

LEADERSHIP INSIGHTS

Issue no: 09 | February 2022



Nick Brown focuses on the fundamentals at Lloyd's Register

Investing in maritime

Lloyd's Register completes its restructuring and returns to its shipping roots. Page 2

Piracy falls; vigilance still vital

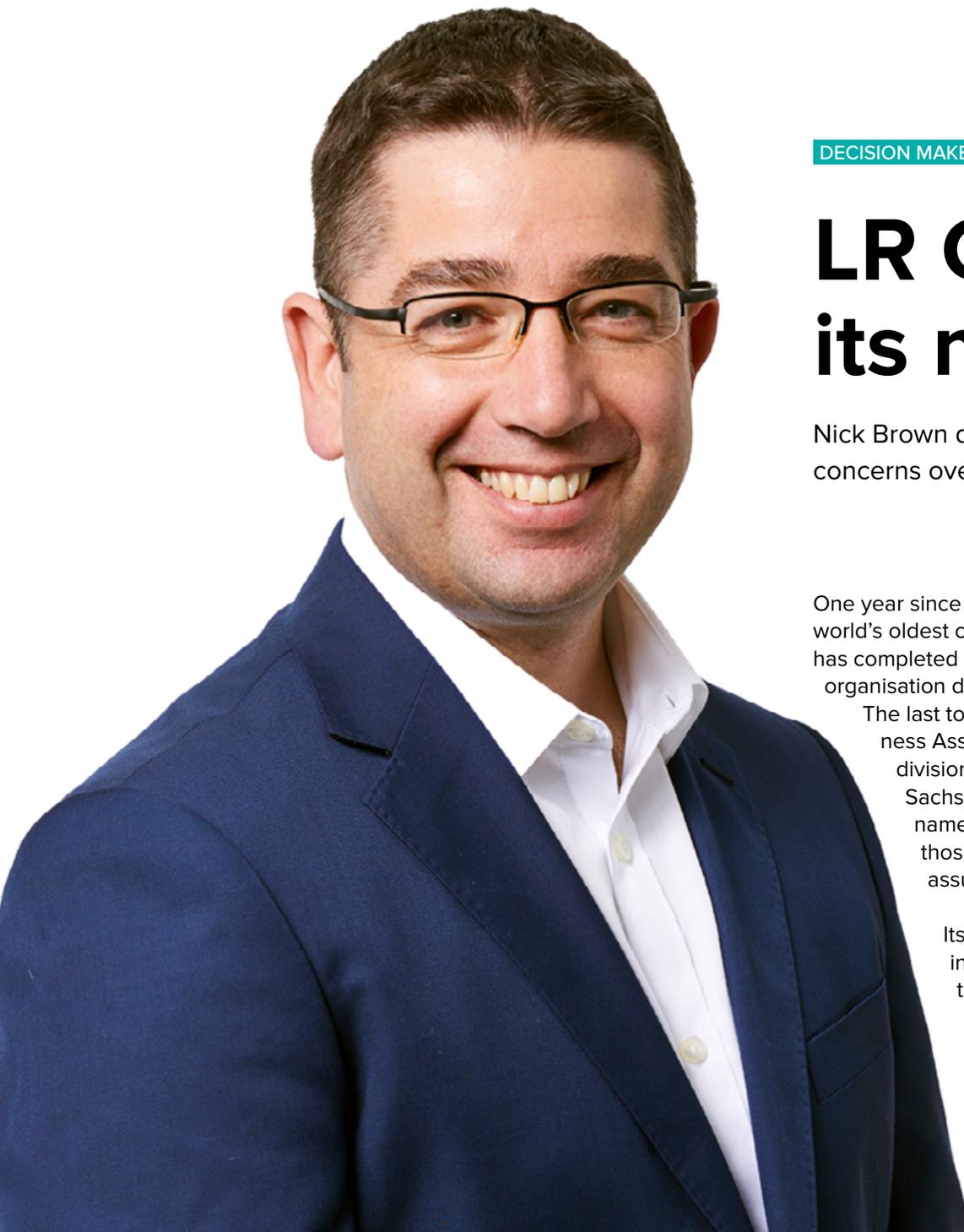
IMB reports reduced attacks during 2021 but it's not game-over in the Gulf of Guinea. Page 8

Handle with care!

Future fuels will pose safety challenges and dictate ship design changes. Page 10

Location, location, location

Panama's position on the shipping map brings rewards and responsibilities. Page 14



DECISION MAKER: NICK BROWN

LR CEO refocuses on its maritime core

Nick Brown draws lessons from global concerns over COVID and carbon

One year since his promotion to CEO at the world's oldest classification society, Nick Brown has completed a process that has seen the organisation dispose of its non-core activities.

The last to go, [in June 2021](#), was its Business Assurance & Inspection Services division, which was sold to Goldman Sachs Asset Management but its new name – LRQA – will be familiar to those who recall its earlier quality assurance subsidiary.

Its sale followed that of LR Energy in October 2020, a business that dated back to the 1930s, although [a statement at the time](#) reaffirmed that “the LR Group remains committed to the energy sector”. Soon after that sale, LR acquired [digital chart](#)

[company C-Map](#) and in August last year it made a final investment to gain full control of Hanseat-icsoft's Cloud Fleet Management business. That was followed by a second acquisition – of the [marine data intelligence company Greensteam](#) – in September 2021.

Brown underlined the thinking behind these sales and purchases. “We were supporting many different types of industries” but now “we’ve started the investment in maritime”, specifically in “digital solutions to support companies”, he told *ICS Leadership Insights*. It is also a return to fundamental principles. “It was critical that Lloyd’s Register refocus all of its activities back on maritime, which is what our brand had always been primarily known for.”

At the same time, he said, its role was expanding beyond what he called the “bare

minimum” class society tasks of “ensuring customers are compliant with safety [and] environmental regulations”.

Instead, it will become a “trusted independent adviser and get much more involved in supporting customers” to understand, for example, the pros and cons of a potential energy-saving investment. “What kind of reliability does it have? How effective is it in service? What savings might be achieved? And what’s the return on investment? That’s the place where I want to take Lloyd’s Register”, he said.

