

WORLD



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BUNKERING

THE OFFICIAL MAGAZINE OF IBIA

FOCUS ON QUALITY

DEALING WITH UNUSUAL CONTAMINANTS

INSIDE THIS ISSUE:

CALLS FOR TRANSPARENCY

ALTERNATIVE FUELS OVERVIEW

INTERVIEW: 'THE VOICE ON MARINE FUEL'



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QUALITY STILL MATTERS

Dear Reader

As I write this, it is six months since Russian tanks rolled across the Ukrainian border and sent the world, still only partially recovering from Covid, into renewed turmoil. Global economic recession now looks very much on the cards while the political imperative to decarbonise sooner rather than later becomes more urgent.

So, does this current issue of *World Bunkering* reflect those grim realities? Yes of course it does. But the bunkering business goes on and some issues are perennial. That is particularly the case with quantity and quality.

In our Industry News, supplier TFG makes the case, again, for mandatory use of mass flow meters. Meanwhile in our Singapore feature we report a criminal case relating to quantity, a very large quantity of MGO as it happens. Highlighting that Singapore's courts take cases of corruption and theft extremely seriously, a former Shell employee is facing spending the next 29 years in jail. He was a mastermind in a scheme that stole more than \$100 million worth of fuel over a 10-year period.

Turning to quality, that is a major focus of this issue. And staying, at least partly with Singapore, Charlotte Røjgaard of Bureau Veritas VeriFuel looks at contamination issues. Her message can perhaps best be summed up as: "Don't panic!"

Nobody would accuse the subject of our Interview, Tim Wilson of LR FOBAS, of panicking over fuel quality. But it is a subject he knows a lot about and the Q&A with IBIA Director Unni Einemo explores quality issues, and more, in some considerable detail.

Talking of considerable detail, in her regular update on developments at IMO, Unni reports on how a regulatory barrier to increased use of biofuels has been overcome. She explains that proving compliance with requirements in the NOx Technical Code had been problematic. Now, a new Unified Interpretation approved by the Marine Environment Protection Committee means that biofuel blends up to 30% will be regarded in the same way as regular oil-based fuels.

While Quantity and Quality have been topics since the first issue of *World Bunkering*, a more recent development is that we now devote considerable space to Alternative Fuels. In this issue there are two overviews covering different aspects.

IBIA's Future Fuels Working Group has been working on its first major project, a comprehensive assessment of the main alternative fuels. We are carrying a summary of its initial findings. The working group not only looks at potential alternative fuels but also considers the potential of efficiency and emission reduction methods and onboard carbon capture and storage (CCS) using scrubbers.

The second overview, by non-regulatory shipping industry safety consortium Together in Safety evaluates potential operational risks of LNG, methanol, hydrogen and ammonia and the scope for mitigating measures.

Taken together these two reports give a good insight as to where we are with decarbonisation pathways. We also look in more detail at specific developments in some of the main alternative options for powering ships.

One alternative fuel that is not covered in the section just mentioned is plastic. Fuelling ships with waste plastic sounds too good to be true, and in terms of wide application it probably is just that. However, as reported in our Innovation section, designing is underway of a concept ship that would collect plastic waste from the sea and convert it into "clean hydrogen", allowing surplus hydrogen to be shipped back to shore. That would tick a lot of environmental boxes, but for now that probably stays in the 'keep-an-eye-on folder'.

So, having only skimmed over the contents of this issue (there is much more), I hope you find plenty of interest within its pages.

Best wishes
David Hughes
Editor





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Axiom Global is built with a mission to offer and build a sustainable and profitable relationship with our stakeholders and trading partners in the field of energy trading, bunkering and risk management. As bunkering industry is under constant pressure due to its very nature, Axiom Global, strives to "deliver more for less" by offering customized solutions for specific markets with a motto of "Our Word is Our Bond".

Axiom Global strives to offer best and competitive trading experience to their trading partners by controlling the entire supply chain from procurement, storage, blending, shipping, and hedging and simultaneously keeping social responsibility and environment at its core at all stages of the supply chain.

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COME ON IN AND GET INVOLVED

IBIA is very much a member-led organisation, but from the outside it may be difficult to understand how we work

Four months into the new term for the IBIA Board, and a lot has happened around us. The geopolitical situation is complex to say the least and this obviously has a significant impact on the shipping and marine fuel industries. We operate in markets that are deeply interconnected and events happening on one side of the world have immediate effects thousands of kilometres away.

As IBIA, we continue to focus on the priorities we set at the start of our term: transparency and integrity, the energy transition, and adoption of globally accepted best practices or licensing schemes for marine fuel suppliers. As, by now, you are familiar with the reasoning behind these priorities, I thought it would be interesting to share more with you about the inner workings of IBIA, how we function and how we strive to add value to our members and to the industry as a whole.

IBIA is a member-led organisation, with members volunteering their time, effort and knowledge for what we consider "a greater good". The IBIA Board of Directors is democratically elected by members of the Association, and seats on the Board become available every year as our terms are "staggered"; this structure provides the organisation with a good balance between renewal and continuity.

Approximately a year ago, we launched IBIA Regional Boards, starting with Asia and Africa. This will be followed by the Americas, Middle East and, of course, Europe. The goal of establishing these Regional Boards is to strengthen our local presence in key areas, as well as creating a "pipeline of IBIA champions" who might eventually run for a seat on the IBIA Global Board. With members' engagement being such a key success factor for our organisation, Regional Boards provide an excellent opportunity for members around the world who want to provide their know-how and skills to make a positive impact on the industry.

Working groups are another great way for members to get involved and focus on some clearly defined goals. Particularly relevant and active IBIA working groups - just to name a few - include Future Fuels, Bunker Licensing & MFM, Events, and Technical.

As much as members' contribution is fundamental for IBIA to achieve its goals, the organisation would not function without the great work of some dedicated and passionate professionals who truly make our association special: the IBIA Secretariat.

Every member who had the chance to interact with Unni, Tahra, Sofia, Tara, and Siti will consistently tell you about their

professionalism and know-how in their respective areas of expertise. Having had the privilege to work alongside them for some time, I feel that IBIA is in great hands with these five women being the backbone of the organisation.

It is not always easy to know, from the outside, how IBIA as an organisation works. My encouragement to you is to take a step towards the inside because it is from the inside that you can have a real impact and both IBIA and the industry will benefit from your active engagement.

Ciao

Timothy Cosulich,
Chair



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A QUESTION OF QUALITY

'Quality' refers to how good or bad something is, or its basic nature. Most of us want good quality, but how do we define it?

Fuel quality has always been a hot potato in our industry. We have an international standard, ISO 8217, to judge fuel quality against, which helps a lot! ISO 8217 is a 'living document' that takes into account the evolution of fuel quality and fuel systems/engine technology. It sets limit values for specific parameters that helps ensure the fuel can be safely used providing it is correctly managed and treated onboard the receiving ship. Work is underway on the 7th edition to replace ISO 8217:2017 to better reflect the nature of fuels in the market today.

Most of the time, ships receive fuels that meet relevant quality specifications and use them without incident. That doesn't make the headlines; only off-specs do. From time to time, chemicals that are not specified in ISO 8217 are suspected to be the cause of operational problems or damage within a ship's fuel system or engine, and hence may be in contravention of Clause 5 in ISO 8217. One major incident took place in Singapore this year. On this occasion, there was broad consensus among fuel testing agencies about the type of chemicals (Chlorinated Organic Compounds) that caused operational problems. This is not always the case; there is no such consensus about which chemicals were to blame for the 2018 problems with fuels originating in Houston.

There is discussion at the IMO's Maritime Safety Committee (MSC) regarding what the IMO can or should do to enhance the safety of ships relating to the use of fuel oil. It is a tough nut to crack. There are very real concerns about the risk to the safety of ships and crew from contaminated fuels. But how can the IMO solve problems that are both rare and often poorly understood? I think it makes sense for IMO to work closely with ISO, CIMAC and IBIA, where fuel quality experts are already well represented and actively engaged. CIMAC and ISO are well versed in collecting and analysing information from such incidents and identifying when there is a clear causal link between a specified chemical compound at certain concentrations and operational issues, as well as identifying appropriate test methods. Bit by bit, we learn more about which chemicals and fuel attributes have the potential to pose a safety risk to ships, how to identify them, as well as how to mitigate negative impacts on ships through preventive measures.

When problems occur and fuel is suspected to be the cause, we need constructive and open dialogue about where problems lie and strive to find ways to address them. This entails detailed fuel analysis and investigation into exactly what happened on the ship. We also need cooperation from the supply-side to prevent fuels suspected of causing problems from being supplied to other ships, and help identify the sources of problem fuels. Also helpful is an effective bunker licensing system and pro-active port authority, as we saw in Singapore where the Maritime and Port Authority (MPA) ensured the supply of the contaminated fuel batch was halted when it was linked to reports of problems on ships. MPA also investigated the incident to see how it came about, and took action against one of the suppliers involved for contravening the terms and conditions of its bunkering license. MPA and the Singapore Shipping Association will co-chair an industry expert group (IEG) to establish a list of chemicals to be tested and their corresponding concentration limits. The expert group is expected to make its recommendations on additional measures to strengthen bunker quality assurance of bunkers delivered in Singapore. IBIA supports MPA's efforts to strengthen fuel quality checks and we have confirmed our participation in the IEG alongside experts from testing laboratories and other relevant bodies.

