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Climate change is the defining issue of our time and ports, like many other players in the heavy lift shipping and project logistics sector, will need to invest to keep up with the new world order.

An interesting report published by American Geophysical Union (AGU) found that the footprint of ports and terminals will need to expand by up to 3,689 sq km worldwide in the next three decades to cope with the combination of rising sea levels and increasing demand.

The study modelled trade growth and port demand through to 2050 under four combinations of climate policy interventions and global temperature increases. All scenarios led to increased traffic through ports, requiring the doubling or quadrupling of port areas compared with the study's baseline year of 2010.

It seems that the majority of developments in the port sector are, and will continue to be, intrinsically linked to environmental policy.

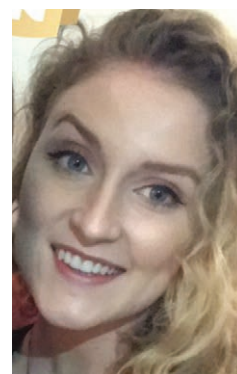
This trend is demonstrated in the pages that follow, with wind energy featured heavily as both an immediate buffer to the economic impacts of Covid-19 and a potential growth area for post-pandemic recovery, thanks to a number of governments putting renewables at the centre of stimulus packages.

On pages 12-15, we take a look at the growing number of ports in Europe, Asia and North America that are investing in facilities specifically geared to supporting offshore wind farms, and the logistics challenges facing ports looking to enter the floating wind market.

This year's supplement also delves into the developments at ports in Europe (pp 4-11), the Middle East (pp 16-17), the Americas (pp 18-24), Africa (pp 26-28) and Australia (p 36).

Aside from being the cornerstone of international trade and globalisation, "ports are centres of innovation", said one industry commentator in our report on smart port technology (pp 30-34) – an accolade that places the sector in good stead to rise to the climate change challenge, and overcome the current crisis.

Sophie Barnes,
News editor



The front cover of HLPFI's Ports & Terminals supplement shows: using both of its Liebherr mobile harbour cranes in a 'tandem-pick operation', the Port of Longview expertly unloads wind tower sections at its Berth 6 facility.

Tender green shoots at the pandemic's mercy

The effects of the Covid-19 crisis have certainly had an impact on the European port sector. The first signs of recovery are now visible but will be dependent on whether the pandemic can be contained.



Earlier this year, Bonn & Mees coordinated the discharge of a vessel hull in the port of Rotterdam using five sheerleg cranes. The hull measured 135 m x 22.8 m and weighed 2,300 tonnes.

Total throughput at the port of Antwerp in Belgium fell by 4.9 percent in the first half of the year compared with the same period of 2019. The breakbulk segment, according to the port authority, had already been experiencing the adverse effects of global trade issues since mid-2019.

Speaking during June at Antwerp XL's first webinar in its 'Summer of Breakbulk' series, which looked at global trends and the economic impacts of Covid-19 on the breakbulk sector, Wim Dillen, international development manager at the Antwerp port authority, spoke of the long and winding road to recovery that the sector faces. "This is not the first crisis and it will not be the last that we face," he said, adding that the breakbulk community is confronted by several suffering sectors.

While some are expected to rebound in the first quarter of next year, Dillen acknowledged that others would feel the impacts for a lot longer. Oil and gas, for example, is forecast to be highly vulnerable for some time. The automotive and steel industries are other sources of breakbulk contracts that are not expected to rebound fully until later next year.

For some ports, however, activity is on the up. The port of Amsterdam is home to a number of general cargo terminals, many of which are active in high and heavy, breakbulk and ro-ro cargoes. According to Ants Tilma, commercial manager at the port authority, the gateway is seeing an increase in this type of activity "due to the construction of several wind farms

This is not the first crisis and it will not be the last that we face... the breakbulk community is confronted by several suffering sectors.

– Wim Dillen, port of Antwerp

inshore and near shore". Tilma added: "We also see an increase in high and heavy and ro-ro because of building activities – houses and infrastructure projects are still increasing."

The port said that it invests in new quay infrastructure every year and one terminal has adjusted its discharging area to load and store wind energy components, such as blades. Other developments in Amsterdam include the construction of one of the largest locks in Europe at the entrance of the North Sea Canal at IJmuiden.

Giant lock gates

Construction began in January 2016 and has seen what are claimed to be the largest lock gates in the world arrive at the port – weighing 3,000 tons (2,721.6 tonnes) and measuring 72 m wide by 24 m high and 11 m thick.

The new 500 m-long lock will enter service in early 2022. Once complete, the port of Amsterdam will be accessible 24 hours a day.

In the future, the port's activity in the heavy lift market will be dependent on the wind energy industry and offshore projects. "There is a lot of ambition to build wind energy parks in the coming years," Tilma explained.

Preparing for a continual increase in cargoes from this industry, the Ministry of





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Infrastructure and Water Management, the Province of North Holland, the Municipality of Velsen, Tata Steel, IJmuiden Seaport and port of Amsterdam signed a partnership agreement that will see the parties transform a dredge sludge depot near IJmuiden, located at the former Averijhaven, into an operational base to support the construction of wind farms in the North Sea. It will have an area up to 15 ha and 600 m of quayside.

“With this development, Amsterdam-IJmuiden will grow into a hub for offshore production, installation and maintenance,” added Tilma.

Stable volumes

At the port of Rotterdam, Covid-19, the resulting economic slowdown and decrease in oil price have led to a slight drop in breakbulk activity, according to Twan Romeijn, business manager breakbulk at the port authority, although he acknowledged that this business segment has remained “rather stable”. Romeijn attributes this to the diverse breakbulk portfolio that is present within the port of Rotterdam – steel, non-ferrous metals, heavy lift/project cargo and forest products.

“There has been a decrease in demand for steel products but an increase in demand for pulp, which is used for hygienic purposes, and increasing stocks of non-ferrous products – these non-ferrous metals plants [such as aluminium operations] continue to produce, although demand from some industry segments, such as the automotive sector, is falling,” explained Romeijn.

He continued: “For heavy lift and project cargo, there has been a delay in projects but the volumes have stayed fairly consistent.”

A big driver of cargoes for Europe’s largest seaport is the wind energy sector. The port’s terminals regularly handle monopiles and jackets for the offshore wind industry, and blades and tower sections for the onshore segment. Its advantageous location and heavy lift capabilities also enable the port area to be a hub for oil and gas-related project cargoes, such as gas turbines and jackets, as well as equipment for the construction of newbuilds in the shipping industry.

Looking ahead, Romeijn said that the outlook for the heavy lift and project cargo market is heavily dependent on how the Covid-19 situation unfolds, and the severity of any second wave of infections. “Nevertheless, delayed projects will eventually take place – it is a matter of time.”

In recent years, Rotterdam’s facilities have benefited from investments and initiatives that boost its heavy lift and breakbulk capabilities. In 2018, four Rotterdam-based



The port of Blyth in the UK has recorded its largest heavy lift to date – the movement of a 516-tonne floating tidal turbine. The Thompsons of Prudhoe and Port of Blyth decommissioning partnership, in collaboration with Mammoet, completed the tandem operation using two crawler cranes.

companies – Metaal Transport, Broekman Project Services, JC Meijers and RHB Stevedoring – agreed to redevelop 12 ha of industrial estate and 1,155 m of quay at the port’s Waalhaven area.

As part of the initiative – known as the breakbulk carousel – the Port of Rotterdam Authority will renovate the sites and port infrastructure, which will give the four companies space to transfer and develop some of their breakbulk operations. Environmental legislations, among other issues, have delayed the progress of the initiative but preparations for the new area have been made; Romeijn said that construction is expected to start in the first quarter of 2021.

Positive outlook

Overall, Romeijn is optimistic: “I believe that the port of Rotterdam will maintain its strong position in the heavy lift/project cargo industry due to the many terminals, shipping companies, expertise and hinterland connections that we offer – we do our utmost to facilitate the industry and ensure it can continue doing business in Rotterdam.”

Port Atlantique La Rochelle in France will also benefit from European wind energy projects; for the next 18 months the Anse

For heavy lift and project cargo, there has been a delay in projects but the volumes have stayed fairly consistent.

– Twan Romeijn,
Port of Rotterdam Authority

UK NEWS in BRIEF

Funding for Great Yarmouth

The Port of Great Yarmouth – part of Peel Ports Group – will receive GBP6 million (USD7.8 million) of funding from Norfolk County Council to establish an offshore energy operations and maintenance site. The site will be located at the entrance of River Yare and will provide access to offshore wind projects in the southern part of the North Sea.

Energy park progresses

Work has begun at Northumberland Energy Park Phase 1 in Blyth, enabling the construction of a new dock, which is being funded by a GBP32 million (USD37.5 million) public sector investment. The works are set to be completed by May 2021.

Blyth boosts infrastructure

The port of Blyth has embarked on a GBP3 million (USD3.75 million) redevelopment project at the Bates Terminal site. The quay will be rebuilt and strengthened, and 1 km of road is being installed to improve access.

Tyne investment under way

The port of Tyne authority will invest nearly GBP10 million (USD12.9 million) in the Tyne Dock Enterprise Park to support the offshore wind energy sector. As part of the investment, the port has reclaimed 30 acres (12.14 ha) of land.

