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*The **Global Maritime Weekly Digest**, based at **Southampton SOLENT University**, provides a regular flow of maritime news and analysis, of significance in a global context.*
Topics covered include shipping fleets and management, seaborne trade, ports, shipbuilding, ship recycling, maritime policy and regulations, and seafarers' labour.

Contents

Editorial comments

- The latest annual survey of ***flag state performance*** has been published by the International Chamber of Shipping (item 3). Criteria used to assess flag state effectiveness include port state control, ratification of international maritime conventions, attendance at IMO meetings as well as, for the first time, participation in the IMO member state audit scheme.
- Monitoring the ***location of ships around the world*** is facilitated by the latest vessel tracking systems. A recent snapshot view showed that three-fifths of ships were located in four regions: south-east Asia, east Asia, UK/Continent and Mediterranean/Black Sea (item 1).There were wide variations among vessel types.
- Of great benefit for the shipping industry is the ***world economy's strong trend***, as emphasised by the latest OECD organisation update (item 2). Global GDP in 2018 could grow faster than last year's increase. But a warning suggests that an escalation of trade tensions has potential for a damaging impact.
- A new survey of ***UK ports' infrastructure investment*** reveals that a massive amount has been identified as under way or planned (item 7). Recommendations include more attention to improving road and rail connections, and also streamlining the planning and consent process.
- A perspective on what lies ahead for ***seafarers involved in technological change*** focuses on several aspects, (item 5). Opportunity and risk for the shipping industry are considered, together with enhancing knowledge, changing job roles in smart and autonomous shipping, and job losses.

Richard Scott MA MCIT FICS, editor (email: bulkshipan@aol.com)

(1) Clarksons Research, 9 March 2018

Tracking Down Shipping, All Around The World

The shipping industry is essential to the smooth functioning of the world economy, transporting around 85% of the world's international trade in tonnage terms. So it comes as no surprise that ships are all over the world at any given time. However, the ability to identify ships' positions by vessel tracking systems today means that one can be more precise than ever in breaking this down a little further…

Mapping It Out

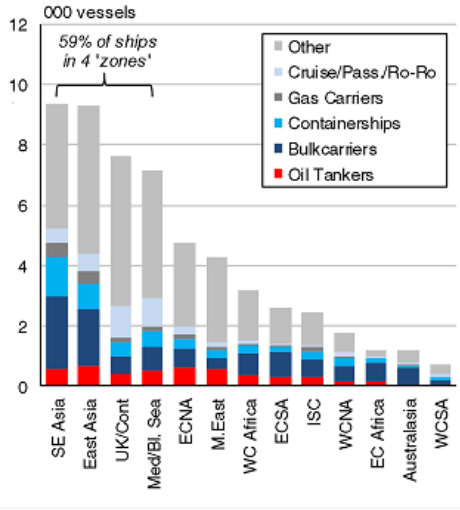
The Clarksons SeaNet vessel tracking system shows latest ship positions recorded via AIS signal. A snapshot taken on 6th March 2018 reveals that 56,438 vessels in the fleet had emitted a signal in the previous three months, with a total tonnage of 1.26m GT. That's 60% of all ships in the fleet and 96% of the tonnage.

The integration of the position data with defined geographic 'global zones' across the world helps us understand where the vessels were. As the graph shows, four zones accounted for the location of 59% of the vessel positions: East Asia (16.6%), SE Asia (16.5%), UK/Continent (13.5%) and Med/Black Sea (12.6%), and for 50% of the tonnage represented by the positions. East Coast North America and the Middle East are the other zones to make up the leading half-dozen.

Graph of the Week

Where In The World? Here, There & Everywhere...

The graph shows the location of the world fleet (100 GT and above) across selected ship types based on a snapshot taken on 6th March 2018 from *Clarksons SeaNet* vessel tracking system (see text), which fully integrates satellite and land-based AIS vessel position data with the Clarksons Research vessel database and a range of global geographic zone and location data. Note: oil tankers basis crude and products tankers 10,000 dwt and above, total fleet statistics basis start March 2018, graph excludes c.800 ships located in the North Asia, Arctic and Southern Ocean zones.



Source : Clarksons Research

A quick comparison of 'Atlantic' versus 'Pacific' zones (leaving the Middle East, East Africa, Indian Sub-Cont. and polar zones aside) also reveals some interesting results. In terms of ship numbers, the Atlantic led the Pacific with 45% compared to 41% of vessels' positions, but in terms of tonnage the result was reversed, with the Pacific leading the Atlantic by 45% to 36%. And as one might expect, there was significant variation across the major volume vessel type sectors.

What Goes Where?