Those transactions have all taken place while the COVID-19 pandemic has been complicating priorities for all business leaders. As for any CEO, he said, his “Number One priority is the safety and health of the people within our organisation and supporting our customers through all the strains and stresses that the pandemic was putting on their operations and activities”.

Brown became chair of the International Association of Classification Societies (IACS) in July 2021 (see box p5) and said he is proud of the classification sector’s response to the pandemic’s impact, for example by implementing remote surveys and inspections (see box p4).

Good COP, bad COP

“Shipping did a fantastic job at COP26”, Brown said. He attended COP26 in Glas-



COP26 showed that shipping is “ahead of government”
(image: Lloyd’s Register)

gow in November and listed its positive outcomes: “It showed that as an industry, we want more regulation, that we are already collaborating and that, in many cases, we’re ahead of government and taking the lead.”

On the other hand, “we want more support, in the form of global regulation, to help us through this transition” to zero-carbon operations. Many were disappointed, therefore, by IMO’s MEPC 77 meeting, held just 10 days after COP26 finished, because “people thought that, on the back of COP, we would have a

big decision ... to go to net zero by 2050, replacing the [goal of] 50% reduction by 2050. ... I think it’s inevitable that that is the direction we’re going in.”

He believes this is possible. “If we can get to the point where zero-emission vessels are not just technically feasible but also the commercial default by 2030 [and] if every ship that gets built from 2030 onwards is a zero emission vessel, then we are inevitably going to get very close to net-zero by 2050.”

There are commercial incentives for owners to invest in such technology, he said, because that is what their customers are focused on, but with different sectors favouring different solutions. Short-sea shipping, for example, is more likely to use hydrogen or batteries than deep-sea tonnage, which will continue to rely on a more calorific fuel, such as LNG. Although many see LNG only as a transition route towards other fuels, it might not be a dead-end: “there may be viable solutions for bio- and synthetic-LNG”, he suggested, which would mean that “LNG-fuelled container ships or bulk carriers being built today could migrate towards net-zero emissions”.

Ammonia

Of all the various alternative fuels currently being explored, the one that is attracting the most R&D interest is ammo-

nia, Brown said. Many “will, quite rightly, point out the risks around its toxicity”, he said, but no firm conclusions about its suitability can be reached “until we actually get some engines designed, tested in a controlled environment and validated”.

He referred to the LR-led [Castor initiative](#), which began in 2020 and has brought together a number of stakeholders [with the aim](#) of building the world’s first ammonia-fuelled tanker by 2025. [The most recent addition to the consortium](#) is Singapore’s Jurong Port, which joined in December 2021.

Collaborative projects such as this, with partners from across the industry “working together, with all the right expertise, and experience” are the best way “to try and make as rapid progress as we possibly can”, he said. “We shouldn’t be waiting for regulation, in the form of minimum standards for ammonia, or hydrogen, or whatever the next fuel is going to be.”

While shipping does not generally act ahead of regulatory requirements, he agreed, he is confident things are different this time. “I honestly believe there will be some first-mover advantage here”, either in the form of a commercial benefit or in terms of brand-recognition, which would be particularly relevant for sectors that are close to end-consumers, such as cruise operators, container lines and car

Learning from the pandemic

Solutions such as remote surveying will outlive the global hiatus, Nick Brown believes. They are examples of how “we have evolved, perhaps faster than might be expected” because of the difficulties of getting service engineers on board. “We’ve proven that physical attendance ... doesn’t have to be the only way we keep ships safe.”

Although remote surveying had been used for some time before the pandemic, its uptake had been limited. But now, “I would hate to think that we’ll lose the ground that we’ve gained. And we can go even further with the use of data and digital twins to continue to supplement physical surveys.”

Nonetheless, classification will never migrate fully to remote surveys, he predicted, because “there will always be a need for hard hats and boots on board using all five senses to carry out a survey”. But many surveys are done when the ship is in port, “at the busiest possible time for the ship’s crew and its operations”, he pointed out, so “if we can



Remote surveys will continue to be used after the pandemic (image: Lloyd’s Register)

[remotely] shift more of that to when the ship is at sea, there are some real benefits for the workloads and stress on the crew”.

Lessons have also been learned by the whole industry, he said, in particular that it “can move really fast when there is a global sector-wide need for it to change”. As a result, shipping has kept critical food, fuel, household items and medical supplies moving around the world, he

said, paying tribute to cooperation between class, flags, regulators and shipowners and operators in this achievement.

“The one area that we all hoped would have gone better is support from governments to help us ensure that seafarers could get on and off ships”, he said, acknowledging the efforts made by ICS and others to press for better support for seafarers.

transporters. It would also help companies attract and retain talent, he said.

Once the first large scale zero-emission demonstrator is in service and its land-based infrastructure is in place, “people’s concerns around safety will be addressed, we’ll have more confidence around the reliability and safety of the new technology and then regulation can follow.”

But there is an important obstacle: cost. According to a report it [published in December](#), *First movers in shipping’s decarbonisation*, Lloyd’s Register’s decarbonisation journey so far “is telling us that for zero-emission vessels to enter the fleet in 2030, the focus should be on fuel costs as these represent the most significant hurdle to overcome.”

Its study considered methanol, ammonia and hydrogen and modelled them on a containership feeder fleet operating in Asia with costs seemingly trumping other factors such as energy density, toxicity and availability. “Ultimately, they are going to become secondary”, Brown believes, but that is because “we can see a route to solutions [to those shortcomings]”. But “until we have some kind of cost on carbon ... future fuels are likely to be two-to-three times more expensive than today’s fuels. That is the biggest barrier to mass adoption”.

A new world order

As new fuels are adopted, there could be a profound impact on world trade routes, Brown believes. Production of e-fuels will be centred on regions with ready access to natural resources, such as sun and wind: places such as Chile, Australia, small islands states and less developed countries – especially those with shallow offshore waters suitable for windfarms or floating solar arrays.

As a consequence, “I think the energy transition may have a bigger impact on trade routes than we are currently discussing”, with north-south energy trades developing to distribute these fuels.

He also did not rule out nuclear power for ships, either using it ashore or on barges to produce e-fuels or with reactors installed onboard. “It’s far too early for us to be closing down options”, he said, and reported that, over the last year, he has seen “more and more customers show an interest in nuclear”.