How to improve quality?

As I was writing this, I looked at dictionary definitions of 'quality'. One of them was "a high standard", and for context, this example was given: "He's not interested in quality. All he cares about is making money." Is that how our industry is perceived? Whether it is a bunker supplier or trader, or a bunker buyer looking for the lowest price product?

We all need to make a living, but if we want to improve our industry, we need to care about quality. And for that, we need people with the right knowledge, skills and mindsets working for companies that embrace and pursue high standards.

The IMO's *Guidance on best practice for fuel oil suppliers for assuring the quality of fuel oil delivered to ships* defines a

quality-oriented fuel oil supplier as: "A fuel supplier with a quality management system certified in accordance with an internationally recognized standard (ISO 9001 or equivalent), and which may be registered with the Member State and/or licensed, where such licensing/accreditation schemes are in place; and therefore can be expected to be on time, meet the statutory requirements, supply the quantity and quality stated on the BDN, provide support and be able to address relevant issues." IMO's best practice guidance for fuel oil purchases/users says they "should strive to purchase fuel oil from quality-oriented fuel oil suppliers" and emphasises the importance of ordering the correct fuel for the ship and onboard fuel oil management to prevent operational issues. IMO's best practice guidance for Member State/coastal State, meanwhile, reminds countries of their obligations under MARPOL Annex VI and encourages them to establish proper oversight over suppliers operating under their jurisdiction.

Implementing those best practices and principles would likely reduce problems related to fuel quality significantly.

IBIA's general stated aims include to increase the professionalism and competence of all who work in the industry, and to promote improved standards, knowledge and understanding in the industry. In other words, continuously strive toward improving the overall quality of the global marine fuels sector and those who work in it. Bit by bit, we're getting there.

Unni Einemo,
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The course materials have been peer reviewed by members of the relevant IBIA Working Groups.

The **Online training** course is recorded video content, it is not live. The duration of each module is up to 60 minutes.. The modules can be attended as stand-alone modules, however students will gain the best value by taking all five modules in the order suggested. On completion of the course, students will receive the '**IBIA Certificate of Attendance**'.

Nigel Draffin



Consultant and IBIA Board Member

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MODULE 5 TO PURCHASE	Adapting to a changing market	Online at www.ibia.net
MODULE 6 TO PURCHASE	Compatibility and stability – Issues with VLSFO fuels and the measurement of Stability	Online at www.ibia.net
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SEPTEMBER		
13 - 15	IBIA Mediterranean Bunkering & Green Shipping Conference	Malta
28	IBIA Members Meeting	Online at www.ibia.net
OCTOBER		
7	IBIA Golf Day and Lunch	Singapore, Asia
NOVEMBER		
14 - 18	IBIA Annual Convention 2022	Houston, United States of America
FEBRUARY 2023		
27	IBIA Annual Dinner 2023	London, United Kingdom

BUNKER INDUSTRY EVENTS 2022

SEPTEMBER		
28 - 29	Transport Evolution Africa Forum & Expo	Durban, South Africa
OCTOBER		
3 - 7	Maritime Week Americas (Petrospot)	Fort Lauderdale, USA
4 - 6	SIBCON 2022	Singapore, Asia
18 - 19	Marine Energy Transition Forum (Petrospot)	Antwerp, Belgium
19 - 21	Argus Fuel Oil and Alternative Marine Fuels US Summit	Miami, Florida
20 - 21	ARACON 2022	Rotterdam, Netherlands
NOVEMBER		
22 - 24	The Motorship Propulsion & Future Fuels Conference 2022	Hamburg, Germany
DECEMBER		
1 - 2	S&P Global Barcelona Bunker Fuel Conference	Barcelona, Spain



Houston



London



Malta

**All dates were correct at time of going to print but may be subject to change, please refer to IBIA's website (<https://ibia.net/events/>) for any updates*

IBIA BUNKERING CONFERENCES & EVENTS

Have you registered yet for the upcoming IBIA Conferences & Events? Become part of IBIA's vision for a stronger shipping, for a stronger bunker industry, for a greener world!

A few words about the physical events we have hosted since June, starting with the welcome reception IBIA hosted preceding Posidonia. IBIA was delighted to welcome our local and international IBIA members and non-members to our first in person IBIA Members Day during Posidonia, one of the greatest celebrations of shipping at the prestigious Marine Piraeus Club. This event brought us together after so long and it was a great opportunity to share with our members our current membership status, our activities, our new board structure and our vision for the future, which is to maintain a stronger, shipping and bunker industry. We would like to warmly thank our sponsor of this event, Island Oil.

To continue with our physical events, some of the most important local and international bunkering/energy and shipping companies presented their insights to almost 200 industry stakeholders from Turkey and around the world at the IBIA 'New Regional Dynamics & the Move to a Green Shipping Future' Conference. This physical event was held in Istanbul, Turkey, on 22 June at the luxurious Raffles Hotel.

IBIA's presence and large numbers of local and international exhibitors and visitors underlined Istanbul's position as one of the most important global bunkering hubs.

The conference was organised by the Turkish Chamber of Shipping. IBIA would like to thank our platinum sponsor Petrol Ofisi, our gold Sponsor Alkagesta, silver sponsor Socar, bronze and registrations sponsor Castrol, bronze sponsor Unerco, lanyards and badges sponsor Methanol Institute, pens and notepads SeaWorld, presentation folders Tufekci law firm, bags sponsor Asmira Bunker, our supporting associations: Turkish Shipbuilders' Association (GISBIR), Turkish Chambers of Marine Engineers and the Turkish Shipowners Association, Kosder, young Shipping professionals Turkey as well as our media sponsors for their support and contribution.

IBIA Mediterranean Energy and Shipping Malta, 13-15 September

IBIA's next conference is the IBIA Mediterranean Energy and Shipping Conference in Malta in September, 2022, which we would like to invite you to join us for an in-depth look at how the geopolitical events in recent months have created a massive disruption in global oil, shipping, and bunker markets. We will discuss these short- and long-term impacts and how they have been particularly destabilizing to Malta and the Mediterranean region. The agenda will also include the below sessions:

- New regional Dynamics – Russian invasion in Ukraine – impact on Mediterranean bunkering market
- Clean Shipping & Decarbonisation – The proposed Mediterranean Emission Control Area (ECA) and Shipping's Decarbonisation Goals.
- Alternative Fuels
- Financing the Marine Industry and price mechanism for current and future fuels



IBIA Mediterranean Energy and Shipping Conference
13-15 September 2022 - MALTA

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- Regional Focus: bunker business in Malta
- Bunker Quality – What is changing?

The IBIA Mediterranean Energy and Shipping Conference will attract shipowners, bunker buyers, leading bunker suppliers, bunker traders bunker brokers, and other industry stakeholders, plus members from local and international Shipping Associations. Prominent speakers will explore the benefits of green alternatives and environmental technologies which will carry the bunkering industry into the future and beyond.

The conference, as well as the IBIA Bunker Training Course that will take place the first day of the event, will be held in person at the Malta Marriott Hotel & Spa, St. Julian's, Malta. The event will include an exhibition hall, in-depth presentations, a series of panel discussions with live Q&A audience participation, a gala dinner and a terminal tour.

The conference is organised by the Ministry of Energy. IBIA would like to thank our gold sponsor Alkagesta, silver sponsor EVOS Terminal, our bronze sponsors Transport of Malta, SGS and Macquarie, as well as our supporter Enemed and our media sponsors. A conference not to be missed. For more information: <https://ibiamaltabunkerconference.com/>

IBIA Annual Convention 2022 Houston, 15-17 November

The bunker industry was looking forward to a year of recovery in 2022 as the Western economies started to put COVID-19 behind them and Asia-Pacific looked set to follow before long. But the war in Ukraine has now upended any sense of calm, with the industry now scrambling to move on from using products of Russian origin and cope with the knock-on impacts of the war and ensuing sanctions on various shipping segments. Bunker prices around the world are now trading at or near record highs, and the long-discussed issue of the bunker industry's access to credit is starting to become more acute. Beyond these immediate concerns, decarbonisation and digitalisation remain the dominant themes for the industry, with both shipping and bunker companies looking to invest in both areas to modernise their operations, cut bills and reduce emissions.

Join us at the IBIA Annual Convention 2022 in Houston in November for an in-depth look at all of these issues and more.



The poster for the IBIA Annual Convention 2022 in Houston, 15-17 November. It features a low-angle shot of modern skyscrapers in Houston. The IBIA logo is in the top left, and the year '2022' is written vertically in a large, stylized font. The text '15-17 NOVEMBER ANNUAL CONVENTION' is prominently displayed. The word 'Houston' is written in a large, white, cursive script across the middle. The website 'www.ibiaconvention.com' is at the bottom right. Below the main image, there are sections for sponsors: Silver Sponsor (Bunker One), Bronze Sponsor (STAR BULK), Media Partner (Ship & Bunker), Delegates Bags Sponsor (terpel), Presentation Folders Sponsor (SEAHAWK SERVICES), 1st Day Coffee Breaks Sponsor (GTGlobalGroup), Bottled Water Sponsor (GLANDER BUNKERING), and Media Sponsors (ALL ABOUT SHIPPING, ELNAVI, BUNKERSPOT, PETROSPOT, Manifold Times, WORLD BUNKERING).

The event will be held in person at the JW Marriott Houston by The Galleria Hotel in Houston on November 15-17.