Bulkcarrier and containership locations were more 'Pacific-centric' than those of the overall fleet. 55% of bulker tonnage was in the Pacific and 50% of boxship tonnage. Oil tankers offered variation on this theme though, with 14% of tonnage in the Middle East and 12% of units in the East Coast North America zone. Alone amongst the major sectors, oil tankers were more heavily located in the Atlantic (38% of tonnage) than the Pacific (33%)

People And Places

More 'niche' sectors reveal different patterns again, particularly those concerned with the transportation of people. Despite expansion of the industry in Asia, 64% of cruise tonnage was in the Atlantic, 43% in the

East Coast North America zone which includes the Caribbean. 71% of passenger ferry tonnage was in the Atlantic, with 66% in the UK/Cont. or Med. Variation between major owner nations' fleets was also apparent. Unsurprisingly, the fleet of Greek owners, the great 'cross-traders', was well-spread, with 10 'zones' home to more than 6% of tonnage, whilst the Chinese-owned fleet was, as one might expect, heavily focussed in Asia with 66% of tonnage (and 76% of ships) in East or SE Asia.
It all goes to show that whilst shipping is a global business, regional patterns are important, with distinct variation across ship types and owner groups. Happily, in the today's world, vessel position data allows us to keep track.
Source: Clarksons
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(2) OECD, 13 March 2018

OECD sees stronger world economy, but tensions are rising

The global economic expansion is strengthening, as robust investment growth, an associated rebound in trade and higher employment drive an increasingly broad-based recovery, according to the OECD's latest Interim Economic Outlook.
The pace of expansion over the 2018-19 period is expected to be faster than in 2017, but tensions are appearing that could threaten strong and sustainable medium-term growth.
The OECD projects that the global economy will grow by 3.9 percent in both 2018 and 2019, with private investment and trade picking up on the back of strong business and household confidence. Inflation is set to rise slowly. The projections reflect slight improvements in the global economy since the previous Economic Outlook in November 2017, and cover all G20 economies.
The Outlook underlines the boost to short-term growth expected from new tax reductions and expected spending increases in the United States and expected fiscal stimulus in Germany, but also points out a number of financial sector risks and vulnerabilities, as well as those posed by a rise in protectionism.

OECD Interim Economic Outlook projections

GDP growth

Year-on-year, %. Arrows indicate the direction of revisions since November 2017

	2017	2018	2019		2017	2018	2019
World	3.7	3.9 ↑	3.9 ↑	G20	3.8	4.1 ↑	4.0 ↑
Australia	2.3	3.0 ↑	3.0 ↑	Argentina	2.9	3.2 =	3.2 =
Canada	3.0	2.2 ↓	2.0 ↓	Brazil	1.0	2.2 ↑	2.4 ↓
Euro area	2.5	2.3 ↓	2.1 ↑	China	6.9	6.7 ↓	6.4 =
Germany	2.5	2.4 ↓	2.2 ↑	India[1]	6.6	7.2 ↑	7.5 ↓
France	2.0	2.2 ↑	1.9 ↑	Indonesia	5.1	5.3 ↓	5.4 =
Italy	1.5	1.5 =	1.3 =	Mexico	2.3	2.5 ↑	2.8 ↑
Japan	1.7	1.5 ↑	1.1 ↓	Russia	1.5	1.8 ↓	1.5 =
Korea	3.1	3.0 =	3.0 =	Saudi Arabia	-0.8	1.6 =	1.7 =
United Kingdom	1.7	1.3 ↓	1.1 =	South Africa	1.2	1.9 ↑	2.1 ↑
United States	2.3	2.9 ↑	2.8 ↑	Turkey	6.9	5.3 ↑	5.1 ↑

"Growth is steady or improving in most G20 countries and the expansion is continuing," said OECD Acting Chief Economist Alvaro Pereira.
"In this environment, an escalation of trade tensions would be damaging for growth and jobs. Countries should rely on collective solutions like the Global Forum on Steel Excess Capacity to address specific issues. Safeguarding the rules-based international trading system is key," Mr Pereira said.

The Outlook underlines a range of policies that would help to sustain medium-term growth. It urges countries to add dynamism to structural reform efforts, particularly in the areas of taxation and skills, to boost employment and inclusive growth over the long term. The fiscal stance in advanced countries should support but not overstimulate demand.
Source: OECD
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(3) International Chamber of Shipping, 15 March 2018