Aberdeen eyes expansion

In Aberdeen, the harbour board has issued further contract awards to the value of approximately GBP4.3 million (USD5.6 million) in support of the South Harbour expansion project.

Saint-Marc terminal will be used as a storage hub for monopiles and transition pieces for France's biggest commercial-scale offshore wind farm at Saint Brieuc.

Under development off the north-west coast of France, the 496 MW offshore wind farm is being constructed and operated by Iberdrola's affiliate Ailes Marines. With an investment to the tune of USD2.7 billion, the project is expected to start construction in 2021 and complete in 2023.

In addition to wind energy components, La Rochelle handles a range of oversize cargo including coils, oil and gas equipment and yachts. The deepsea port has 360 m of quay that is heavy lift certified for 6 tonnes per sq m; 6.6 ha of yard space available for heavy lift parcels; and easy road access for exceptional convoys. Soon, the port will also benefit from 250 m of quay space that is certified for 15 tonnes per sq m.

Anthony Velot, marketing and property manager at the port authority, said that "traffic results have remained steady for the last three years, handling more than 20,000 tonnes per year". In terms of its infrastructure, Velot added: "The port of La Rochelle has already invested in access roads and adapted gates for the increasing size and quantity of oversized cargo transiting the port. As part of the expansion plan – Port Horizon 2025 – the port is planning to build a new wharf at the Chef de Baie terminal for multipurpose operations."

Brexit issues

Across the English Channel, there are plenty of port developments in the UK as the nation transitions out of the EU. Its gateways hope to capitalise on the booming wind energy industry (see panel on p7). Nevertheless, cargo volumes have felt the effects of international lockdowns and economic fallout of the pandemic.

In the south-east of the UK, project and breakbulk activity at Port of Dover Cargo's terminals "has been disappointing since Covid-19 began", said Nik Scott-Gray, general manager. "Cargoes that we had anticipated have been delayed," he added. "Hopefully, the return of the construction industry plus some business normality will see some of the promised projects return."

In December 2019, Dover's GBP250 million (USD318 million) terminal opened its doors after five years of construction. The port had seen an expansion in its customer base, with new and existing customers making use of the various features of the new facilities, including an additional multipurpose berth.

Scott-Gray said the port's cranes, water depth and infrastructure are ready for the



Port Atlantique La Rochelle in France handling wind energy cargoes.

Thierry Rambaud

(eventual) upturn in the market.

With Covid-19 taking centre stage for much of 2020, discussions over the future trading relationship between the UK and the EU continue to drag. The likelihood of a trade deal that suits both parties being agreed by the end of this year feels increasingly remote.

There is a lot that can change before then, and the UK's port sector is on the front line when it comes to connectivity with the EU.

Even before the pandemic, adapting to a significant change in the terms of trade with the EU would have been an uphill battle.

The country is moving ahead with plans to establish up to ten free ports in a bid to support logistics supply chains. The UK hopes to confirm the position of the new zones at the end of this year so they can open for business in 2021.

Free port status is no silver bullet,

however. There are a number of other Brexit-related concerns that need to be addressed. During June, the EU's ambassador to the UK said that the bloc has no plan to reciprocate the UK's decision to offer traders a six-month phased transition of the revised importing arrangements – meaning full Customs controls and checks on goods from the UK will be imposed from 2021.

Frontier delays

The news spurred on predictions that there would be significant frontier delays. The British International Freight Association (BIFA) has raised its concerns over the capability of the Customs brokerage sector to increase capacity, at a time when the sector already faces a huge shortage of suitable staff; it is thought that thousands of additional Customs experts are required to keep up with demand.

A package announced by HM Revenue & Customs does aim to accelerate the growth of the UK's Customs intermediary sector through funding for employee training and IT improvements.

However, BIFA director general Robert Keen questioned whether there was enough time for the companies that manage cross-border trade between the UK and EU to make the necessary preparations to facilitate the revised arrangements.

As part of the expansion plan – Port Horizon 2025 – the port of La Rochelle is planning to build a new wharf at the Chef de Baie terminal for multipurpose operations.

Anthony Velot,
Port Atlantique La Rochelle

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The port of Tarragona assisted with the assembly of a syncrolift, which measured 150 m long and 30 m high.



Spain's port priority strategy stabilises project volumes

Covid-19 has had minimal effect on the movement of project cargo through several Spanish ports, enabling infrastructure works to continue.

Project cargo at the port of Tarragona remains stable despite the fallout from the Covid-19 pandemic, said port authority commercial director Genoveva Climent. She attributes this to the fact that most projects it is supporting were booked or started before the crisis hit.

The port, Climent continued, also benefits from its close location to the largest chemical cluster in southern Europe, with the likes of BASF, Dow Chemical, Repsol and Cepsa all having facilities in the area. This means the

port regularly handles project cargoes relating to the energy sector, “specifically from the petrochemical, chemical and gas industries. For example, refinery components and cooling tanks,” added Climent.

Slight reduction

“We did see a slight reduction in heavy cargo activity for a number of weeks due to working restrictions enforced by the Spanish government,” explained Climent. “However, since ports were considered strategic, project cargo activity has recovered

to the expected numbers for 2020, but with some delay in their schedule.”

In Spain's southern Andalusia region, the port of Seville recorded significant growth in its project cargo shipments, with a 312 percent increase in oversize cargo volumes from January to July 2020 compared with the same period of 2019. The main goods moved through the port have been wind turbine towers for both onshore and offshore projects; metal bridges and other infrastructure; transformers; and heavy machinery. For the most part, these



pieces have been manufactured in Seville's Shipyard Industrial Estate.

In northern Spain, the port of Bilbao is also home to several OEMs. Wind energy companies such as Haizea Wind, Lointek, Navacel and Vicinay Cadenas manufacture parts on the port quays and ship them all over the world, while other manufacturers – Siemens Gamesa, Acciona and Sakana, for example – use the port as an export hub.

Cargo volumes

In 2019 the port handled 4,099 'special parts', including units weighing up to 500 tonnes and other components measuring 70 m long. Within that cargo mix, 142,000 tonnes of wind turbine components passed through the port last year.

Despite Covid-19 slowing many projects around the world, the port has kept up pace in the first half of 2020 and handled 2,295 special consignments – an 11 percent increase on the same period last year. In total, 96,711 tonnes of wind energy cargoes flowed through the port, including engines, rotors, blades and other equipment, which

represents a 23 percent increase on the same period for 2019.

Developments in wind energy show no sign of abating. Rather, the sector looks set to embark on an upward trajectory. The port referenced the approval of measures in Spain that promote the transition towards a 100 percent renewable electricity system which, according to the Port Authority of Bilbao, removes barriers to the massive deployment of renewable sources.

Aligning itself with the growing wind energy market, the port authority is embarking on a number of initiatives to solidify Bilbao's position as a hub for the sector.

Earlier this year, the port authority and the Provincial Council of Bizkaia approved a plan to create up to 11 lay-by areas on the N-240 highway, which links Tarragona to Bilbao. The stop zones will be located between Zeanuri and Bedia and will be able to accommodate specialised vehicles; the widths of the lay-bys will range between 5.5 m and 13 m, while the lengths will be between 107 m and 243 m.

Main transport route

According to the port, the N-240 is widely used by special transport vehicles and is the main route between companies that manufacture heavy components.

Meanwhile, the port has been busy creating more land for logistics and industrial use; works on the first phase of the new central quay have been completed, creating a new surface area in the port in excess of 300,000 sq m, with a 1,100 m-long berthing line.

Further development works in this area will be conducted in three stages. The first, covering 201,399 sq m, has just been awarded EUR8.5 million (USD10 million) in funding, with an eight-month completion period.

Works for the extension of Dock AZ-1, which will generate 50,000 sq m of new surface area and a new berthing line of just over 200 m, will be tendered out this autumn.

In Seville, development is also under way. During June, the port relaunched five public tenders for enhancement projects, including

We did see a slight reduction in heavy cargo activity for a number of weeks due to working restrictions enforced by the Spanish government.

–Genoveva Climent, port of Tarragona

The ports of Seville and Bilbao have both reported strong volumes during 2020, with wind energy cargoes comprising a large part of their respective volume increases.

the expansion of the Muelle de Armamento (Armament Pier). The project, according to the port, will enable the facilities to handle large structures. The works will include an extension of the dock by approximately 19,000 sq m.

Meanwhile, the Port Authority of Valencia is investing EUR135.9 million (USD152.6 million) in the facilities at the port of Sagunto and will begin studies into a possible third dock.

The investments will support the development of railway access and beach tracks that will connect the facilities of Parc Sagunt with the port, and the central and southern port areas for loading and unloading operations.

A border control post will be operational by the end of the year; funding has also been earmarked for either a bulk warehouse at a new terminal on the northeast quay, or for the next tender of the multipurpose terminal on the centre quay.

State-of-the-art infrastructure

In Tarragona, the port has state-of-the-art infrastructure in terms of berths, quays and land access – as well as a qualified and competitive workforce capable of handling heavy lift projects. It has a 280,000 sq m area dedicated to project cargo, 11 ro-ro ramps and a range of lifting equipment with capacities up to 140 tonnes.