Russian icebreakers and submarines have used nuclear power for many years, “so you could argue nuclear has more technology readiness than ammonia”. Societal readiness, is another matter: “I don’t believe society is ready to accept a nuclear-powered containership entering Southampton or Long Beach.”

Nick Brown’s balancing act

Just six months after becoming Lloyd’s Register’s CEO, Nick Brown took on additional responsibility as chair of the International Association of Classification Societies (IACS) in July 2021 – the first to be elected to that position and the first to serve a term longer than one year; he will be in post until the end of 2023.

With two positions to hold down, he has to prioritise his time and talents. “I live by the mantra that a CEO should only be doing the tasks that only a CEO can do”, he told *ICS Leadership Insights*. In short, “don’t get involved in things that members of your team can do”.

That team includes three appointments to LR’s Executive Leadership Team, [announced in February 2021](#) as being tasked with driving growth in its maritime business. They were internal candidates, he said, which he saw as an advantage that echoed his own progres-

sion: “My entire career has been at Lloyd’s Register”.

So when he became IACS Chair, he did not have to simultaneously immerse himself in understanding his new role, as an incoming CEO might have to do. “I had spent the previous five years as part of the executive team responsible for the global marine and offshore business”, he said.

His two roles are not in tension, he said, especially now, when the industry is facing the shared challenge of decarbonisation, which has created “the need to ensure that the industry does its best to move as one”. Whenever there is any kind of major transition in an industry, collaboration is particularly important, he said, “and of course IACS is where class societies need to be collaborating and avoiding duplication of effort. ... That is exactly where we intend to make progress during my chairmanship.”

Collaboration essential for decarbonisation, say shipping leaders

Collaboration will be the only way for shipping to reach its decarbonisation goals, according to maritime leaders speaking at an ICS webinar held on 26 January.

Speakers at the [Leadership Insights Live](#) event joined to discuss shipping's next steps towards the green transition, convening for the first time since COP26.

Christine Cabau Woehrel, CEO, CMA Ships, CMA CGM, said that to accelerate the development of alternative propulsion technologies and fuels, the shipping industry must join forces and "learn in ecosystems". "This cannot be a lone trip; it needs a collective effort where all stakeholders join together to implement the most efficient solutions," she said.

Woehrel said that CMA CGM is creating strategic partnerships with energy firms in a bid to overcome scalability issues of alternative fuels needed for shipping. "We need to get started somewhere so CMA CGM has joined forces with French energy group ENGIE," she said.

Meanwhile, Nick Brown, CEO, Lloyd's Register, called on CEOs to play their



From top left to right: Nick Brown, CEO, Lloyd's Register; Katrin Harvey, COO, Ban Ki-moon Centre for Global Citizens; Christine Cabau Woehrel, CEO, CMA Ships, CMA CGM; Esben Poulsson, Chairman, ICS; Rolf Thore Roppestad, CEO, Gard AS (image: ICS)

part and lead by example. "My message is for leadership to get involved; it doesn't take much for you to offer some expertise from your organisation. We have amazing talent across all stakeholders and more that can dedicate time and expertise in this."

Rolf Thore Roppestad, CEO, Gard AS, added that while everyone has a role to play in the decarbonisa-

tion of shipping, not everyone can or should focus on innovation or new fuels. "Some of us in maritime do not have a direct role in those areas but can indeed contribute to others. We all must find our role and do what we are best at during the transition," he said.

● [Register here](#) for the upcoming ICS Leadership Insights Live, held in conjunction with ECSA.

ICS and renewable energy body join forces

ICS has [signed a Partnership Agreement](#) with the International Renewable Energy Agency (IRENA) to support the decarbonisation of the shipping sector and its role in the transition towards a global energy sector based on renewables.

Signed during a meeting between the heads of the two organisations in January 2022, the partnership will provide a framework over the next two years for ICS and IRENA to assist with the decarbonisation of the shipping sector and the use of renewable technologies. It will also enable the industry to work closer with IRENA's global membership of more than 160 countries and territories on decarbonising shipping.

The organisations will set up a regular exchange of information on energy supply and demand relevant to the shipping sector and exchange of data on scenarios of 'future fuels', for both nation states and the shipping industry. This partnership agreement draws particular focus on the need to ensure an equitable energy transition for developing economies and the important role of capacity building as well as recognising the energy needs of shipping itself.



New ICS guide helps seafarers navigate the digital bridge

The newly launched edition of the [Bridge Procedures Guide](#) from the International Chamber of Shipping (ICS) reflects the rapid technological advances taking place in the shipping industry. It provides crews with the knowledge and confidence they need to deal with the digital transformation taking place within the world fleet.

Referenced in several International Maritime Organization documents, the

ICS *Bridge Procedures Guide* is widely acknowledged as the principal industry guidance on safe bridge operations.

The guide complements the guidance in the ICS [Engine Room Procedures Guide](#) and, when used in collaboration, readers can be confident of gaining a comprehensive understanding of the latest best practices in the industry.

● For further information on the new edition, [click here](#).

Seafarer champion, Natalie Shaw, awarded MBE

Natalie Shaw, Director of Employment Affairs at the International Chamber of Shipping (ICS), has been [made an MBE](#) in The Queen's New Year's Honours List for 2022. A respected member of the maritime sector, Shaw has been recognised for her monumental efforts in driving the

global repatriation of stranded seafarers and ensuring that shipping could continue to operate safely during the pandemic.

Shaw acted as the lynchpin for diplomatic, logistical and operational efforts to navigate the wave of COVID restrictions

preventing the free movement of seafarers. As a result of her work, hundreds of thousands of men and women have been able to return safely home, often against seemingly insurmountable odds.

Esben Poulsson, Chairman of ICS, offered congratulations

“
Shaw has been recognised for her monumental efforts in driving the global repatriation of stranded seafarers

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on behalf of the ICS Board. “Natalie's tireless efforts in championing the welfare of our seafarers over many years is well known, and this richly deserved award reflects these efforts. Well done Natalie – we are proud of you!” he said.

