

Decarbonisation

A special report

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Decarbonisation

Decarbonisation remains the number one item on the industry's mid-term agenda and will colour all significant investment and strategic thinking in the years ahead. Halving shipping's emissions by 2050 requires investment in excess of \$1.4trn and the timeline requires zero-emission vessels to become a viable commercial, safe and scaleable reality in the 2020s. This report addresses the immediate and long-term challenges that lie in wait as shipping navigates its way towards a carbon-free future.



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The point of the EEXI is to make existing ships as technically efficient as their newbuild counterparts.

New efficiency measures will not radically change shipping

The majority of the global fleet is, however, going to have to take action to comply with incoming regulations, with engine power limitations looking likely to be the most widely used tool, **Anastassios Adamopoulos** reports

Before ships start using low-carbon fuels, before a carbon levy and before difficult decisions are taken, shipping has a few years to ease into the future by meeting more-familiar and less-abrupt requirements.

In less than two years, ships will need to start adhering to new operational and technical efficiency measures — which, though unlikely to transform the business, will force owners and operators into some behavioural changes.

Barring any unforeseen twists, at its environmental meeting in June, the International Maritime Organization will finalise and adopt a package of two distinct yet highly connected measures.

Their combined goal is to help the global fleet reduce its average carbon intensity by at least 40% by 2030 compared to 2008.

The operational efficiency measure, known as the carbon intensity indicator (CII), comes into effect in 2023 and is broadly expected to be the more consequential one, because it will force ships to monitor their annual operational efficiency and rate them from A to E,

depending on that performance. However, that regulation also has important outstanding issues that have to be resolved, including what the actual carbon intensity improvements are for ships — and what formulas will apply to each ship type.

The energy efficiency existing ship index (EEXI) is the technical measure that could come into effect as early as the fourth quarter of 2022. An exact date will be determined in June. The IMO has already provisionally agreed to the improvement rates for each vessel type.

New vessels are already bound by a technical requirement through a regulation known as the energy efficiency design index (EEDI), which has been in place since 2015 and is currently in its second phase for all ship types.

The point of the EEXI is to make existing ships as technically efficient as their newbuild counterparts and effectively lock in energy savings from the fleet. It is a one-off, meaning ships need to demonstrate compliance with the regulation during their first renewal survey after it comes into force.



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Critics of the upcoming measures say they lack both ambition in terms of the actual environmental impact and, in the case of CII, sufficient enforcement; ships with poor ratings will have to develop plans on how to rectify their underperformance but they will not be forced into retirement as many had initially hoped.

Proponents argue the measures are stringent and point to the fact that they will enable the IMO to get to its 2030 target. They also believe the rating system will incentivise better performance by owners, who will not want to see their fleet marginalised by charterers for higher-quality vessels.

Preliminary analysis of IMO fleet data for 2019 from Lloyd’s Register principal specialist Matthew Williams shows that the majority of bulkers, tankers and containerships that are already meeting EEDI requirements are in compliance with the EEXI.

The picture changes dramatically, though, when considering those ships that are not covered by EEDI requirements.

Mr Williams’ analysis of both EEDI and non-EEDI existing ships, based on data from the EU’s shipping emissions and fuel consumption database (MRV), shows that in all three segments, the vast majority do not comply with the EEXI.

Regardless of the real environmental impact, the majority of the fleet is going to have to undergo changes.

Engine power limitation is broadly expected to be the most used tool for ships to meet EEXI requirements. This method requires the engine manufacturer to adjust a ship’s maximum power, either physically or electronically, therefore also limiting its maximum potential speed and hence showing improved energy efficiency.

Star Bulk, one of the biggest publicly listed companies in the world, with almost 130 bulkers in its fleet, will rely on engine power limitations on its ships for compliance with the EEXI, according to company chief strategy officer Charis Plakantonaki.

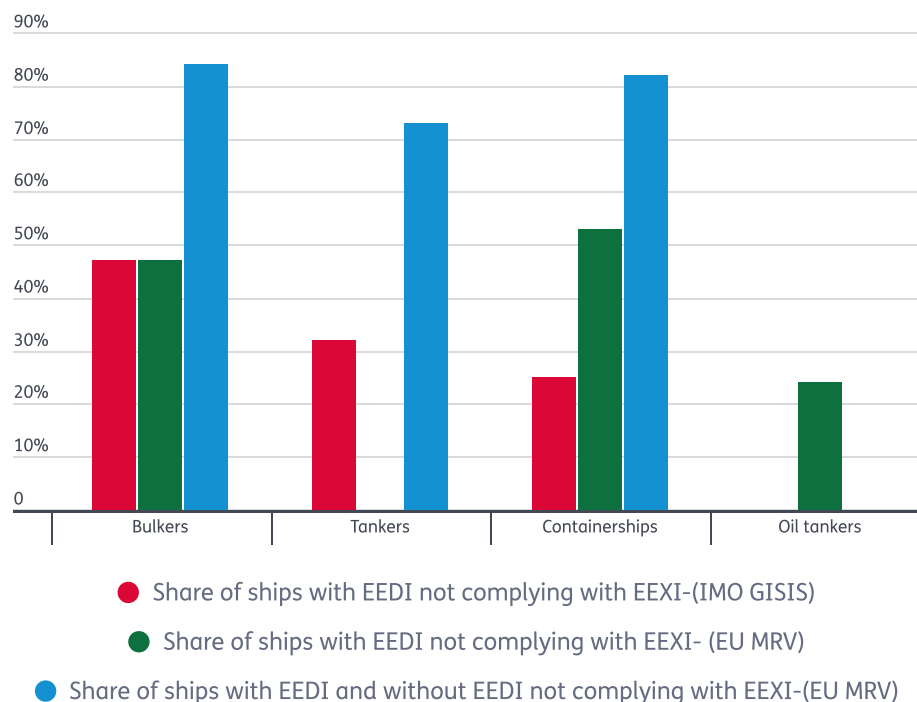
Bulkers are one of the ship types that already run on relatively low speeds, so limiting their design speed may have less of a commercial impact compared to other vessel segments that may have to considerably reduce their actual speeds as a result of the EPL.

“So we see that in the vast majority of our vessels, the operational profile will not be impacted significantly,” Ms Plakantonaki said.

The EPL is not the only tool at a

Most ships are not in compliance with the EEXI

2019 fleet data shows the difference between EEDI and non-EEDI certified vessels*



*The data has not yet been validated and should be taken as indicative

Source: Lloyd’s Register principal specialist Matthew Williams

shipowners’ disposal. Giulio Tirelli, business developer director at technology vendor Wärtsilä’s Marine Business division, said EPLs will be a major contributor to EEXI requirements — but not the only ones.

Shipowners can also retrofit their ships with energy-saving technologies. Mr Tirelli said these are divided between those that address power on board, such as the main engines and auxiliary engines, and equipment that affects the propulsion.

Air lubrication systems

Among these measures is the use of air lubrication systems, especially for cruiseships, according to Lloyd’s Register marine and offshore director Mark Darley.

Yet for some, the relatively unobtrusive nature of EPLs and the lack of investment required means they may be the sole option.

Star Bulk will consider selling or scrapping those ships for which EPLs may not be enough to meet EEXI requirements, according to Ms Plakantonaki.

A new regulation like the EEXI that targets the existing fleet should, in theory, send more ships to recycling yards as owners decide they are not worth the added costs.

However, shipping executives and technical experts agree that the EEXI alone is unlikely to lead to any meaningful scrapping, beyond clearing out the

bottom of the barrel in terms of vessel quality and age.

“It will trim the fleet, rather than reform the fleet,” Mr Darley said on the EEXI.

The ability for many to comply through relatively simple processes like EPLs means the EEXI will not radically change the profile of the fleet.

“Basically, the industry will get rid of the least-efficient vessels,” Ms Plakantonaki said.

Nonetheless, scraping the bottom of the barrel could have more of an impact than the numbers suggest; as Ms Plakantonaki noted, some of these older, inefficient ships may be among the most polluting.

Hafnia chief executive Mikael Skov believes that though general environmental regulatory pressures will cumulatively push scrapping for certain ship types, the EEXI individually is unlikely to have an impact.

“I don’t think the EEXI on a standalone basis would accelerate scrapping,” Mr Skov told Lloyd’s List.

What limited effect the EEXI will have, however, will be compounded by CII, which observers agree will be a bigger driver for scrapping because it targets the operations of the ship.

Yet with the all-important details on CII implementation still undecided, the extent of that impact is hard to determine at this stage.



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Decarbonisation timeline

Key dates on shipping's agenda towards a zero-carbon future

FuelEU Maritime

April 2021: The European Commission will publish its proposal (**FuelEU Maritime**) for reducing carbon intensity from shipping at European ports.