IBIA would like to thank silver sponsor Bunker One, bronze sponsor StarBulk, presentation folder Seahawk, delegates' bags sponsor Terpel, 1st day coffee breaks sponsor GT Global Group and our media partner Ship & Bunker for their support and contribution.

To view the agenda please visit <https://www.ibiaconvention.com/>. Should you want to participate as sponsor and/or speaker at any of the above Conferences, please do not hesitate to contact me directly.

IBIA Annual Dinner London, 27 February 2023

Last but not least, we invite you to celebrate with us IBIA's 30 years anniversary as an association at the much-anticipated IBIA Annual Dinner on 27

February 2023. IBIA finds a new home for 2023, at the elegant and modern Park Plaza Westminster Bridge for an unforgettable celebration and black-tie evening shared with our members and their guests. As a well-established fixture in the bunker industry's calendar, we are looking forward to welcoming you for an evening of networking and sharing our very special anniversary with our valued members and their guests.

Take advantage of the Early Bird offering. Members who purchase tickets by 30 September 2022 will pay only £240 per ticket rather than the full price of £290. To book your table, secure your sponsorship and for more information about the Dinner you can contact Tahra at: tahra.sergeant@ibia.net

Any queries you might have with regards to membership or membership validations you may contact Tara at: tara.morjaria@ibia.net



By joining IBIA you will become part of a global network of bunker industry experts who collectively form the world's leading authority on bunkers. Not only will you have access to a wealth of information and insight (we publish newsletters and industry updates on current issues) which offer pragmatic advice for managing the industry's challenges; members also have the potential to shape and influence both international and local legislation. Who is attending our activities: Shipowners, Ship Managers, Refiners, Shipping Agents, Independent Suppliers, Bunker Traders, Storage & Blending, Law Firms, Credit and Finance Firms, Testing Agencies, Brokers, Major Oil Companies, Barge Operators, Oil Companies, Shipping Agents, Lubricant Suppliers, Charterers, Fuel Distributors, Bunkering Services.

Make sure you are part of this voice! If you and your company wish to join the IBIA community, participate in the members meetings, actively contribute to our working groups, attend conferences and training courses, you can become an individual or corporate member now!

You can access all information on our website www.ibia.net.

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IBIA is appealing to all of its members to join this important initiative by showing support for our Code of Ethics. It's an aspirational statement and an important step towards our aim of promoting the adoption of a common set of ethical values across the industry. We believe that when the entire industry acts with the highest ethical standards that this will be to the benefit of us all.

FAIR BUSINESS

- We conduct our business in a fair and transparent manner
- We will always act in the best interest of each business partner and are honest with the stakeholders involved in our business
- We only engage in business using compliant products, and deliver the quality and quantity agreed with our business partners
- We always act in good faith

BEST PRACTICE

- We always act in accordance with applicable legislation, including sanctions
- We always meet contractual obligations in a timely manner
- We always do our best to avoid disputes and seek resolution promptly if disputes occur
- We comply with all applicable competition and anti-corruption laws
- We respect confidential information and do not unlawfully use any intellectual property

SOCIAL RESPONSIBILITY

- We seek to minimise our environmental impact and the risk of environmental damage
- We will always ensure employees' health, safety and security
- We offer equal opportunities, prohibit unlawful discrimination and respect human rights
- We offer the same opportunities for professional development to all our employees

TRANSPARENCY

- Our accounts and records are kept accurately and reflect the true state of the company and its operations
- During audits or investigations, we fully cooperate with the authorities
- We will not receive or give any gift or entertainment of disproportionate value
- We are fully committed to preventing both money laundering and terrorist financing

To sign up for the Code of Ethics working group email ibia@ibia.net



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IBIA AFRICA'S VOICE: HELP FORMULATE IBIA'S POSITION AND GET INVOLVED

We would be very pleased to have more of our IBIA Africa members actively involved in working groups and speaking at our upcoming conferences

As we head into the second half of 2022, we can reflect that it is now 'business as usual'. Our experience here in Africa is a steady joining of new members to the IBIA Africa membership, and we welcome them all to the association, and look forward to meeting face to face in due course.

Some of the more positive take aways from the time of global isolation and pandemic limits on travel, is the broader acceptance of online meetings and events. Whilst all these tools were readily available pre-Covid, the adoption of digital meetings and activities has assisted us in a far wider reach and has brought countries and companies together with ease.

Exemplary examples of this are the IBIA Member Meetings, Future Fuels Working Group, chaired by Constantinos Capetanakis, Bunker Director (Starbulk S.A.) and IBIA Vice Chairman, Bunker License and Mass Flow Meter Working Group chaired by Alexander Prokopakis, CEO (probunkers) and the IBIA Africa Regional Board meetings. We have a number of IBIA Africa members participating in our working groups and would like to extend a further invitation to them to join these workings groups or get in touch with me to explore other opportunities for further involvement.

Future Fuels Working Group

The world is changing, and we need to change with it. Shipping needs new fuels to meet the ambitions of the IMO's greenhouse gas strategy to dramatically cut carbon emissions. This working group focusses on how the bunker industry can be proactively involved in identifying and developing solutions. It will be where we formulate IBIA's positions and input to the IMO and collaboration with other organisations. The working group has already produced informative tables assessing new and existing fuels and will be meeting beginning September to discuss the next projects.



Bunker licensing development Working Group

IBIA has stated its ambition to work for bunker licensing schemes, preferably introducing mandatory massflow meters, to be implemented in the 10 most important bunker hubs around the world. This working group's task is to drive this work forward, including identifying the key elements of licensing schemes, which bunker hubs to approach and how to overcome obstacles. Many of our members participated in the survey conducted to assess the appetite for these schemes, and further actions will be discussed in the upcoming meeting end September.

The IBIA Africa online survey will remain available until end September. We are looking to gain valuable insights to further understand and identify the specific regional needs of the Africa markets. The regional team proposes to establish a more targeted and region-specific offering to our members, industry and future members. The online survey, aimed at the wider maritime industry, will serve as a valuable tool to get the industry's views, and help mould IBIA Africa's strategic growth and engagement.

We continue to finalise plans for the 3rd IBIA Africa Conference. This conference will take place in West Africa and will allow us to bring the Africa shipping and bunker industry together and will be making the announcement in the next two months.

I would like to extend a warm invitation to our Africa members to attend and participate in the upcoming IBIA Annual Convention, which will be held in Houston, Texas this November (15 – 17) as well as the much-anticipated IBIA Annual Dinner, hosted in London on 27 February 2023.

Should any of our members wish to discuss these plans in more detail please contact me directly.

More generally, if you would like to engage with the IBIA Africa team, or become a member of IBIA, speaker, sponsor or find out more about our local engagements and events, you can contact me at:

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A NEW CHAPTER

IBIA Asia resumes activities after transition period

It has been a few months of change for IBIA Asia – we moved out of our previous office premises, we had significant staff movements: Hello! I am Siti, the new Regional Manager for IBIA Asia, taking over from Alex Tang.

As our members may be aware, Alex Tang and Noraini Salim, IBIA Asia's Office Manager who have been holding the fort for IBIA Asia over the past few years, left in April 2022. I would like to thank them for their services during their time with IBIA Asia and wish them all the best in their new endeavours.

Just a quick introduction of myself – I joined IBIA in July 2022, after more than 10 years with the Singapore Shipping Association (SSA). At SSA, I held several different roles, including being the Secretary for the SSA Marine Fuels Committee, Mass Flow Meters Sub-Committee and Alternative Marine Fuels Sub-Committee. During the Covid-19 pandemic, I was also privileged to be part of a working group which led operational initiatives to facilitate crew change and seafarers' vaccination in the Port of Singapore.

I am humbled to be given the opportunity to be part of IBIA during this time, where the future of fuels and energy is on the cusp of change. Collaboration between stakeholders is key during this time and I look forward to learn and work together with our members to find focused and practical solutions to meet the industry's future needs. Whilst finding solutions to future demand is important, the transition

between now and then is of equal importance and I hope that's something we won't lose sight of.

Courses

I would like to thank you for your patience and understanding as we paused conducting our courses during the transition period.

I am pleased to share that we are planning to restart our 2-Days Basic Bunkering Course (SS 600:2014 & SS 648:2019) and 2-Days Advanced Bunkering Course (SS 600:2014 & SS 648:2019) in August and September respectively. More details will be shared shortly via emails and on our website.

I would like to assure all of you that our courses remain a priority to us at IBIA Asia as much as it is for the industry, and our trainers are ready to share their knowledge and experience with people from the industry – existing and new.

SIBCON

I'm sure many of you will be pleased to note that after a hiatus caused by the pandemic, the Singapore International Bunkering Conference and Exhibition (SIBCON) is back as a physical event for the first time since. This biennial conference, to be held on 4-7 October 2022, is one of the world's largest marine fuel events; and managed to attract more than 2,000 participants from across the globe at the last in-person SIBCON back in 2018.

Over the years, IBIA has been a strong supporter of SIBCON and it is no different

this year - IBIA will be well-represented on the list of speakers over the three-day event!

In conjunction with SIBCON, I am pleased to share that IBIA is looking to bring back the golf event. We are still firming up the details and will keep members updated. Do keep a lookout for our updates! I look forward to meeting you, our members, during SIBCON, if not before!