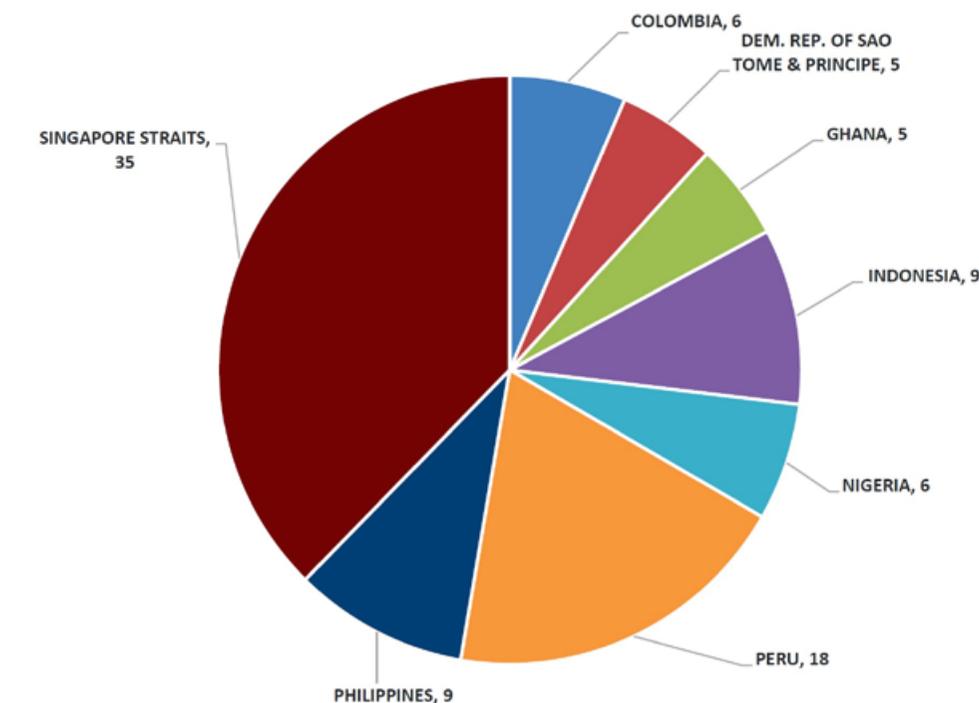
Nigeria piracy down, but focus remains on Gulf of Guinea

Piracy incidents in 2021 were at their lowest level since 1994, with a total of 132, down from 195 in 2020, according to the latest [annual analysis](#) published in mid-January by the International Maritime Bureau.

Nigeria showed a particularly significant improvement, with six incidents during the year, compared with 35 in 2020, which had included a record number of kidnappings. Incidents in the Singapore Straits, on the other hand, increased from 23 in 2020 to 35, continuing an upward trend from a low point of three incidents in 2018.

Those incidents – which represent 26% of the global total – are mostly “opportunistic thefts” rather than hijacking vessels or kidnapping crews for ransom, IMB director Michael Howlett told *ICS Leadership Insights*. Nonetheless, “the pirates seem quite capable of getting on board, which obviously is a concern.”

So despite the improved numbers for Nigeria, “the focus should very much continue to be on the Gulf of Guinea, as this is where we believe the biggest threats to seafarers exists. It’s nowhere near game-over”, said Howlett.



Eight locations contributed 71% of piracy incidents reported in 2021 (source: IMB)

A development that helped improve the situation was the creation last year of the Gulf of Guinea Maritime Collaboration Forum on Shared Awareness and Deconfliction ([GoG-MCF/SHADE](#)), which held its inaugural meeting in July 2021. It brings together regional authorities, some international navies, the shipping industry and the IMB “to try to create an information

exchange mechanism that would allow for coordination and a robust response” to reported attacks, Howlett said.

Its formation was “a good step forward ... This is exactly the sort of mechanism that was missing previously but it must be built upon and sustained”, he said.

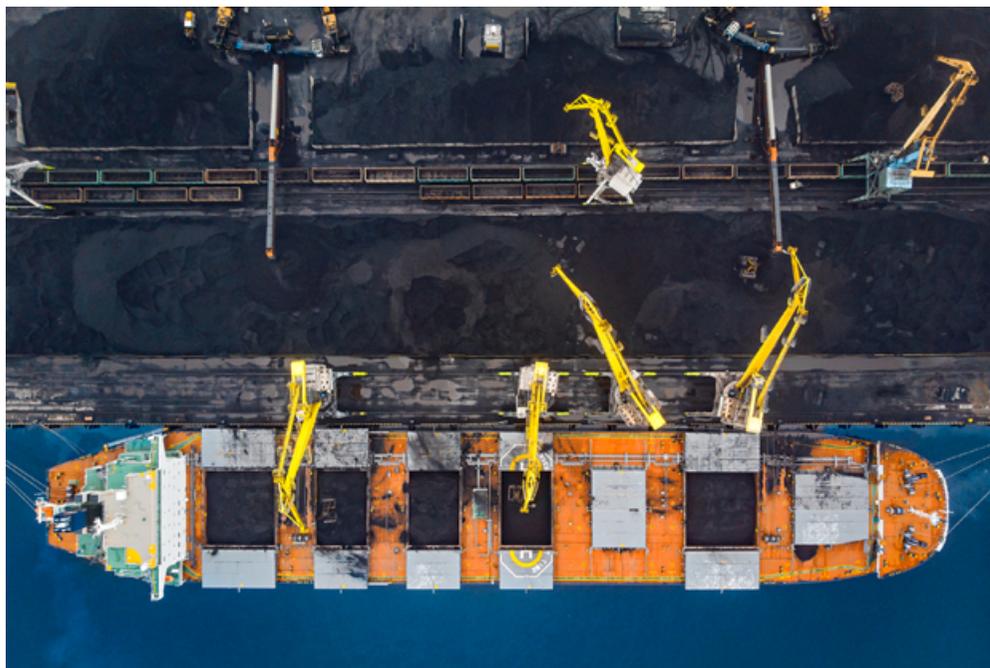
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It’s nowhere near game-over
Michael Howlett

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John Stawpert, Manager (Environment and Trade) in the ICS’ Marine Department, agrees. “What keeps us awake at night is whether [the reduced activity] is sustainable or not. ... It will depend on increased cooperation between external navies and regional navies”, he said.