ICS Publishes Latest Flag State Performance Table with New Criteria Included

The International Chamber of Shipping (ICS) has published the latest version of its Flag State Performance Table, which can be downloaded free of charge via the ICS website.
The Table provides a helpful indication of the performance of individual flag states worldwide, which analyses how the administrations included deliver against a number of criteria such as port state control records, ratification of international maritime Conventions and attendance at IMO meetings. This year, a new criteria on participation in the 'IMO Member State Audit Scheme' has been included.
ICS Deputy Secretary General, Simon Bennett, remarked: "Following the entry into force of amendments to the relevant IMO Conventions, the IMO Member State Audit Scheme has become mandatory. This is a significant development that should make further contributions to improving maritime safety and the prevention of pollution."
He added, "ICS also recently released a new interactive version of the Table, which contains a search facility and allows users to compare and contrast the performance of up to four flag states at a time".
The 2017/2018 Shipping Industry Flag State Performance Table is currently being distributed among ICS national shipowners' associations and their member companies, which cover over 80% of the world merchant fleet.
Source: International Chamber of Shipping
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(4) Lloyd's List, 13 March 2018

Shipowners are not asking for autonomous shipping, technology companies are pushing it

While renewed development in shipping is to be welcomed, there is little demand from shipping for autonomous vessels, other than from the technology providers, argues International Chamber chief Peter Hinchliffe

INTERNATIONAL Chamber of Shipping secretary-general Peter Hinchliffe has said he has "a real fear" that industry discussions on the development of autonomous vessels are being led by technology providers and not the shipowning and operating community itself.
"Why are we actually doing this?" he asked a panel of classification societies and the US Coast Guard at the CMA conference in Stamford, Connecticut.
The ICS was not receiving calls from its members to be heavily engaged in the topic, he said, and the industry should be preparing for a future where some ships are unmanned and many are still manned.
While Mr Hinchliffe stressed that the shipowning community was not against the development of technology to improve safety, he pointed out that there are a lot of other industry initiatives and regulatory requirements that require focus.
ABS global marine executive vice-president Kirsi Tikka said that after a long time without significant investment in research and development in shipping, it was exciting to see both government and industry investing in technology. However, rather than just thinking of the end-goal of fully autonomous vessels in

the future, the industry should look to see how the ships of today can benefit from this technology development.
"You do not need new ships to implement this technology, they can be retrofitted," Dr Tikka said. She assured shipowners that new tonnage being delivered in 2020 would not be obsolete by 2030 as they could take advantage of the electrification of propulsion systems, connectivity to shore, increasing analytical capabilities that enable greater use of preventative and predictive maintenance and navigation aids — all of which is being researched as part of wider autonomous developments.
While the industry is transitioning to more autonomy, it will be increasingly important to document how the crew interact with systems on board so that this can be considered in the building of autonomous systems and information required by staff onshore to resolve situations when necessary.
"The industry must manage and balance today's operational needs with investment for the future, and that is not going to be easy," Dr Tikka said. "The skills of the master marines and engineers are still going to be required for the future, the challenge will be to create a pipeline for these skills." She said that organisations' training requirements needed to encompass new technologies and "will have to prepare the new generation for change and critical thinking".
Source: Lloyd's List
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(5) Hellenic Shipping News, 14 March 2018/ Clyde & Co

Shape up or ship out? What lies ahead for shipping crews in the wake of technological change

"Technology on the march. A huge step forward for shipping, technology is changing many aspects of our personal and work lives. The challenge is to benefit from the positive aspects and minimise the negative." MV Yara Birkeland – First Zero Emission Autonomous container Carrier, Maritime HR Association website

Over the last two decades the marine industry has been led by innovative change, with crews changing size and skills to adapt to new technologies. The most recent proposals in relation to digitalised energy management, onshore control centres and even unmanned ships suggest that radical changes to marine labour forces are afoot. If current predictions come true, we are likely to see the industry shake off the last of its traditional vestiges.
Technological advancements mean that unmanned vessels and smart shipping are no longer a mere notion but a real possibility. In that context, Clyde & Co teamed up with IMarEST to understand how more than 20,000 marine professionals around the world are responding to these emerging technologies.
Across the four categories of unmanned ships, smart shipping, energy management and green technology the strong majority of survey recipients all shared a common message: when considering the adoption of new technologies, management needs to keep crew at the forefront of their minds.

Opportunity and risk for the industry

Those driving the new technology debate are keen to point out the benefits of smart and autonomous shipping, in terms of cost and safety. The benefits appear to be recognised by those surveyed who identified the top 3 advantages of autonomous vessels as:

- Reduced health and safety risks;
- Reduced risk of human error; and
- Cost saving in personnel.

On the other hand, there are certainly those who doubt whether the claims made by technology companies can be achieved within a foreseeable timeframe or indeed at all, and the union lobby in particular is raising questions about the safety risks inherent in automation, and whether the crew cost reduction figures being mooted are realistic.
As well as the obvious benefits, it has also been suggested that piracy will be eliminated by autonomous ships as there will be no human hostages to take as leverage for ransom payments. Caution is needed here, though. With new technology, new risks arise – the prospect of digital piracy by hackers with the potential to take over ship controls.