In the meantime, please feel free to contact me should you wish to have a chat about the work of IBIA, our membership, or just to say hello!

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USEFUL INFORMATION

- 15% discount for 3 years membership, (Paid in one instalment) – Guarantee no membership price increases for the next 3 years.
- Unregistered offices will not get IBIA benefits

Bunker Licensing and Mass Flow Meter Survey Analysis



TRANSPARENCY AND TRUST

We present details from this major survey, and conclusions flowing from it

The International Bunker Industry Association (IBIA), with support from **BIMCO**, launched an extensive online survey in February 2022 to identify to which extent the maritime industry stakeholders believe there is a need for a wider adoption of bunker licensing schemes, mass flow metering (MFM) and transparency to improve market conditions. The answer – for the most part – is yes.

When we closed the survey at the end of March, 189 respondents had completed the survey, sharing their experiences and opinions. The survey questions were carefully crafted by the IBIA Bunker Licensing & MFM Working Group, which BIMCO takes part in, and the data has been examined in detail by the group. IBIA member Jeff Mildner of Vortex used his technical knowhow to help us set up the survey.

Alexander Prokopakis of probunkers and Chairman of the IBIA Working Group highlights that “There is a clear support among the respondents towards building further transparency and compliance within the shipping and bunkering industry, despite the underlying expectations of increased premiums and enhanced competitive landscapes.”

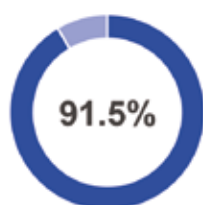
BIMCO’s Head of Marine Environment, Aron Sorensen, said: “Bunker licensing and properly certified and used MFMs can build transparency and trust in the bunker sector, improve market conditions, and help build a level playing field for quality operators. The survey findings show this is what the industry wants, and it seems an investment worth making to help raise the standards and ensure transparency.”



Conclusions flowing from the data

#Overall

According to the responses acquired in the survey, there is significant interest in building further transparency and compliance within the shipping and bunkering industry.



Agree that there is a need for increased transparency between suppliers and buyers



Average score on Bunker Licensing support, on a scale of 1 to 10

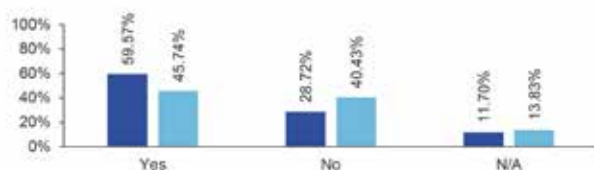


Average score on Mass Flow Meter support, on a scale of 1 to 10

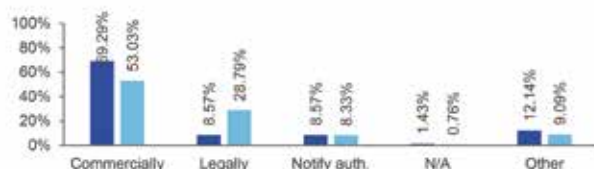
Looking to the case of Singapore, the vast majority of respondents believe that the introduction of a Bunker Licensing Program (74.5%) and mandatory use of Mass Flow Meters (76.1%) have had a positive impact on bunkering in the port.

#Disputes

Have you experienced any QUANTITY and/or QUALITY dispute(s) over the last 12 months?



How do you usually settle a dispute?



86,289

Deliveries

196,589

Deliveries

1,392

Disputes

1,925

Disputes

1.61%

Dispute Percentage

0.98%

Dispute Percentage

27,790

Average Cost

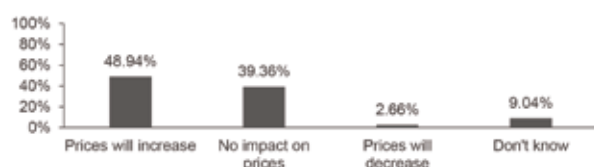
54,009

Average Cost

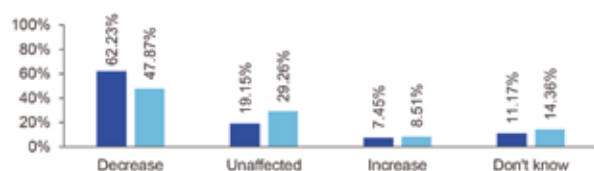
■ Quantity ■ Quality

#Licensing

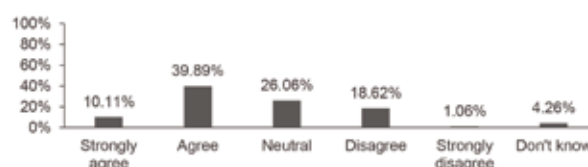
What do you think will happen to bunker prices in a port that introduces a Bunker Licensing program?



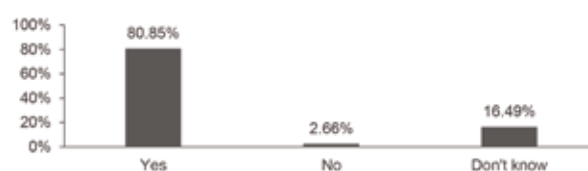
What impact would Bunker Licensing have on disputes at a port in your opinion?



A Bunker License program would cut down the number of suppliers in the port.



Would you prefer to bunker at port that has a Bunker Licensing program?

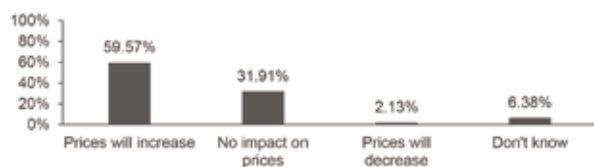


■ Overall ■ Quantity ■ Quality

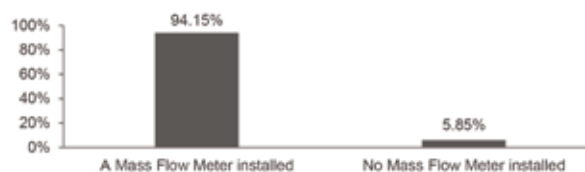


#MFM

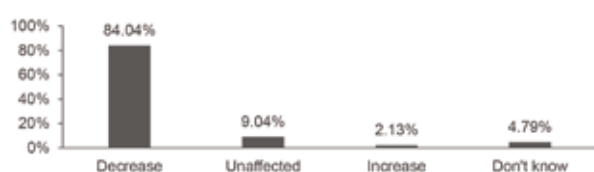
What do you think will happen to bunker prices in a port that introduces mandatory use of Mass Flow Meters?



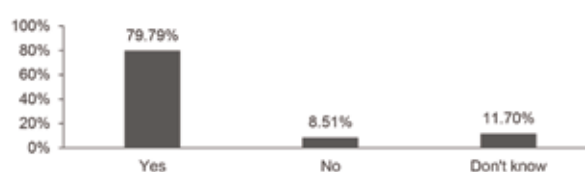
Would you prefer to bunker from a supplier that has:



Using Mass Flow Meters at a port, QUANTITY issues will:



When a Mass Flow Meter is installed, certified, and used properly, do you accept supplier's figures?



#Concluding

In connecting the data, there is clear support towards building further transparency and compliance within the shipping and bunkering industry, despite the underlying expectations of increased premiums and enhanced competitive landscapes.

#Disputes

- Quality disputes have a considerably lower frequency relative to quantity disputes, yet with a substantially higher average cost
- Most disputes are usually settled commercially, albeit more than 1 out of 4 quality disputes are settled legally – presumably due to the higher average cost

#Licensing

- Respondents are torn on whether bunker licensing will lead to price increases or not
- Expectations are that bunker licensing will reduce the number of suppliers in port as well as the number of disputes
- There is substantial support towards implementing bunker licensing with more than 4 out of 5 respondents preferring ports having such programs

#MFM

- By introducing mass flow meters, quantity issues are expected to decrease, while bunker prices are expected to rise
- More than 9 out of 10 respondents prefer taking bunkers from suppliers having a mass flow meter installed
- There is a strong consensus that the supplier's figures are determinant, when a certified and properly installed mass flow meter is used

To conclude, the overall focus appears to promote all possible levers that change industry standards for the better, building further transparency and trust. It does not seem possible to conclude that economic incentives alone can change industry standards, i.e. the willing cost against needed investments versus claims size and frequency, does not provide an unambiguous clear financial incentive to drive industry changes for higher standards and further transparency.

Conclusions flowing from context

The substantial focus on quality, quantity, and compliant bunker licensing has improved transparency in Singapore.

- Since the authorities implemented mandatory use of MFM systems, we have experienced a significant decrease in the amount of quantity claims
- All non-compliant suppliers have relocated their operations to neighbouring ports, Hong Kong or similar, where the amount of quantity claims now appears to be rising
- The local authorities in Singapore are providing subsidy schemes for suppliers wanting to install MFM systems



- The Maritime and Port Authority of Singapore (MPA) is involved in case of disputes, and sends a representative onboard the implicated vessel if issues arise
- Despite mandatory use of MFM, some customers may still request compensation due to commercial relations

Industry context: Change is possible

- The IMO2020 transition emanated from ideological incentives and was considered successful because it applied to all actors within the shipping and bunkering industry
- Up to 2020, there was significant doubt as to the success of the transition, availability of products etc., but the industry came together and proved the doubters wrong
- The key to success was regulation and governance. With these going hand in hand, there was a level playing field aiding the successful implementation.
- This constituted the largest change to the bunkering industry since the change from coal to oil, and it was made possible!