IMO MEPC76

June 14-25, 2021: IMO Marine Environment Protection Committee 76 meeting that will finalise new short-term GHG emissions measure. Could also see further discussion of market-based measures. It should also adopt a ban of heavy fuel oil in the Arctic Sea.

** Potentially in 2021: The EU could produce its sustainable finance taxonomy that could act as the standard for what is considered an environmentally sustainable activity/business for investing purposes. This would include shipping. It is unclear when the Commission will publish its final version, because its draft proposal received a massive number of responses. The factors at play here are highly political and way beyond shipping. So it is unclear if this is coming out in 2021 and how it will look.*



2021

ETS

June 2021: The European Commission will publish its revised **Emissions Trading System** proposal that will include shipping in some shape or form.

COP 26

November 1-12, 2021: Though this is a high-level conference in Glasgow, Scotland, covering all sectors of the economy, it could add a key pressure point for the IMO and the next MEPC.

IMO MEPC77

November 8-12, 2021: Key topics will depend on progress of MPEC 76, but market-based measures will almost certainly be on the agenda.



2022

EEDI Phase 3

April 1, 2022: New energy efficiency requirements on newbuilds come in for containerships, general cargoships, LNG carriers, big gas carriers and some cruiseships.

CII regulations



2023 (Date TBC): Carbon Intensity Indicator (CII) regulations that need to be finalised at MEPC 76 would come into effect in 2023.

IMO MEPC 78



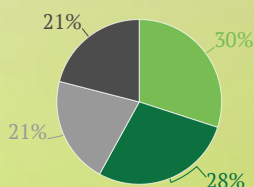
2023 (Date TBC): IMO MEPC will revise its initial GHG strategy, which means shipping could get new decarbonisation targets.

HFO ban



July 1, 2024: HFO (Heavy Fuel Oil) ban in the Arctic Sea comes into effect. However, waivers and exemptions mean some vessels are exempt until July 2029.

Share of total CO2 emissions

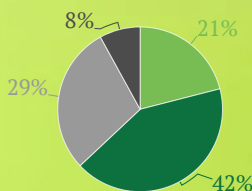


● Container ● Bulker
● Tanker* ● Other

*Includes both oil and chemical tankers
Source: IMO Data Collection System

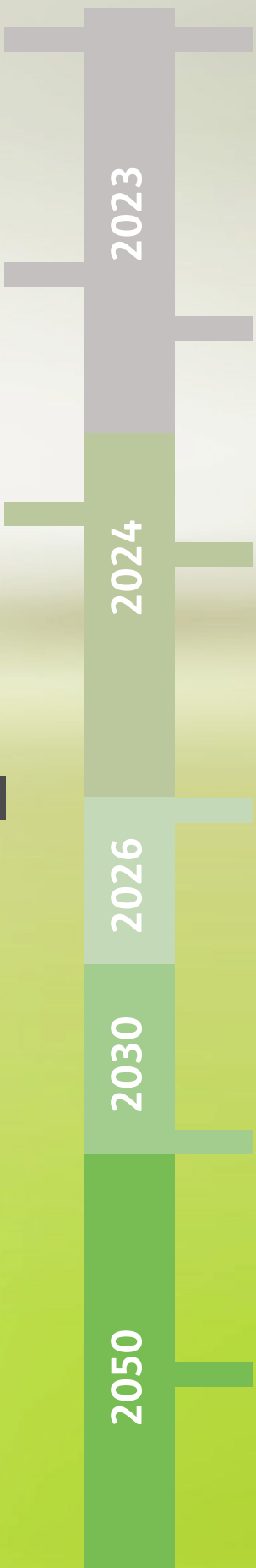
Share of global trade

DWT-nautical miles



● Container ● Bulker
● Tanker* ● Other

*Includes both oil and chemical tankers
Source: IMO Data Collection System



EEXI



January 1, 2023: Energy-efficiency measures for existing ships that will be finalised at MEPC 76 could begin to be applied any time from Q4 2020 to Jan 1, 2023.

Kitack Lim



December 31, 2023: End of IMO secretary-general Kitack Lim's second term.

BWM Convention

September 8, 2024: The final day by which every vessel must be compliant with the **Ballast Water Management Convention**.

IMO GHG review

January 1, 2026: The IMO will have finished a review on the short-term GHG measures and will consider any potential changes based on this decision.

IMO 2030 goal



January 1, 2030: IMO's target of reducing average CO2 per transport work by at least 40% by 2030 compared with 2008.

IMO 2050 goal



January 1, 2050: IMO's target of reducing shipping's total greenhouse gas emissions by at least 50% by 2050 compared with 2008.



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Shipping has seven months to show decarbonisation progress

Much like other industries, a mentality shift in shipping has been evident, as well as commitments for zero-emissions ships by 2030.

The next Marine Environment Protection Committee in June is the last opportunity for the IMO to demonstrate intentions to satisfy delegates and critics ahead of November's COP26, **Anastassios Adamopoulos** reports

When governments meet in Glasgow in late November for the most important environmental conference since the 2015 Paris Agreement, shipping will not top the agenda – but it will be an easy target.

COP26, officially the 26th United Nations Climate Change Conference, will see countries negotiate strengthening commitment and present plans to combat climate change for the first time since the landmark agreement to restrict global warming at 2015's COP21 held in Paris.

In the course of a likely hectic and tense 12 days in the Scottish city, governments will also scrutinise the progress the International Maritime Organization has made in decarbonising an industry that contributes to just under 3% of global greenhouse gas emissions.

Those close to COP26 do not believe progress has been adequate.

Peder Osterkamp, shipping lead for COP26 climate action champions – tasked with bringing together non-state actors like businesses, cities and non-governmental organisations to mobilise the race to zero emissions and climate adaptation and mitigation – believes the IMO has not done enough in practice.

“It is time to be clear that every sector needs to decarbonise by 2050.

There is no exception,” Mr Osterkamp told Lloyd's List.

In the almost three years since the IMO adopted its initial strategy to tackle GHG emissions and committed to reducing its GHG emissions by at least 50% by 2050 compared to 2008, global pledges of net zero emissions by the middle of the century have become the norm.

The IMO's 2018 initial GHG strategy does, in fact, aim for emissions reductions consistent with Paris Agreement temperature-reduction goals.

However, Mr Osterkamp said the action it has taken so far – especially when it comes to short-term measures – has been far from impressive.

Mr Osterkamp's assessment will be hardly surprising to those in tune with high-level external commentary aimed at the industry.

UN secretary-general Antonio Guterres said in December 2020 that current regulations in shipping are not compatible with ambitions to deliver zero-emissions ships by 2030 and need to be strengthened.

If governments and COP26 echo this sentiment in November and decide the IMO has not been pulling its weight, Mr Osterkamp warned that could change how shipping emissions are regulated.

“It might not be that the IMO has the monopoly forever,” he said.

Much like other industries, a mentality shift in shipping has been evident — at least from the larger stakeholders — as well as commitments for zero-emissions ships by 2030, pledges for net zero emissions and greater requirements from lenders and charterers.

Yet the global face of shipping is still the IMO, and there is no greater proxy for progress in shipping decarbonisation.

The reprimands coming from outside the sector can, at times, feel strange and confusing. Some of the governments that regulate shipping through the IMO will be the same ones likely chastising the industry in Glasgow later this year.

Part of that may be the discrepancy between transport officials at the IMO and environment officials crafting climate policy at home, who can also increasingly be seen at the IMO. Part of it may also be the influence that industry and corporations have at the IMO.

Arguably, though, it is also down to the distinct lack of attention that governments pay to shipping, with its mostly non-existent voting constituents, unless it suits political ends.

Shipping may be a unique and idiosyncratic industry and the long-established grip of the IMO on its regulation, including its decarbonisation, can create a false sense of isolation and insulation from the machinations of global geopolitics.

Aside from countries potentially committing to higher reductions of their domestic shipping emissions, COP26 will likely result in greater direct pressure on shipping and the IMO to act faster on emissions cuts than their current plan, devised three years ago, dictates.

This is the sort of higher-level action that would be difficult to ignore and could be a catalyst for a different pace of regulatory action seen so far, ultimately culminating into a commitment in 2023, when the IMO reviews its strategy for full decarbonisation by mid-century.

However, COP26's impact may become apparent immediately.

When the IMO's Marine Environment Protection Committee meets in June, regulators will want to wrap up the short-term technical and operational efficiency measures on shipping emissions, which the industry argues are even more vital and challenging, despite claims from environmentalists that they are insufficient and weakly enforced.