Interesting questions are raised around the impact of dwindling crew numbers on those who remain, with smaller crews isolated on vessels for months at a time. Will it become increasingly difficult to attract seafarers to these conditions and will the industry be able to support any mental health issues which arise?

While the development of autonomous ships is still in its infancy, 65% of those surveyed thought that autonomous ships will arrive within the next 15 years in varying forms of sophistication, and certainly the developments in smart shipping are already changing the way crew operate at an incredible rate. Whether change will be immediate or, more likely, in stages it seems certain that technology will continue to drive changes to the role of crew into the next generation.

The need to plug the knowledge gap

Digital technologies continue to be developed to determine and optimise the operational efficiency of a vessel, and in the short term this is to the benefit of crew, with one respondent commenting: "If correctly utilized, data-centric operation will enhance the functions of existing crews."

The biggest benefit of smart shipping is to allow these developments to work alongside crew to increase operational efficiency. However, as with any new idea the use of these technologies will, if they are to be used efficiently, require a change of mind-set throughout the organisation.

We spoke to Karen Waltham of HR Consulting at Spinnaker Global, an industry organisation which works with maritime employers globally. She comments: "The rate of change in the world generally is increasing. I question whether the industry is ready for the change at all, let alone the pace of change we are seeing. While some appear to be supporting and even championing change, there is still fear and resistance in many quarters. We as an industry need to be thinking outside of the box. It is now widely accepted that we are 20 years plus behind the times in HR management covering everything from attraction, performance, development and retention of people. We can learn so much from other industries in this regard. While we are unique and different as an industry, we are also the same as any other business in many respects. It will require real investment and focus from Board level to facilitate, truly embrace and support the cultural changes which will be required to benefit from this changing world."

While the benefits of new technologies are clear, ship-owners will need to assess whether their crews are ready to use the tools available. 31% of those surveyed felt that crew competencies and skill sets were not at all prepared for smart shipping and only 15% felt that crews were prepared. As a result, ship-owners face a knowledge gap between the technology available and the ability of crews to use those technologies.

While the experience of seafarers is undeniable, the use of technology alongside that experience will be important to ensure vessels are running at optimum levels. Ship-owners will therefore need to think about the training needs of their crews in order to benefit from smart shipping developments.

Alongside this, there will also be a need to recruit IT specialists who are able to train staff, run the new technology and be available for when things go wrong.

Changing job roles in smart and autonomous ships

The feeling amongst those surveyed is that smart shipping will not act to reduce crew sizes. Instead there is likely to be a shift in control from the experienced seafarer to the onshore software engineer. This fundamental shift raises difficult questions about how to protect the existing workforce, how to fill future roles and how to manage the difficult safety issues which arise from this new dynamic.

As more and more operational functions are carried out onshore through technology systems, what will this mean for the role of the master and other skilled crew? Will we see a loss of valuable knowledge, a "dumbing down" of the role as the crucial functions of analysis and decision making are taken over by technology?

Many believe that no technology can replace the instinctive knowledge of an experienced master, yet experience from research and advancements in other sectors is generating evidence that computerised data based decision-making is more effective than human decision-making.

Much will depend on the quality of the systems. The risk, of course, lies in the technology creating a new source of error – technological rather than human – and confidence in smart technologies will depend heavily on minimising such errors to the satisfaction of stakeholders including maritime regulators. It is clear that the regulatory framework needed to properly regulate new technologies, including autonomous shipping, is a long way from reality, and much work will need to be done in this area in partnership with industry before radical changes to crewing arrangements can be implemented.

Total loss of crew?

In comparison to smart shipping, there is the inescapable feeling that when autonomous ships arrive on the seas, crew reductions and job losses are waiting.

With 78% of those surveyed indicating that there would be crew reductions and job losses as a result of automation, ship owners will need to be aware and prepared to deal with redundancies. Ship owners should ensure that they understand their legal obligations which could involve consultation and negotiations with crew and /or unions who represent them.

It may seem inevitable that in the autonomous revolution the traditional seafarer roles will become redundant. However, many believe that automation will lead to alteration rather than elimination of jobs, not least because of a desire to hold onto some of that experience. Good quality onshore roles in the sector should increase significantly and should, at least in the early days of the technology, benefit from experienced and skilled crew with knowledge of real time life aboard a ship. Re-training crew for these new onshore roles will be critical to retaining knowledge and avoiding redundancy costs. If change is, as expected, going to by stages then the industry has an opportunity to react positively to this as an opportunity rather than a risk.

However, the reality is likely to be that the skill set for new technology roles will be very different to that of the average crew member. 59% of those surveyed felt that current crews lack the experience or skills to support or act as shore-based operators. It, therefore, remains to be seen whether the industry is able to manage that transition effectively.

