricity at the market,” **Margus Vihman**, the Port of Tallinn’s CCO and Member of its Management Board, commented.

Other transport-related industries are also looking into greening their activities, hence decreasing their clients’ negative environmental impact. In September 2021, **Cargotec** said it will use SSAB’s fossil-free steel for producing its cargo handling equipment. The goal is to reduce the manufacturer’s upstream emissions, which account for over one-third of the company’s emissions. According to the parties, steel demand will rise in the future, requiring the development and use of fossil-free alternatives. “I am proud that we are paving the way in the cargo handling industry through commitment to using fossil-free steel and have this unique opportunity to work with a forerunner in fossil-free steel development. This is an important step towards our vision of becoming a leader in sustainable cargo flow,” **Mika Vehviläinen**, Cargotec’s CEO, said. SSAB’s President and CEO, **Martin Lindqvist**, also commented, “We are happy to welcome Cargotec as a partner for fossil-free steel products. Close collaboration with the development of a fossil-free value chain means we contribute to strengthening our customers’ competitiveness and to reducing their carbon footprint. Together, we also ensure the best solutions for end users.”

Before September’s end, Stena Line, the **Municipality of Frederikshavn**, and the **Port of Frederikshavn** launched a green project. The partners aim at making Frederikshavn-Gothenburg the world’s first fossil fuel-free ferry service of its kind. Specifically, Stena Line will deploy two battery-powered *Stena Elektra* ferries (by 2030) while the Danish associates – the necessary charging infrastructure. “Our ambition is to lead the development towards fossil fuel-free shipping and sustainable transport at sea. That is why we are investing in new technologies and various alternative fuels. We

are already ten years ahead of the international shipping industry’s target for reducing carbon dioxide emissions, but with *Stena Elektras* we are taking another big step on Stena Line’s sustainable journey, on the road to a completely fossil fuel-free operation [Stena Line plans to cut its carbon emissions by 30% by 2030 towards becoming fully fossil-free by 2050],” Stena Line’s CEO **Niclas Mårtensson** (who is also a Member of the Swedish Government’s Commission for Electrification), said. **Mikkel Seedorff Sørensen**, CEO, the Port of Frederikshavn, added, “The Port of Frederikshavn shares the high and green ambitions that make this project possible. The city has also shown that it has a unique capacity for change in its DNA, which is evident not least in its sustainability work. When we are now taking steps towards making the Gothenburg-Frederikshavn line completely independent of fossil fuels is not only positive for us, but for the entire Kattegat region.” *Stena Elektra* will be approximately 200 m-long, offering 3,000 lane metres of cargo capacity and room for 1,000 passengers across the three-hour-long Frederikshavn-Gothenburg crossing (with one hour turnaround call/charging time). She will feature around 60-70 MWh battery capacity, requiring a high voltage shore power cable of about 30-40 MW. Stena Line has already been operating the hybridised *Stena Jutlandica* across the service in question since 2018. Adding batteries made it possible to cut CO₂ emissions by 1,500t/year.

At the beginning of November 2021, news surfaced about plans to build a hydrogen production plant in Gothenburg. GPA and the Norwegian energy company **Statkraft** are investigating the set-up of a 4.0 MW facility in the Swedish seaport. The parties are conducting a preliminary study, expected to be completed at the beginning of 2022, chiefly focused on safety aspects. Once inked, the SEK60m (€6.1m) investment can be up and running in 2023, delivering two tonnes of hydrogen per day. “The Port of Gothenburg is Scandinavia’s largest port and as a hub for transport by sea, rail, and road, it operates a wide range of heavy freight-handling equipment. Hydrogen has the potential to replace fossil-based diesel for all these items of equipment,” **Arvid Guthed**, VP, Port Development, GPA, commented. He added, “We know there is already significant demand in and around the port for using equipment powered by hydrogen. A number of companies and organisations are ready and waiting, and we are convinced that local production of hydrogen would represent a breakthrough.”

Heading east of Gothenburg, **Rederi AB Gotland**’s subsidiary **Gotland Tech Development**, **Helios Nordic Energy**, **METS Technology**, and ABB received financial support to investigate the electrification of **Destination Gotland**’s ferries. The funds, SEK1.2m (€120k) granted through the **Swedish Energy Agency**’s **Energy Pilot Gotland** programme, will be used for studying the feasibility of replacing ship generators with batteries to provide electricity for aboard use by passengers, including charging e-vehicles. The project aims at reducing the carbon footprint of the ferries that link Gotland with the Swedish mainland by one-tenth. The vessels’ ‘power banks’ will be recharged during port calls from Helios Nordic Energy’s solar farms. The company’s Project Manager **Magnus Rahm** commented, “Electrifying large fast ships is a great challenge in itself due to the very large capacity requirements. But in this case, we are also dealing with the heavily constrained grid on Gotland. We’re now putting all hands on deck to assist Gotland Tech Development to see how our utility-scale solar parks and batteries combined can loosen the biggest knots on the transmission lines and contribute in the best way possible.” **Christer Bruzelius**, Project Manager, Gotland Tech Development, also noted, “An important step towards both fossil- and emission-free maritime transport is to start electrifying parts of the existing ferries’ energy systems.”

Also at the beginning of November 2021, the Turkish **Cemre Shipyard** was entrusted with building the new double-ended hybrid vessel for **Scandlines’ Puttgarden-Rødby** service. The 147.4 by 25.4 m ferry will offer about 1,200 lane metres of cargo capacity, plus room for 140 passengers. The newbuild is due for launch in 2024. Initially, the ship will be charged in Rødby (the charging option in Puttgarden will be added once Scandlines can procure green energy). The crossing will be covered in one hour by sailing on electricity only. The new ferry will be able to work in a hybrid mode, slashing the passage to three quarters. “Scandlines has for several years focused on the entire area of sustainability. The hybrid system was a quantum leap in green ferry operations. Scandlines not only operates the world’s largest fleet of hybrid ferries, the system is also being copied worldwide and has been a huge success. Now we are ready to take the next big step and insert the first zero-emission ferry. The next generation of ferries is ready to take over on the Puttgarden-Rødby route,” **Vagn Sørensen**, Chairman of Scandlines’ Supervisory Board, said.

DECARBONISATION / ONSHORE POWER SUPPLY

The first onshore power supply (OPS) news brings us back to 2021's start and Gothenburg, where another quay connected to the grid in February. Quay 712 at the **Ro-Ro Terminal** now offers high voltage (10.7 kV, 1.5 MW at 50 Hz) power supply. The new facility – which fulfils the ISO/IEC/IEEE 80005-1 2019 and IEC 6213-2, 2016, type J requirements – has the potential to cut the port's carbon emissions by 650t/year, according to GPA. "A growing proportion of our ships are being adapted to connect to shoreside power and it will become increasingly important for ports to offer a shoreside power option. The Port of Gothenburg has for a long time been at the forefront in this area, and DFDS has taken a positive view of the expansion that is currently taking place," **Poul Woodall**, Senior Advisor Climate & Environment, DFDS, commented (the company's *Flandria Seaways* was the first to make use of the new facility). Moreover, GPA is planning to furnish its Energy Port with OPS (scheduled for commissioning in 2022). As such, the Swedish port could be the first in the world to offer cold ironing to tankers in a hazardous area. Emitting some 2,100t of CO₂/year could be avoided thanks to this installation.