As the dust settles on those measures, the MEPC will have to tackle a much thornier matter and address a new proposal by the Marshall Islands and



The IMO's 2018 initial GHG strategy does, in fact, aim for emissions reductions consistent with Paris Agreement temperature-reduction goals.

the Solomon Islands to impose a \$100 levy per tonne of CO₂ equivalent on all ships by 2025.

The proposal by the two Pacific island nations well and truly pushes the sector beyond maritime lines — and, in some ways, is an appropriate precursor to COP26.

Two countries endangered by climate change are broaching a very uncomfortable but key tool in shipping decarbonisation, a global fuel tax, while demanding the majority of the revenues go to climate change-related purposes, not to industry projects and financing.

Shipping is the target, but the geopolitical and financial implications will not be lost on anyone.

The levy will not be endorsed or rejected by the IMO MEPC 76 in June. Yet how delegations respond will send a message as to how governments feel about the prospect — at least today — of going down a path that many in the industry deem necessary to enable energy transition.

The IMO needs to show the world that it is intent on moving in the direction of a carbon levy and commitment for a decarbonised industry by 2050, by demonstrating progress in the discussions of this proposal, according to Mr Osterkamp.

“Any industry that wants to be seen as a positive contributor to the transition will need to have something to say at COP26,” he said.

As luck would have it, the five final days of COP26 coincide with MEPC 77. Any conclusion or recommendation from the former will likely feed heavily into the discussions of the latter, where market-based measures could take centre stage.

Trafigura global head of fuel decarbonisation Rasmus Bach Nielsen believes the IMO needs to urgently discuss the carbon levy proposal. COP26 could be a big push in this direction.

“We believe the carbon levy discussion is taking higher and higher priority and that at COP26, many leaders will realise that the required action to decarbonise shipping is a global carbon levy,” he recently told Lloyd's List.

He believes — and hopes — that as a result, at MEPC 77 a number of countries will be able to support a carbon levy.

The IMO will grab much of the maritime spotlight in Glasgow, but eyes will also be on the industry's track record.

Several cross-sector initiatives — including the Getting to Zero Coalition, which targets the commercial deployment of zero-emissions ships by 2030 — are evidence that some in the industry are working on a viable pathway.

However, more companies could be setting net zero emissions targets ahead of COP26, according to Mr Osterkamp.

The COP26 climate action champions want to see companies accounting for 20% of revenues across their sectors taking the carbon neutrality pledge.

More concrete commitments are also needed on other fronts, such as from shipowners to zero-emission-ready ships and cargo owners to paying cost premiums to finance transition, as well as the development of the first zero-emission shipping routes, he added.

Seven months is still a long time for an industry whose mentality has changed radically in less than three years.

Shipping’s mid-century emissions targets do not leave much room for the use of carbon offsets — but with massive growth forecast for the next decade, could that change? **Anastassios Adamopoulos** reports

The carbon offset market is expected to grow into a multi-billion-dollar industry over the next decade.

For shipping companies, that is both an opportunity to access a largely untapped resource to reduce their emissions footprint — and a challenge to navigate through a market that is still fraught with credibility issues and often viewed with suspicion.

Shipping companies have already used offsets, but it has been limited; more recently, Navigator Gas offset the emissions of one of its voyages by financing a solar panel project in the Philippines.

However, it is similar actions taken by energy providers such as Occidental, Total, Shell and Repsol, who have rolled out “carbon-neutral” shipments of oil or liquefied natural gas using carbon offsets over recent months, that have raised eyebrows.

Carbon offsets allow an entity like a company to compensate for its emissions by financing an external emissions-reducing or saving project.

That project can issue these carbon credits based on the level of its emissions savings. Each credit equals one tonne of CO₂.

There are several types of carbon offset projects that cover different activities and sectors such as renewable energy, forestry and land use, waste, transport and others.

A key premise for a carbon offset-worthy project is that without selling carbon credits, it would have had trouble ever existing, due to its high costs. Another is that the emissions savings that its credits give should be permanent.

Proponents of carbon offsets believe they can both genuinely help companies reduce their environmental impact and support the development of these projects — especially in developing or least-developed countries — thus helping them reduce their direct national emissions.

Critics, however, argue that the process



Carbon offsets allow an entity like a company to compensate for its emissions by financing an external emissions-reducing or saving project.

Waiting on the carbon offset boom

allows companies cheaply to pay their way out of taking concrete action to reduce their own direct emissions, while touting their green endeavours. They also believe that many projects and the market itself can be of questionable quality and integrity.

Carbon offsets can be voluntary, such as those undertaken by the energy companies above, aimed at reducing their carbon footprint. They can also be a tool within an established carbon market that is run by governments or other authorities.

One such high-profile carbon market is the UN’s Clean Development Mechanism, which allows developed countries to buy offsets in projects in developing nations.

The International Civil Aviation Organization has also set up an offset scheme that has just entered its pilot phase and will become compulsory in 2027.

These mandatory carbon markets saw 10.3bn tonnes of CO₂ permits traded in 2020, with a record transaction value of €229bn (\$269.8bn), according to data from Refinitiv.


The size and value of the voluntary carbon market is negligible in comparison — but it is on the ascent.

Ecosystem Marketplace, an environmental finance information provider, reported that in 2019, total offset transactions in the voluntary market reached a record 104m tonnes — a 6% increase from 2018.

It estimated the value of these annual transactions at \$320m, the highest since 2012, but still considerably short of its 2011 peak of \$602m.

More than 40% of the 2019 voluntary offsets were from renewable energy projects. Another 35% were from forestry and land use.

Wijnand Stoefs, policy officer at Carbon Market Watch, a non-governmental organisation focused on carbon pricing, said carbon offsets have become more popular over the past few years with the increase of corporate commitments to carbon neutrality.

A man wearing a blue t-shirt, safety glasses, and a camouflage baseball cap is focused on working on a large, complex industrial machine. He is holding a tool or component of the machine. The background is a blurred industrial setting with various pipes and machinery.

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“I don’t see this ending any time soon because there is so much hype around it,” Mr Stoefs said.

His premonition is in line with various projections of aggressive growth that paint the picture of a highly lucrative carbon offset market over the next decade.

The global voluntary carbon offset market today is worth around \$400m, according to a recent report from Trove Research and UCL. They anticipate the same market will be worth up to \$25bn in 2030.

Consulting firm McKinsey also reported the market could be worth anywhere between \$5bn and more than \$50bn by 2030, depending on several factors such as demand and pricing. German bank Berenberg has said the value of the market could reach \$200bn by 2050.

Though voluntary offsets are experiencing a resurgence, there are perennial concerns about the voluntary carbon market’s quality, which have prompted calls for a complete overhaul of the system.

This is a highly fragmented market, with no single authority or standardisation body. Instead there are several certifiers of projects looking to issue credits, which use independent auditors to verify the potential emissions savings of these projects.

Interested buyers connect with projects through various platforms that can assess how suitable they are to company requirements.

Beginning in 2021, international offsets are not allowed in the EU Emissions Trading System, the EU’s carbon market that accounts for 90% of the global carbon markets in terms of value, according to Refinitiv. This is clear evidence for some that offsets should not be legitimised further.

Pricing is mostly subject to individual projects and there are concerns that carbon offset prices today are generally too low, allowing companies to get off cheaply.

In 2019, the average price in the ETS market was €25 per tonne of CO₂, according to Refinitiv. In the voluntary market, renewable energy projects and forestry and land projects averaged just \$1.4 per tonne of CO₂ and \$4.3 per tonne of CO₂, respectively, according to Ecosystem Marketplace.

Proponents believe that if done carefully and with a robust assessment process, project carbon offsets can be a genuine decarbonisation enabler.

David Antonioli, chief executive of Verra, one of the largest developers of standards for the voluntary carbon markets, said these offsets are a great transitional tool, especially in the absence of actual government measures.

“That starts to enable companies to make a transition to a lower-carbon future by reducing their carbon footprint,” he told Lloyd’s List.

And, despite the widely acknowledged shortcomings, carbon offsets do enjoy high-level support as a concept and as a contributor to net zero emissions from certain corners.

A dedicated taskforce led by Mark Carney, former head of the Bank of England and current UN special envoy for climate action, argued in a lengthy report that carbon offsets should be an integral part of global net zero emissions efforts.

To help out meaningfully in containing temperature increase to 1.5 degrees celsius, voluntary carbon offsets should grow by more than 15-fold by 2030, the report argued.

Offsets and the shipping industry

Earlier in 2021, Occidental used offsets for emissions associated with the lifecycle of 2m barrels of crude oil it shipped, based on standards developed by Verra.