The industry calls for enhanced transparency

- There is a strong incentive to build and solidify trust and compliance in the industry
- The survey shows that market players desire enhanced transparency and control, despite the overall expectation of facing price increases
- Further regulation must be established to create and sustain transparency
- Given the extent and complexity of such industrial measures, financial incentives are difficult to establish and cannot solely justify change by themselves



- This calls for an ideological approach to “(re)branding” the industry, rather than an economic one

Naturally, it all comes at a price.



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NEW ECA, NEW GHG MEASURES, NEW AMBITIONS

MEPC 78 saw some ambitions come to fruition and new ones to reduce GHG emissions gain traction. IBIA's IMO representative, Unni Einemo, outlines developments impacting the marine fuels sector

There are strong signals that the IMO's stated aim to halve greenhouse gas (GHG) emissions from international shipping by 2050 will soon be replaced by a much more ambitious target, significantly speeding up the sector's transition to a carbon-neutral future.

As our climate heats up, with temperatures recently reaching unprecedented highs above 40°C in London, debate is also intensifying at IMO, where in-person meetings are due to resume at its London headquarters in September.

The Marine Environment Protection Committee (MEPC) is due to adopt a revision of the IMO's *Initial Strategy on the reduction of GHG* at its 80th session in mid-2023. At MEPC 78 in June this year, a large number of Member States supported a full phasing out of GHG emission from shipping by 2050, compared to the current 50% reduction target. There were also proposals to strengthen the level of ambition for 2030, and to introduce additional milestones between 2030 and 2050.

A significant number of member states are sceptical about these proposals, arguing that it is premature to strengthen 2030 targets and that phasing out GHG

from shipping by 2050 is not a realistic target, and would have a heavy impact on international trade and possibly restrict trade. The impact on developing states from the costs associated with the energy transition, both on ships and the production and supply of carbon neutral fuels, was stressed again and again.

Moreover, there were calls for the revision of the IMO's GHG strategy to be evidence-based, not just focusing on targets, with a need for more data and a feasibility study before setting realistic goals. For the same reason, many delegations were against holding an Intersessional Working Group on GHG (ISWG-GHG) to make progress prior to MEPC 80.

IBIA took the floor at MEPC 78 to comment on the above: "We recognise the desire and need for analysis, reviews and impact assessments associated with the IMO's GHG strategy, but we must also recognise that it is not possible at this stage to fully and accurately predict availability of solutions in 2050, or the full impact of 2050 reduction targets. Nevertheless, various stakeholders need clear targets to reach for; we need that certainty to have confidence in the investments required. The IMO has committed to adopting a revised GHG Strategy in 2023, so we believe an ISWG

dedicated to this subject will be needed to make progress, which is evident from the various concerns raised. Moreover, agreeing now to dedicate an ISWG to the revision of the IMO GHG Strategy does not pre-empt the outcome."

There are also varying views on the specific policies to support the IMO's levels of ambitions, such as how to calculate emissions from shipping, the exact form, function and magnitude of market-based measures and other proposals for regulations to put shipping and the marine fuel supply industry on a path to reach short, mid-term and long-term targets.

There was majority support for holding an ISWG-GHG prior to MEPC 78, but it is clear from MEPC 78 that the revision of the IMO's initial GHG Strategy to decide on levels of ambition will be challenging, as will discussions on the further regulations that will be needed to meet those ambitions.

CII and other short-term measures

IMO adopted a series of guidelines to support implementation of regulations aimed at ensuring international shipping meets the 40% carbon intensity reduction target by 2030 set out in the IMO's Initial GHG Strategy.



Regulations enter into force on 1 November 2022, introducing the Energy Efficiency Existing Ship Index (EEXI); the annual operational carbon intensity indicator (CII) rating and an enhanced Ship Energy Efficiency Management Plan (SEEMP). EEXI and CII certification requirements take effect on 1 January 2023.

Since their adoption in November 2020, work has been underway on developing a set of guidelines setting out how these regulations will work in practice. Elements of these guidelines are viewed by many as less than perfect, in particular those relating to the CII rating and correction factors, and they will be kept under review.

Under the CII rating system, ships rated as D for three consecutive years or rated as E are required to implement corrective action to improve their rating. MEPC 78 discussed issues related to Procedures for Port State Control regarding whether it should be regarded as a detainable deficiency if the implementation plan and/or the plan of corrective actions were not implemented by the ship as planned at the time of the inspection.

MEPC decided to ask the 8th session of Sub-Committee on Implementation of IMO Instruments (III 8) for advice on this matter. III 8 met in July and had extensive discussions on this subject, during which divergent views were expressed. Several delegations stressed the importance of effective enforcement of the CII

framework, but a majority pointed to practical difficulties with enforcing the plan of corrective actions and ambiguities in criteria for detention and release of a detained ship. In the end, there was not sufficient support within the Sub-Committee to regard these elements as a detainable deficiency.

It looks like the subject of effective enforcement of the CII framework, and what constitutes a detainable deficiency, will be revisited during the review of the short-term GHG reduction measures that is due to be undertaken by 2026.

GHG life-cycle guidelines

MEPC 78 held a truncated discussion on this complex subject due to time constraints. Rather than having a full consideration of proposals, the Committee agreed instead to establish a correspondence group on marine fuel lifecycle GHG analysis to further the work. The correspondence group will submit an interim report to MEPC 79, and final draft guidelines are due to be adopted by MEPC 80.

At present, IMO regulations only deal with Tank-to-Wake emissions from ships.

The majority view at the IMO is that the LCA guidelines should allow for a Well-to-Wake calculation, including Well-to-Tank and Tank-to-Wake emission factors, of total GHG emissions related to the production and use of alternative marine fuels.

IBIA supports this holistic view, without which there would be very limited scope for drop-in solutions such as biofuels which emit CO₂ when burned but have the potential to be carbon-neutral when taking lifecycle emissions into account.

Speaking of biofuels, MEPC 78 also approved a Unified Interpretation helping to overcome a difficulty in using biofuels and biofuel blends relating to proving compliance with the NOx Technical Code, which we explain elsewhere in this issue of *World Bunkering*.

New ECA coming

IBIA was among those welcoming a proposal to designate the Mediterranean Sea as an Emission Control Area (ECA) for sulphur oxides (SOx) at MEPC 78.

"We support the proposed ECA in the Mediterranean, which should bring air quality benefits for populations in the region. We already have experience with extensive ECAs in Northern Europe and North America, where implementation of the 0.10% sulphur limit was relatively smooth. There should be sufficient availability of compliant fuels for this new ECA too, as marine gas oil with maximum 0.10% sulphur are offered in most supply locations both in the Mediterranean, and globally," IBIA told the meeting.

Our comment was noted in the report from a technical group set up to further assess the proposal and prepare the



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relevant draft amendments to MARPOL Annex VI, alleviating concerns raised by some about sufficient availability.

Following the technical group's report, MEPC 78 approved draft amendments to MARPOL Annex VI to designate an ECA for sulphur oxides and particulate matter for the Mediterranean Sea, with a view to adoption at MEPC 79 (12-16 December 2022).

If adopted at MEPC 79, which is highly likely, the Mediterranean SOx ECA could take effect from early 2025.

New guidelines to assess scrubber discharges

Justification for restrictions on discharge water from exhaust gas cleaning systems (EGCS) continues to divide opinions, but newly approved IMO guidelines aim to provide more uniform criteria. MEPC 78 approved the new *2022 Guidelines for risk and impact assessments of the discharge water from exhaust gas cleaning systems*, to provide information on recommended methodology for risk and impact assessments that Member States should follow when considering local or regional regulations to protect sensitive waters from EGCS discharge water.

The majority of Member States supported approving the draft guidelines presented to MEPC 78 as they were, however there were some reservations. Two papers were submitted with comments on the draft guidelines. One raised reservations about replacing the well-established Whole Effluent Toxicity (WET) method with the summation method in the draft IMO guidelines for evaluating the effect of chemical substances, asking for a scientific review by GESAMP prior to finalisation and approval of these guidelines. Another proposed the addition of a list of emission factors for environmental risk assessment.

IBIA made a statement at MEPC 78 to say that we shared the concerns about the scientific rigour of the proposed draft 2022 guidelines, and therefore agreed with the proposal for the Committee to invite GESAMP to evaluate and provide a technical opinion prior to finalisation and approval of these guidelines. IBIA also suggested a GESAMP review of list of emission factors for environmental risk assessment.

MEPC 78 decided to go ahead with approving the 2022 guidelines, but without the proposed list of emission factors. In light of comments and various concerns raised, MEPC agreed that the guidelines will be kept under review, which means further changes can be made as more experience is gained.

Late last year, MEPC 77 adopted the *2021 Guidelines for exhaust gas cleaning systems (2021 EGCS Guidelines)*, updating the 2015 *EGCS Guidelines*. These guidelines are there to ensure scrubbers are effective in meeting sulphur emission limits while also meeting environmental criteria for water discharges.

HFO definition

MEPC 78 began discussions about a proposal to amend the legal definition of 'HFO'. HFO is currently defined as products with a density at 15°C above 900 kg/m³ or a kinematic viscosity at 50°C above 180 cSt, in line with the MARPOL Annex I definition of heavy grade oils.