On the plus side, the increase in shore side roles could be attractive to a whole new type of individual, an hitherto untapped market of talent. In particular, quality shore based roles are likely to be more attractive to women, a group currently much under-represented in the industry.

Karen Waltham comments: "With the increasing focus on diversity globally and along with the increasing competition from other sectors, we need to ensure that we maximise the potential of all available talent. From our Maritime HR Association's 2017 Salary Survey of approximately 100 shipmanager, shipowner and shipbroking companies, we know that women make up only 34% of the maritime workforce, and those roles tend to be focused on administrative and support roles. Maritime employers have a real opportunity to take advantage of the changes afoot to attract and retain more talented women into a much more diverse set of roles."

Ship-owners will need to consider where to base their onshore operations and a big part of that decision will have to include where they will find those with the appropriate skills. The places where the sector can source technology expertise may be very different to current crew sourcing jurisdictions. As a result, while there may be cost saving from reductions in the numbers of personnel needed, there is no way around the need to have highly qualified workers, and the cost of those workers may well be higher than the traditional crew salary.

With additional onshore workers comes additional employment law obligations. Onshore employees will benefit from clearer access to courts and tribunals in the jurisdictions in which they work, and may have access to minimum entitlements relating to pay and protection from dismissals which they may not have been able to access before.

The future of technology

In conclusion, the technologies available today come with huge benefits to all industries and the shipping industry is no exception. To ignore these changes would result in the maritime industry being left behind. While the shipping industry is still very much uncertain about the changes that will result from these technologies, especially in regard to regulatory and legal changes, it is clear that workforce needs will need to be reviewed. Changes to the workforce will present challenges and opportunities for ship-owners but an early review of the future needs now, will help navigate the technological changes of the near future.

Source: Clyde&Co (Written by Heidi Watson) (https://www.clydeco.com/insight/article/shape-up-or-ship-out-what-lays-ahead-for-shipping-crews-in-the-wake-of-tech)

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(6) Clarksons Research, 13 March 2018

The Tanker Orderbook: Watching The Tide Go Out

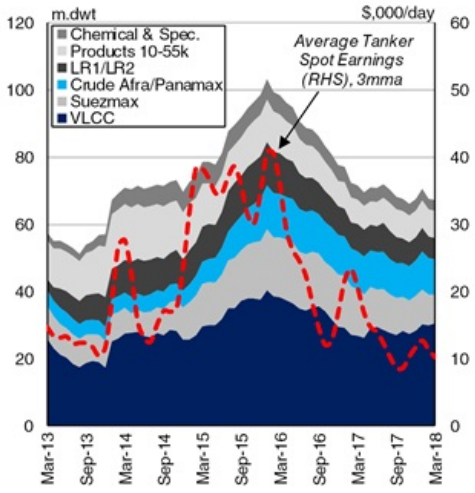
Shipbuilding Focus last took a look at the tanker orderbook in late 2015, when it was heading towards its most recent peak, following a year of firm ordering. Since then, the pattern has reversed, and in November last year the orderbook hit 66.1m dwt, its lowest level since 2013. With significant delivery volumes ongoing, and contracting currently remaining limited, the trend appears to be well-established.

A Smaller Swell

Against a backdrop of weakening market conditions, the tanker (10,000+ dwt) orderbook has declined in size by 35% in dwt terms since the start of 2016, to stand at 632 units of 67.2m dwt as of 1st March 2018. This was due to both historically weak ordering in 2016, and firm deliveries, which last year reached their highest level since 2011 in dwt terms. At the start of March, the orderbook was equivalent to 11.3% of the tanker fleet in dwt terms, the lowest level since 2013.

Graph of the Month

The Tanker Orderbook: A Breaking Wave?



The area on the graph shows the size of the tanker (10,000+ dwt) orderbook in dwt terms at the start of each month over the last five years, split by vessel type. The dashed line shows the 3-month moving average of monthly tanker spot earnings over the same period, in $/day. A wide range of tanker orderbook data is available on the *Shipping Intelligence Network*.

Source : Clarksons Research

An Ebb Tide

The size of the crude tanker orderbook has declined by 31% in dwt terms from the start of 2016 to stand at 49.4m dwt as of 1st March 2018, with the Suezmax orderbook shrinking fastest by 53%, to reach 8.5m dwt. The VLCC orderbook declined by 24% over the same period to reach 30.5m dwt, despite firmer ordering in 2017. Meanwhile, the product tanker orderbook stood at 14.6m dwt as of 1st March, a sharper 44% drop in dwt terms since the start of 2016. As in the crude sector, the fastest drop was at the larger end, with the LR1 and LR2 orderbooks shrinking 57% and 47% respectively from the start of 2016 to 2.0m and 4.3m dwt as of 1st March. Elsewhere, the chemical tanker orderbook declined by 48% in the same period in dwt terms to 3.2m dwt.