Mr Stoefs believes that carbon neutrality labels slapped on shipments of fossil fuels like LNG are blatant greenwashing attempts and that applying the concept of carbon neutrality to a single action, like a shipment or a voyage, does not make sense.

Mr Antonioli believes carbon-neutral shipments and voyages are a legitimate tool. However, he also cautioned that they only make sense if part of a broader decarbonisation strategy and company commitment, not as a one-off exercise conducted in isolation.

“It can be somewhat meaningless if it is not part of a strategy,” he said.

Shell, Total and Repsol have committed to becoming net zero emitters by 2050, while Occidental has set 2040 as its target.

Mr Stoefs is also concerned that certain projects financed by offsets, such as Total’s support of a forestation project in Zimbabwe for its carbon-neutral LNG, are vulnerable to loss or damage in the future, which would mean the emissions savings claimed by Total would disappear.

“You are creating an equivalency between an easy to dissipate carbon source [forest] and an extremely secure, million-of-years deposit of carbon,” he said.

Mr Antonioli recognises this question of preservation is an important one when it comes to natural resource projects.

To combat the problem, Verra has developed a system where projects that it certifies need to deposit a certain share of their credits into a pool. If a project, like a forest, suffered destruction later down the line, these deposited credits would be used to offset that loss.

To offset or not to offset?

The forecast boom in the carbon offset market in pursuit of decarbonisation also serves as a poignant reminder of another challenge that shipping and the rest of the world has not solved: what exactly should net zero emissions define?

The term, which means that an entity should emit the same level as it removes from the atmosphere, is thrown around casually and interchangeably without much explanation of what role carbon offsets are expected to play — and, if they are, how big.

Those who question the real contribution of offsets will want to ensure they are not part of the equation, especially regulations, going forward. For others, they are an integral part of the solution. Shell, for instance, said earlier in 2021 that it wants to use 120m tonnes of nature-based carbon offsets annually by 2030.

Far from a technical detail, this element can be decisive for the pace and extent of shipping decarbonisation — and that may become apparent on the regulation.

While governments adopted the Paris Agreement in 2015, they have been unable to agree on the exact rules that would govern a new global carbon market that would succeed the CDM. They will try again at the UN’s next major climate conference, COP26, in Glasgow this November.

Though shipping’s emissions are regulated from the IMO, this specific outcome of COP26 will be just as important.

The IMO’s initial greenhouse gas strategy currently focuses on a minimum 50% absolute reduction in GHG emissions by 2050, without any mention of offsets.

If the IMO follows the rest of the world and commits to international shipping hitting net zero emissions by 2050, the question of carbon offsets becomes very pertinent. Would the global maritime regulator accept carbon offsets as a compliance tool with carbon neutrality?

Even if the compliance utility of carbon offsets has devalued significantly in 30 years’ time, thanks to the wide use of zero-carbon fuels and technologies, acceptance of the practice by the IMO would likely lead to a proliferation of use by the sector in the shorter term. If ICAO’s carbon offset set-up is any indication of what lies ahead, the prospect of IMO-sanctioned carbon offset use is realistic. Then again, the global sense of urgency and expectation of absolute decarbonisation in 2016 pales in comparison with today.

That chasm will only grow further by 2023, when the IMO agrees on a revised — and most likely more ambitious — strategy. The real potential of carbon offsets may be better understood by then.

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CSSC is now the world's largest shipbuilding group by asset size following the merger deal in 2019.

Build-and-scrap subsidy for green ships? Perhaps not

An industry expert suggests China should first create a roadmap from the top that carefully assesses the feasibility of different fuel options and design a suitable pathway towards green shipping, **Cichen Shen** reports

Beijing has been advised to bring back the controversial build-and-scrap subsidy.

Dong Qiang, a member of China's top political advisory body — the Chinese People's Political Consultative Conference — raised the idea as part of the green ship proposal he made to a recent legislative session.

Decarbonisation was put in the spotlight during this year's gathering. The retired chairman of China State Shipbuilding Corp, which later merged with China Shipbuilding Industry Corp to become the world's largest shipbuilding group, fits perfectly into the trend.

However, policymakers must think carefully about the idea. It is important to

keep the strategic industry competitive, yet at the same time prevent it from being addicted to government handouts.

Introduced in 2010, the build-and-scrap subsidy was once a powerful policy weapon.

The last round of distribution in 2013-2017 poured billions of dollars into the country's shipping and shipbuilding industries predominated by state majors.

It not only lifted yards out of a severe order drought, but also helped build an impressive fleet of modern vessels for domestic owners.

Cosco Shipping alone had nearly 100 newbuildings, including a batch of the then largest ore carriers, oil tankers and containerhips, backed by the state funds and loans from policy lenders.

Yet the subsidy has also drawn criticism that it has sabotaged market competition and prolonged shipping's overcapacity headache.

Eventually, the government decided to drop the policy at the end of 2017 and refused a request for reinstatement a year and a half later.

It said it wanted to pivot to market rules to lead the country's development of more efficient and greener vessels in the longer term.

The problem is that the new strategy does not appear to have quite worked out.

'Palpable gap'

As ships are facing stricter emission rules, prompted by the International Maritime Organization's decarbonisation targets, there is a "palpable gap" between Chinese shipbuilders and their competitors in aspects such as vessel design, research in new fuels and propulsion systems, as well as the domestic production of key equipment, Mr Dong admitted.

Meanwhile, Chinese owners, led by Cosco and China Merchants, are more

cautious than many of their foreign peers about using cleaner fuels, including liquefied natural gas, in their new ships.

Financial incentives from the government are still necessary to "lower the cost burden" for companies willing to go green, said Hu Keyi, head of the technology committee at Jiangnan Shipyard.

His company, a major unit of CSSC, is prominent at constructing liquefied petroleum gas carriers and ethane tankers. It is also the builder of several 24,000 teu dual-fuel containerships ordered by French carrier CMA CGM.

However, the way in which subsidies should be designed would require greater deliberation this time, as the marine fuel transition marks a revolutionary change compared to shipping's previous emission-cutting efforts, said Mr Hu, who is also a CPPCC member.

Some experts believe that tax cuts, government incentives for research and development or investment in fuel infrastructure will be more effective ways than a vessel-ordering subsidy for the Chinese maritime sector to speed up its green ship initiatives.

"We are talking about new technologies and perhaps even new ways of operating the ships," said a China-based shipping executive.

"If, say, Beijing decides to pay for the Chinese owners to order LNG-fuelled ships at Chinese yards, it won't help them try to reduce costs and be more efficient.

"The more forward-looking approach would be for China to invest in the supply chain of LNG bunkering."

Create a roadmap

Nevertheless, the debate about subsidies can wait, Mr Hu argued.

In his view, the foremost thing is for China to create a roadmap from the top that carefully assesses the feasibility of different fuel options and design a suitable pathway towards green shipping.

"We must first have a clear vision of our own about which technological directions we should go in the short, middle and long terms and the respective targets of emission reduction."

This sounds a sensible suggestion for the government to think about before it spends any money.



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Ammonia is gaining traction as one of the most viable zero-carbon fuels for international shipping. Even so, the transition appears insurmountable, **Michelle Wiese Bockmann** reports

The cost to build a plant that will produce enough green ammonia to supply marine fuel for just four post-panamax-sized vessels is currently between \$690m and \$791m.

That sobering statistic best illustrates the enormous commercial challenges shipping faces to transition to a zero-carbon, emission-free world.

Ammonia might be carbon-free, but it is also highly toxic, comes with serious safety risks, and has not been used for internal combustion engines for cars or aircraft. It represents a giant leap into the unknown for shipping.

The money that needs to be spent to decarbonise the global maritime sector is staggering.

Some \$70bn needs to be invested by 2025 if international shipping wants to switch 5% of marine fuels to zero-emission alternatives by 2030 and meet climate-change objectives, according to Peder Osterkamp, the shipping lead from COP26 Climate Champions.

A further \$390bn needs to be spent within the following five years to meet 2035 targets – and \$1.9trn in total by 2050, Mr Osterkamp’s analysis shows.

Some 87% of that \$1.9trn cost accounts for building ammonia marine fuel infrastructure, while 13% finances the building of zero-emission vessels.

These figures do not include the huge investment needed to produce hydrogen-based fuels such as ammonia on the scale needed, only highlighting the financial barriers alongside already considerable technical uncertainties.

It will cost up to \$6trn to build green ammonia and renewable energy plants around the world to decarbonise 40% of international shipping by 2050, an Environmental Defense Fund white paper published in 2020 estimates.

A plant that produces 700 tonnes daily, costs between \$690m and \$791m “and is approximately equivalent to the daily consumption of four post-panamax-sized vessels”, the paper said.