Also in February last year, Esbjerg connected a new OPS, capable of serving multiple ships simultaneously (the Danish seaport has already been offering shore power, but to smaller vessels only). The well-stimulation vessel *Island Patriot* became the first to draw electricity from the new 1,300

amp installation. "We want to contribute to reducing carbon emissions and promoting the green transition, and the ship's owners have put their money where their mouth is by investing a considerable sum in readying the vessel to connect to the new green power supply," **Flemming Copso**, CEO, **Copco**, a supply base company for *Island Patriot*, commented.

Fast forward a few months, and Europe's strongest OPS for cruise ships came online. The 20 MVA facility, located in Rostock-Warnemünde and completed in the summer of 2020, was used for the first time on 10 May 2021. The set-up makes it possible for two cruisers to concurrently draw electricity at the port's berths P7 and P8. The modular OPS has its components stacked inside twenty-foot containers. The installation includes an integrated frequency converter to transform shore electricity to accommodate all standard global shipboard power supply systems (50 and 60 Hz). The Rostock-Warnemünde OPS results from a 2018-initiated co-op between the **Hanseatic and University City of Rostock**, the federal state of Mecklenburg-Vorpommern, **Rostock Port**, and **AIDA Cruises**.

Next, in July 2021, cold ironing was inaugurated in **Nynäshamn**, with the Swedish ferry company Destination Gotland becoming the first to draw electricity from the shore in the **Ports of Stockholm's** harbour. The OPS investment totalled some SEK8.0m (approx. €780k). It will help the Ports of Stockholm to decrease quay emissions by 25% over 2019-2025.

In October 2021, another Swedish seaport, **Gävle**, announced it will also set up an OPS facility. Having received support from the country's environmental protection agency to combat climate change, the Port of Gävle plans to make vessels able to 'cold iron' at the energy harbour as of summer 2022. "It is a bit of a chicken and egg situation. We have followed the development domestically and internationally for a long time for the sectors we have in Gävle, namely container, bulk, project, and tanker traffic. It feels incredibly hopeful that shipping lines from the energy sector will now start preparing their newbuilds to draw power from the shore," **Niklas Hermansson**, responsible for traffic at the Port of Gävle, commented.

Also in October 2021, **Copenhagen's** first OPS went online. The facility, delivered in a 40-foot container by **Actemium** at DFDS' terminal on Dampfærgevej, was inaugurated by the shipping line's *Pearl Seaways* on 26 October. According to the project's technical advisor, **COWI**, DFDS ferries using cold ironing will reduce annual emissions by some 912t of CO₂, 18t of NO_x (1.6% of Copenhagen's overall vehicle traffic), and 400kg of particulates. DFDS' ferries sail between Copenhagen and Oslo around 700 times in a typical year. During the trial, from end-August to 25 October, CO₂ emissions were reduced by about 69t and diesel consumption by 154 m³. The 10 kV system, certified with IEC/ISO/IEEE 80005, can deliver 3.0 MVA, corresponding to approx. 2.7 MW. The DKK15m investment (€2.0m) was co-financed (20%) by the EU's Connecting Europe Facility (CEF). **Copenhagen Malmö Port** plans to provide additional shore power at its cruise facilities in the Danish seaport: at Ydre Nordhavn and Langelinie in Østerbro in 2024. "We are facing the green transition, which is enormously complex, and it is precisely partnerships and joint efforts such as this that are essential when we need to develop green, innovative solutions and move in the right direction," **Peder Gellert Pedersen**, DFDS' EVP and Head of Ferry Division, underlined.

Finally, the **Hansalink 2** project of the ports of **Lübeck** and Helsinki and the terminal operator **Lübecker Hafen-Gesellschaft mbH** (LHG) received CEF funding in March 2021. The €3.4m grant will be used for greening the parties' operations, including investing in cold ironing. Two berths in Lübeck-Travemünde's Skandinavienkai will be equipped with OPS, and two in Helsinki. Hansalink 2 will have been completed by June 2023 at the latest.



Photo: Rostock Port

DECARBONISATION / PORTS & OFFSHORE WIND ENERGY

Providing certain marine fuels and electricity follows the ‘what goes in, goes out’ pattern, meaning that the end product, say hydrogen, is as pro-ecological as the power used to produce it. **Or, as the World Economic Forum (WEF) colourfully puts it,** “Depending on production methods, hydrogen can be grey, blue or green – and sometimes even pink, yellow or turquoise – although naming conventions can vary across countries and over time. But green hydrogen is the only type produced in a climate-neutral manner [...]” According to WEF, green hydrogen “[...] currently makes up about 0.1% of overall hydrogen production, but this is expected to rise as the cost of renewable energy continues to fall.” Apart from offshore wind energy (OWE) powerhouses like Esbjerg, several Baltic seaports decided in 2021 to tap into the trend of making their harbours wind operations-friendly. That and coupling the venture with the potential of supplying future fuels as a bonus.

In mid-May 2021, Ørsted and the **Port of Gdynia** signed a letter of intent, seeing the two to work on, among others, developing Poland’s offshore wind industry. In detail,

the signatories plan to share knowledge, develop business cases, engage in research & development, and form applications for EU co-funded projects. Ørsted and the Polish state-owned **PGE** intend to install some 2.5 GW of capacity in the Baltic Sea. In total, Poland plans to have 8-11 GW of energy supply coming from offshore wind farms by 2040. “Ørsted [...] intends to invest actively in the development of Polish offshore wind energy. [...] Recognised as the world’s most sustainable energy company in 2021, we conduct our investments in cooperation with local companies and communities to ensure that offshore wind development benefits local economic development,” **Agata Staniewska**, Member of the Board, **Ørsted Polska OF Services**, commented. Following the decision of the Polish government, a part of Gdynia’s under construction Outer Port will function as the country’s OWE hub. That said, in the middle of June 2021, **Equinor** chose the Polish **Łeba** as its offshore wind energy operations & maintenance (O&M) port. The Norwegian state-owned multinational energy company acquired a site at the Port of Łeba to serve

as the base for OWE projects it develops together with **Polenergia**. Equinor will construct, own, and operate the base, which will support the Bałtyk I, Bałtyk II, and Bałtyk III investments. The decision resulted from Poland’s Energy Regulatory Office awarding contracts for difference to the Equinor and Polenergia’s Bałtyk II and Bałtyk III 50:50 JVs (1,440 MW of combined potential capacity; Bałtyk I, 1,560 MW, follows a different timeline). Equinor is the projects’ operator through the development, construction, and operations phases. The companies said that construction of the wind farms infrastructure could begin as soon as 2024. “We are making a long-term investment in Łeba as a future hub of offshore wind in Poland. We are committed to creating lasting local value through our projects in Poland, and the O&M base means jobs and investment for Łeba and the region. We are excited to contribute to a new chapter in the rich maritime tradition of Łeba and will continue to engage in a dialogue with all stakeholders as Poland’s offshore wind industry takes shape,” **Michał Kołodziejczyk**, Equinor’s Country Manager in Poland, commented.