There are loopholes “through which the pirates escape” that still need closing, in particular where one security force hands over responsibility to another “to ensure that the pirates can be pursued all the way back to the shore and arrested”.



Coal-fired electricity and global coal demand approach record levels

Global demand for coal could reach an all-time high this year, along with the amount of electricity generated worldwide from coal, according to a report, [Coal 2021](#), published by the International Energy Agency (IEA) in December.

It estimates that global coal consumption in 2021 will be 7,906 million tonnes, a 6% increase on 2020's level, with three countries – China (+4%), India (+13%) and the US (+17%) – accounting for the bulk of the increase, with a further 1.5% rise to a record 8,025 million tonnes this year.

Growing coal consumption will boost shipping demand (image: Shutterstock)

By 2024, the report predicts global demand to reach 8,031 million tonnes, driven by demand in China, India and countries in Southeast Asia, while demand in the US and Europe will decline.

“Coal is the single largest source of global carbon emissions, and this year’s historically high level of coal power generation is a worrying sign of how far off track the world is in its efforts to put emissions into decline towards net zero”, said IEA Executive Director Fatih Birol in a statement to accompany the report. “Without strong and immediate actions by governments to tackle coal emissions ... we will have little chance, if any at all, of limiting global warming to 1.5°C.”

For shipping, the focus is on reducing emissions and moving towards zero carbon fuels. “It was clear at COP26 that shipping is aligned to reach net zero carbon emissions by 2050. The industry is doing everything it can to decarbonise and recognises the pace this must be done. Shipping will do all it can to support countries’ decarbonisation journeys and will play a key role in the transportation of zero emission fuels globally,” said Helio Vicente, a Senior Policy Adviser at ICS.

The report’s publication came just two weeks before the first stage of the EU’s [Climate Delegated Act](#) came into force on **1 January 2022**. The Act sets out a classification system, or taxonomy, to encourage private investment in sustainable growth and contribute to a climate neutral economy.

If approved, lenders or investors would need to bear this in mind when they consider investing into certain industries, Vicente suggested, which could affect shipowners seeking finance for ships to carry cargoes such as coal, he said.

ICS Policy Adviser Georgia Spencer-Rowland confirmed that there is concern over this ‘cargo carried’ provision in the taxonomy, which is still under discussion. “The industry is engaged in discussions with the Commission to ensure that shipping is not unfairly penalised”, she said.

She also drew attention to [an assessment](#) published last April by the European Community Shipowners Associations which warned that “considering cargo as part of the shipping maritime activity under the shipping taxonomy will lead to negative and unintended consequences”.

- [An overview](#) of how the EU’s taxonomy will apply to transport investments was published last year by the law firm Watson Farley Williams.

Future fuel safety has been ‘overlooked’

Experts urge industry and regulators to give safety a higher priority

Safety aspects of future fuels have “so far been overlooked and trivialised”, Stephen Brown, Innovation Manager at Shell Shipping and Marine, told *ICS Leadership Insights*. “We hear people flippantly talking about hydrogen and ammonia ... but there are a lot of challenges to overcome before we turn those into reality”.

Ammonia, in particular, might look attractive in academic modelling, but its impact on design and safety – both personal and process safety – is overlooked, he believes.

Lloyd’s Register CEO Nick Brown also shares concerns over maritime’s switch to new fuels. “There are some real safety risks to manage,” he said, yet although many events discuss future fuel options, “you would struggle to hear the word ‘safety’ mentioned in most of them”.

He is also Chairman of the International Association of Classification Societies



(IACS), which held its 84th six-monthly Council meeting in December at which the organisation [committed itself](#) to making “supporting safe maritime decarbonisation” a main objective.

IACS has also alerted IMO to the need for a safety-based approach to new fuels.

Piping arrangements are critical for safe handling of ammonia (image: Wärtsilä/Christoffer Björklund)

In a [submission](#) to the organisation’s 32nd Assembly in December, it advised that “the assessment of alternative technologies and fuels will require accepted safety regulations at a detailed level”.

Sunil Krishnakumar, senior technical manager at ICS, said that two IMO Correspondence Groups (CGs) are looking at fuel safety. One is tasked with reviewing the International Code of Safety for Ships using Gases or other Low-flashpoint Fuel (the IGF Code), which reports to the Sub-Committee on Carriage of Cargoes and Containers (CCC).

The code focuses on LNG but was drafted with the expectation that other fuels would be added to its scope. The CG has already considered methanol, with additional requirements for liquefied petroleum gas, hydrogen and ammonia next on its agenda.

Another CG, established by the Maritime Safety Committee (MSC), is developing further measures to enhance the safety of ships relating to the use of fuel oil.

This includes SOLAS amendments regarding the reporting of confirmed

cases where oil fuel suppliers have failed to meet the flashpoint requirements of SOLAS (currently stipulated as a minimum of 60°C) and actions against oil fuel suppliers that have been found to deliver these fuels.

Krishnakumar said MSC's remit is "to ensure that the flashpoint requirements for conventional oil fuels are strengthened and adequately enforced", with discussion about alternative low flashpoint fuels dealt with by the CG looking at the IGF Code. MSC's group is due to report back to MSC 105 in April. It is not clear when the CCC's CG will complete its work.

In [an article following MSC 103](#) in May last year, Unni Einemo, Director of the International Bunker Industry Association, considered the CG's goals, saying that "it is clear ... that [consultative organisations and member states] want regulations targeting the supply side to prevent fuels below SOLAS limit from being supplied to ships in the first place, and to ensure suppliers face consequences if it still happens."

New fuels and ship design

A joint project including Lloyd's Register, the Maersk Mc-Kinney Moller Centre and others is exploring how new fuels will have an impact on ship design, focusing on developing guidance of using ammonia

as a fuel. in a project to develop guidance around the safe use of ammonia as a fuel.

[It began in April 2021](#) and Lloyd's Register Decarbonisation Programme Manager Charles Haskell said in January that the partners are conducting a detailed Quantitative Risk Assessment (QRA) of three concept vessel designs (tanker, bulk carrier and containership) and different forms of storage (refrigerated, pressurised and semi-refrigerated). "The QRA model is at an advanced stage of development and we are starting to generate some risk results", he said.