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It will cost up to \$6trn to build green ammonia and renewable energy plants around the world to decarbonise 40% of international shipping by 2050.

Ammonia: The trillion-dollar question

“*Very near term, you’ve got to prove the technology from an operational standpoint and get pilots running from deepsea ports... then you can start to think about scale*”

Peder Osterkamp
Shipping lead
COP26 Climate Champions





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Pilot projects

Despite this, it is likely the first deepsea, zero-emission-ready, ammonia-powered ships will be in the water by 2024, with further government investment needed to support more pilot projects.

“Very near term, you’ve got to prove the technology from an operational standpoint and get pilots running from deepsea ports... then you can start to think about scale,” said Mr Osterkamp.

Zero-emission pilot projects could focus on vessels plying dedicated routes, such as from Asia to the west coast of the US, where necessary port and marine fuel infrastructure exists at both ends, he said.

Shipowners, cargo owners and energy providers all have to invest in any pilot to make it feasible, he said.

Zero-emission vessels need a guaranteed return over a longer period, unlike the shorter-term charters that characterise today’s fleet employment and leave most of the risk sitting with the shipowner.

“For the pilots and early-stage work, we can get to there without a carbon levy – but for the full transition, there will obviously need to be some market-based measure to make it viable,” Mr Osterkamp added.

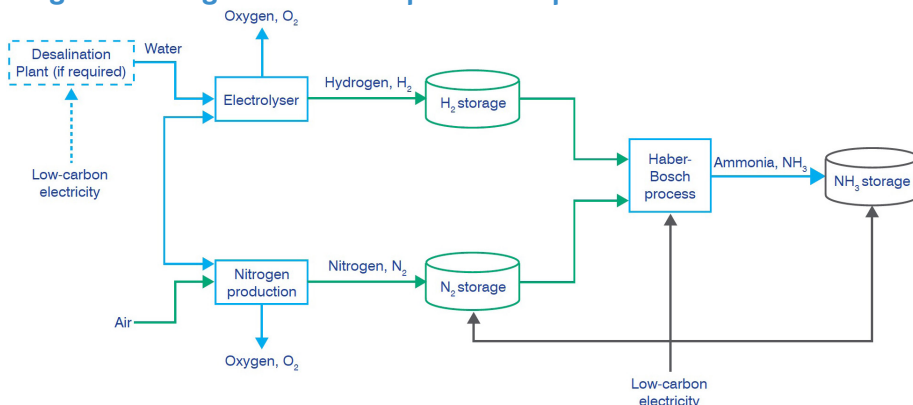
“There are issues on bringing institutional investors into shipping’s decarbonisation, as transparency needs to be improved, and ESG standards required to attract that kind of industry financing.”

Ammonia production

Green ammonia is produced using water, air and renewable electricity, as green hydrogen is combined with nitrogen using electrolysis.

So-called brown ammonia is produced using natural gas or coal as feedstock, while blue ammonia refers to natural gas via carbon capture and storage.

Diagram of the green ammonia production process



Source: Sailing on Solar (EDF)

Funding needed to reach 5% zero-carbon fuel by 2030

	2020	2025	2030	2035	2040	2045	2050
Total energy needed*	9.3 EJ	11.2 EJ	12.9 EJ	13.6 EJ	14.8 EJ	16 EJ	18.2 EJ
Zero-emission fuels % of total energy**	0%	1%	5%	27%	39%	93%	98%
Total energy needed from zero-emission fuels	-	0.1 EJ	0.6 EJ	3.6 EJ	5.8 EJ	15 EJ	17.8 EJ
Zero-emission fuels % towards 2050	0%	1%	4%	20%	33%	84%	100%
Percentage of investment needed I	1%	4%	20%	33%	84%	100%	100%
Total investment needed (cumulative)**	\$12bn	\$69bn	\$386bn	\$621bn	\$1.6trn	\$1.9trn	\$1.9trn

* UMAS ** S-Curve *** GTZC report

I Assumption precedes five-year fuel adoption

Source: Peder Osterkamp, Climate Change Champion

“There are issues on bringing institutional investors into shipping’s decarbonisation, as transparency needs to be improved, and ESG standards required to attract that kind of industry financing”

All use the Haber-Bosch process to produce the ammonia.

About 170m tonnes of ammonia was made in 2018, mostly for the fertiliser industry, with negligible volumes of this classed as ‘green’ and seaborne trade at some 18m tonnes.

Shipping needs more than three and a half times of the world’s current ammonia production – and all of that sourced from clean, renewable electricity – to power the international fleet, the EDF paper concludes.

That fleet of around 70,000 vessels consumed the energy equivalent of 650m tonnes of ammonia in marine fuel oil based on 2012 figures, according to a paper on the subject produced by class society DNV.

Such volumes require 6,500 TWh of renewable electricity, or the total amount of electricity generated in China today.

“If ammonia were to be produced from wind energy today, a typical capex for an onshore wind farm is \$500,000 per GWh annual production capacity, which implies a capex of the electricity needed of \$3.2trn,” DNV said in a study.

“Assuming at least \$2,000 per tonne annual production capacity for the ammonia plant via electrolysis of water, 650m tonnes of ammonia would lead to \$1.3trn investments in ammonia plants.

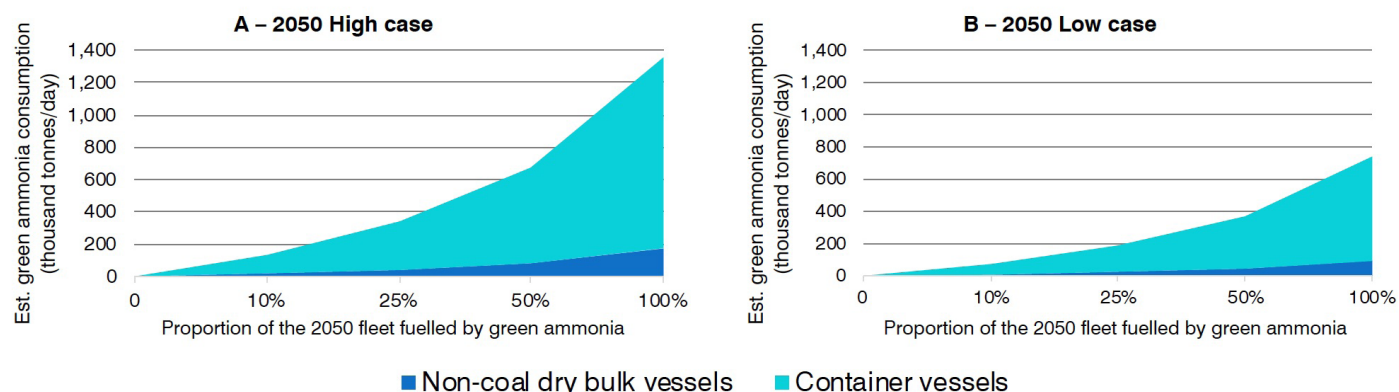
“The total investments for the fuel alone would need to be \$4.5trn before taking into account economies of scale, which would reduce investment costs.”

The price of ammonia derived using renewable energy like wind or solar power depends not only on the cost of the electricity, but also capital expenditure to build the electrolyser.

The electrolyser accounts for some 65%, with the DNV study calculating that would price green ammonia at between \$2,200 and \$3,500 per tonne.

That compares to when ammonia is produced using natural gas, at \$860 per tonne.

Green ammonia consumption in 2050 for the two scenarios



Source: *Sailing on Solar* (EDF)

So-called brown ammonia at the same energy content corresponds to paying the equivalent of \$600 per tonne for low-sulphur fuel oil, according to DNV.

That means ammonia is already unable to compete with VLSFO on financial merits, DNV concludes. The higher cost of green and blue ammonia makes it impossible to calculate payback times for investing in this technology.

Feasible pathway

Despite this, when it comes to decarbonisation, ammonia has more pros than cons as an alternative fuel.

There is an easy, feasible pathway to ammonia-powered vessels: dual-fuel engines are now widely accepted for liquefied natural gas and fuel oil, offering future flexibility.

And, while it is a dangerous chemical that needs careful handling, it is easier to store in tanks than hydrogen, according to DNV.

That is why around 40 LPG carriers already deployed for ammonia transport are seen as natural candidates for the first ammonia-fuelled engines, DNV says.

The global ammonia trade shipped in LPG carriers can be refrigerated, semi-refrigerated or under pressure.

Proponents of ammonia point out that bunkering infrastructure is already established at ports served by these gas carriers worldwide, as they already load and discharge at terminals as part of fertiliser trades.

When it comes to engine costs, DNV believes ammonia engines cost the same as an LPG engine, although tanks will need to be about twice the size.