Photo: Port of Esbjerg

Michał Michalski, President of Polenergia's Management Board, added, "We see our offshore wind projects as an important part of the transformation – not only energy-wise but also for the economies of Poland and Europe. Our goal for the projects development is not only reducing emissions and support energy diversification but to create additional jobs, bring a chance for many companies' modernisation, innovation and new competitive advantages of Polish industry as well. Therefore, together with our partner we have created a flagship program to support Polish wind energy industry development and now, while building supply chain for our offshore wind farms, we can implement them step by step. The first and a very important step on that path is selection of the port in Łeba to become operations and maintenance base for Bałtyk II and Bałtyk III projects."

At the end of August 2021, Rønne was selected as Baltic Eagle's installation base. **Iberdrola** and **Vestas** will use the Danish seaport for shipping 50 turbines of the V174-9.5 MW model for installation in German waters some 40 km west of Bornholm. The turbines will be pre-assembled and installed out of Rønne in 2024. Once online, the Baltic Eagle offshore wind farm will provide 476 MW of capacity. Coupled with Iberdrola's first German project, the 2017-launched 350 MW Wikinger, 45% of electricity consumption of the Mecklenburg-West Pomerania state will come from Baltic offshore wind. The two farms will make it possible to prevent emitting 1.65mt of CO₂ per year.

Then, in September 2021, **Mukran** was picked by **Ems Maritime Offshore**, **Vestas**, and **Parkwind** as the O&M base for the 257 MW offshore wind farm Arcadis Ost 1. A 1,800 m² facility will be set up in the German Baltic port from which 40

professionals will oversee the operations and maintenance of Arcadis Ost 1. Offshore installation works on the wind farm located northeast of the island of Rügen will begin in 2022. Once fully operational one year later, Arcadis Ost 1 will generate energy to power the equivalent of 290k households. Next, in November 2021, the **New Offshore Wind Ports in the Nordics (NOW Ports)** initiative won **Nordic Innovation's** Sea Meets Land Mobility Mission. Consequently, the consortium of 11 parties from Denmark, Norway and Sweden, including seaports, will get additional funding of up to NOK3.0m (ca. €300k) to prepare Nordic ports for the expanding offshore wind industry. Specifically, NOW Ports will develop an offshore wind alliance to act as an innovation advisory board for existing ports and industry players in the value chain. In addition, a new multi-purpose site concept for utilising port infrastructure and establishing an optimal supply chain model for supporting future offshore wind ports and sites will be created. The project parties also hope to inspire other regions to learn best practices from leading Nordic offshore wind ports and their supply chains. "As wind turbines are growing in weight and size, great demands are placed on new and existing offshore wind ports alike. In this project, eight Nordic ports and super sites will enter an innovative collaboration with offshore wind players, with a view towards upgrading, redesigning, and adapting existing facilities and decarbonising ports' infrastructure," Nordic Innovation underlined in its verdict. **Glenda Napier**, CEO, **Energy Cluster Denmark**, added, "Ports are key players in the offshore wind supply chain because those are the focal point of enabling commissioning and installation as well as operation and maintenance of offshore wind

farms. We need to get Nordic ports ready for the expanding offshore wind industry, and we need more collaboration and innovation across the Nordic countries. This project is an important step in that direction." The winning consortium consists of Energy Cluster Denmark, the **Norwegian Offshore Wind Cluster**, **OffshoreVäst**, **MARLOG**, **Eigersund Næring og Havn**, the **Wergeland Group**, **Westcon Helgeland**, the **NorSea Group**, and the ports of Rønne, **Karmsund** and **Trelleborg**.

To top the theme off, the Port of Esbjerg and **Valmont SM** entered into an OWE co-op in November last year. In detail, the two signed an agreement according to which the former will erect a wind turbine tower factory in the Danish seaport. The investment is scheduled for completion in late 2023. Valmont SM will use it to manufacture wind turbine towers for its client base, including **Siemens** and **Vestas**. "The Port of Esbjerg is a leading hub for offshore wind in Denmark and Europe, and we expect the market to grow strongly in the years ahead. Via Esbjerg, we'll get access to the markets in the UK, Germany and the Netherlands. In addition, the port has an efficient infrastructure that has attracted many other businesses as well, including service providers," **Niels Brix**, CEO, Valmont SM, underlined. The agreement forms part of Esbjerg's larger green master plan. In 2020, the Nordic infrastructure fund **Infranode** announced a DKK1.0b-big (approx. €130m) investment scheme, following which facilities for manufacturing and warehousing offshore wind components will be set up in the Danish seaport. "These investments will be implemented as producers of wind turbine components and service providers step up their activities," the Port of Esbjerg explained.

DECARBONISATION / AUXILIARY WIND PROPULSION

Last year brought several new contracts for the Finnish **Norsepower**, a developer of Rotor Sails, an automated auxiliary wind propulsion system. In short, the solution is a spinning cylinder that uses the Magnus effect to use wind power to thrust a ship. In January 2021, the company adapted its installation by making it tilttable. **SEA-CARGO's** side-door ro-ro **SC Connector** was outfitted with two 35 m-tall Rotor Sails that can tilt down and back up if the ship needs to sail under a bridge or a power line. According to the parties, up to 25% in fuel savings can be expected from the investment. Moreover, in favourable wind

conditions, **SC Connector** will be able to maintain regular service speed by sail alone. "Completing the installation has been extremely rewarding, as it reflects how, in taking a collaborative approach with a customer, we can innovate to create solutions that allow Rotor Sails to benefit almost any vessel type or trading route," **Tuomas Riski**, CEO, **Norsepower**, commented. He furthered, "As we get closer to 2030 IMO targets [CO₂ emissions reduced by at least 40% vs. 2008 levels], we are seeing our technology gaining momentum – with the market seeing the flexibility we can provide to suit different vessel requirements.

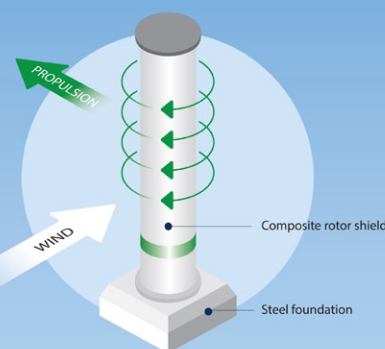
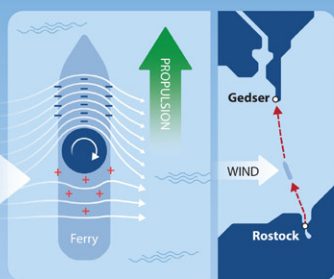
This installation demonstrates the technology can go a long way to future-proofing IMO GHG compliance, while ensuring significant emissions, and fuel reductions to a variety of vessel profiles today." **Ole Sæviild**, Managing Director, **SEA-CARGO**, shared his company's perspective, "We are focussing on utilising available renewable energy and using it for direct propulsion to design more environmentally-friendly vessels. The Rotor Sail technology has been proven in the market for a while, but the size is unique for our project. The sails are far more efficient than conventional sails of the same size and the tilting function

A ROTOR SAIL WIND POWERS SCANDLINES

THIS IS HOW THE ROTOR SAIL WORKS

- 1 The rotor sail uses the Magnus effect for propulsion.
- 2 When the wind meets the spinning cylinder, the air flow accelerates on one side and decelerates on the opposite side.
- 3 The difference in pressure creates a force that helps push the ship through the water. Thereby, the ship can reduce the use of the diesel generators and thus lower CO₂ emission by:

4-5 %



Scandlines HYBRID FERRY



Scan the QR-code to read about the Magnus effect.