Making Waves

Looking across builder countries, Korean yards' tanker orderbook declined by 43% in dwt terms from the start of 2016 to stand at 26.7m dwt at the start of March. In the same period, the volume of tanker tonnage on order at Chinese yards fell by 32% to 20.4m dwt, while the orderbook at Japanese yards remained steadier, down by 12% to 14.9m dwt. At the start of March, Korean yards accounted for the largest share of the crude orderbook, 46% in dwt terms. However, Chinese yards accounted for a much larger share (6.3m dwt, 43%) of the product tanker orderbook than yards in Korea (4.0m dwt, 28%), where the volume of tonnage on order fell by 68% from the start of 2016.

Over The Crest

Looking forward, the tanker orderbook looks now to be relatively 'front-heavy'. In total, 46% of the current orderbook in dwt terms is scheduled for delivery this year, with a further 38% due in 2019. Following a

slight flattening out in the decline of the tanker orderbook it seems likely that a sharper downward trend could return if ordering remains limited.
Overall, the tanker orderbook has declined sharply since peaking at the start of 2016. Contracting volumes have remained limited, and in contrast some tanker owners have turned to the demolition markets in 2018 so far. With this in mind, and a relatively 'front-heavy' delivery schedule, for now the tanker orderbook tide is still firmly moving one way.
Source: Clarksons
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(7) British Ports Association, 12 March 2018

New Report Reveals Scale of UK Ports' Infrastructure Investment

The British Ports Association has today published new research by infrastructure advisory firm Moffatt & Nichol which shows that UK ports and terminals have an estimated £1.7bn of port infrastructure investment in the development pipeline.
The research is part of the British Ports Association's 'Port Futures' programme and was undertaken by Moffatt & Nichol. It captures significant schemes all over the UK and highlights how ports in all parts of the UK are investing in new facilities to foster growth in the UK market. You can read the report here.
Welcoming the report, Mark Simmonds, the British Ports Association's Policy Manager and BPA Port Futures programme coordinator said:
"Ports are doing their bit but we rely on Government to ensure that road and rail connections from the port gate are fit for purpose. The terrestrial and marine planning and consenting process is also cumbersome and costly and often holds back or even prevents some sustainable port development. We hope that this report helps Government to develop an accurate picture of the investment that industry is making when developing its policies and making its own investment decisions regarding infrastructure"
"This research demonstrates that UK ports are investing in new infrastructure to keep goods and people moving as efficiently as possible. The UK ports industry operates in a competitive and commercial environment, independently of Government, so this significant investment is at no cost to the taxpayer."
The research was carried out by Joseph Collins, of Moffatt & Nichol. Commenting on the report, Joseph said:
"This report focusses on developments which have been announced in the press in the last 12 months and provides a snapshot of the potential scale of UK ports' investment in infrastructure. Despite there being no guarantee that all of these projects will be fully realised, with greater engagement between key stakeholders such as Government, the Ports, Investors and Statutory Bodies, the realisation of these developments has the best chance of success. It's also likely that there are a many more privately financed infrastructure projects planned or underway all around the country, which haven't been discussed in public yet. Together, these projects help ensure that the 95% of UK trade that moves through our ports continues to do so as efficiently as possible."
Moffatt & Nichol undertook the assessment using publicly sourced data taken from the last 12months.
The British Ports Association will be writing to the Infrastructure Projects Authority to ensure that officials have a clear picture of industry investment, highlighting significant projects such as Aberdeen's £350m new 'south harbour' project and the Port of Tyne's £38m investment in in support of an overall £300m development of a new biomass plant. There are over a dozen other significant port projects listed in the research. These projects were not included in the most recent 'pipeline' report from the Infrastructure and Projects Authority, but demonstrate great optimism in infrastructure development and growth in the port sector.
The British Ports Association will also be working with its wide range of port members and will be keeping the list of investment up to date as new projects are announced.
Source: British Ports Association
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(8) Hellenic Shipping News, 12 March 2018/ Green Biz

Europe sails towards electrified shipping fleets

Since early 2015, a mid-sized car ferry, the MS Ampere, has been traversing the Sognefjord in western Norway from early morning to evening, seven days a week — without a whiff of smokestack exhaust or a decibel of engine roar. The 260-foot Ampere, which carries 120 cars and 360 passengers, is the one of world's first modern, electric-powered commercial ships, with battery and motor technology almost identical to today's plug-in electric cars, only on a much larger scale.