Safety risks can be managed, ships can be built for conversion later, existing engines can be retrofitted, and so-called brown or blue ammonia could be used initially if there are supply issues for green ammonia.



“Given the pace of IMO [policy] development and what they have on their agenda now, it’s fair to assume that the technical ability will be in place before there are any revisions to the code”



Hans Anton Tvete
Programme director, maritime fuel research
DNV

Regulations currently prohibit ammonia’s use as a marine fuel, with changes needed at the International Maritime Organization.

The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) does not allow for any toxic cargo like ammonia to be used as a fuel.

“Given the pace of IMO [policy] development and what they have on their agenda now, it’s fair to assume that the technical ability will be in place before there are any revisions to the code,” said DNV’s programme director for maritime fuels research, Hans Anton Tvete.

“We’ve tried to overcome that barrier by developing our own class rules, so that we are in a position to assist our clients with all the questions that are coming up now.

“Our goal is that our class rules will be accepted as an alternative [while the codes are updated],” he added, something that has been done before.

Equipment needed

Nitrogen oxides are emitted when ammonia is used via internal combustion, so selective catalytic reduction equipment is needed.

Ammonia is also difficult to ignite, so engines require diesel or some form of pilot fuel for co-combustion.

“We mustn’t forget that technology transitions all happen along an S-curve,” said Mr Osterkamp.

“It is very expensive [initially] and that first step is tough – but once you get past that tipping point, that’s when things take off.”

The first ammonia-fuelled vessels are set to hit the water by 2024 but uptake will not be significant before 2030, according to Marius Leisner from DNV.



Lloyd's Register

Samsung Heavy Industries, shipowner MISC Berhad and MAN Energy Solutions received approval in principle from Lloyd's Register for an ammonia-fuelled tanker design.

Ammonia pilot projects

Source: EDF Sailing on Solar/LR/Lloyd's List

There are 106 pilot and demonstration projects for zero-emission fuels, according to the Getting to Zero Coalition study published in March 2021.

While there are no clear preferences for a single fuel, four new ammonia ship demonstration projects have begun in the past year and the first orders for ammonia-powered vessels placed.

MS Green Ammonia

Norway's Grieg Star Group and Finland's Wärtsilä are building a green ammonia tanker to ship green ammonia as part of the Zero Emission Energy Distribution at Sea project, with the ship to be launched in 2024.

The zero-emissions vessel is still in the technology development phase and it is too early to discuss issues such as where the ship will be built and how much it will cost, the company said in December 2020. A green ammonia plant will be built in Berlevåg, Norway.

50,000 dwt MR ammonia tanker

Lloyd's Register has approved in principle an ammonia-powered 50,000 dwt tanker design for Hyundai Mipo Dockyard using MAN Energy Solutions' ammonia dual-fuel engine. The project will run from 2020-2025.

Ammonia-fuelled very large crude carrier

China State Shipbuilding Corp and China Classification Society have begun a concept study for the design of this vessel. The project is running from 2021.

Ammonia-fuelled gas carrier

Exmar received approval in principle for an ammonia-fuelled 40,000 cu m gas carrier designed at China's Jiangnan Shipyard, with Wärtsilä Gas Solutions supplying the engine and propulsion.

Containership 'Chittagongmax' (2,700 teu)

Shanghai Merchant Ship Design & Research, MAN Energy Solutions and American Bureau of Shipping agreed a project in 2019 to develop a concept design for an ammonia dual-fuelled containership.

'Ammonia-ready' suezmax tanker

Avin International ordered an ABS-classed suezmax tanker, which is under construction at New Times Shipbuilding (China). It will be conventionally fuelled but designed for conversion to ammonia.

Ultra large containership (23,000 teu)

Lloyd's Register has granted approval in principle to Dalian Shipbuilding

Industry Co and MAN Energy Solutions for the concept design of a 23,000 teu containership.

Daewoo Shipbuilding & Marine Engineering and MAN Energy Solutions were also awarded approval in principle.

Ammonia-fuelled tanker design

Samsung Heavy Industries, shipowner MISC Berhad and MAN Energy Solutions received approval in principle from Lloyd's Register for an ammonia-fuelled tanker design. The concept study is due for completion by 2024.

Liquefied ammonia gas carrier

A demonstration project to research and develop a liquefied ammonia gas carrier, using ammonia as the main fuel, as well as an ammonia floating storage and regasification barge, has been undertaken by NYK Line with Japan Marine United Corporation and class society ClassNK. The project began in 2020.

Ammonia-fuelled capesize bulk carrier

Shanghai Merchant Ship Design and Research Institute has been granted approval in principle by Lloyd's Register for the concept study of an ammonia-powered bulk carrier of 180,000 dwt. The project commenced in 2019.

Risk-averse industry

"It will easily take a few years before the shipping industry can be convinced that this is a good fuel and this is natural — the industry is quite risk-averse and there are good

reasons for that," he said. "We'll need to see the experience from running these vessels, make sure that they're running without problems and start building trust that this is a good fuel, so those who want to can start

building out the bunkering infrastructure.

"We have seen that story with LNG. It takes time to build trust in technology to build the infrastructure before everyone else can follow."



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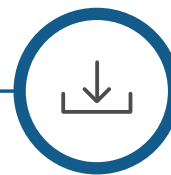
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Arctic black carbon emissions from shipping increased by 85% from 2015-2019.

Black carbon offers shipping a chance to clean up reputation

To stop emitting CO₂, shipping must equip its entire fleet with propulsion technologies that do not yet exist. Cutting black carbon — responsible for 7%-21% of shipping’s climate impact — would be much easier, **Declan Bush** reports

In June 2019, Austin Ahmasuk, an Indigenous Alaskan hunter, looked across from the shores of his Kawerak community on the Bering Strait and snapped a photo of an oil tanker on the horizon.

He later tracked the plume of smoke emanating from its exhaust for 17km. He complained to authorities about the air pollution, but there was nothing they could do.

Tribal communities like Mr Ahmasuk’s blame soot deposits from ship exhaust for health problems, declining fish and animal populations, and disrupted Arctic ecosystems.

Ships are increasingly common in the region as melting Arctic ice opens sea lanes.

Their emissions contain black carbon, tiny unburned particles that can stay airborne for up to two weeks before

settling like a grey blanket on the ice, making it warmer and less reflective.

Black carbon is a potent “climate forcer”: its global warming potential can be up to 3,200 times as strong as CO₂ over 20 years.

Green groups say it is responsible for 7% of shipping’s climate warming impact over 100 years — and 21% over 20 years.

Shipping emits just 2% of the black carbon in the Arctic, but this share is growing. Emissions from ships rose 85% in the Arctic from 2015 to 2019, according to the International Council on Clean Transportation.

Unlike CO₂, it is short-lived in the atmosphere. However, environmentalists worry this means shipping’s emissions are more damaging than those from other sources, since they float lower in the atmosphere and so are more likely to land on ice.

“What is emitted from shipping in the Arctic is almost certainly all going to stay in the Arctic, which means at least some of it is going to be deposited locally and then have an impact on warming,” said Pam Pearson, a former US diplomat, now director of the International Cryosphere Climate Initiative.

Black carbon’s warming effect is stronger in the Arctic than elsewhere, and shipping is emitting more of it, while other man-made sources decrease.

“Ships are really the only source of black carbon that are sometimes literally breaking through the ice and emitting black carbon at the same time,” said ICCT marine programme lead Bryan Comer.

Dr Comer said added to this, 72% of the heavy fuel oil burned in the Arctic is from four-stroke engines, which emit more black carbon per unit of energy than the two-stroke engines that power bigger ships.

“The trend is the wrong way, both globally and in the Arctic,” he said.

Non-governmental organisations want the International Maritime Organization to make ships in the Arctic switch from using residual fuels (high- and low-sulphur fuel oil) to distillates (marine gasoil and marine diesel oil) to reduce emissions.

Doing so would cut Arctic black carbon emissions by about 44%, they say, and boost confidence in the shipping industry’s claim to be serious about its climate responsibilities.

The IMO has hosted talks on black carbon for more than a decade, so far to little result. NGOs say forcing a fuel switch would bypass the need to develop standard black carbon measurements, potentially avoiding more years of talks.

There are other options to reduce emissions — avoiding using older, mechanical-injection engines in or near the Arctic, or switching to LNG-fuelled ships as Russia’s state shipping company Sovcomflot is doing — but these are much costlier.

Environmentalists also dislike LNG engines because they emit unburned methane, a potent greenhouse gas.

Yet IMO regulation of black carbon is unlikely any time soon. Most states say more research is needed before rules can be set — though some, such as the International Bunker Industry Association, support a voluntary switch to distillates.