The largest investment related to its project cargo handling capabilities, according to Climent, is the development and commercialisation of the Logistics Activity Zone (LAZ), which will span 900,000 sq m and is expected to be operational in 2021.

The works will increase the port's land area by 20 percent and add 500 m of quay access, "meaning new opportunities for industries related to the oversized cargo sector", added Climent.

Looking ahead, Climent noted that the port has "several lines of development" in terms of heavy cargo activity and it expects there to be "a growth and diversification in projects handled at the port".

Offshore wind turbine jacket foundations produced by Bladt Industries at Lindø port of Odense.



Investors scramble to catch wind energy boom

A growing number of ports in Europe, Asia and North America are investing in new facilities specifically geared to supporting offshore wind power projects. *Phil Hastings reports.*

Energy industry observers suggest that ports and terminals around the world will need to significantly invest in their facilities if the sector as a whole is to effectively service the anticipated future growth in renewable power, particularly in Asia.

Current investment in additional port facilities to handle offshore wind projects is being driven primarily by three factors – a continuing increase in the size of turbine components; the ever-larger number and scale of the wind farms; and the expansion of installation locations.

Another significant driver of investment over the next few years is the anticipated development of commercial floating wind farm operations, which have some different logistics requirements to those of traditional fixed installations.

Ole Haugsted Jørgensen, sales manager for Lindø port of Odense in Denmark, affirmed the need for more port investment to handle larger turbine components. The port's current involvement in that sector includes providing a base for the nacelle production of MHI Vestas Offshore Wind, the foundation production of Bladt

Industries, and the testing facilities of Lindø Offshore Renewables Centre (LORC).

"The increasing size of wind turbine components is placing greater demands on facilities and areas for production and storage to service that sector," he stated.

"To meet those needs, we are seeing more and more ports investing in a huge expansion of their areas as well as new and better facilities. Ports have opened their eyes to the business potential of the wind sector and are in sharp competition with each other to offer the best conditions for production and warehousing."



The latest major investment in this context by Lindø port of Odense involves a 400,000 sq m expansion of its terminal facilities for handling offshore wind activities. That development, which is due to be completed by the end of this year, will boost the port's total site area to 3.9 million sq m.

Manufacturing location

Jørgensen outlined the background to that investment and a series of other offshore wind-related developments by Lindø port of Odense over the last few years. "It is evident that the production and supply chain for the coming generation of wind turbines should be located at ports due to the sheer size of the components, as well as the final product," he commented.

Elsewhere in Europe, Dutch minister of infrastructure and water management, Cora van Nieuwenhuizen highlighted the need for further significant port investment earlier this year. "The large-scale construction and maintenance of sustainable wind farms in the North Sea requires more port capacity," she stated when commenting on a decision to go ahead with the redevelopment of a dredging depot near the Dutch port of

IJmuiden as an 'energiehaven' (energy port) to service the industry.

Located on the seaside of the North Sea Canal, next to the IJmuiden lock complex, the energy port will support, for example, the construction of the Hollandse Kust West and IJmuiden Ver wind farms, said the port of Amsterdam authority.

Tata Steel is allowing land access to the energy port through its site in Velsen North. The company is also providing 5 ha of industrial estate. With Tata Steel's area, as well as the existing acreage of the Averijhaven, the public port area will cover more than 15 ha.

The port of Amsterdam and IJmuiden Seaport will be responsible for the commercial operation of the energy port, on behalf of the other partners.

The increasing geographical expansion of the offshore wind energy industry and the resulting need for new specialised port facilities to service such projects is highlighted by developments in Taiwan.

Earlier this year, for example, the port of Taichung authority reported the completion of the first of five wharves, Wharf No 106, currently being constructed or renovated to "actively support the construction of Taiwan's expanding offshore wind farms and, eventually, service their ongoing operational and maintenance needs".

Built at a cost of around USD40 million and "soon to be put into service receiving wind turbine parts and materials and shipping out assembled turbine components ready for



Ports have opened their eyes to the business potential of the wind sector and are in sharp competition with each other to offer the best conditions for production and warehousing.

– Ole Haugsted Jørgensen,
Lindø port of Odense

The large-scale construction and maintenance of sustainable wind farms in the North Sea requires more port capacity.

Cora van Nieuwenhuizen,
Dutch government

installation", Wharf No 106, includes a total waterline length of 450 m, an operating water depth of 16.3 m and a load-bearing structural (wharf) width of 33 m.

"To meet the needs of jack-up vessels, the seabed – in an area extending 200 m beyond both ends of the wharf and 60 m outward from the base line – has been sufficiently reinforced to permit turbine installation vessel anchor loading operations up to 90 tonnes per sq m," added the port.

Japanese growth

Elsewhere in Asia, Japan is also expected to see significant investment in additional infrastructure at some of its ports and harbours over the next few years to service an anticipated major expansion of offshore wind operations.

However, according to a report titled *Offshore Wind in Asia: Recent Developments and Future Opportunities*, published by UK-based international law firm Ashurst, Asia as a whole requires much more investment.

"Port capacity and location is a common challenge that must be overcome in the development of offshore wind in Asia," warns the report.

"Relevant port facilities will need to be upgraded in many countries in order to ensure that the ports, which will be used for the development and maintenance of wind farms, are capable of handling the vessels and heavy loads that accompany the construction of an offshore wind farm."

Worldwide, some ports will also need to invest in additional facilities specifically designed to handle components for new-generation commercial floating wind farm projects.

One example is Brest in the Brittany region of northwest France, which is already pushing its case as a potential base for handling floaters (large floating foundation structures) for planned future floating wind farms in the Atlantic Ocean off the western/southern coast of Brittany, the first of which is expected to start construction in 2025/26. These types of projects could also generate support service business for a second Brittany port, Lorient, which is close to the targeted installation sites.



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An aerial view of the recently finished port of Taichung wharf No. 106.

Lucile Hérítier, director of ports for the Brittany region, described some of the different logistics challenges such projects could present: “The difficult nautical conditions in the Atlantic mean that the floaters for such installations will have to be very big to provide the necessary stability for the turbines to operate and that creates particular construction issues,” she explained.

Floating investments

“If you have a very big dry dock, you could build a floater there and when it is completed, open the gates to allow the water in and let it float. However, the floaters being looked at for the next generation of floating wind turbines will be 100 m wide and the biggest dry dock in Brest at the moment, which is also one of the largest on the Atlantic coast, is 80 m wide so it would not be suitable for such work.”

In the light of those limitations, continued Hérítier, large new-generation floaters would therefore have to be assembled on land, but that would then present a challenge when it came to actually getting the units into the ocean.

“You could use a very heavy crane capable of lifting the floater and putting it in the water, but right now the maximum weight any such crane can lift is about 3,000 tonnes and we already know that the floaters planned for the Atlantic will be heavier than that, so maybe using cranes will not be feasible or cost-effective,” she said.

“Another potential solution is to launch the floater from the land via a quay onto a very large barge, but then you are faced with the challenge of how to manage that operation when you have as big a tidal range as you have on the Atlantic coast – in Brest, for example, it is about 8 m. You would need

to have a huge barge which could ballast very quickly so it could be kept level during the loading operation. Right now, such a barge does not exist.”

A third option, suggested Hérítier, would be to construct a slipway to allow the completed floater to be slid into the water. “However, that would be fixed infrastructure for a specific operation and very constraining for the port.”



The floaters... for the next generation of floating wind turbines will be 100 m wide and the biggest dry dock in Brest at the moment, which is also one of the largest on the Atlantic coast, is 80 m wide.

—Lucile Hérítier, Région Bretagne

Terminal construction

More immediately, Brest is constructing its Marine Renewable Energy (MRE) terminal to handle traditional fixed installation offshore wind turbine components, while Lorient is looking to develop as a service hub.

The new Brest terminal will eventually include 400 m of quay, a 100 m-wide handling berth and 40 ha of industrial land, primarily to service the fabrication of jackets for fixed offshore turbines. Some of the landside development has already been completed but the dredging and construction of the marine facilities is currently subject to a delay.

Meanwhile, it has been confirmed that Brest will undertake work on some of the 62 jackets being manufactured by a joint venture between Spanish shipbuilder Navantia and Spanish multinational wind tower manufacturer Windar Renovables for a new 496 MW fixed offshore wind farm in the bay of Saint-Brieuc, France, due to start installation next year.

HLPFI

Historic pact with Israel heralds new opportunities

Covid-19 inevitably emerges as a theme across the Middle East. Nevertheless, ports and terminals in the region do have reason to be cheerful. Felicity Landon reports.

The UAE and Bahrain signed an agreement in mid-September to establish diplomatic relations with Israel, news that was welcomed as a possible historic turning point in the Middle East.

Dubai Ports World (DP World) was quick to follow up with its own announcement – that DP World and Dubai Customs will be exploring opportunities to develop trade links between Israel and the UAE.

DP World signed a series of memoranda of understanding (MoU) with Dover Tower – a company owned by Shlomi Fogel, the co-owner of Israel Shipyards and the port of Eilat. These cover an assessment by DP World of the development of Israeli ports and free zones and the potential establishment of a direct shipping route between Eilat and Jebel Ali; trade promotion and facilitation through Customs best practice and innovative processes; and Drydocks World exploring business opportunities with Israel Shipyards on a joint venture for developing, manufacturing and marketing ISL products. Also, a DP World-Israel Shipyards joint venture is planning to tender for privatisation of the port of Haifa.