The proposal by Norway and Iceland highlighted the difficulty in cleaning up oil spills if the fuel solidifies in water. They suggested that once the ban on use and



IMO hears concerns about the difficulty of cleaning up fuel spills in the Arctic ©iStock

carriage of heavy fuel oil (HFO) in the Arctic comes into effect (1 July, 2024), the density could be adjusted by adding more paraffinic components. This, in turn, would make the pour point of the fuel higher, making it more difficult to clean up in the event of a spill in cold Arctic waters. Their proposal was to add an upper pour point of 0°C limit to the definition.

The proposal received support from some member states; others raised doubts. A number of NGOs with consultative status at IMO pointed to various questions that need to be answered and called for more data. IBIA was among them, pointing out that “rewriting the HFO definition by introducing an upper pour point of 0°C would mean that some fuels that are actually distillates would be classified as HFO. This would be confusing as HFO is widely understood to be products containing residual fuel oil.” IBIA also lent its support to a suggestion put to MEPC from ISO that it may be more appropriate to develop a separate notation for ‘Polar Fuel Oils’ or ‘Polar fuels’ with details on the specific fuel characteristics for fuels that can be used in polar regions.

Other questions raised included if maybe it was more appropriate to improve the

design of oil spill response equipment, and the potential impact on fuel properties and the propensity to emit black carbon if there is a move to restrict paraffinic content in fuels used in the Arctic. Paraffinic fuels typically have very good ignition and combustion characteristics and may therefore emit less black carbon, or soot, than more aromatic fuels.

MEPC 78 agreed to forward the proposal from Norway and Iceland to the next session of the sub-Committee on Pollution Prevention and response (PPR 10) to consider the proposal further.

New flashpoint documentation requirement

Suppliers will soon be required to include Information about flashpoint of fuel oil on the BDN under draft amendments to MARPOL Annex VI, in line draft amendments to SOLAS recently approved by the IMO, which we covered in detail in the previous issue of *World Bunkering*.

MEPC 78 approved draft amendments to appendix V of MARPOL Annex VI, and if adopted by MEPC 79, the new flashpoint documentation requirement is expected to enter into force on May 1, 2024.

Appendix V of MARPOL Annex VI, “Information to be included in the bunker delivery note”, already requires sulphur content and density to be documented on the BDN. The draft amendment will require either flashpoint measured in Celsius (°C) or a statement that flashpoint has been measured at or above 70°C.

What this means in practice is that suppliers will need to provide an actual measured flashpoint value on the BDN, unless the flashpoint has been measured at or above 70°C. In other words, a statement will be adequate if the flashpoint has been measured at or above 70°C, but suppliers can also provide an actual flashpoint on the BDN for values above 70°C if they choose to do so.

IBIA is pleased with this outcome from MEPC compared to original proposals to include a specified flashpoint measurement as mandatory information in the BDN, regardless of the measured value. IBIA has stressed time and again that requiring specified flashpoint values above 70°C is neither necessary nor practical in relation to compliance with the 60°C minimum limit for fuel oils required under SOLAS.



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THE VOICE ON MARINE FUEL

If a ship can run on it, chances are he knows a lot about it. IBIA's Unni Einemo speaks to Timothy Wilson, one of our industry's most sought-after experts

Timothy Wilson spent 20 years at sea as a marine engineer and has since spent even longer as a consultant on marine fuels, exhaust emissions and fuel management. He is a member of IBIA, CIMAC and the ISO committee overseeing revisions of ISO 8217, and has been an active contributor in all of these. He frequently assists IBIA and others at the IMO, and has also helped inform the EU in fuel-related matters.

His current job title is Principal Marine Consultant Engineer, FOBAS, at Lloyd's Register EMEA. Lloyd's Register describes him on their website as "Our voice on fuel".



Tim Wilson

UE: You have more than 40 years of experience with marine fuels. Did you see much change in fuel quality and handling characteristics for residual marine fuels and marine distillates in the period prior to 2020, when new VLSFO blends took over as the main marine fuel?

TW: Fuel quality and handling characteristics have not varied greatly over the past 40 years. We have seen reoccurring concerns of fuel stability, water and sulphur content, abrasives and levels of ash forming metals and the rare incidents, but nevertheless sometimes devastating impact, of deleterious materials finding their way into the fuel supplied. The regulatory drive to reduce the sulphur contents of fuels, such as the initial 1.50% and 1.00% sulphur limits and finally 0.10% for emission control areas (ECAs), did indeed result in some fuel compositional changes but none more so than the 2020 switch to 0.50% sulphur for fuels outside ECAs. The move to VLSFO in 2020 primarily brought a marked step change in the diversity of the composition of the fuels delivered, with sulphur becoming the main factor dictating the blend composition as opposed to the viscosity and density of the past. This has been reflected by the wide range of viscosity of fuels being delivered against the past norm of around a 380 cSt.

These variances in fuel composition also placed challenges for onboard handling, elevating the need for segregation of bunkers and thermal management during storage and handling to manage the sensitivity to fuel instability.

UE: Do you think the ISO 8217 marine fuel quality standard kept pace to reflect those quality changes?

TW: The process of updating a fuel standard takes a minimum of three years and requires factual and technical understanding of the fuel characteristics to determine what amendments to the current standard are needed. The ISO committee, involving global representation from the national standardisation bodies, TC28 SC4 Working Group 6 (ISO WG6) is responsible for the ISO 8217. In view of the lack of time and the fact VLSFOs were not on the market yet, the ISO WG6 focused on developing an interim publicly available specification, PAS 23263:2019 to address the urgent market concerns being raised and predicted the prior to 2020. This PAS emphasised the validity of the ISO 8217:2017 for which fuels post 2020 should be still supplied against, as well as highlighting the key elements of change anticipated and updated recommendations to manage these.



UE: There were a lot of concerns about VLSFO quality prior to 2020. To what extent do you think they were justified?

TW: The impact of any forthcoming legislation justifiably raises levels of uncertainty about the resulting unknown consequences. The implementation of the 0.50% m/m sulphur limit highlighted uncertainty about how the additional blending might impact on certain parameters such as flash point and fuel stability, as well as the introduction of new blend stocks amid concerns about blend stock availability, and importantly the sulphur compliance limit being met. One positive outcome was that the raised concerns alerted ship operators to the importance for ships to prepare to address these uncertainties of fuel compositions. It subsequently prompted the IMO MEPC recommendation for ships to apply a ship implementation plan for this transition, ensuring compliance from 01 January 2020. As a result, the transition has been overall carried out in a safe manner, a marvel and credit to all marine industry stakeholder efforts.

UE: Since the introduction of the 0.50% sulphur limit, we see a lot of BDNs describing the fuel only as "VLSFO", as opposed to using a DM or RM grade name in accordance with ISO 8217 table 1 and 2. What do you think about that, in light of the difference between 'heavy fuel oil' and 'light fuel oil' used to report fuel consumption data to the IMO?

TW: Yes, we, at our LRGMT FOBAS laboratories can confirm many BDNs only specifying VLSFO as the fuel grade supplied. This, one hopes, does not reflect the fuel bunker quality ordering clause where the specific fuel grade ought to be stipulated in accordance with ISO 8217 Table 1(DM) or 2 (RM) grades, and any additional limitations should have been clearly stipulated. Ideally the ordering specification should be reflected on the BDN so both the barge, the receiving ship and the laboratories are clear as to what has been declared as supplied against what the supplier is providing. "VLSFO" does not cut it for BDNs!

UE: Which ISO specification would LR FOBAS test against when you receive samples with only VLSFO on the sample label and copy of the BDN? And would the test report advise which ISO grade the product actually fits into to help fuel users report the right type of fuel to the IMO's data collection system on fuel consumption?

TW: LR FOBAS test programme will always default to the latest ISO specification and base the results against the sulphur and viscosity grades as tested, reporting accordingly, unless being advised otherwise by our client.

UE: When something goes wrong on a ship and it seems fuel-related, the shipowner tends to blame the supplier while the supplier will blame poor fuel management on the ship. Do you see a clear trend as to where the problem lies?

TW: This is a natural course of events in the opening stage of any dispute resolution process, which has not changed over the years, each side defending their corner. There is no specific trend-change one way or the other; although, with the advent of IMO 2020, there was an intense focus on the importance of on-board management in preparation for the VLSFO. One might expect engineers on board are now much more aware of the importance of fuel management and recording events as they happened to support any claims they may wish to pursue.

UE: Unless there is a clear cause and effect linked to fuels that fail to meet ISO 8217 parameters, fuel-related problems might be covered by Clause 5 in ISO 8217 and/or Regulation 18.1 of MARPOL Annex VI. In these cases, how can we determine the root cause, and whether a fuel has failed to meet Clause 5?

TW: While machinery problems are infrequent, a fuel that has passed the regular suite of ISO 8217 test is still not proven until it has been consumed in the machinery plant without any adverse impacts, and so it can still be suspected to have been the cause. Cause and effect are not easily established, so it is of vital importance that the crew and shore office build up a portfolio of 'evidence' on the fuel they deem responsible.

In the first instance therefore, the ship should make certain to have duly applied best practices and logged all events leading up to, during and after the operational issues experienced, along with any mitigating actions taken, for which the fuel quality is suspected as the cause.

The ship may seek consultative guidance on the best approach for investigating the damaged components and make a link with the fuel in use.

In use fuel samples should be drawn and investigative analysis as applicable may be carried out to determine which bunker was in use and if there are any undesirable chemical species in the fuel in use at the time that might point to a possible cause.