Clean Arctic Alliance lead adviser Sian Prior said reducing black carbon emissions would make a big and immediate difference to shipping’s climate impact — and perhaps to its reputation.

Emissions could be cut further if ships used exhaust treatments like particulate filters and electrostatic

“*Ships are really the only source of black carbon that are sometimes literally breaking through the ice and emitting black carbon at the same time*”

Bryan Comer
Marine programme lead
International Council on Clean
Transportation

precipitators, she added. “We could actually achieve something very quickly if we were to switch to lighter or cleaner forms of fuel, or even move away from fossil fuels altogether.”

Decarbonisation is shipping’s thorniest problem. Shipping must replace the power source of its entire fleet with zero-carbon alternatives, which do not yet exist. The cost will be huge and the future uncertain.

By contrast, helping to fix black carbon in the short term boils down to the price difference between VLSFO and MGO — about \$30 a tonne in Rotterdam on March 22.

“It’s only really a problem for whoever’s footing the fuel bill. And if everybody’s playing by the same rules, then you’re actually not at a disadvantage anyway,” Dr Comer said.

Eventually a global black carbon regulation will be needed, maybe in the form of an engine standard. That means first agreeing on how to sample and measure it — a process that could take years because of the variety of fuels and engines used in the maritime industry.

Black carbon emissions vary widely by engine and fuel types, as well as factors like engine load and condition.

Newer engines are much cleaner than older ones, and there are signs that VLSFO emits less black carbon than HSFO because it burns better.

BIMCO, the biggest shipping association, said it supports black carbon reduction, but new measures should be introduced in a “practicable manner”.

“At this point, we believe more work is needed before the IMO can make the most practical and fact-based decisions,” said deputy secretary-general Lars Robert Pedersen.

He said switching to distillates for all ships operating in the Arctic was not straightforward.

BIMCO and other industry groups have also disputed some IMO black carbon studies, saying they relied on unrepresentative fuel samples and engine types, and so risked overstating emissions.

Mr Pedersen added that the IMO has already agreed a ban on the use of heavy fuel oil in Arctic waters from July 1, 2024. This would force many ships to use distillate fuels.

However, that long-awaited ban was defanged when Russia — by far the biggest HFO user and emitter — won a waiver until 2029 for Arctic-flagged ships and those with protected fuel tanks.

Dr Comer said with its various exemptions, the ban stops only 16% of HFO use and reduces black carbon emissions by 5%.

Russia opposed the ban on economic grounds, arguing it would increase the cost burden for ships serving 35,000 km of its Arctic coastline.

On March 26, Russia told the IMO shipping was responsible for a “very small share” of overall emissions. It said controls should be based on reliable measurements and consider economic costs.

“We do not see the grounds at the moment to develop any mandatory regulatory measures,” Russia said.

NGOs’ calls for a mandatory switch to distillates got nowhere at the IMO pollution subcommittee meeting on March 26, as countries opted instead for further talks.

Most countries supported a proposal to work on “goal-based guidelines”, with France warning “there are no simple solutions” and “making a choice today may mean we make the wrong decision”.

Sweden and the Solomon Islands said mandatory cuts should be discussed as soon as possible, while other countries voiced unease that the IMO had been so slow to discuss the problem. The Clean Arctic Alliance was left “utterly shocked and bitterly disappointed” at the result, Dr Prior said later.

The political discussion continues at the IMO’s Marine Environment Protection Committee in June. Until then, NGOs hope ships will make the voluntary switch to distillates.

Mr Ahmasuk said black carbon was a global problem and there were many aspects to be managed.

However, he said cutting emissions could buy more time “to protect Arctic indigenous people ... and Arctic ecosystems from the impact of melting”.

Accounting for carbon consumption



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Customers want more than just green promises from carriers.

As consumers increasingly want to know the carbon footprint of the goods they buy, shippers and beneficial cargo owners are looking for greater transparency from their carriers, **James Baker** reports

The decarbonisation of shipping is a matter of interest not just to the shipping industry, but also to its customers.

That is particularly true in container shipping, where the customers include some of the world’s most powerful brands, many of which have their own decarbonisation agendas.

There is growing societal pressure on the vendors of goods to account for

the carbon emissions of their products. Consumers, the final link in the supply chain, want to know the green credentials of the product they are buying.

Achieving that requires a level of transparency on carbon emissions that the box shipping sector cannot yet deliver, but for which there is increasing pressure to achieve.

“Our customers expect us to help them decarbonise their global supply chains,

and we are embracing the challenge, working on solving the practical, technical and safety challenges inherent in the carbon-neutral fuels we need in the future,” said Maersk chief executive Søren Skou.

Carriers are aware that both the International Maritime Organization’s 2050 ambitions and other commercial and social drivers require solutions to prevent carbon emissions from the sector.

Yet they are also noticing greater customer demand for greener shipping.

“Our major customers in particular are indeed increasing their focus on these issues,” said Bud Darr, executive vice-president, maritime policy and government affairs, at MSC Group.

“They generally have their own environmental, social and governance goals to meet, and they expect their supply chain partners to also be decarbonisation partners.

“We have to be responsive to that need, as well as the internal drivers for meeting these objectives.”

CMA CGM is also noticing increased interest from its customers.



“*Our major customers in particular are increasing their focus on these [green shipping] issues*”

Bud Darr
Executive vice-president, maritime policy and government affairs
MSC Group

“So many more customers want to talk to us about sustainability and want to ensure they can address their Scope 3 emission and have the right visibility,” said CMA CGM vice-president for sustainability Patricia Picini.

“If you go to some of the big B2C companies, their consumers ask them for visibility – and they ask us, as their suppliers, for visibility.”

One of those companies that is taking those decarbonisation goals seriously throughout its supply chain is L’Oréal, the beauty products brand.

“We work with many suppliers and it is critical that we understand and involve them in any climate change initiatives,” said transportation vice-president Adam Hall.

“It is not OK to isolate and disregard the overall supply chain’s ability to bring sustainability to the forefront.”

L’Oréal is taking what it describes as a series of “small, concise actions” to reduce carbon emissions in its transport by 50% by 2030.

“There is an opportunity for transport leaders to put a stake in the ground and declare our intention to be radical in our thinking,” Mr Hall said.

“We will be holding our carrier partners accountable for bringing better solutions to the table. We want to be able to optimise by CO₂, and have a carrier partner that is investing to bring equipment that differentiates.

“We need more choices but we need to incentivise and reward good behaviour and move away from those that are not getting on board with sustainability.”

Yet even big shippers cannot move the market alone, says Ingrid Irigoyen, associate director for ocean and climate at the Aspen Institute Energy and Environment Program.

“It is going to require working together as a group,” Ms Irigoyen said.

“In terms of getting shippers together, it is important to understand their goals and how serious the commitment is.

“In order to get the first-movers together, it is necessary to get them to see how cleaning up their maritime transport fits with their other investments in climate impacts.”

However, one of the biggest issues faced by shippers is a lack of transparency from carriers regarding carbon emissions.

“There is a lack of good information. How do carriers compare with each other?” Ms Irigoyen said.

“Pushing towards greater transparency could make a really big difference – having systems in place where shippers

“*So many more customers want to talk to us about sustainability and want to ensure they can address their Scope 3 emissions*”

Patricia Picini

Vice-president for sustainability
CMA CGM



are able to make more informed choices. Some of that is starting to come up in other segments, such as the Sea Cargo Charter in the bulk sector.”

Doing something similar for the container shipping sector would be “complicated, but possible” and would allow shippers to make better-informed choices.

Ms Picini argues there are moves afoot already among the carrier community, such as the Clean Cargo Working Group, where lines agreed on the way they calculated emissions.

“It is very important, as it is where we are with shippers and some of the carriers – and shippers can express their concerns and what they would like to have,” she said.

“We probably need to do more to align on that, but the working group is a good basis for these discussions and normally we have a common definition.”

Nevertheless, many shippers still feel they lack the information required.

“For a lot of them, it feels very mysterious and a lot of the information that is out there has been described as garbage,” Ms Irigoyen said.

“Is that a fair characterisation? Perhaps. What we will start seeing is the imposition of transparency on companies. There has got to be more transparency so shippers can compare apples to apples.”

Some freight forwarders are already stepping forward and are becoming important players in this space.

Kuehne + Nagel’s SeaExplorer, for example, gives specific CO₂ emissions and ratings per routing on port pairs.

DHL Global Forwarding also provides a carbon dashboard that tracks data from DHL, as well as five other logistics service providers.

The resulting transparency allows customers to benchmark and set targets, as well as identify carbon contributors and develop reduction strategies.