Scandlines



Photo: Scandlines

is essential to our voyage routes.” He also announced, “Given the estimated emission savings, we will use our experience of this full scale project, and proceed to develop it further for other vessels in our fleet.”

In May 2021, Norsepower revealed that it will fit Vale’s VLOC charter with its Rotor Sails, the first dry bulk carrier equipped with the solution. The auxiliary wind propulsion system for the 325k dwt ore carrier, owned by **Pan Ocean Ship Management**, will comprise five 24 m-tall, 4.0 m in diameter, and tiltable rotors. “Norsepower has analysed the routes for the vessel chartered by Vale and estimates that its technology would be able to achieve an efficiency gain of up to 8% and a consequent reduction of up to 3,400 tonnes of CO₂ per year,”

said the Finnish tech company. **Rodrigo Bermelho**, Shipping Technical Manager at Vale, added, “If the pilot proves effective, it is estimated that at least 40% of the fleet will be able to use the technology, which would result in a reduction of almost 1.5% of Vale’s annual iron ore maritime transport emissions.”

After over one year of using the solution aboard *Copenhagen*, the ferry line Scandlines decided in autumn 2021 to equip her sister ship *Berlin* with Norsepower’s 30 m-tall and 5 m in diameter sail. The installation is scheduled for 2022. “We expected *Copenhagen*’s Rotor Sail to provide a 4-5% CO₂ reduction. That expectation has been met, so we have now taken the next step and prepared the sister

ferry *Berlin* for installation,” Scandlines’ COO, **Michael Guldmann Petersen**, said. He also underlined, “Our [Gedser-Rostock] route across the Baltic Sea is north/south bound, and the prevailing wind is from the west or east. In other words, our Rotor Sails have optimal conditions.” Tuomas Riski also commented, “We are delighted that Scandlines is expanding its use of our Rotor Sail technology after achieving its CO₂ emission reduction targets on its first vessel, *Copenhagen*. Our Rotor Sail technology is technically applicable to approximately 30,000 vessels in the current global fleet and we hope that this is a further signal to ship owners and operators that confidence is growing in wind propulsion technology.”

PORT DEVELOPMENT

Naturally, the Baltic port industry made strides in other fields than OWE or alternative fuels in 2021. For instance, in February last year, the Swedish **SCA** declared to invest nearly half a billion Swedish crowns in the **Port of Sundsvall**’s Tunadal harbour. With SEK460m (approx. €45.5m) put on the table for 2021-2024, the timber, pulp, and paper manufacturer will set up a new container terminal and other cargo handling areas. The facility, 100k TEUs of yearly handling, will serve

ships with a draft of 15 m (relative to today’s 12 m). The company also intends to build land south of the existing port to create new space for cargo handling. “SCA’s investments in the Östrand pulp mill, in addition to the ongoing investments in pulp production at the Ortviken industrial site, will more than double the volume of pulp to be shipped from the Sundsvall region. The increased volumes mean that the pulp will be delivered to new and more distant markets. The Tunadal

and Bollsta sawmills are also ramping up their production volumes,” the company listed. According to SCA, the volume of containerised trade (incl. pulp and solid-wood products) from the Tunadal harbour has more than doubled over the past five years. “This development has meant that we need to be able to handle larger volumes of containerised cargo than previously and be able to accommodate larger ships – both container ships and break-bulk vessels,” **Magnus Svensson**, President



Photo: Boskalis Terramare

Sourcing and Logistics, SCA, commented. He added, “With the expanded port, the combined terminal [three 650 m-long tracks, due for completion in 2024] being built by the Municipality of Sundsvall and the improved rail links to the Tunadal port, we will have a transport infrastructure that will move Sundsvall closer to the global export markets and the Scandinavian domestic market, thereby benefiting industry and trade across Northern Sweden.”

Also in February 2021, news broke out that the Swedish battery producer **Northvolt** will establish what it says will be Europe’s largest energy storage factory. The \$200m investment in Gdańsk – on the territory of the **Pomeranian Investment Centre**, near the **Port of Gdańsk** – will encompass a 50k m² facility, erected in two stages, with works on the first scheduled for commencing in autumn 2021. Initially, from 2022, the plant will have an annual output of 5.0 GWh of energy storage modules and packs, up to a total capacity of 12 GWh after completing the second phase. In addition to the production line, an engineering R&D centre of excellence will be created. The factory will receive its supply of lithium-ion battery cells from the Northvolt Ett gigafactory, located in Skellefteå (annual capacity of at least 32 GWh by 2024, with the potential to expand it to 40 GWh). The new factory will be powered with renewables, including on-site energy generation. “Securing battery cell manufacturing capacity in Europe is key to its industrial future, but what is equally critical is the industrial capacity for integrating cells into real-world solutions. It is this that the new factory will deliver – sophisticated, sustainable energy storage systems to support the transformation of Europe’s electricity grid and its industry,” **Peter Carlsson**, Co-Founder and CEO, Northvolt, underlined.

Next month, **APM Terminals Kalundborg** went live. The 50k m² container terminal, offering a yearly handling capacity of 50k TEUs, began operating in the Danish **Port of Kalundborg**’s Ny Vesthavn. The facility offers 500 m of berthing length and a maximum draft of 15 m. Quay operations are carried out using two 100t and one 150t of lifting capacity cranes. There are 100 reefer plugs in the yard. The terminal’s reachstackers and tractors run on gas-to-liquid fuel. “This solutions allows for the use of cleaner fuel in conventional diesel engines, practically free of sulphur and aromatics and producing significantly less smoke,” **APM Terminals** stated. The new facility has been included in Maersk’s feeder network, instead of the Port of Copenhagen, with two weekly rotations linking the Danish seaport with **Bremerhaven**, **Halmstad**, **Helsingborg**, **Aarhus**, and **Frederica**. “We are proud that Maersk as our first customer subsequently

has chosen APM Terminals in Kalundborg to serve as their main point of logistics in the Eastern part of Denmark. With Kalundborg, we see an opportunity to provide customers with a great service and an efficient and competitive product in a strong location which is well connected, accessible and closer to the industry and customers of the port,” **Dennis Olesen**, Managing Director Nordics, APM Terminals, said. **Stig Kirkegaard**, Country Manager Denmark of **A.P. Møller-Mærsk**, added, “Kalundborg is a port undergoing rapid development and investments and now also with APM Terminals as an operator, we see a great synergy in moving our business to Kalundborg. Also, Kalundborg is situated well to cater for our growth ambitions in Zealand and to manage our current customer base better and more sustainably.”

In June 2021, construction started on the **Port of Ust-Luga**’s gas & chemical



Photo: SCA



Photo: Port of Tallinn

complex. The investment comprises an LNG production plant with a yearly output of 13mt. The investors, **Gazprom** and **RusGazDobycha**, will also produce liquefied petroleum gas and ethane and pentane-hexane fractions. The annual production capacity of the chemical complex will amount to 6.5mt.