In another intriguing development, the UAE minister of energy and infrastructure Suhail Bin Mohammed Al Mazrouei and Yuval Steinitz, Israel's minister of energy, met to discuss ways of reinforcing the



Mina Zayed has an extensive equipment asset base.

bilateral ties between the UAE and Israel in the energy and infrastructure sectors, particularly in renewable energy.

The UAE Energy Strategy 2050 aims to increase the contribution of clean energy in the UAE's total energy mix from 25 to 50 percent by 2050, and reduce the carbon footprint of power generation by 70 percent. The UAE's plans include investment to the tune of AED600 billion (USD163.4 billion) by 2050 to meet growing energy demand and ensure sustainable growth with an energy mix combining clean energy, gas, clean coal and nuclear.

The two ministers also discussed strengthening cooperation in oil and gas.

Any or all of this could, of course, lead to shifting and new demands for heavy lift and project cargo movements across the region's ports and terminals.

Green aspirations aside, the oil and gas

sector continues to dominate project cargo handling activities, for now.

Among those that are busy and expanding is Abu Dhabi Ports, which handles project cargo across its numerous ports including Zayed, Khalifa, and Musaffah port and free port.

Leading operator

"Abu Dhabi Ports is today one of the leading operators for project cargo movements in the Middle East," said Saif Al Mazrouei, head of ports cluster at Abu Dhabi Ports. "Since its inauguration back in 1972, Zayed port has been an integral logistics hub for multiple Abu Dhabi National Oil Company (ADNOC) projects. Most recently, the port has been instrumental in supporting the operations of ADNOC Offshore and ADNOC Onshore."

Mina Zayed has an extensive equipment asset base consisting of tugs, heavy lift trailers, lowbeds, forklifts, truck-mounted cranes and mobile harbour cranes, Al Mazrouei added. In the case where heavy lift cranes are required, Abu Dhabi Ports outsources the units from a third party.

In the coming year, Abu Dhabi Ports will see a significant increase in its general capacity and heavy lift cargo capability with the completion of three major expansion projects.

The UAE's plans include investment to the tune of AED600 billion (USD163.4 billion) by 2050 to meet growing energy demand and ensure sustainable growth with an energy mix.



ICTSI's Basra Gateway Terminal at Umm Qasr port.

This includes the ongoing work at Mugharra port located in the Al Dhafra region, as well as the South Quay and Khalifa Port Logistics development at Khalifa port. "Altogether, the total development covered across all three projects will add more than 6.6 km of new quay wall and will significantly increase our general cargo capability," explained Al Mazrouei.

Enhanced capacity

"The expansion project at Mugharra port is aimed at enhancing the port's capacity to cater to the evolving needs of the region's oil and gas offshore sector, with the creation of a dedicated 480 m quay wall and six ro-ro ramps. As a result, the port's design and specification take into consideration heavy lift, breakbulk, wet, and dry bulk cargo movements."

In 2019, 657,000 freight tons of project cargo was handled across Abu Dhabi Ports, including but not limited to generators, oil country tubular goods (OCTG) and line pipes, turbines, demethanisers and heavy lift modules. This was within a total throughput of 22 million tons, including 12 million tons of bulk cargo and 2 million tons of steel products.

The past year, however, has been challenging for many industries. Al

Mazrouei added that many sectors have experienced significant drops in volume and an overall slowdown. "At Abu Dhabi Ports, we are proud of how we have managed to weather the crisis with minimal disruption to our operations. Thanks to our robust business continuity strategies, implemented in the early stages of the Covid-19 pandemic, Abu Dhabi Ports is moving forward steadily despite the challenges and continues to perform its vital role as a key facilitator of global trade."

And there is optimism for the year ahead: "Despite the global economic slowdown in the wake of the Covid-19 crisis, we anticipate continuing our steady year-on-year growth in terms of performance," said Al Mazrouei.

To the north, International Container Terminal Services Inc (ICTSI) Iraq is anticipating a slight slowdown in project

cargo flows, due to lockdowns in countries where items are being sourced.

ICTSI has invested USD280 million in the development of Umm Qasr port's infrastructure, cargo handling equipment, training, terminal operating system and ISO certifications. Last year it inaugurated two new berths, providing 500 m of quay with a 14 m draught, 200,000 sq m of storage area and new road connections to the highway.

Top project sectors

Marko Miskovic, oil and gas project development executive, said the main sectors generating project cargo were power, oil and gas exploration, development and production, petrochemicals, refineries and industry-related cargoes such as cement factories.

Recent projects have been handled for the Ministry of Industry, Ministry of Power (various power plants), Basra Gas Company, Petrochina, CNOOC, Siemens, General Electric, ENI, Basra Refinery, Karbala Refinery and Exxon.

Umm Qasr is capable of handling and receiving any kind of project cargo, with berth capacity up to 800 tons (725.7 tonnes), said Miskovic. "There are no limitations in terms of berth draughts, berth capacities, yards, warehouses and connecting roads out of the port. With proper planning, we can handle all types of projects." **HLPFI**

Despite the global economic slowdown in the wake of the Covid-19 crisis, we anticipate continuing our steady year-on-year growth in terms of performance.

– Saif Al Mazrouei, Abu Dhabi Ports



NWSA specialises in ro-ro cargo, handling mostly construction-related equipment but also agriculture and mining equipment.

Wind energy cargoes counteract breakbulk gloom

Ports across North America are reporting mixed results. Some are feeling the impacts of the protracted US-China trade war and the economic fallout from Covid-19, while others are enjoying healthy volumes of wind energy cargoes.



Our cargo is derived from strategic partnerships with key ro-ro ocean carriers...

– Andre Elmaleh, NWSA

At the ports of Tacoma and Seattle on the USA's Pacific Northwest, the Northwest Seaport Alliance (NWSA) has felt the dual impact of the USA's trade dispute with China and Covid-19's impact on the production and sales of construction and agricultural equipment, said Andre Elmaleh, NWSA's senior business development manager. Breakbulk volumes are down approximately 37 percent year-on-year.

When asked how the market for heavy and oversized cargo handling will develop in the next 12 months, Elmaleh considered: "With the fluidity of the global pandemic and the trade dispute, it is difficult to predict activity in the breakbulk sector for that length of time."

The ports specialise in ro-ro cargo, handling mostly construction-related equipment but also agriculture and mining equipment. "Our cargo is derived from strategic partnerships with key ro-ro ocean carriers and our geographic location, which makes us uniquely suited for serving the transpacific trade," said Elmaleh.

Port upgrading

Not to rest on its laurels, NWSA has been busy upgrading its cargo-handling capabilities by replacing older, environmentally unrated equipment with Tier 4 emissions vehicles, including a new yard tug and forklift. "We also expect to take possession of two new reachstackers in the next few months. This investment will increase our in-house lifting capability by 47 percent," explained Elmaleh. "Additionally, the versatility of the reachstackers will allow us to handle different types of cargo [with odd dimensions] previously prohibited by the top picks."

In Florida, Port Canaveral has also invested in its equipment fleet and took delivery of a USD6.2 million Liebherr 600 mobile harbour crane during 2019. With an 18-container reach, a lifting capacity of 154 tons (139.7 tonnes), and a jib length of 190 ft (57.9 m), the crane is the largest of its type in the USA, said port authority CEO Captain John Murray.

It was specifically built to lift rocket boosters and other heavy cargo, and complements the port's recently completed North Cargo Berth 8 (NCB8) – a new multipurpose berth that is currently being extended by 120 ft (36.6 m).

Murray explained: "With the port experiencing unprecedented demand for bulkhead space, coupled with rapid economic growth in Central Florida and a burgeoning commercial space industry right here on the Space Coast, NCB8 ensures we



North Cargo Berth 8 ensures we have the ability to meet the increased demand for diversified cargo-handling capabilities, while keeping us well positioned for the future.

– Captain John Murray,
Canaveral Port Authority

have the ability to meet the increased demand for diversified cargo-handling capabilities, while keeping us well positioned for the future."

The port is also renovating and rebuilding North Cargo Pier 3 (NCP3). The USD37 million, two-year project was awarded a USD14.1 million grant from the US Department of Transportation Port Infrastructure Development Program and has a USD14 million funding commitment from the State of Florida Department of Transportation.

Space operations record

So far in 2020, the USA's space programme has kept Canaveral's new crane and berth busy, due to an increased space launch cadence. Indeed, April was a record month for mobile harbour crane utilisation for space operations.

These operations are forecast to increase further, with the expansion of the space programme expected to result in growth in commercial space cargo. Canaveral is poised to benefit and said that more launches are scheduled in the coming months.

Another sector that has been, and is expected to be, somewhat shielded from the economic effects of the pandemic is the wind energy industry. Already, ports on the US West Coast have positioned themselves as hubs for developments in this arena.

Earlier this year, the port of Longview authority noted that imports of wind energy

Port Canaveral took delivery of a USD6.2 million Liebherr 600 mobile harbour crane during 2019.



components, as well as steel shipments and soda ash exports, helped it exceed its 2019 budget projections.