Norway's long and jagged Atlantic coastline — with thousands of islands and deep inland fjords — made the Norwegians a seafaring people long ago, and even today ferry travel is the fastest way to reach many destinations. Given this geography and the country's abundant hydroelectric resources, it's hardly surprising that the Norwegians have plunged ahead in the development of electric shipping, beginning with light, short-range ferries.

Currently, Norway has just two fully operational electric-powered ferries. But 10 more will be christened this year, 60 by 2021, and by 2023 the country's entire ferry fleet either will be all-electric or, for the longer routes, equipped with hybrid technology, experts say. Moreover, Norway's top cruise ship operator soon will launch two expedition cruise liners with hybrid propulsion that are designed to sail the Arctic. Several Norwegian companies have teamed up to construct a coastal, all-electric container ship that could eliminate 40,000 diesel truck trips annually. Eidesvik Offshore, a firm supplying offshore oil rigs, has converted a supply vessel to operate on batteries, diesel and liquefied natural gas.

Norway is already a global leader in the adoption of electric vehicles, spurred in large measure by the hydropower that provides 98 percent of the country' electricity. So moving into the forefront of tackling a major global environmental challenge — decarbonizing the world's shipping fleet — was a natural step for the country. Other nations — including Finland, the Netherlands, China, Denmark and Sweden — also are beginning to launch electric ships. Last year, China, for example, commissioned a 230-foot all-electric cargo ship, one that, ironically, transports coal along the Pearl River.

But if the electrification of the world's automobile and truck fleet represents a daunting challenge, then converting the global shipping fleet from heavily polluting fuel oil and diesel to renewable sources of energy is no less complex. It's one thing to use electricity and lithium ion batteries to power a car ferry across a Norwegian fjord, with charging stations at both ends of the run. It's quite another to power the more than 50,000 (PDF) tankers, freighters and cargo carriers in the world's merchant fleets across oceans. International shipping accounts for about 3 percent of global carbon dioxide emissions, and this could shoot up dramatically to 17 percent (PDF) by 2050 if other sectors decarbonize while shipping emissions climb higher, as they have unremittingly in recent years (PDF). The booming cruise ship industry has become a significant problem recently, emitting large quantities of carbon dioxide and sulfur dioxide, among other pollutants, according to German environmental group NABU.

Converting the world's shipping industry to run on renewable energy remains a longer-term goal that experts say will require the development of more sophisticated battery technology and a new regulatory framework.

"A lot of energy is needed to propel ships," argued Olaf Merk of the International Transport Forum, a think tank for transport policy that is part of the Organization for Economic Cooperation and Development. "Electric ships are becoming attractive options for ships sailing short distances. But longer distances would require huge battery packs. This wouldn't be attractive at the moment because of its high costs."

Countries with huge fleets are obstructing changes that would drive forward the electrification of marine transport.

Yet many analysts say that even though the technology to power large, ocean-going vessels on electricity is not yet ripe, the shipping industry's conservative mindset is also a major impediment to the sector's transformation. "The industry doesn't really believe that a switch from bunker fuels is possible," said Faig Abbasov, a shipping expert with Transport & Environment — a Brussels-based international environmental organization — referring to the fuel oils used to power ships. "And it's countries with huge fleets that are obstructing changes that would drive forward the electrification of marine transport."

Abbasov says the sector would change much more quickly if ship fuels were taxed — which they currently are not — and electricity for powering ships wasn't taxed, as is currently the case across Europe. "This means that ship owners sticking with the dirtiest fuels are given a free ride," he said.

Despite these challenges, Norway is steadily making progress toward converting its shipping fleet to run on renewable energy. “It’s really impressive — the transformation of shipping is beginning right now, it’s happening very fast, and not just in Norway,” said Borghild Tønnessen-Krokan, director of Forum for Development and Environment, an independent Norwegian NGO that has for years pushed for low-carbon transportation. “Shipping is part of a bigger green revolution in transportation in Norway,” he added, noting that more than half of all Norwegian cars sold last year were hybrid or electric.

The flurry of activity in electric shipping may begin to address the glaring omission of shipping in the Paris Climate Accord, which did not cover maritime transport. Shipping industry lobbyists and nations such as China and Brazil aggressively fought the inclusion of ship emissions in the accord, claiming that such a truly international sector couldn’t be held responsible for emissions in the same way that countries are.

The EU and the International Maritime Organization (PDF) (IMO) have set up monitoring criteria and energy efficiency standards that will become more stringent over time, but the IMO, at the behest of the industry and high-profile shipping countries, has resisted meaningful and binding emissions reduction goals for shipping companies. The EU has pushed back, threatening that it will include the sector’s CO2 pollution in its emissions-trading scheme if the IMO fails to take significant action.