In July 2021, Tallinn's new cruise terminal was opened, with the port authority describing it as "the most modern and multifunctional terminal in the region." The Estonian seaport also said it took numerous steps during construction to ensure the environmental sustainability of the new terminal. Among other things, solar panels, designed to suit the Nordic climate, generate energy, while heating comes from a heat pump using sea power. "These decisions allow the facility to operate outside the cruise season – hosting events, concerts, and conferences," the port said. A new promenade was opened, too, connecting cruise guests from the terminal to the 'culture kilometre,' a direct walkway between the port and numerous historical and leisure areas (incl. the Patarei Sea Fortress, the Seaplane Harbour naval museum, and the seaside cultural area of Noblessner). "The new terminal makes the capital of Estonia and all the city has to offer more accessible – the aim is that all tourists leave with a safe and unforgettable travel experience and that cruise lines are able to reduce their environmental footprint by using environmentally-friendly port facilities," the Port of Tallinn added.

In September 2021, Gdynia's new Public Ferry Terminal was officially

commissioned, ready to welcome ships up to 240 m in length. The PLN292m investment (€63.4m), co-financed by the EU (PLN116.8m/€25.3m), lies closer to the open sea than the older terminal, making it possible to handle calls within two hours (from mooring to exiting the port). Also, Gdynia is Poland's first port to offer cold ironing (3.5 MW, 11kV, 50Hz/60Hz).

In November 2021, the construction of Farehamnen in **Varberg** started. The new harbour, offering 300 m of quay wall, is scheduled for commissioning in June 2024. The works kicked off by strengthening the future harbour's area with a 1.5-2 m-high layer of stones coming from the nearby tunnel construction. "It is an improvement for the town, the industry, and the port business. Now the port and the town can develop side by side. We get a unique opportunity to build a harbour from scratch and create optimal solutions for cargo handling for our clients and us," **Reine Antonér**, Chairman of the Board, the **Port of Halland** (governing the ports in **Halmstad** and **Varberg**), underlined. He furthered, "We see many possibilities with the new harbour, not only concerning sustainability. We are future-proofing the operations and moving into higher gear for electrification, automation, and digitalisation for what will become Europe's most modern forest products harbour."

Last in 2021 but certainly not least, Vuosaari's fairway became deeper. **Terramare** not only dredged **Helsinki's** cargo harbour from 11 to 13 metres but also finished the EU co-financed project on schedule and under budget. The works started in spring 2020 and were officially

completed on 30 November 2021, costing €26.5m (some €10m less than the original estimate). The project was granted 20% co-funding from CEF. "The biggest single factor contributing to staying under budget was that the Vuosaari contract was tendered at the same time as the City of Helsinki's Hernesaari dredging and filling contract, which made it possible to get a good bid for both. The chosen contractor, Terramare, also has high-quality equipment and experienced personnel, which make for efficient work," **Seppo Paukkeri**, Project Manager, the **Finnish Transport Infrastructure Agency**, explained. **Jukka Kallio**, VP Cargo, the Port of Helsinki, added in this regard, "In addition to the concurrence of the two projects, the contractor's previous experience in the construction of the Vuosaari fairway contributed to staying under budget." A total of 1.1m m³ of soil was dredged, and 800kt m³ of rocks were excavated. The latter was transported 21 km by sea to Hernesaari, where it will be used for reclaiming land from the sea for a tourism and leisure residential area, with port and industrial functions moving elsewhere. "The transport by sea significantly reduced lorry traffic on the streets of Helsinki. The solution replaced about 40,000 lorry loads and reduced fuel consumption by 1.1 million litres and carbon emissions by about 2,500 tonnes," **Mikko Suominen**, Land Mass Coordinator, the **City of Helsinki**, highlighted. Paukkeri also illustrated, "The Vuosaari fairway has the busiest vessel traffic in Finland. The dredging and excavation work had to be carried out in the fairway in such a way that large cargo ships could safely pass. Every week, we had a joint traffic meeting in which we went through the upcoming work with the pilots of the vessel traffic service, the shipping companies and the contractor and agreed on the rules to ensure safety. Although the work required additional signage and speed restrictions, all parties involved in the project were willing to be flexible and contribute to the safe implementation of the project." **Ramboll CM Oy** acted as the construction consultant and supervisor. The company also worked as the project's planner, geotechnical, risk management and environmental expert, safety coordinator, and was responsible for communications. Shortly, Vuosaari's buoy gate will be widened. Further works will be carried out in 2022 involving the deepening of the Kuiva Hevonen marina and the construction of a breakwater.

DIGITALISATION

The first major tech announcement took place in May 2021, when **Furetank's Fure Vinga** received Bureau Veritas' SMART notation – the first time the classification society awarded a full suite of smart ship notations. The tanker, designed by **FKAB** and built by **China Merchants Jinling Shipyard (Yangzhou) Dingheng**, is equipped with smart systems for monitoring the ship's hull condition (H) as well as integrated machinery (M) and navigation (N) systems. *Fure Vinga's* has optimised hull lines, a dual-fuel engine that can run on LNG and bioLNG, a battery pack for hybrid operations, and is fitted with a ducted propeller. The vessel's computer systems incorporate smart functions for collecting, transmitting, analysing, and visualising data to support the crew with informed decision-making to enhance safety and optimise operations and maintenance. The ship also complies with all tier one requirements included in Bureau Veritas' Rule Note Additional Service Feature SMART (NR675); hence it was granted the SMART (H1, M1, N1) notation. "The associated requirements have been specifically developed to set a benchmark for

the safe and reliable design and operation of smart systems on-board ships, covering both hardware and software, and includes extensive on-board system and integration testing," the classification society underlined. Bureau Veritas' Gijsbert de Jong added, "As the maritime industry continues its digital transformation journey, improving safety and minimising operational risk using smart technology for monitoring and decision support makes a lot of sense. Furetank has achieved this across the key systems of *Fure Vinga*, and the ship has become the first BV classed ship to be assigned the full suite of smart notations. This, in turn, provides the shipowner with an additional – digital – differentiator in the charter market." **Lars Höglund**, Managing Director, Furetank, also underscored, "We always have safety, quality and environmental care as our main priorities. This is why we equip our new vessels with the latest technology in order to be able to deliver the best possible performance to our clients. Our new generation of intermediate sized oil and chemical tankers get us to the next level in terms of on-board system integration. We are happy

to work with Bureau Veritas as they support innovative solutions with relevant classification notations and technical requirements, which set new standards in our industry." Also in May last year, the **Baltic Future Port** kick-started in Lübeck. The **Lübeck Port Authority (LPA)**, together with eight partners, now works on digitalising port operations by establishing a 5G network. To this effect, the **German Federal Ministry of Transport and Digital Infrastructure (BMVI)** granted the LPA €3.9m to furnish the Skandinavienkai and Seelandkai harbours with the latest-generation broadband cellular technology networks. The Baltic Future Port project's overarching aim is to provide real-time communication, thanks to which ro-ro operations will become more efficient, hence the overall handling capacity will increase. The initiative will run till end-2023. Apart from LPA, the consortium comprises **CDO, LHG, TraveKom, Baltic Rail Gate, Titus Research, TT-Line, the Technical University of Applied Sciences Lübeck**, and the **University of Lübeck**. In July 2021, another tech (and green) partnership was struck. The Port of Esbjerg