In some cases, it is quickly established as to what has caused the damage, such as the recent Singapore incidence of high levels of Chlorinated Organic Compounds contamination pointed to a specific fuel supply where strong evidence of chemical and corrosive attack had taken place on the sliding fuel system components. However, more often it is not clear cut and so the dependence is on a detailed portfolio of evidence gathered of the fuel in use being linked to the fuel as supplied. Details of the effect on the damaged components is crucial for a timely resolution between parties concerned. Given then the evidence to hand, the buyer can lean on the ISO 8217 in its entirety and in particular the Clause 5 statement.

UE: There are many different opinions regarding which chemicals and what concentration may be harmful to ship fuel systems and engines, but aside from those listed in ISO 8217 or ASTM D7845, there are few specified limits or universally accepted guidance on what is safe and not, nor universally recognised test methods. How should we deal with this? Is it worth establishing a list of the "usual suspects" and indicative limit values linked to engine problems, even where test methods may be in-house and proprietary to specific fuel testing agencies?

TW: Noting the hundreds of thousands of different chemicals on the market that could find their way into marine fuels, determining which and at what level could



be harmful is an unrealistic proposition as there are so many influencing factors. The case of 2018 and Houston has not been fully resolved as to the real cause. However, the ISO WG6 is looking into the known and proven chemicals of those that are suspected to have caused issues, from this a further listing may be developed. This takes time as the cases are infrequent and very often difficult to directly link the cause and effect together. Again, for the most part onus is on the ship to gather the evidence of pointing to the fuel in use at the time of the issues experienced.

UE: What lessons can we learn from the 2018 Houston problem fuels, and the more recent major chloride contamination incident that occurred in Singapore during February and March this year?

TW: A complex supply chain and commercial pressures by some to cut quality checks and controls makes the supply chain vulnerable. In view of this, it remains critical that both supplier and ship carry out due diligence in ensuring best practices are applied to formulating the bunker to be supplied and to managing the fuel received on board. Evidence is the key along with the selection of a reputable supplier. My experience from receiving many years of feedback on fuel related matters has shown that in general, where care is taken to purchase bunkers from reputable suppliers who have established quality assurance and management of change procedures in place, buyers rarely have issue with the quality of their bunkers as received. If problems still occur then these are normally resolved in a timely and cooperative manner.

UE: Do you expect chlorinated compounds, such as the dichloroethane identified by many fuel testing agencies in the Singapore case, to be added to the

ASTM D7845 suite of tests, and/or the parameters specified in the next revision of ISO 8217?

TW: Yes, this is work in progress, however there are already established total organic chlorides (TOC) test methodologies widely used which form the recommended first base check approach and unlike the GCMS methodology, encompass a total count of organic of organic chlorides which can then warrant a secondary stage of more detailed chemical analysis if seen to be too high. I am aware that some labs have already modified, in house, the ASTM D 7845 to detect these chlorinated organic compounds (COC), but also labs have applied other inhouse methods further using GCMS analytical techniques to target chemical species of concern. In the meantime, work is in progress through ISO WG6 to include a list of these organic chlorides in the ASTM D7845 and providing a standardised approach for determining the chemical composition of these COCs.

UE: SO 8217:2017 allows for a range of carbohydrates from refining and non-refining sources to be used when blending marine fuels. In light of various fuel issues you have seen over the years, are there specific blend stocks that would be best avoided?

TW: There is a growing concern that because there has been an evolving acceptance of biofuels being blended into both DM and RM fuels, that anything goes for bio fuels. However, acceptance is based on transparency by the supplier to the recipient as to the product being blended, the sustainability of the feedstock source and against which quality specification it now can be accredited to and that the end product still falls within the requirements of ISO 8217 grade as ordered. It is not an open house for any biofuel product to be

blended. Currently acceptance must be met in accordance to that defined in ISO 8217 such as FAME at EN 14214 and ASTM 6751. We are suspecting that some biotype products are being blended with no mention to the recipient of their presence or even the content level. We suspect operational problems being reported are attributable to a series chemical species not normally found in marine bunkers. Investigations are be on going for cause and effect.

UE: Do you see many misunderstandings around fuel quality and fuel management issues? If so, what can we do to overcome those?

TW: There are many publications and training modules online and face to face workshops available to build on the awareness and the competence of engineers, pressing home the importance of following best practice fuel management for all sectors of the industry, and no more so than for the ships' engineers and shore support staff. IBIA provides a good coverage in the area of training and on the knowledge required.

UE: Interest in biofuels and biofuel blends is growing in light of the drive to reduce shipping's carbon footprint. Do we have sufficient experience with FAME-based biofuels and blends to declare them as fully fit for purpose and safe to use now? When will we have a standard for these beyond the 7% FAME distillates (DF) we already have an ISO 8217 table for?

TW: Over the past three years we have seen a growing number of ships trialling FAME blends with RM VLSFO and in some cases both HVO and FAME in DM fuels. The aim was to assess the technical and operational suitability of such blends ranging from 10% to 100%



to be considered a 'drop in fuel' for the conventionally design ships. The feedback on results has been very positive with few concerns being expressed to the point now we can expect ISO 8217 to address this new interest to use these biofuels in the next revised specification, expected in the first quarter 2024.

UE: What about other types of biofuels and biofuel blends, what do we know about their suitability as marine fuels and handling characteristics? Are they a 'drop-in' solution to replace oil-based liquid fuels?

TW: The industry is being driven to move away from the use of fossil fuels, however the immediate solution to use 'drop in fuels' is opening up the potential for other biofuel products that perhaps will not meet the stringent requirement of the automotive industry but might still be suitable for engines more accustomed to burning heavy residual fuels. Manufacturers of such products should be mindful of the importance of meeting the ISO 8217 technical specification and need to be transparent to the recipient in way of quality certificates. Ships considering for the first time to use such fuels should apply similar cautionary risk assessment processes as applied through the ship implementation plan for the 2020 transition.

UE: Other types of fuel are gaining traction in the effort to reduce GHG emissions, such as LNG, methanol, ammonia and hydrogen. These will have much less complex chemistry than the oil-based fuel oil blends we have known for the past several decades. Will this mean the end of fuel quality disputes?

TW: We certainly hope so, however we cannot let our guard down. Each fuel will have their own individual challenges – quality and the compositional characteristics of the fuels will still be an area that will need to be understood, and marine specifications so defined will vary based on the evolving individual machinery requirements to use such fuels. For example, a marine methanol fuel specification is currently being developed and already it has become clear that the specification for methanol will be different for internal combustion engines and that

for fuel cells, the latter requiring a much more refined and precise product.

UE: What do you see as the main fuel options to reduce GHG emissions from ships? And with oil-based fuels still accounting for more than 90% of the energy consumed by international shipping, is it mainly price, availability, technology or something else that's preventing more widespread uptake today?

TW: It is clear that between now and 2050 no single fuel or alternative energy sources will answer the call to meet the GHG emissions targets, so it is hard to predict what the outcome will be. What we do know is that something has to change and we need to pull away from fossil-based fuels.

We need to see the IMO regulatory framework complete the requirements for defining the life cycle analysis of both conventional and new fuels, this will provide better direction for fuel manufacturers and shipping companies to make informed decisions on investments.

The application of the CII and SEEMP is already driving ships to apply efficiency enhancing /hybrid technologies. Biofuels, both liquid and gas, will help in the initial transition to the full application of green LNG, methanol ammonia and hydrogen. However, we will see conventional petroleum still being in primary demand for some time yet.

Shipping after all is a commercial enterprise for most part so cost is key, and availability to maintain the shipping routes travelled is equally important in deciding which fuel or method for GHG reduction is to be applied.

The main investment channels will need to go on shore into production of sufficient quantities of the new fuels and make these available across the shipping routes.

UE: You have been with a member of IBIA for many years. What do you think are the most important services we provide for our members and the marine fuels sector in general, and how do you see IBIA's role going forward?

TW: IBIA provides an excellent platform for all the stakeholders in the marine bunker industry to come together and share their experiences, concerns and receive training and awareness on effective fuel management and the changing fuel regulatory scene. Importantly IBIA, on behalf of its members, has been providing a strong voice on fuel related matters by actively contributing to IMO committees as a recognised nongovernmental organisation.

The annual dinners and regional conventions along with training workshops, provides excellent cross industry opportunities for dialogue and networking and not least keeping the industry abreast of the latest subject news.



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NAVIGATING ENDEMIC FUEL QUALITY ISSUES

*Ever since the 2018 fuel incidents, marine fuels have been analysed like never before, writes Charlotte Røjgaard
Global Head of Marine Fuel Services at Bureau Veritas VeriFuel*

Operators are concerned about the risk of experiencing operational issues and today some are routinely performing GCMS analysis on their bunker fuels. However, GCMS analysis often raises more questions than answers and occasionally results in costly – and completely unnecessary – debunkering.

When Bureau Veritas VeriFuel were contacted by customers having problems using fuels bunkered in February 2022 in Singapore, VeriFuel immediately started its troubleshooting response. The first step is to understand the operational problem through detailed information from the ship as well as the scale of the issue, e.g. a stand-alone case or an endemic case involving more ships. Based on this, VeriFuel's team of experts issue their recommendations for the next steps considering all aspects, such as further operation, potential claims case and analytical scope.