Yet carriers, too, are starting to come to the party.

“We already feel pressure from large forwarders who have their own sustainability programmes,” Mr Darr said.

“Quite honestly, it is an enormous effort to keep up with that. Just because they’ve come up with some metrics, it doesn’t mean they are compatible with our own, even if we’re trying to do the same thing. There needs to be some standardisation and collaboration.

“The public and non-governmental organisations also want more transparency and we provide a carbon calculator, where our customers can get a calculation of what the estimated carbon emission will be on a particular container on a particular trade route. They can make their own choices based on that.”

At CMA CGM, Ms Picini says it is possible to look at emissions from individual port pairings, but the finer granularity is more difficult.

“It is not possible to give calculations on a per-vessel level, but only on port pairings,” she said.

The carrier does, however, provide “after the fact” reports to its customers and offers tailor-made reports with real figures. “There are more and more requests for this,” Ms Picini said.

Yet for Mr Hall at L’Oréal, it is no longer an option to simply rely on forwarders or other partners to self-report emissions.

“We have to own the data,” he said. “Investment in systems that look at CO₂ as being as important as miles, transit and cost, is key.”

Pressure will continue to grow in this field, and carriers will need to do more to make visible the changes they are making with their sustainability goals, in the face of increasingly determined customers.

As Mr Hall puts it: “We have a considerable amount of influence and opportunity.”

Maersk Tankers touts benefits of scale in decarbonisation efforts

Chief executive Christian Ingerslev says the industry must be prepared for failures on the path to clean shipping, Janet Porter reports

Reducing vessel emissions and meeting ambitious decarbonisation targets are daunting tasks, even for the world's biggest shipowners.

The same is true of digitalisation, with a huge amount of investment needed as shipping is transformed from a business still heavily reliant on traditional processes to one in which state-of-the-art technology is applied along the entire supply chain.

The most tempting option for those shipowners with just small fleets and limited resources may be to quit altogether, leaving others to shoulder the costs of decarbonising and digitalising the shipping industry.

For just like the pharmaceutical industry, where many clinical trials will probably fail before a new drug is successfully developed, so shipping is likely to suffer numerous setbacks in the search for a new generation of ships powered by green fuels, and controlled by digitalised fleet management systems.

That will require a mindset change within the shipping world, says Maersk Tankers chief executive Christian Ingerslev, who is actively involved in numerous projects aimed at reducing vessel pollution and ultimately eliminating carbon emissions altogether.

At the same time, Maersk Tankers is developing digital tools that enable it to maximise operating efficiencies.

Dare to fail

However, finding the best solution straight away is never likely to happen.

"We need to dare to fail as much, if not more, than we succeed. Failure is a good thing," he contends.



Maersk Tankers

Ingerslev: confident tankers still have a viable future as some fuels that replace oil will be in liquid form.

“*We need to dare to fail as much, if not more, than we succeed. Failure is a good thing*”

Christian Ingerslev
Chief executive
Maersk Tankers

That confidence to accept failures, though, has to be accompanied by scale and a healthy balance sheet.

Shipowners are natural risk-takers, yet those with only a few ships cannot afford to test out new propulsion methods or other technologies that may prove to be losers rather than winners.

That is particularly true for an industry that has not made much money for long periods of time, albeit with occasional spikes.

Nevertheless, the demands on them to make shipping cleaner are the same as those for the industry heavyweights.

Right across the maritime world, shipowners “are facing pressure from their investors, from their customers, and also from their employees to cut emissions”, said Mr Ingerslev.

However, the future of smaller players in this unpredictable world, where the Covid-19 pandemic has added to the uncertainties, is not as bleak as it may seem.

In fact, they can make a positive contribution by joining forces with other operators of similar ship classes to create the size of fleet needed to operate vessels as efficiently as possible.

Currently, 38 product tanker owners have placed their ships under the management of Maersk Tankers, which now operates close to 240 vessels within seven pools, compared with 165 at the end of 2018.

Maersk Tankers had been sold a year earlier by AP Moller-Maersk as it transitioned to an integrated container transport and logistics company.

The buyer was AP Moller Holding, majority shareholder in AP Moller-Maersk. That enabled Maersk Tankers, which was established in 1928, to keep the Maersk name and continue to use the white star logo.

Its ships were transferred to Maersk Product Tankers, an asset-play joint venture between AP Moller Holding and Mitsui & Co, leaving Maersk Tankers as a business focused on all aspects of shipmanagement.

Measured in terms of ship numbers, it is the world's largest commercial operator of product tankers.

Size matters

That magnitude brings many benefits.

"It is much easier for us with scale to optimise the use of the assets. For example, to use the vessel that has high fuel consumption in trades where there is more port time, deploy more efficient assets on longer-haul routes, and triangulate voyages in order to limit ballast legs," said Mr Ingerslev during a telephone interview.

Digital tools, such as those developed by its ZeroNorth spin-off, are vital in constantly monitoring a ship to determine its optimal speed when taking into account variables such as weather conditions, hull configuration and freight rates.

"We made a deliberate choice to be truly digital. That means we create solutions that provide access to analytical insight and to algorithms that increase our ability to position our vessels into the right market at the right time," said Mr Ingerslev, who joined AP Moller-Maersk in 1997 and was appointed chief executive of Maersk Tankers in 2016.

Those applications enable owners



Maersk Tankers

Maersk Tankers now operates close to 240 vessels within seven pools, compared with 165 at the end of 2018.

“*We made a deliberate choice to be truly digital. That means we create solutions that provide access to analytical insight and to algorithms that increase our ability to position our vessels into the right market at the right time*”

and operators with ships on the Maersk Tankers platform to reduce their emissions footprint and maximise their financial returns.

Yet none of this is as straightforward as it sounds, and Mr Ingerslev admits algorithms or other tools do not always come up with the best answers.

"It's not easy, this is not a product you just buy and it works," he told Lloyd's List. "You have to invent and innovate, and we are investing significant money this year in developing digital solutions."

That is why size matters, but Mr Ingerslev insists that the Maersk Tankers pools are not a first step towards consolidation in the product tanker trades; rather, he sees Maersk Tankers as a facilitator for those owners that want to stay in the business, or for those that may want to venture into a new sector for the first time.

"We provide that safe haven," he said.

Reducing ship emissions has been a core goal for many years, but the challenge of climate change moved to centre stage after Maersk Tankers' change of ownership.

That provided the opportunity for management to look at industry trends and challenges, and decide where it should focus its efforts.

The outcome was a Shaping the Future strategy, for both Maersk Tankers and the wider industry, which recognised the importance of scale in achieving its stated aims.



Maersk Tankers

Maersk Product Tankers, accounting for 30% of ships under Maersk Tankers management, saw fleet emissions drop by 3.3% in 2020.

Falling emissions

By working with other shipowners through its pools, Maersk Tankers is able to obtain more attractive returns for its partners, while helping to reduce emissions.

Maersk Product Tankers, which currently accounts for about 30% of ships under Maersk Tankers management, saw its fleet emissions drop by 3.3% in 2020, as measured by the Energy Efficiency Operational Indicator.

This is an industry measure of carbon emissions per unit of cargo expressed in tonne-miles.

Overall, Maersk Product Tankers has achieved a 28.7% drop since 2008, the base year, and the decline is thought be much the same for all ships on the Maersk Tankers platform.

The goal is to reduce carbon emissions by 30% during 2021 and 45% by 2030 compared with 2008 levels, which would be ahead of International Maritime Organization targets.

In the meantime, Mr Ingerslev has made no secret of his support for regional steps to cut carbon emissions if the IMO cannot work faster.

“The time to act is now,” he said. The shipping industry cannot afford to wait for a perfect solution.

“*Even though fuel supply and demand patterns are changing, [Mr Ingerslev believes] oil will continue to play an integral part of the global energy infrastructure for many years*”

He is one of those calling for a carbon levy and says shipowners should be willing to work with not only the IMO, but also with other authorities such as the European Union.

“As long as the solutions created regionally do not hinder an overall global solution in time, then I feel we have to support it.”

Tanker prospects

However, as shipping moves towards a zero-carbon industry, what of the future for tankers that are not only fuelled by oil, but also carry crude or oil product cargoes?

Mr Ingerslev is not too concerned about the immediate future.

Even though fuel supply and demand patterns are changing, “oil will continue to play an integral part of the global energy infrastructure for many years”, he predicts, even as new energy sources emerge.

Looking further ahead, he concedes that no-one yet knows what will replace fossil fuels – but what is likely is that some fuels will continue to come in liquid form.

That means tankers will still have a role to play in transporting the fuels of the future, even in a decarbonised world.



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