The budget projected lower revenue resulting from global market conditions that had adversely affected several grain products. While overall tonnage came in lower than anticipated, a diverse cargo mix helped offset the reduction in tonnage at the Export Grain Terminal (EGT) at Berth 9, said the port.

Turbine blades

At the port of Vancouver USA, meanwhile, wind turbine blades for the Golden South wind energy project in Canada have been arriving at the port onboard G2 Ocean vessels since late April.

"During the Covid-19 pandemic, the port continues to operate to keep the supply chain and commodities moving," said Julianna Marler, port authority ceo, in May. "The port has proven our unique ability to handle these types of large projects," she added. "Customers know our heavy lift mobile cranes, acres of laydown space, highly skilled workforce and dedication to renewable energy make the port of Vancouver the perfect port for receiving wind energy components."

To the north, changes are afoot at Fraser Surrey Docks, which in February 2020 was acquired by DP World.

The acquisition was first announced during 2019, when the Dubai-

headquartered port operator entered an agreement with Macquarie Infrastructure Partners (MIP).

As a result of the transaction, DP World said that it had added the largest multipurpose deepsea marine terminal on the West Coast of North America to its portfolio – complementing its Canadian footprint, which also includes terminal operations in Vancouver, Nanaimo, Prince Rupert and Saint John. The integrated coast-to-coast platform provides customers with bulk, breakbulk and general cargo services.

Sultan Ahmed Bin Sulayem, group chairman and ceo of DP World, said: "DP World has been seeing growing demand from our customers for multipurpose facilities in the region and we believe Fraser Surrey Docks has the relevant infrastructure and is in the right location to service this demand. We are confident that our innovative approach will bring DP World's best-in-class terminal operations to Fraser Surrey Docks."

We are confident that our innovative approach will bring DP World's best-in-class terminal operations to Fraser Surrey Docks.

– Sultan Ahmed Bin Sulayem, DP World

Founded in the early 1960s, the terminal operates more than 1,200 m of berth, 189 acres (76.5 ha) of yard space and is one of the region's major steel import terminals.

Ports on the US East Coast have seen relatively steady project cargo volumes and, despite market upheavals, the offshore wind energy sector is encouraging large-scale investments into handling infrastructure here too.

The US state of New Jersey released plans to construct a purpose-built marshalling and manufacturing port dedicated to this sector in Salem County. Named New Jersey Wind Port, the facility would be located close to some 50 percent of the USA's offshore wind lease areas on the eastern seaboard.

Wind energy capacity

New Jersey aims to have 7,500 MW of offshore wind energy capacity installed by 2035. Governor Phil Murphy said that to meet this goal, the state must be as ambitious in building out its energy infrastructure. The port "is one way that we will position our economy for growth as we emerge together from this pandemic", said Murphy.

The New Jersey Economic Development Authority (NJEDA) is leading the development and construction could begin during 2021, taking place across two phases. The first would see a 25 acre (10.1 ha) manufacturing site and a 30 acre (12.1 ha)



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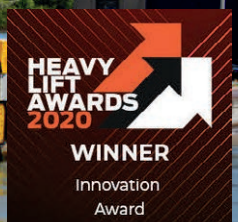
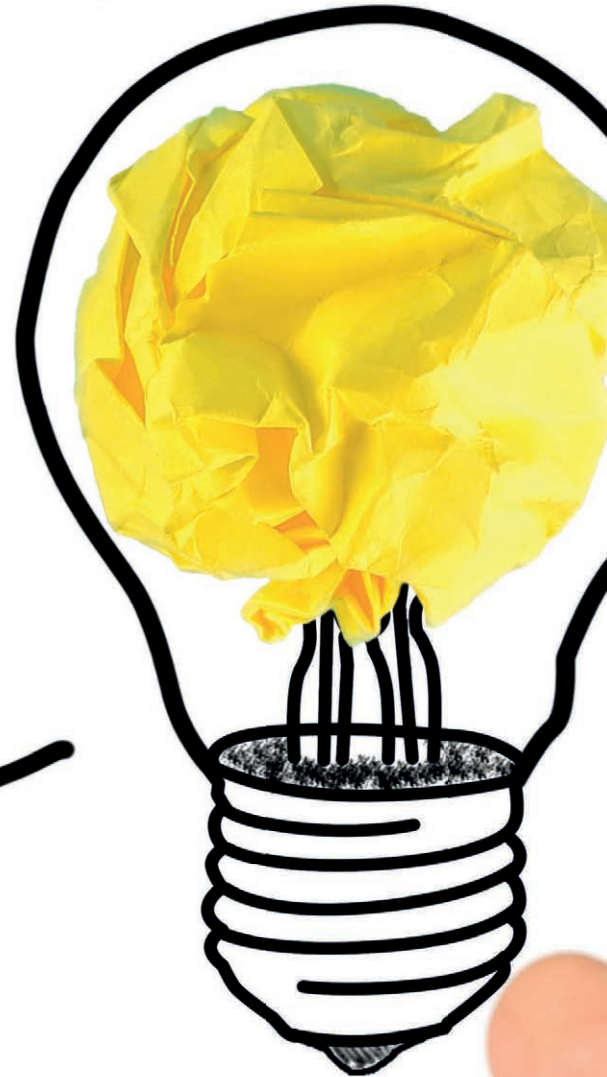
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marshalling yard come online in 2023 – in time to support the first round of New Jersey and East Coast projects.

The first phase includes: dredging from the Delaware River channel; the construction of a heavy lift wharf with a dedicated delivery berth and an installation berth that can accommodate jack-up vessels; and an overland heavy haul transport corridor.

Phase two would expand the marshalling and manufacturing space by a further 160 acres (64.7 ha). Parcels are expected to become available between 2024 and 2026.

Also supporting the state's ambitious clean energy goals is South Jersey Port Corporation's (SJPC) Paulsboro Marine Terminal, which opened in 2017. The second phase of the terminal's construction is scheduled for completion in 2021, at which point it will be equipped with three berths on the Delaware River and a barge berth on Mantua Creek.

Paulsboro has already handled millions of tons of steel since opening and will support the offshore wind energy sector.

Offshore wind projects

While New Jersey lays claim to planning the first greenfield, dedicated wind energy hub, a similar operation is already under way at the port of Virginia, where renewable energy company Ørsted has leased approximately 2 acres (0.8 ha) of land at the existing Portsmouth Marine Terminal (PMT) as a staging area for its Coastal Virginia Offshore Wind (CVOW) project with Dominion Energy.

The lease will run through to 2026, during which time Ørsted plans to install nearly 3,000 MW of wind energy projects in the USA.

Similarly, the New Bedford Marine Commerce Terminal in Massachusetts will serve as the primary staging and deployment base for the construction and installation of the Vineyard Wind and Mayflower Wind projects.

Constructed and operated by the Massachusetts Clean Energy Center (MassCEC), the New Bedford Marine Commerce Terminal is a 29 acre (11.7 ha) heavy lift facility designed to support the construction, assembly and deployment of offshore wind projects, as well as handle bulk, breakbulk, container and oversized marine cargo. The lease agreements, worth approximately USD32.5 million, will see the facility support the offshore wind energy projects from 2023 into 2027.

Already reaping the benefits of North America's wind energy revolution is the port



of Duluth-Superior. Wind energy cargoes arriving at its Duluth Cargo Connect facilities are contributing to one of the port's strongest years ever for breakbulk cargo, said Deb DeLuca, executive director of the Duluth Seaway Port Authority, and Jonathan Lamb, president of Duluth Cargo Connect.

"Both 2020 and 2021 are expected to be strong years for the wind energy industry and our cargo volumes reflect the trend of increasing renewable energy development throughout North America's heartland. Duluth Cargo Connect set a single-season freight tonnage record for wind energy cargo in 2019, and that record will likely be eclipsed in 2020."

Indeed, wind energy components are the primary oversized cargoes transiting the port this year, a trend that Duluth Cargo Connect expects to continue. As North America's furthest inland seaport, Duluth-

Superior is uniquely situated and equipped to serve as a multimodal hub for the transport of oversize/overweight cargo throughout North America's hinterland.

"With wind farm development expanding across the American Upper Midwest, Great Plains and Canadian prairies, Duluth emerged as the most economical, most efficient multimodal hub for receiving and dispatching those oversize/overweight wind energy cargoes," explained DeLuca and Lamb.

Significant investment

In order to ensure its facilities are capable of handling these heavy and oversized cargoes, the port has significantly invested in the Duluth Cargo Connect terminal in the past several years; since 2015 more than USD27.5 million of capital investments have been pumped into terminal infrastructure and handling equipment. This includes rehabilitating a historic 28-acre (11.3 ha) dock, creating two new Seaway-depth ship berths and adding on-dock rail.

"Additionally," DeLuca and Lamb continued, "we have added a new road through the terminal to smooth traffic flow, and a new scale and truckers lounge. We have also expanded and enhanced the CN Duluth Intermodal Terminal with added rail and paved storage areas.

Our cargo volumes reflect the trend of increasing renewable energy development throughout North America's heartland.