Photo: Tom Körber/Port of Kiel

and the IT company **Atos** are working on a solution to calculate the carbon footprint of individual routes and specific modes of transport. Once in place, the two expect customers will enter relevant data into the system (such as departure location, final destination, and type of goods) and will then be provided with an overview of the most optimal routes. Customers will be able to pick the ones with the lowest environmental impact while, according to the parties, also achieving a financial gain through lower excise duties. “It’s relatively easy to calculate the carbon footprint when you ship goods from A to B. But identifying the best option – in terms of both mode of transport and route – wasn’t so simple. We aim to be a carbon-neutral port and therefore would also want to have an influence on the route network. That’s why we came up with the idea of developing a system that would provide customers with an overview of the most climate-friendly routes,” **Dennis Jul Pedersen**, the Port Esbjerg’s CEO, explained. He went on, “The simulator that we’re developing will help our customers make green decisions, and there’s nothing like that anywhere in the world. We’re very proud to have pitched an idea that some of the best in the world find interesting and want to help us develop.” Just before August 2021 ended, Stena Line renewed and stepped up its IT co-op with **Surikat**, deciding to implement the latter’s Lynx software-as-a-service terminal operating system (TOS). The two began working together in 2016, with the initial task to simplify and digitalise the damage checks and claims handling processes across Stena Line’s European network. The product range grew until Surikat was supplying Stena Line with a portfolio of tools to aid the running of operations across their 20+ terminals in Europe. “We are very proud to extend our strategic partnership with Stena Line for five more years. Stena Line will now have access to the complete range of features offered in Lynx TOS, and Surikat will continue to benefit from Stena’s vast experience and expertise as they contribute to our ongoing roadmap and standard product development,” **Andreas Karlsson**, Surikat’s Director, said. **Carl-Johan Hellner**, Stena Line’s Chief Operating Officer, Ports and Digital Transformation, added, “The continuous digitalisation and automation of port operations is vital for both Stena Line and our customers’ success in the future. We continue to invest in Surikat’s system that enables us to improve the efficiency and streamline our processes in our ports and terminals, to improve the service to our customers.”

In mid-September 2021, Stena Line also introduced its in-house developed Artificial Intelligence (AI) Fuel Pilot fuel-saving tool aboard another ship, the *Stena Nordica* ferry plying between Gdynia and **Karlskrona**. Fuel Pilot is a decision-making support solution that combines data from different sources – including wave, current, wind, depth, given vessel’s specifics, and timetable – to propose the optimal speed to cut fuel consumption, hence emissions. “We are working towards reducing fuel consumption on board our existing ships while at the same time developing future technology, vessels, and fuels. It is a shining example of how we can combine modern AI technology with the huge nautical competence our seafarers have to jointly reduce our environmental impact,” the company’s Erik Lewenhaupt commented.

Remaining in Sweden, the Port of Gothenburg implemented the digital berth planner tool Allberth, developed by the Finnish **Awake.AI**, in early autumn. “We can now use the same tool to examine the safety parameters to determine whether a ship can moor at a specific berth, to position the ship, and to plan the time,” **Fredrik Rauer**, Traffic Coordinator and Project Leader for Berth Planner at GPA, explained. He furthered, “We can also show external parties the calls that have been coordinated with the terminal and the calls for which we only have an approved vessel notification. Without this status distinction, it will appear as if we have two or three moored vessels overlapping and an outsider would logically put this down to scheduling problems. With Allberth we can give mooring personnel, the ship’s agent, and the terminal the opportunity to act immediately on the information that we visualise in the application.” Allberth offers two-way integration – for in-house use by berth planning personnel at the Gothenburg Port and external use by the various parties involved in calls.

In September 2021, Awake.AI also won a tender to provide vessel schedule estimates in Finland. **Fintraffic**, a governmental organisation that controls and manages traffic in Finland, contracted the tech company to implement a new port call schedule system. The Port Call Time Stamp and Estimation Service are based on machine learning and AI data analytics. The forecasts are influenced by many factors analysed using global automatic identification system messages. In addition to automatic classifications, such as where a ship is coming from and where it is going, a ship’s estimated arrival time is

influenced by many variable factors, such as its speed and route, the weather, and the ice situation. By utilising machine learning, the service remembers what has happened in the past and how various factors have affected a ship’s arrival time. The AI learns the deviations for a particular locality and adjusts its calculations accordingly. “In practice, the new port call schedule service will provide the necessary APIs [application programming interfaces] from which port operators can obtain time data for use in their own systems,” **Kimmo Kummala**, Project Manager and VP of Engineering at Awake.AI, explained. The company also marked, “The service will first be introduced at Finnish ports, but can in practice be used anywhere. This offers global opportunities in a variety of sectors. Finland is a world leader in digital development, and activities such as the port call schedule service will ensure that Finland remains at the forefront of global digitalisation.”

To conclude the tech thread, at the beginning of December 2021, BMVI granted funds to establish and operate a digital test field in the Port of Kiel. As part of the **D-TECH-BASE** project, ro-ro terminals in the port’s Ostuferhafen and Schwedenkai will become test fields for new 5G communication and traffic control. The €1.75m worth project, to last until 30 June 2024, will see the set-up of a 5G campus network for fast data transmission, allowing for, among others, tagless optical unit tracking. A fleet management system is also planned, enabling the connection and scheduling of all terminal forklift trucks in real-time. Smart multimedia screens are also planned, displaying dynamic content, such as traffic guidance information imported from the gate operating system. As part of the work package for intelligent traffic control, more video scanning gates for trucks and trailers will be installed at both harbours. Gates for rail freight traffic will be erected for the first time. New camera systems with optical character recognition (OCR) will support transport unit data collection. OCR input will be compared with the port’s terminal operating system data to minimise distances and reduce mileage-related emissions. At the same time, the Port of Kiel partakes in the **Förde 5G** project together with the **Christian-Albrechts University of Kiel** and other partners. Within this initiative, IT systems will be developed on an industrial scale to promote tech-driven gains in tracking, cargo handling, and IT security (solutions developed within Förde 5G specifically aim at optimising storage, transfer, and retrieval processes).

LNG & bioLNG

The bio-version of LNG has been trending for at least two years, capitalising on its sustainability and circularity credentials relative to the 'vanilla' variant (the potential to reduce greenhouse gas emission of which is still a topic of debate). The Baltic gas-powered shipping sector was keen to give it a try, either as a blend or going full bioLNG bunkering. With all the rage about hydrogen and ammonia lately, LNG is persistent in its strive for carving out a greater market share.