So far, the group's work has looked at the risk to personnel on board. "We have assessed both the toxic and flammable effects of ammonia leaks [and] the work is generating useful insights into ship design", he said.

Class society DNV is looking into the safety risks of hydrogen fuel and where it can be stored. "The few vessels so far designed to use hydrogen store it in deck-mounted tanks, but we have started looking at the possibility of having hydrogen tanks below deck", said Christos Chryssakis, Business Development and Alternative Fuels Expert at DNV.

Because hydrogen tanks are large, stability has to be considered carefully, especially for a small vessel, he



Maersk's methanol-fuelled newbuildings will have their accommodation forward (image: Maersk)

“
You have to basically start from scratch

Christos Chryssakis

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said. “You have to basically start from scratch”, he said.

Stephen Brown, Innovation Manager at Shell Shipping and Marine identified one key design change for hydrogen-fuelled ships: to address its safety risks, crew accommodation should be placed forward. This also results in a more even weight distribution – especially in a fuel-cell vessel, with less machinery weight – which means less ballast is needed, allowing more cargo.

Maersk has already adopted that arrangement for eight 16,000TEU methanol-fuelled container ships, [which were ordered in December](#). When the project [was first announced](#) in February 2021, its purpose was described as “solving the practical, technical and safety challenges inherent in the carbon neutral fuels”.

Engine designers put safety first

Peter Kirkeby, Promotion manager & Business Development – Dual fuel engines at MAN Energy Solutions, disagrees with view reported above that safety is rarely mentioned in relation to alternative fuels.

“It’s actually the centrepiece of every discussion” about its development work on ammonia-fuelled engines, the first of which it expects to be delivered to a shipbuilder by one of its licensees in 2024. A South

FUTURE FUELS SWOT TABLE

Fuel	Strength	Weakness	Opportunity	Threat
LNG	Marine fuel since the 1970s	Methane slip from some engines	Potential transition fuel	Pressure to cease use of carbon-based fuels
LH2	Non-toxic	Extremely flammable and explosive	Higher-efficiency fuel cell possible	Advanced firefighting techniques required
Ammonia	Existing production and handling methods	Highly toxic	May work with ICEs	Highly objectionable to coastal amenities
Methanol	Liquid at room temperature	Low energy density	Methanol fuel cells under development	Often mistaken for edible ethanol

Selected extracts from a SWOT analysis of future fuels. The full analysis is available [here](#)

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Korean-built 4T50ME-X test engine was installed in its Copenhagen plant in 2020 and full-scale tests are due to start this year.

If it hits its target, that 2024 delivery will be the first full scale ammonia engine to go into service. “The engine technology itself is taken for granted”, he said. “People trust that we’ll actually do what we say when it comes to engine development.”

Safety measures for an ammonia-fuelled engine are much the same as those for any other dual-fuelled engine, he said: “you need to make sure that if there’s a leakage, it can be detected [within] the next revolution [and] the engine runs on oil instead.”

Any leak would be contained within the double-walled piping used for the fuel and then purged via [a system that would capture the ammonia](#) to prevent it venting to the atmosphere; “these engines are being designed so that the engine room is not classified as a hazardous area”, Kirkeby said.

Before any maintenance is carried out, the system would be purged with nitrogen – as it is for engines fuelled by methanol, which is classed as both a toxic and a low-flashpoint fuel.

Fuel supply systems are clearly critical in ensuring their safety and Mathias Jansson – Wärtsilä’s Director, Fuel Gas

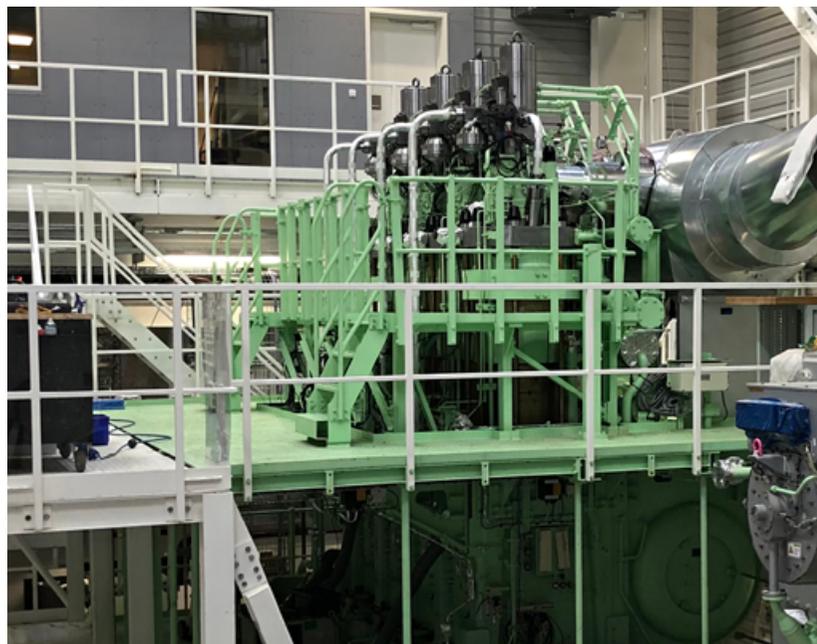
Supply Systems, Marine Power – is responsible for that aspect on any vessel using LNG or any other future fuel in its four-stroke engines.

There is very little risk of ammonia escaping into the engine room, he said. In the event of a leak of LNG or methane into the double-walled piping, both could be vented to the air in an emergency, but because of ammonia's toxicity, Wärtsilä is developing additional systems to prevent or neutralise any escape. If someone were in the vent's vicinity, "the consequences could be catastrophic", Jansson said.

It is not just in emergencies where this might be necessary: for maintenance it may be necessary to purge as much as 100m of pipe, he said

Methanol is an easier fuel to handle than ammonia, LNG or hydrogen, Jansson said. Its bunker tank does not need pressurising or refrigeration and only the piping between the high-pressure pump to the engine has to be double-walled. Hydrogen, on the other hand, requires similar pipework to LNG, except that it must be more insulated and more of it must be double-walled because of its low temperature.