– Deb DeLuca, Duluth Seaway Port Authority
– Jonathan Lamb, Duluth Cargo Connect

Brazil's T-MULT ramps up project cargo handling

A relative newcomer to Latin America's port sector is the Multicargo Terminal (T-MULT) at the port of Açú in Brazil. Since the consolidation of its infrastructure and the beginning of its operations in July 2016, T-MULT has recorded a significant ramp-up in project cargo handling – a staggering compound annual growth rate of 61 percent in three years.

While supporting projects and the oil and gas industry in Brazil, T-MULT has strengthened the port of Açú's role as a logistics hub. The port itself has a potential area of 130 sq km and claims to be the largest port, industrial and energy complex in Latin America.

Selling point

A unique selling point is that it has been funded with private investment. "Without the inefficiencies and large bureaucracy found in public ports, the port offers an efficient, low-cost operational model that cuts red tapes, optimises costs and ensures high productivity in the naval, oil and gas and power industries, while meeting the highest international safety and security standards," said the port authority.

While strategically located close to the main oil and gas fields of Brazil, T-MULT has also been engaged in several other heavy lift projects, including receiving cargoes for one of Latin America's largest thermoelectric power parks, UTE GNA I. "Most of the UTE GNA I's imported equipment, parts and components were handled by T-MULT, including the first gas turbine of the plant," said the terminal.

"The turbine, manufactured by Siemens, was transported in the first part of the journey by barge from Mülheim, Germany, to the Katoen-Natie terminal in Antwerp; from there it departed to Açú in the first vessel to make the Antwerp-Açú route. The handling for the GNA gas hub proves T-MULT's advantages in terms of location, capacity and cargo handling efficiency to support large-scale projects."

During August, the Duluth Cargo Connect team unloaded wind turbine towers from the heavy lift vessel Josef.

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NWSA specialises in ro-ro cargo, handling mostly construction-related equipment.



State takes control of Mexico ports

Mexico President Andrés Manuel López Obrador moved forward with his plans during August to clean up the country's ports and Customs service. Government officials assumed control of the ports of Tampico and Altamira in Tamaulipas state, the Tuxpan port in Veracruz, and Puerto Vallarta port in Jalisco state.

Mexico has a total of 117 ports, although 24 of those comprise the country's main maritime transportation network. His goal is to fight drug trafficking and corruption in the country's ports. It is still unclear, however, how the decisions will affect port projects.

BNAmericas reported that all port infrastructure approvals now depend on Rosa Icela Rodríguez, named by President Andrés Manuel López Obrador as port and marine commerce coordinator during July. She will be responsible for the supervision and implementation of port policies, concessions, permits, security, fees and international commerce, among others.

"In terms of lift capacity, we have increased it in the form of a new Manitowoc 2250 300-ton (272.2-tonne) capacity crane and a Taylor XRS 9972 reachstacker. Those machines complement our existing fleet of heavy lift vehicles and our twin Duluth-built 90-ton (81.6-tonne) capacity gantry cranes."

Looking ahead, more investments are in the pipeline. The port received a USD10.5 million Maritime Administration grant to help complete USD21.5 million worth of projects over the next three years. These developments include repairing 1,750 lineal ft of dock wall and the construction of a 56,000 sq ft (5,202 sq m) warehouse.

New ro-ro ramp

Investment is also under way at the port of Albany. In the third quarter of this year, a new ro-ro ramp boasting a load bearing capacity of 1,200 lbs per sq ft (5.9 tonnes per sq m) came into operation.

In addition, a 60,000 sq ft (5,574 sq m) general cargo warehouse is currently under construction. Tony Vasil, maritime business development manager at the port authority, said this should be completed in December.

"We have had a moderate increase in ship and barge vessel calls in the heavy lift and project cargo market compared with January-August last year," he added. Heavy lift tonnage for this same period is up 2 percent compared with 2019 figures, and Vasil is confident for the port's prospects. "We are holding our own in the heavy lift project sector considering market conditions prior to and during Covid-19."

Cargo types

Generators, rotors and affiliated equipment and accessories are some of the main types of oversize cargo transiting the port. As for breakbulk, largely from the forest products market, the port is up slightly on vessels calls and up substantially on tonnage – "ships are laden with more cargo, thus there is an uptick on tonnage on each ship".

Looking ahead, Vasil considered: "Projects that have been placed on hold will probably remain that way through the first and probably the second quarter of 2021." Nevertheless, "if certain positive developments occur, the third quarter should see an uptick."

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Growth in Africa faces **infrastructure challenge**

A perennial problem for the project cargo supply chain in Africa is infrastructure – or lack thereof. Considering the locations of most greenfield project sites, port options are somewhat limited.

Out of Africa's 54 countries, 16 are landlocked and dependent on their neighbouring nation's ports and border agencies for the flow of goods – whether it is containers or heavy project cargo.

The performance of Africa's ports varies considerably and with a continent's worth of trade on their shoulders – and a limited

amount of port investment compared with their western, more developed counterparts – efficiency is a major complaint from various users of ports in Africa. Generally speaking, capacity constraints coupled with lengthy import and export procedures add considerable time to clear goods.

The Covid-19 crisis has thrown up some additional challenges. Speaking with *HLPFI*

earlier this year, Harald Maas from shipping line UAL explained that maintaining its services during the pandemic was a serious struggle "as the authorities in most West African countries adopted very last-minute measures to curb the virus," which in turn resulted in the last-minute closure of ports.

Maas said that the upheaval is causing costly delays for shippers and tramping

Meridian Port Services reached a milestone in its Tema port expansion project with the completion of the first phase, also known as Terminal 3.



vessels with limited options to adapt their schedules. These carriers could be stuck with nowhere to go when ports are temporarily blocked. For UAL, however, its own port and freezone in Malabo K5 in Equatorial Guinea proved to be a tremendous asset – with its two jetties and over 900 m of space available for berthing providing an option for its ships.

Aside from the pandemic, existing ports in Africa require investment. There are port expansion and development projects in Dar es Salaam (Tanzania) and Nacala (Mozambique) that will reduce congestion; investment in a ro-ro terminal in Port Saïd, Egypt; and the establishment of the Lagos Deep Offshore Logistic Base (LADOL) in Nigeria, among others.

LADOL partnered with Mammoet earlier this year to expand its capacity to handle project cargo. As a result of the agreement, LADOL will utilise Mammoet's crane fleet and call upon its project

management services to provide clients with “more comprehensive” services. A heavy lift terminal crane, the MTC 15, is now stationed at the site and, with a payload of 600 tonnes, has the ability to turn any quay into a heavy lift terminal.

In Mozambique, LNG projects are driving infrastructure developments; Total and ExxonMobil-led projects are under way or planned in the north of the country on the Afungi peninsula.

Mario Luis Joaquim, general manager at Bertling in Mozambique, detailed the country's port options. “The three main ports of Mozambique are located according to the three main economic zones. There is one port in Maputo to serve the south region of Mozambique as well as some of the southern African countries, such as Swaziland, South Africa and Zimbabwe, through the Maputo Corridor. Beira port is located in the central region mainly to serve the hinterland countries of Malawi, Zimbabwe, Zambia, Democratic Republic of Congo (DRC) and Botswana, as well as other capital projects in Mozambique – the VALE coal mine and Cahora Bassa Hydroelectric dam.

“Nacala port serves the northern region of Mozambique and Malawi in the hinterland,” he explained.

Port capabilities

According to Joaquim, all three ports are equipped to, and do, receive container liner services on a weekly basis with no major problems. However, he continued, none of them receive breakbulk liner services.

“All ports have limited capacity to receive breakbulk cargo and especially out-of-gauge cargo. The limitation is mainly related to handling equipment as well as storage areas within the port's premises.” He added that all oversized cargo is expected to be handled by a vessel's own gear and preferably by the vessel's crew.

As it stands, there is not sufficient operational port capacity to receive a large

All ports [in Mozambique] have limited capacity to receive breakbulk cargo and especially out-of-gauge cargo. The limitation is mainly related to handling equipment as well as storage areas within the port's premises.

– Mario Luis Joaquim, Bertling

influx of the project cargo related to the LNG projects, said Joaquim. “This is one of the reasons why a material offloading facility is being developed near the project site in Palma-Afungi peninsula.”

The facility will reportedly handle over 2 million freight tons of cargo during the LNG plant's construction. In addition to supporting the project, the facility will reduce the pressure on Mozambique's other ports, which will still need to serve the country.

Foreign investment

Across Africa, a significant portion of port investment is expected to come from foreign players, with China leading the way. Over the last decades, China has established a significant economic presence in most African countries. Big development projects have moved forward under the Belt and Road Initiative (BRI), which provides a massive opportunity to African countries. An overarching trend of China's BRI projects in Africa is its focus on ports and port areas.

According to the Observer Research Foundation (ORF): “Of the 49 countries that China claims have signed MoUs or officially expressed support for the BRI, 34 (nearly 70 percent) are located along the coast of Africa – 16 in the West, eight in both the North and the East, and two in the South. These include Djibouti Port (Djibouti), Port Sudan (Sudan), Port Said-Port Tewfik (Egypt), Port Ain Sokhna (Egypt), Zarzis Port (Tunisia) and El Hamdania Port (Algeria).”