Gasum saw the writing on the wall and in February 2021 said it will work towards scaling up the supply. The company intends to make 4.0 TWh of biogas available on the market from its own production and that of certified European partners by 2025. To deliver more biogas, Gasum will set up new facilities, among others, the industrial-scale manure-based plant (120 GWh/year) in the Swedish Götene, scheduled for completion by the beginning of 2023. The company also plans to build biogas plants in Borlänge and Kalmar in Sweden, and Oulu in Finland. Last year, two sites entered commercial production: Lohja (40 GWh) in Finland and Nymölla (75 GWh) in Sweden. Today, the company operates 17 plants through the two countries. In addition, Gasum is looking into producing other renewable gases in the Nordics

– synthetic methane and green hydrogen. Moreover, Gasum has set a goal of reducing its carbon footprint by one million tonnes. Apart from providing greater availability of biogas, the company will also reduce the emission intensity of its LNG and biogas production chains by 1%/year. "Biogas is a renewable energy source that can be produced from many kinds of biodegradable waste. Biogas production is a good example of fully utilising raw materials and promoting the circular economy. Circularity is further enhanced by the fact that nutrient residues arising as a by-product in biogas production can be returned to the food chain as a fertiliser or processed for industrial needs to replace mineral or fossil nutrients and fertilisers. The use of biogas as a fuel in road transport can help to reduce carbon dioxide emissions by up to 90% compared to fossil diesel," the company listed the benefits.

Also in February last year, Destination Gotland started bunkering more bioLNG, increasing the share in its bunker blend, supplied by Gasum, from one to ten per cent. The Swedish ferry line said that this move will decrease the company's footprint by some 9,000t/year of CO₂. "It is an extremely important step for us, and I'm proud and happy that we are contributing to the development of shipping

by reducing emissions. We are firmly committed to making Gotland traffic climate-smart, and by 2045, preferably much earlier, it will be entirely fossil-free," Christer Bruzelius, back then Destination Gotland's CEO, commented. He noted, "The price of biogas is still noticeably higher than that of natural gas, and the bunker changeover involves a big investment. The benefit of considerably reducing emissions, however, justifies it."

In April 2021, another news bit came around about Gasum. This time the company secured a bioLNG contract with the **Finnish Border Guard**. The first delivery took place on 1 April – from a plant in **Turku** to Helsinki, where it was used to bunker the gas-run patrol vessel *Turva*. Interestingly, the second shipment was delivered from Gasum's facility in the Norwegian **Risavika** to Finland's capital via the company's terminal in the **Port of Pori**. "The purpose of these deliveries is to test logistics and practicalities on board as well as demonstrate biogas as a renewable energy source in maritime transport," Gasum explained. Commander **Marko Aheristo**, Head of Ship Technical Unit, the Finnish Border Guard, commented, "We are happy to be forerunners in environmentally friendly shipping practices. Through these test deliveries we will expect to gain more experience



Photo: Gazprom Neft



Photo: Damen

on using biogas and to support further our efforts to reach the carbon neutrality goals Finland has set for 2035.” **Jacob Granqvist**, VP Maritime, Gasum, added, “Gasum has supported the Finnish Border Guard’s LNG-fuelled offshore patrol vessel *Turva* since the beginning of her operations, and now we are very happy to continue this journey with bioLNG deliveries. Using biogas alongside with LNG in marine transport is a new step forward in decarbonising the shipping industry and we are looking forward to completing more successful trials with biogas in the near future.” Later, in August 2021, Gasum also won a governmental maritime LNG supply contract. The Finnish central purchasing body **Hansel** chose the company in a competitive tendering process, which will see LNG delivered

to the Finnish Transport Infrastructure Agency and the Finnish Border Guard. The 2021-2022 framework agreement includes an option for two more years.

In June 2021, the sea trials of **Gazprom Neft’s** LNG bunkering vessel *Dmitry Mendeleev* were completed ahead of the ship joining the company’s fleet in the second half of 2021. The 100 m-long and 19 m-wide *Dmitry Mendeleev* offers 5,800 m³ of storage capacity, providing bunkering services in the Baltic Sea (chiefly to *Marshal Rokossovsky*, **Rosmorport’s** dual-fuel ro-ro set to connect the ports of Ust-Luga and **Baltiysk**). The vessel has the Arc4 ice-class, meaning she can sail independently through 80 cm thick ice. The ship’s digital system makes it possible to control *Dmitry Mendeleev* by a single crew member directly from the navigation bridge.

In October 2021, another gas bunkering vessel started operating in the Baltic. The Tallinn-based **Infotrar** investment company took delivery of *Optimus*, afterwards chartered to **Eesti Gaas’ Elenger**. The 100 m-long, 1A ice-class ship features two type-C tanks for storing up to 6,000 m³ of LNG. *Optimus* was constructed at **DAMEN Shipyards Yichang** and completed her gas trials at the **DAMEN Verolme Rotterdam** ship repair yard. The construction of *Optimus* was backed through CEF. The vessel has replaced the tank trucks used for bunkering **Tallink & Silja Line’s** *Megastar* cruise ferry. She will also bunker the shipping company’s *MyStar* set to enter traffic in spring 2022. Elenger also has pre-agreements for LNG supply to other shipowners and operators.

WAREHOUSE LOGISTICS

Despite the coronavirus pandemic, or maybe in some instances thanks to it, trade across the Baltic Sea region wasn’t short of breath last year. Specific segments (think e-commerce) kept regional logistics going robustly, especially across the Nordics. Perhaps that is why many news items about setting up new warehouses and logistics centres cropped in 2021, particularly across Sweden. Finally, yet importantly, the greening trend has also become the game’s name in warehousing. First, in mid-January 2021, DSV started erecting a new logistics centre near Stockholm. The 68k m² warehouse in Rosersberg, north of the Swedish capital, also comprises 5.0k m² of cross-docking area, plus office space. “With the new site, we can offer automated robotic storage combined with narrow aisle racking and thus a very efficient and competitive utilisation of the general warehouse space. The capacity

is almost twice that of a conventional warehouse,” **Ian Swinhoe**, Managing Director, **DSV Solutions AB**, highlighted. **Brian Winther Almind**, EVP, Group Property and Smarter Storage, DSV, commented on the eco-friendliness of the investment, “We are always looking for sustainable solutions when building new sites. The buildings will be DGNB [the German Sustainable Building Council] certified, 80% of the materials can be reused, solar panels on the roof will provide a large part of the electricity required for the operation and the building’s expected lifespan is minimum 50 years.”

Next, in February 2021, DFDS leased a new 34,560 m² warehouse in Borås, around 70 km east of Gothenburg. The facility was built by the property developer **CH Square** from whom DFDS rented the warehouse for ten years, with an option to extend the agreement after the initial lease period. The new

facility will help DFDS to expand its contract logistics offering.

In summer, the Port of Gothenburg and **Castellum** formed a 50/50 JV to develop Halvorsång into a logistics hub. The partnership aims to facilitate planning, development, and construction at Halvorsång, an approximately 270k m² plot, with 155k m² reserved for building space. The area lies north of the Port of Gothenburg’s container terminal and the adjacent oil depot, next to the Hisingsleden bypass. The parties expected to kick off the construction works in autumn 2021, with commissioning planned after four years. Castellum’s initial investment will involve acquiring a 50% interest in the land at an estimated cost of around SEK400-450m (about €39.5-44.5m), with a further development investment of SEK550m (€54.3m).