Fighting climate change, however, was only one motive that inspired the niche shipyard Fjellstrand; Corvus Energy, a Canadian energy storage firm; and Norled AS, a ferry operator, to join forces with international heavyweight Siemens AS, Europe’s largest industrial manufacturer, to get Norway’s novel electric ferry pilot project off the ground.

The historic Fjellstrand shipyard, nestled on the shores of the Hardangerfjord in southern Norway, had been toying with the idea of battery-powered ferries for years. Fjellstrand surmised that since the country’s electricity supply is almost all renewably generated, thanks to its abundant rivers and mountain lakes, the economics of electric propulsion eventually could undercut the cost and large quantities of fuel that sea travel requires.

A new electric ferry reduced CO2 emissions by 95 percent and operating costs by 80 percent.

European engineers had tinkered with electric ships for over a century, but after a heyday in the early 1900s, electric motors lost out to the internal combustion engine in the 1920s. Norwegian submarines long have relied on hybrid diesel-electric locomotion, and Fjellstrand commissioned a series of viability studies for ferries.

But a decade ago, the technology, particularly the batteries, was simply too primitive and costly. “Our first studies found that we needed 450 tons of batteries to make it work,” explained Edmund Tolo of Fjellstrand. “In terms of size, ferries are of an entirely different dimension than cars.” It wasn’t until the company switched from designs using lead-acid batteries to more sophisticated lithium-ion batteries, and won a tender from Norway’s transportation authority in 2010, that the electric ferry project began to take off.

The biggest hurdle was no longer battery size. Storage technology had improved dramatically, and a medium-sized ferry’s engine room, which is large enough to accommodate roughly 12 tons of engine, can hold a lot of batteries. But the issue was how, in terms of time and magnitude, to deliver the massive kilowatt charge — about 100 times that required for a plug-in automobile — required by even a moderately sized vessel to cross the Sogne Fjord, a distance of 3.5 miles.

Fjellstrand’s solution was to have battery packages and heavy-duty charging stations on both shores, at the port towns of Oppedal and Lavik, as well as in the MS Ampere itself. The shore-based batteries would be charged mid-journey, enabling the power to be transferred to the boat’s batteries while it docks, and in just 10 minutes. Many other Norwegian ports already have shore power stations, an accessory instrumental for its offshore oil industry.

“The other big issue was safety,” said Tolo. The thermal reaction that occurs in lithium-ion batteries generates intense heat that can lead to explosions and fires. The Ampere’s team had to design a unique cooling system for the 12-ton packs of lithium batteries.

Industry studies have underscored the Ampere’s benefits and its technology’s maturity, showing that electric propulsion reduced CO2 emissions by 95 percent and operating costs by 80 percent.

The technology is there, but to make it happen there have to be sticks as well as carrots.

“The energy costs are lower than diesel,” said Jan Kjetil Paulsen, a shipping expert with Bellona, an international environmental NGO based in Oslo, Norway. “Maintenance costs are less, too, as the electric motor is less complex than the diesel engine. And an electric motor lasts three times longer than a typical internal combustion system.”

Elsewhere in Europe, the electrification of maritime travel is gradually beginning to take off. Late last year, Finland launched its first electric car ferry, and dozens of hybrid ferries and electric-powered ferries are scheduled to go into service in the coming years. Finland's cutting-edge maritime research vessel, the Aranda, has switched to hybrid propulsion. The ship, which belongs to the Finnish Environment Institute (SYKE), has benefited in more ways than one from adding an electric power system.

The Aranda is equipped with a front-end ice-cutter that slashes through Arctic ice fields en route to monitoring stations and other winter research locations. Because the electric motor has higher rotational force than the diesel motor, it is significantly more effective at powering the cutter to break up thick ice cover, said Jukka Pajala, a senior adviser at SYKE. Moreover, the electric motor doesn't expel pollutants that exacerbate the ice melt caused by global warming. And the electric motor is virtually silent, a critical advantage for researching marine life.

Denmark and Sweden are cooperating on two large eight-ton, electric passenger ferries that will travel the seven miles between Helsingborg, Sweden and Helsingör, Denmark. This summer, the Dutch company Port-Liner will unveil five all-electric, driverless, emissions-free barges, dubbed the "Tesla ships," that will navigate the canals linking the ports of Amsterdam, Antwerp and Rotterdam.

Despite these signs of progress, serious national and international regulations and incentives on converting the shipping industry to renewable sources of energy must be enacted, including a ban on heavy fuel oil in the Arctic to reduce the emissions of sooty, heat-absorbing pollution particles. "The technology is there," said Tønnessen-Krokan of Norway's Forum for Development and Environment. "Incentives have worked to make it happen, but there have to be sticks as well as carrots. Shipping should have been subject to emissions targets years ago."

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