European companies also have a strong foothold on the continent. The Netherlands-headquartered APM Terminals, part of A.P. Møller-Mærsk, has a comprehensive port network with 18 terminals in Africa and the Middle East. Bolloré Ports, meanwhile, is a leader in Africa and has a presence in Mauritania, Senegal, Guinea, Sierra Leone, Liberia, the Ivory Coast, Ghana, Togo, Bénin, Nigeria, Cameroon, Central African Republic, Gabon, Congo, Union of the Comoros and Réunion.

In Ghana, the two heavyweights have a joint venture operation under the brand Meridian Port Holdings Limited which, in turn, has a joint venture with Ghana Ports and Harbours Authority – Meridian Port Services Limited (MPS). At the end of April, MPS reached a milestone at its Tema Port expansion project with the completion of the first phase, also known as Terminal 3.

The phase one scope of works included building a 1,000 m-long wharf, which consists of three berths and a 98 ha terminal facility on land reclaimed from the sea.

The companies have also teamed up for

APM Terminals is investing USD80 million in its facilities in Apapa, Nigeria, for the year 2020-2021.



developments in the Ivory Coast; a consortium of Bolloré and APM Terminals signed contracts with China Harbour Engineering Company (CHEC) for the construction of Abidjan's second container terminal, known as Côte d'Ivoire Terminal (CIT).

With an investment to the tune of EUR400 million (USD472 million), the terminal will be located adjacent to the existing Abidjan terminal. Once operational at the end of 2021, CIT will have 1,100 m of quay.

Significant growth

In recent years, the Ivory Coast has recorded significant growth in import and export volumes. With the additional capacity provided by CIT, the terminal and the port of Abidjan will be positioned as a preferred gateway for surrounding landlocked countries such as Burkina Faso, Mali and Niger, which currently use less optimal routes due to capacity restrictions at gateway terminals, said APM.

Other investments from APM Terminals have seen its Apapa location in Nigeria welcome two state-of-the-art mobile harbour cranes. The new cranes were acquired as part of its investment of USD80 million for the year 2020-2021.

David Skov, head of terminals, Africa and Middle East region of APM Terminals, said:

"The additional investment we are making is to handle the increased trade volumes into Nigeria. Trade in Nigeria is growing due to the many favourable efforts and policies of the federal government of Nigeria including, but not limited to, the policy on ease of doing business; stabilisation of foreign exchange; closure of the land borders which has increased the use of our sea ports; and diversification of the economy."

He said that with the acquisition of the new cranes, the terminal now operates with a total of ten mobile harbour cranes, 23 rubber-tyred gantry cranes, six empty handlers, six reachstackers and 11 forklifts.

Also boosting its equipment fleet is the port of Dar es Salaam in Tanzania. In February 2020, Tanzania Port Authority (TPA) took delivery of two mobile harbour cranes from Italgru. The electric cranes, which have a maximum lifting capacity of 125 tonnes, were transported from the port of Marghera in Italy aboard a BBC Chartering vessel and will be used to handle

containers and heavy goods.

In the first quarter of 2021, TPA will take delivery of six Kalmar rubber-tyred gantry cranes for Dar es Salaam. The Kalmar RTG combines diesel and electric technology for fuel savings, low emissions and easy maintenance. The units delivered to TPA will have a lifting capacity of 40 tonnes under the spreader.

Capacity increase

In the east, there are plans to increase Djibouti's capacity and there is still plenty of land available around the port, said Andrew Jones, former ceo of Louis Dreyfus East Africa, and now a consultant on African market entry. The limitations on capacity arise in terms of onward transportation, he said.

Speaking with *HLPFI* earlier this year, Dominic McVey, entrepreneur and former chairman at Hela Clothing, questioned whether that situation will change. He said: "Ports with monopolies have little incentive to improve or bring down costs of trade. The alternatives must be brought in as mainstream options."

In reality, Africa still has a long way to go in terms of port infrastructure. Through well functioning ports, Africa can strengthen its connectivity and trade volumes both domestically and with the rest of the world.

The additional investment we are making is to handle the increased trade volumes into Nigeria.

– David Skov, APM Terminals

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Smart technology

provides solutions to port challenges

As shipping lines race to the bottom in terms of pricing, ports are under increasing pressure to improve turnaround times and reduce costs. To address this, ports are undergoing digital transformations. Megan Gildea reports.

According to Piet Opstaele, innovation enablement manager at the port of Antwerp: “Ports are centres of innovation... I hear a lot of people say the maritime industry is old-fashioned and we are not innovating – I do not believe so.”

Although there is significant room for improvement, particularly in the breakbulk sector, great digital strides have been made at ports and terminals across the world.

Speaking at AntwerpXL’s ‘Summer of

Breakbulk’ webinar series, Opstaele observed that in the past digitalisation has been considered a bottleneck due to the costs involved. But now that technology is becoming cheaper, it is enabling ports to tap into their true potential.

Smart ports

Becoming a ‘smart port’ could mean a variety of things but broadly includes adopting automated processes – at terminals or locks, for instance – to become more competitive

and ease logistics operations. Within this, ports are turning their attention to data analytics, blockchain technology and artificial intelligence (AI).

Opstaele is an advocate for the use of networks as a means of data-sharing to improve efficiency. “The network always wins; two people are smarter than one.”

On this point, Fernando Gago, head of innovation at Kaleido Logistics, said that “true, and honest collaboration is key”. Transparency is a necessary caveat for the efficient sharing of data. “There is more to gain than keeping information to oneself,” he continued.

A good example of this is the Connected Ports Partnership – a global data and resource sharing initiative that includes the ports of Tyne (UK), Rotterdam (the

Now that technology is becoming cheaper, it is enabling ports to tap into their true potential.



Port of Antwerp

Netherlands), Gdansk (Poland), Helsinki (Finland), Hamburg (Germany) and Los Angeles (USA).

Joyce Blik, director of digital business solutions at the port of Rotterdam, said: “The Connected Ports Partnership is about co-creating new models of data exchange, and collaboration is vital for sustainable development across international gateways. Ports have a major role to play in using smart technology that can improve global logistics.”

While ports do not hold full responsibility, they are able to lay the groundwork by providing the infrastructure (physical and technical) for data sharing.

For instance, Gago referenced wind energy projects, which have a large amount of ancillary equipment. He said that often, time is wasted locating the different components; a simple digital tool/tracking system that locates all components and resources in such projects could eliminate this issue and reduce delays. “This is simple but requires basic infrastructures – a port that enables this is a smart port.”

With growing pressure to digitalise shipping over recent years, many are keen to unlock the potential of blockchain technologies. In India, a project to evaluate

ways to implement electronic bills of lading and other trade documentation across all export-import transactions is under way.

The Indian Port Community System, comprising 19 Indian gateways, entered a trial project with the blockchain platform CargoX and carrier G2 Ocean. Proof-of-concept tests and simulations were run with various user-case scenarios, including breakbulk and container shipments, to and from India.

Workflow simulation

Leif Arne Strømmen, vice president of project cargo at G2 Ocean, explained that due to the Covid-19 pandemic, simulations were run to provide the required insights. “Because of the lockdown situation, we were unable to execute regular live shipments within the given narrow time frame. Therefore, we successfully simulated shipments and processing based on real historic bills of lading, to provide complete insight into the future workflows and optimisations.”

Blockchain bill of lading solutions, according to G2 Ocean, are a key way to improve port operations and to address some of the challenges created by the global pandemic. Cargo stoppages due to the inability of courier agencies, the requirement of delivering physical format-based trade documentation, and the sheer time added in person-to-person contact



Pilots, pilot boats and tugboats receive pilotage and towage details on their mobile devices [using marineM] – much like Uber – and then provide real-time updates on the operation wirelessly.

– David Yeo, Innovez One

while handling paper documents, were key considerations in deciding to proceed with the digitalisation effort, said G2 Ocean.

Other technological initiatives are already bearing fruit. In partnership with Cavotec, the St Lawrence Seaway Management Corporation (SLSMC), which operates the Canadian sections of the St Lawrence Seaway, developed an innovative hands-free mooring (HFM) solution for locks.

The passage of a vessel through a lock usually requires vessels to equip themselves with steel wires and rollers. SLSMC said that the lockage is labour intensive, slow and at times hazardous. The HFM solution uses vacuum technology and requires only the push of buttons to secure and detach vessels.

The solution has been under development since 2007 and represents a CAD95 million (USD72 million) investment. SLSMC said that the solution was a result of researching different technologies to increase its competitiveness and reduce operating costs.

The organisation added that the system has cut down transit times through the Welland Canal by 40–48 minutes and reduced the prevalence of wire breakages, thereby improving safety for employees and crews.

Moreover, the time-savings could allow for extra voyages, and the labour savings (only one employee needed per lock compared with three) could contribute to improved productivity.

A similar project is under way in Amsterdam; the port has been working on its digital lock planning systems over the last two years.

Milembe Mateyo, harbour master at the port of Amsterdam, explained that, “the lock is often seen as an obstacle in a ship’s journey” but it can also provide a unique opportunity for planning and controlling the timetable of project moves. Digital systems will not only help the port authority but the agents and crew.

Developing marine services

When it comes to the development of smart ports, David Yeo, Innovez One ceo and founder, said that a lot of the innovation and software has so far focused on the landside part of operations. Marine services at ports often lack the backing of digital technology to optimise the heavily manual and paper-based processes that define towage and pilotage operations. That is why the company developed its AI-powered port management application, marineM, which integrates berth planning, job planning and dispatch, mobility and billing.