Photo: DSV

Also in the summer of 2021, the **Municipality of Eskilstuna** started planning a new area for logistics and industry, situated north of the existing intermodal terminal. The Gunnarskäl park will cover 310 ha, possibly including storage for sun-harvested hydrogen, and feature a 5G network. Talking about Eskilstuna, a new tenant decided to enter **Eskilstuna Logistikpark**. The construction company **Bockasjö** will furnish a 29k m² logistics centre for the e-commerce company **GardenStore Nordic**. The new facility will come online in February 2023. Its environmental credentials will be verified according to the sustainability validation & certification system **BREEAM**. Bockasjö intends to reach the Excellent mark thanks to, among others, making the facility draw electricity from its own solar panels. The French multinational **GEODIS** also opened a warehouse in Sweden. The 16k m² facility in Arendal began operating on 1 December 2021 to provide contract logistics

throughout the country. GEODIS offers warehousing and distribution services through it, including receiving goods to a warehouse management system, inventory storage, pick and packing, case palletisation, value-added services, returns processing, quality control, and distribution. The fast-growing retail and e-commerce verticals are the core businesses served. "The GEODIS Freight Forwarding business has been long-established in the country and our traditional customers have been calling for an extension to our services. We will draw on our well-established contract logistics operations capabilities throughout Europe and around the world to help our customers to achieve their ambitions for business growth. It's the ideal stepping-stone for GEODIS growth in Sweden," **Thomas Kraus**, GEODIS' President & CEO North, East and Central Europe, commented. Coming full circle, in November 2021, DSV announced it would invest in 20 large-scale multi-user automated warehouses across

Europe, North America, and Asia-Pacific. The facilities, based on **AutoStore** technology with goods-to-person automated workstations, will be part of the company's larger campuses. The DSV Fulfilment Factories will be connected on a 'string,' meaning that one company can have stock placed in multiple warehouses across regions or continents while at the same time having a unified stock overview. The interconnectivity system will automatically choose the product at the warehouse closest to the delivery point. Four facilities are already operational (in Kolding, Oslo, Helsinki, and Venlo), and six are underway (Northamptonshire, Duisburg, Barcelona, Toronto, Stockholm, and Copenhagen). The remaining ones will be erected in North America and Asia-Pacific in the coming few years. "With DSV, Fulfilment Factory companies do not need to be multinational to get automated, competitive and efficient warehousing," **Ronald Poort**, EVP, DSV, underlined.

WASALINE & FINNLINES' NEWBUILDS (AND VIKING LINE'S, TOO)

To top Baltic transport 2021 highlights, let's look at the newest ships that sport the green and tech fashions.

First, before the end of summer 2021, **Wasaline's** *Aurora Botnia* was christened and ready for her first crossing. The naming ceremony took place in the ferry's homeport of the Finnish **Vaasa** on 25 August. The €120m-worth newbuild, constructed by **Rauma Marine Constructions (RMC)**, went for her first round-trip between Vaasa and the Swedish **Umeå** on Saturday 28 August (initially, she was expected to enter traffic in May 2021, but the yard had to fight off corona). The 150 by 26 m gas-run (LNG/bioLNG) ferry offers room for 800 passengers and 1,500 lane metres of cargo capacity. The ferry can also connect to OPS. According to the company, she is "[...] the first car and passenger ferry in the world to meet the criteria of the Clean Design class notation." **Peter Ståhlberg**, Wasaline's CEO, also highlighted, "*Aurora Botnia* is the most environmentally friendly large ro-pax ferry in the world, and its degree of domestic origin exceeds 80 per cent." **Jyrki Heinimaa**, RMC's CEO and President, added, "We've had a wonderful opportunity to build such a magnificent vessel, which is totally unique even from a global perspective. I would like to thank the client for their excellent cooperation, which has

enabled us to successfully complete the project, despite the very challenging conditions." Another modern thing about *Aurora Botnia* is that it offers high-speed Internet via **AecorLink's** microwave system (a long-distance shore-to-ship, satellite-free connection, the previous version of which was also available aboard Wasaline's previous ferry, *Wasa Express*).

A bit earlier, in April 2021, **Finnlines'** *Finneco I* was launched. The first in a series of three brand-new ro-ros was floated out at the Chinese **Nanjing Jinling Shipyard**, expected to begin connecting Finland with the Bay of Biscay at the turn of the year. The 238 m-long and 34 m-wide freighter, sailing under the Finnish flag, offers 5,800 lane metres of cargo capacity. Additionally, her car decks have a capacity of 5,800 m², while the weather deck – room for 520 TEUs. As such, the company says, *Finneco I* can take up to 300 trailers, 150 cars, and half a thousand containers per sailing (about 38% more freight than Finnlines' current largest ro-ros, the Breeze-class vessels). The ships – *Finneco II* and *III* will be delivered in 2022 and serve the company's traffic between Finland, Sweden, continental Europe, and the UK – feature lithium-ion batteries (for zero-emission port visits), solar panels, and an air lubrication system for cutting their carbon footprint. They

are also equipped with scrubbers to sail within the Sulphur Emission Control Areas and have the 1A Super ice-class to call to north Baltic seaports without icebreaker assistance. Together with two under construction ro-paxes, the Finneco series forms Finnlines' €500m-big Newbuilding Programme. "We are constantly renewing and developing our fleet and the upcoming hybrid ro-ros as well as eco-efficient Superstar ro-paxes are a next step in the evolution of Finnlines' fleet. These new vessels will increase our cargo and passenger capacity significantly. Together with our connections we can meet the needs of our customers better. Our eco-sustainable new vessels will serve our customers, and communities where we operate, long into the future. More than ever, our economies rely on dependable transport links and we are committed to ensure vital sea freight operations in a sustainable way," **Emanuele Grimaldi**, CEO, Finnlines, highlighted.

In October 2021, construction started on Finnlines' second new Superstar. Steel cutting began for *Finnscanopus*, the second in a series of two ferries to be delivered by **China Merchants Jinling Shipyard** (Weihai) in 2023. The 1A Super ice-class ro-pax will be 235 m-long, offering room for 1,100 passengers and 5,200 lane metres of cargo capacity. Together with her sister



Photo: Kvarken Link



Photo: Viking Line

ship, *Finnsirius*, *Finncanopus* will sail on the **Naantali-Långnäs-Kapellskär** service. Both will connect to shore power and feature several other emission reduction solutions, including scrubbers, waste heat recovery, a battery pack, and air lubrication. They will also have ballast water treatment systems. To conclude, **Xiamen Shipbuilding Industry** handed over the cruise ferry *Viking*

Glory to **Viking Line** just before year-end. The 222.55 by 35 m vessel, offering room for 2,800 passengers and 1,500 lane metres of freight capacity, is on her way from China to start serving the Turku-Åland Islands-Stockholm route as of March 2022's beginning. Alike other Baltic shiny new ferries, also *Viking Glory* will boast several green tech solutions: Wärtsilä's 31DF dual-fuel

gas (LNG/bioLNG) engines, Norsepower's Rotor Sail, waste heat recovery (but also cold recovery, as the first in the world), dynamic air conditioning and lighting system, and ABB's Azipod propulsion. "It is estimated that the ship will consume up to 10% less fuel than *Viking Grace*, which is smaller and was hailed as the world's most eco-friendly ship of its time," the ferry line underlined.



Photo: Finnlines