Jansson also spoke about bunker connections for these fuels. "This is definitely an area where ammonia and liquid hydrogen bunkering will need their own



MAN Energy Solutions is conducting ammonia engine studies on this 4T50ME-X test engine (image: MAN ES)

chapter in different rules", he said. "More than ever, there's no room to cut any corners on safety".

- A detailed SWOT (strengths, weaknesses, opportunities, threats) analysis for a number of potential fuels, including LNG, liquid hydrogen (LH₂), ammonia, methanol, and their green equivalents, is available [here](#), using data from various sources. A brief summary can be found on p12.

Test programmes explore hydrogen safety

Class society DNV is conducting a series of tests at its specialist fire and explosion research and testing centre in Spadeadam in the UK to explore the risks of a hydrogen explosion in a marine setting.

Speaking on [a video about the project](#) released in December, Dan Allason, Head of Section, Research & Development, explained that "the explosions that we do are centred around making sure that they don't happen in reality".

One of the partners in the project is Shell Shipping and Marine, which views hydrogen as the most likely long-term fuel, not just for shipping but for other sectors, according to its Innovation Manager, Stephen Brown. "there are many unknown unknowns" related to using hydrogen safely and "only when you when you uncover them, can you design for them," he said.

Along with DNV and many other partners, it is also part of the [MarHySafe joint development project](#), which has launched a handbook for hydrogen-fuelled vessels and continues to do work towards the standardization of hydrogen operations.

Shell will also start its own 18-month project in Q1 this year that will look at hydrogen safety in a number of sectors. A number of companies are already involved in the work and Brown expects others to join as the work progresses.

Shipping revenues are vital for Panama

Its canal, register and maritime services support Panama's social and welfare structures

Panama is a maritime country like no other, thanks to the Panama Canal and ship register. Both attract businesses and create employment that give Panama a complete maritime business infrastructure, including ports, cruise operators, agents, training facilities, law firms and shipyards.

According to Panama Canal Authority Administrator Dr Ricaurte Vásquez, in fiscal year 2020, Panama Canal's direct contributions to the economy represented 2.7% of the country's GDP and its total contribution provided an estimated 3.8%.

According to the [business data platform Statista](#), GDP that year was US\$52.94 billion, but that was down from its 2019 pre-pandemic figure of US\$66.79 billion. It is expected to show a further decline for 2021, which is estimated to have had a GDP of just \$30.12 billion, but is pro-



In August 2021, *Star Breeze* was the first passenger vessel to berth in Panama since the start of the Pandemic (Image: Hutchison Ports PPC)

jected to resume its upward trajectory from this year onwards.

Meanwhile, the Panama Maritime Authority (AMP) [has reported record income](#) for 2021 of US\$186.1 million, a result that it credits to a focus on growing the Panamanian fleet, among other things. IMO data for end-2020 shows Panama as the largest register, with 226.58Mgt, with Liberia in second place with 185.13Mgt.

At the time of writing in late January, IMO had not published its end-2021 figures but unofficial data seen by *ICS Leadership Insights* in mid-December indicated that both fleets have increased, to around 231Mgt and 196Mgt respectively.

Most of the register's revenue goes into the National Treasury to fund "the economic reactivation of the country [and] help improve the quality of life of Panamanians", AMP's report said.

As for the canal's national contribution, its impact "transcends the economic perspective", Dr Vasquez said. For example, the Canal Authority operates an Environmental Economic Incentives Program that supports farmers to reforest, protect, and cultivate land in its watershed, with coffee, cocoa, and fruit as key crops.

Conserving those waters is part of the Canal's constitutional mandate, he

explained, since they not only supply the Canal, they are the main sources of water for half the country's population. "Currently, the Canal is working towards a solution that will guarantee water availability in the long term", he said.

Kim Christiansen, Commercial Manager of the shipping agent Altamar Panama, confirmed that Panamanians are very proud to have the Panama Canal, especially of "how efficiently and very professionally it is handled". Whether they are aware of its economic impact, however, is not so clear; "you do not see much of this in the local news", he said.

COVID-19

Dr Vasquez took up his post in September 2019, so he has been dealing with the pandemic for most of his time in office. "We executed a series of changes to our operations to protect the health and safety of our workforce and that of our customers and their crews", he said, which has allowed operations to continue uninterrupted. Those measures "will remain in place in one form or another", he said.

Although the canal has kept working, other sectors have been hard-hit by COVID-19, in particular cruise – not only because of the global downturn in the sector but also because of an executive decree on 13 March 2020 that suspended cruise calls.

Panama's green agenda

Panama is one of only three countries worldwide that is carbon negative, since its forests capture more carbon than the country emits, according to its Minister of Foreign Relations, Erika Mouynes.

Speaking during the ICS event '[Shaping the future of shipping](#)', held during COP26 in November, she said that, because the country is surrounded by water and has the world's main waterway, Panama has "a huge responsibility, along with an opportunity, to lead the way in terms of commitment to climate change".

Specifically, "we want to transform Panama into a hub for clean fuels ... so we're looking into concrete projects on [storage and distribution of] methanol, ammonia and green hydrogen".

Ahead of COP26, the Panama Canal Authority added its name to the 'Getting to zero coalition', which is committed to getting commercially-viable deep sea

zero-emission vessels into operation by 2030.

Panama Canal Authority Administrator Dr Ricaurte Vásquez explained that its support reflects a long-held ambition "to provide greater value to customers beyond serving as a shortcut, with environmental benefits top of mind". The authority has set itself decarbonization targets for 2030 and created tools to help customers create more sustainable supply chains. These include a [CO₂ Emissions Dashboard](#) that calculates the CO₂ emissions saved by vessels using the canal rather than alternative routes.

Other measures include generating electricity from renewable sources to migrating the Canal's fleet to electric vehicles and hybrid tugboats, Dr Vásquez said. "Our team will also explore a pricing strategy that promotes the efficiency and low-carbon emissions of the ships that transit the waterway."

That was lifted in August 2021 and just days later, on 28 August, Windstar Cruises' *Star Breeze* called at the cruise terminal operated by Hutchison Ports' Panama Ports Company (PPC) in Cristobal, making it the first cruise ship to call in Panama since the pandemic had started. During the hiatus, plans to improve the port's facilities were put in hand, its CEO, Jared Zerbe, said.