“The software dates back to 2005 when it was built as a customised mobile solution for the port of Singapore, which at the time was the world’s busiest port,” said Yeo. In 2015/16, it was decided to make the solution accessible for the market, with the aim of optimising towage and pilot operations.

Leveraging data

By leveraging data from ports – collecting information to ascertain when a vessel is arriving and departing, the type of vessel and the berthing location – the pilot and tugboats are assigned the operation.

“Pilots, pilot boats and tugboats receive pilotage and towage details on their mobile devices – much like Uber – and then provide real-time updates on the operation wirelessly. [This gives] ‘eyes’ to the marine command centre, enabling them to know the status and more importantly the progress of each of the movements,” he added.

This has a number of benefits for port and terminal operations. Yeo explained: “Firstly, it helps with timings, and that means you can optimise schedules. A main key performance indicator for ports is vessel turnaround times and a study a couple of years ago said that one reason why vessels were delayed at ports was the availability of marine services.”

In addition, the software also assists with billing. “Dues are often paid for the duration of the job and with marineM you have accurate timings.” He added that there are often different billings for certain routings. With the app, GPS technology tracks the job, making it easier to calculate the charges.

Of course, safety is a major factor in the development of such software – increased port traffic comes with an increased risk of

collision. “Asking how we can navigate these waters safely goes hand in hand with how to optimise marine services,” said Yeo.

The benefits are particularly important for project cargo or heavy lift movements in ports. “These carriers have large vessels and need specialised facilities/berth areas, and you need experienced pilots – something that is taken into account with marineM. It looks at the vessel, the suitability and experience of a pilot and the tugs before assigning them to the job.

“It is important to optimise the schedules for these operations,” Yeo continued, “as there are not many senior pilots. In some places you cannot just simply snap your fingers and have a pilot master suitable for heavy lift/project cargo operations; they are a very expensive resource to have. You can optimise their time and not waste their experience on smaller jobs.”

Yeo also noted that in recent years there has been an increase in demand for technology in ports. The uptake is tied to the popularity of AI, but is also linked to those further ashore. “In the last couple of years, connectivity has improved significantly, with 3G, 4G and now even 5G onboard ships. This, coupled with the increased popularity of Internet of Things (IoT) devices, has

spurred on new innovations and applications in the maritime sector... we can start putting things together,” commented Yeo.

Covid-19 has pushed this trend forward too. “Lately, people are thinking about how personnel can work from home and access the same information as if they were at the site. With technology, you can sit at home and track the actual operations,” he said.

Although Covid-19 has increased the demand for digital technologies, the economic fallout of the pandemic could potentially dampen funding for such initiatives, as budgets come under pressure.

Covid consequences

Gago at Kaleido Logistics said that his company has not been hugely affected by Covid-19, but it has seen funding for innovation projects impacted. “Cargo will always need to go from A to B, if you do not do it, someone else will,” he said. Innovation programmes are always at risk of not going ahead, however.

There is still a way to go with ports embracing technology. To date, IT innovation has been pushed forward, in the most part, by large gateways that have dedicated IT teams to develop customised solutions.

“Large ports account for about 5-6 percent of the world’s total ports,” said Yeo. “We want to bring the same level of automation and optimisation that the large ports enjoy to the majority of ports globally. This will create a level playing field.

“For those that still rely heavily on paper timing sheets from pilots and Excel spreadsheets – a longwinded process with room for mistakes – there are many opportunities, so technology can help save time and avoid human errors.” **HLPFI**

Ports are centres of innovation... I hear a lot of people say the maritime industry is old-fashioned and we are not innovating – I do not believe so.

– Piet Opstaele, port of Antwerp

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A collage of four images showing various breakbulk cargo operations at Dunkerque Port. Top left: A large crane lifting a heavy load from a ship's deck. Top right: A worker in a high-visibility vest standing next to several large, black, cylindrical objects (possibly engine components) on a ship's deck. Bottom left: A worker in a high-visibility vest standing next to large, yellow, cylindrical objects (possibly pipe sections) on a ship's deck. Bottom right: An aerial view of a large cargo ship docked at a pier, with a yellow crane on the ship's deck.

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Training gaps are being recognised, and more terminals are looking into simulation, according to CM Labs.

Change drives demand for simulation training

Bigger, faster and increasingly automated port equipment is resulting in surging demand for safe and cost-effective simulator training.

As adoption of automation technology accelerates, changes in training will follow, said Elena Shalabanove, CM Labs' ports product manager. Currently, CM Labs provides heavy equipment simulation training for the port, construction and forestry sectors.

"On the port side, we cover the full spectrum of dock and yard-side heavy equipment," said Shalabanove. This includes but is not limited to: ship-to-shore cranes, mobile harbour cranes, rubber-tyred gantry cranes and reachstackers.

"Simulation training for equipment operations has been widely used in aviation, mining and the military," she added.

"In the port industry, interest in this

technology has been growing for some time and, despite the pandemic, its growth is strong today.

"Training gaps are being recognised, and more and more terminals are looking into simulation. The increasing pressure on performance, automation of heavy

The increasing pressure on performance, automation of heavy equipment, shortage of skilled workforce, and safety concerns make simulation training invaluable for ports.

– Elena Shalabanove, CM Labs

equipment, shortage of skilled workforce, and safety concerns make simulation training invaluable for ports."

Simulator training is known to be much safer and more cost-effective than training on real equipment, and in recent years a number of trends have emerged.

"They follow the general port technology trend of introducing bigger, faster, more automated and semi-automated equipment for dock and yard-side operations. There is a growing interest in training for automation and remote operations."

'Fascinating shift'

Shalabanove described this as a "fascinating shift" as the operator moves from the crane cabin to the cabin on the ground, then on to an office desk. "The result is an uptick in training requirements, and with simulation technology evolving in lockstep – for instance, with simulators for remote operating desks."

But, Shalabanove added: "While automation is an important trend, we recognise that different terminals are at different stages of automation. We, therefore, cover all training needs: from creating industry-standard immersive in-cabin operating experiences to simulating remote operations from a desk."

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Direct discharge to rail is a distinctive feature of the West Basin 4 berth at the port of Newcastle.

Wind and rail projects keep NSW ports on track

Project cargo moving through ports in New South Wales, Australia, is on the up, as a number of rail projects commence and renewable energy developments continue at pace.

The port of Newcastle has seen a steady flow of project cargo over the past 12 months “thanks to the port’s close proximity to Sydney, the Hunter Valley mining region and a number of new wind farm developments throughout the state”, said Daniel Miles, business development specialist at the port.

The port benefits from a diverse project cargo mix – wind farm components, electrical transformers, passenger rail wagons, yachts, ferries, industrial plants, large cranes, mining screens and other equipment have all traversed the port’s wharves during the past year, and its heavy lift activity shows no sign of slowing down.

Newcastle was selected as the port of choice to support the import of the Sydney Growth Trains Stage 2 and Sydney Ferries river cats. “There is also a strong pipeline of wind farm projects commencing in the next five years and that will see the continued import of wind turbine blades and components through the port of Newcastle,” added Miles.

In addition, the port has seen the return of ro-ro vessel calls, with Höegh Autoliners’

Triton Ace and Höegh Tracer delivering large pieces of mining and industrial machinery intended for customers in the local area.

“An increase in ro-ro vessel calls will also provide significant supply chain cost savings for mining, construction and agricultural equipment customers in the Hunter Valley and northern New South Wales,” Miles explained.

He continued: “Port of Newcastle has two well-established precincts capable of handling project cargo: the Mayfield 4 and West Basin 4 berths. The port’s project cargo handling capability is further enhanced by direct access to berthside rail and the heavy vehicle road network, as well as large hardstand laydown and storage area”

As such, Miles added, “the port of Newcastle is well-positioned to support

There is also a strong pipeline of wind farm projects commencing in the next five years.

– Daniel Miles, port of Newcastle

future large-scale infrastructure projects designed to stimulate the economy post Covid-19.”

Also in New South Wales is port operator NSW Ports. The company holds long-term leases at Port Botany and Port Kembla, and manages the Enfield Intermodal Logistics Centre and Cooks River Intermodal Terminal.

Recently, NSW Ports’ operation in Port Kembla has seen increasing volumes of project cargo. In the wind energy segment, the port facilitated the import of 31 turbines for the Biala wind farm and, more recently, components for 46 wind turbines for the Bango wind farm in the Southern Tablelands.

Hydro expansion

The port is also supporting the Snowy 2.0 pumped-hydro expansion project – one of the largest renewable energy projects in Australia. During August, tunnel boring machine components – some of which weighed 174 tonnes – were transported to Port Kembla on board the heavy lift vessel AAL Shanghai.

Another heavy lift project at Port Kembla saw new intercity fleet trains – the first new intercity train to be introduced in the NSW network in 49 years – arrive at its facilities.

“One of Port Kembla’s key advantages is the ability to unload cargo directly onto the port’s on-dock rail infrastructure, where it can efficiently connect to the broader Sydney and regional NSW rail network. These new trains will become a regular occurrence over the next few years as the full fleet of 554 rail carriages are imported through Port Kembla,” said NSW Ports.

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