In November, the Panama Cruise Terminal – an initiative by the AMP to provide cruise facilities at the Pacific end of the canal – [received a test visit](#) from *Viking Star*, marking the start of a homeport operation for the vessel. During its inaugural visit, 681 passengers disembarked and 524 passengers embarked, all of them fully vaccinated.

Then in early December, [the AMP began offering vaccinations to seafarers](#) on Panamanian ships and to ships calling at its ports. The campaign, run in conjunction with the Ministry of Health, has access to 300,000 doses and shipping agents are providing information to gauge the number of seafarers who want to benefit from the scheme.

Ports, too were initially involved, said Zerbe. "We had an initial link with some shipping lines for the programme [but now] vaccinations are being coordinated with local authorities to be done by them at the anchorage".

Location, location, location

Panama's location ensures "high logistics and port competitiveness", said Jared Zerbe, CEO of Hutchison Ports' Panama Ports Company (PPC). His point is underlined by the near dominance of transshipment cargo handled at its two ports: 92% in Balboa and 96% in Cristobal.

And since the canal's larger locks came into use in 2016, "we have not noticed major changes; Balboa already received ships of 13,000TEU long before the expansion", he said.

However, "we have noticed changes in our operations in connecting routes: cargo from Asia for the Caribbean or the East Coast of Central America was previously handled by Balboa in conjunction with the multimodal system, continuing its journey from terminals in the Atlantic. Now shipping lines can consolidate their cargo with other routes, such as from the US East Coast".

Panama's location also makes it a good place to deliver spare parts and perform crew changes, according to Kim Christiansen, Commercial Manager of the shipping agent

Altamar Panama. It also has the advantage of using the US dollar, he said, to which Panama's own balboa is tied with a 1:1 exchange rate.

“
We have experienced a large increase in demand for services

Kim Christiansen

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The country has more than 100 licensed agents and they have been affected by the twin challenges of COVID-19 followed by the global congestion as trade re-sets. But their impacts have been very different.

Passenger flights were suspended and crew changes were prohibited and have not yet recovered, Christiansen said. Like other businesses, shipping agencies have had staff working from home and have implemented procedures to avoid staff and clients getting infected, he said.

Alongside this, canal transits increased during 2021. "Heightened demand for consumer goods led to more transit demand than expected ... largely driven by new liner services, transits of ships with extra cargo and the repositioning of ships between routes", explained Panama Canal Authority Administrator Dr Ricaurte Vásquez.

As a result, Christiansen said, "we have experienced a large increase in demand for services, both in number of new clients and numbers of services per call". Backed by this strong growth, Altamar has made alliances with other agencies in the Americas and one in FarEast. It also joined BIMCO last year, Christiansen said.

The Panama Canal Authority is planning to build a [fourth bridge](#) across the canal and, although work on the bridge itself has not yet started, new roads are already being laid. This is generating work for agents; in Altamar's case, this included handling the arrival of a jack-up barge that is assisting with the construction.

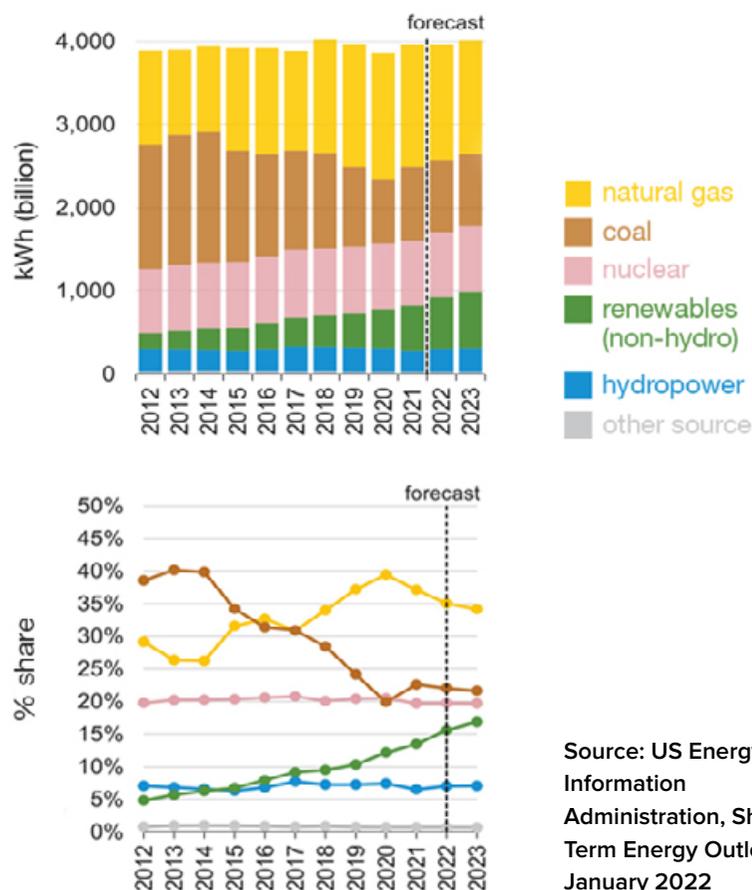
US generators used more coal and renewables in 2021

Electricity generators in the US used more coal last year than in 2020 while continuing a multi-year upward trend in renewable energy sources, according to the US Energy Information Administration.

In a report, [Short-term Energy Outlook](#), published in January, the administration noted that coal-fired power generation had fallen every year since 2014 but in 2021 it grew by an estimated 17% compared with the year before. Some of this increase was a result of the overall increase in US electricity demand after the pandemic-related decline in 2020, “but most of the increase ... was in response to natural gas prices”, which were on average double those available in 2020, the administration says.

Renewable sources will increase from 20% in 2021 to 23% in 2022 and 24% in 2023, the report predicts, mostly from new solar and wind capacity, with hydropower steady at about 7% in 2022 and 2023, following a reduction to 6% in 2021 because of a drought in the west of the continent.

US electricity generation by source, all sectors



Source: US Energy Information Administration, Short-Term Energy Outlook, January 2022

ICS is the principal international trade association for merchant shipowners and operators, representing all sectors and trades and over 80% of the world merchant fleet.

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