The endemic case in Singapore earlier this year, caused by presence of organic chloride contamination, once again fueled the discussions about whether testing to ISO8217 is sufficient or whether

investigative testing such as GCMS is required to protect the ships against operational issues.

Except for very few components, the fact is that no one can confidently say whether presence of specific chemical specie(s) will result in operational issues. It is not only about the specific component but also about concentrations and combinations of components. Each component/concentration/combination must undergo a cause-and-effect evaluation before you can prove a correlation to the risk of operational issues.

The testing agencies sit on years of GCMS data and can correlate presence of various components/concentrations/combinations with the risk of operational problems. Unfortunately, very few testing agencies are willing to openly share their data despite this information being of immense benefit to the industry. Some would even state that the fuel – before it is put into use – violates ISO 8217 Clause 5 basis GCMS findings either of common compounds or compounds found at insignificant concentrations.

In 2018, the most pessimistic voices predicted that what happened was a precursor for what we could expect from IMO 2020. Although teething issues were experienced in the first half of 2020, not from chemical contamination but from the supply industry adjusting to the new blends, the industry agrees that the transition to IMO 2020 was smooth.

Today, pessimistic voice raises concern that the geopolitical environment will result in more contamination issues and consequential operational challenges to the ships. The truth is that most marine fuels can be consumed basis ISO 8217 test parameters and associated operational advice. This has been the situation for decades. Occasionally an operator experiences problems with a specific fuel which cannot be explained through the ISO 8217 parameters. However, endemic cases where several ships are affected come and go with the two recent ones being the 2018 fuel incidents and 2022 organic chlorides in Singapore.



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Petrobras has seen two CEOs sacked over fuel prices ©André Motta de Souza/Agência Petrobras

OUT OF THE FRYING PAN

Political upheaval and economic pressures have hit South America just as it emerges from the pandemic, John Rickards reports

Oil prices, exchange rates and inflation have meant a fresh wave of uncertainty across many South American economies, even as the knock-on effects of western sanctions on Russia over the invasion of Ukraine have allowed for unexpected opportunities in some sectors. Nevertheless, it is rather grim picture overall. Several countries have had to institute emergency financial measures, and there are worries that at least one of the continent's biggest economies, Argentina, could default on its debt. The general mood has not been helped by the febrile atmospheres around elections in Brazil later in the year and Colombia in June, as well as immense pressure on the governments of Argentina and Peru. State-run Brazilian oil giant and major bunker producer Petrobras, for instance, has seen two CEOs fired by the Bolsonaro government this year alone for introducing unpopular fuel price rises while he struggles for re-election.

All told, and while the continent isn't exactly alone in this, it's hardly a picture of long-term stability at present. Still, shipping generally carries on regardless and usually enjoys some cushioning against the worst.

Colombia is a case in point. Gustavo Petro will take office as president shortly after the time of writing, having run on a platform promising an end to further oil exploration, an end to fracking, and a weaning-off of the country from its economic reliance on hydrocarbons. The country exported US\$7.46 billion in oil and other fossil fuels in 2020, making it the world's 18th biggest exporter, with hydrocarbons accounting for over half Colombia's exports by value. However, even with some doubts as to the likely success of Petro's suggestion of raising Colombia's agricultural output, the country's trade is reasonably mixed in other areas, and its maritime sector has been lifted somewhat by the post-pandemic resumption of the cruise industry.

To get a clearer idea of the current state of the market, *World Bunkering* spoke to Eugenia Benavides Buitrago, marine director at Colombian oil and gas firm Terpel.

WB: Russia's invasion of Ukraine has caused a spike in oil prices, not to mention shifts in global trading patterns, that doesn't show much sign of easing any time soon. Has that impacted business at all?

EBB: When fuel prices rise in the world, they rise here, but customers still buy fuel as ships are still moving. The offshore operations in Colombia of the GORGON 1 (Shell) and UCHUVA (Petrobras) wells have increased consumption volumes in Colombia of ULSD.

We have also seen a big demand for coal in the post pandemic due to the reactivation of industry and high consumption in thermoelectric industries, cement and steel among others. The European Union increased demand for carbon from the rest of the world as a result of sanctions and blockades on Russia. This will result in an increase in coal exports next quarter.

WB: On a very broad global level, shipping traffic and trade seems to have largely recovered from the worst of the pandemic. Is that the case on a local level, though, or are there still difficulties to overcome?

EBB: The business least affected by the pandemic was the maritime business. Ships still come and move. Dimar, the general maritime directorate of Colombia, reported that in the first half of this year a total of 60,685 ships arrived



at the country's ports, of which 4,379 corresponded to international cargo transit, split between bulk carriers, tankers, container ships, fishing boats, yachts and sailboats. Likewise, there was a national transit of 56,306 ships, where 39,972 of the movements generated correspond to passenger ships and 11,467 to pleasure ships, and the remaining 4,867 arrivals refer to special services, logistics support on the high seas, mixed transport, tugboats, naval craft, among others.

The foregoing allows Colombia to be seen in a competitive economic balance with the mobilisation of basic necessities, raw materials, goods and services to the different regions of the country. In addition, it facilitates a safe reactivation of the sector for seafarers, men and women who, in the difficult conditions that have developed in recent years, in 2021 supported 7,976 operations of international maritime cargo transport vessels, 2.3% more than in 2020, while at the national level, they contributed to the mobilisation of 93,880 national transport or cargo cabotage vessels, registering a positive variation of 203.2% in relation to the previous year.

Tourism in Colombia has been reactivated. Cruise ships have already begun to arrive in Cartagena. With revenues for the Cartagena tourism sector estimated at US\$13.7 million, the 2021-2022 cruise season ended with 80 completed calls, with 77,829 passengers and 60,027 crew members, according to data from the Port of Cartagena Group.

These figures mark the reactivation of cruise tourism in the city, after 18 months suspended by Covid, which was possible thanks to the joint effort of various entities which had to establish local contingency plans with biosafety protocols, in addition to the promotion of Colombia as a tourist destination in the international market, among other actions.

However, cruise activity is still far from reaching pre-pandemic behaviour: in the last season before the health emergency was declared, 620,000 visitors arrived and profits for the local tourism sector amounted to US\$70 million.

The foregoing is a response to global factors such as the reluctance of citizens to travel on cruise ships for fear of the virus, the increase in the price of fuels that made tariffs more expensive and the war between Russia and Ukraine that has kept the world alert for the possibility that an international conflict of greater proportions breaks out.

WB: What do you think the overall outlook for the coming months is? Are there any particular challenges or opportunities on the horizon?

EBB: Well, the only truth is that the dollar exchange rate has been increasing so much that I guess it will be very difficult to travel outside but very convenient for the tourists coming to Colombia.

With the change of government that will take place on 7 August, changes are expected in the ministerial team, so we are waiting to see what happens. We will wait and see.

"Wait and see" seems like a sensible approach across the continent. Prior to the spike in oil prices and subsequent economic pressure, things had seemed to be guardedly optimistic emerging from the worst of the pandemic - Colombian supplier CI International passing through insolvency and restructuring to continue

operations, Minerva launching a new physical supply operation in Argentina, and Bunker One's Brazilian arm trialling a biofuel diesel blend on two of the company's Rio tugs.

Until the shoreside economic and political pictures become clearer, though, and suppliers have a firm idea of the level of trade and bunker traffic they can expect to see, similar moves are likely to be made much more cautiously.

There have been some brighter points recently, albeit smaller. Peru's Famoil has begun supplying HSFO at Callao for the first time since just after IMO 2020 came into force in response to local demand. It's been announced too that the Brazilian port of Rio Grande, whose operators have been eyeing cargo not just from Brazil but also northern Uruguay and Paraguay in competition to Montevideo and the River Plate ports - albeit with winning custom from those requiring better connections that seem unlikely in the immediate term - is going to have continuous dredging of the ship channel, allowing larger vessels guaranteed access throughout the year and lifting trade levels.

These are small measures, though, and it seems unlikely that we'll see the market direction clarify and stabilise until the wider economic situation ashore does too.



Cruise vessels are back in Cartagena in a boost to bunker suppliers ©Reg Natarajan/CC-BY



Seattle sits at one end of the 'green corridor' ©Port of Seattle NWPCA

BRANCHING CORRIDORS

Cutting carbon from North American shipping poses challenges – but also opportunities, as John Rickards writes

With vessel traffic picking back up as pandemic recovery continues, even as economies creak under the pressure of high oil costs, it's decarbonisation which has dominated recent developments in the continent.

Building work has begun at Fincantieri Bay Shipbuilding for what will be the largest LNG bunker barge to serve the US market for Crowley Shipping in a supply partnership with Shell. The 12,000 cubic metre vessel is due to be delivered late next year and will serve the East Coast. Crowley's vice president Tucker Gilliam said: "In partnership with Shell, this vessel will expand the availability of LNG to vessels and help advance the transition to lower-emission fuels as the industry seeks to reduce emissions."

The company has also inked an MOU with the oil major with the aim of exploring alternative energy options for the company's shoreside and terminal operations across the US. This would, Crowley says, possibly include lower-emissions vessels and port equipment, as

well as electrification and other solutions at terminals. The company has committed to achieving net-zero by 2050.

On the West Coast, a clutch of US and Canadian ports have stepped up proposals to establish a "green corridor" of zero-carbon shipping, initially led by the cruise sector, between California, British Columbia and into southern Alaska.

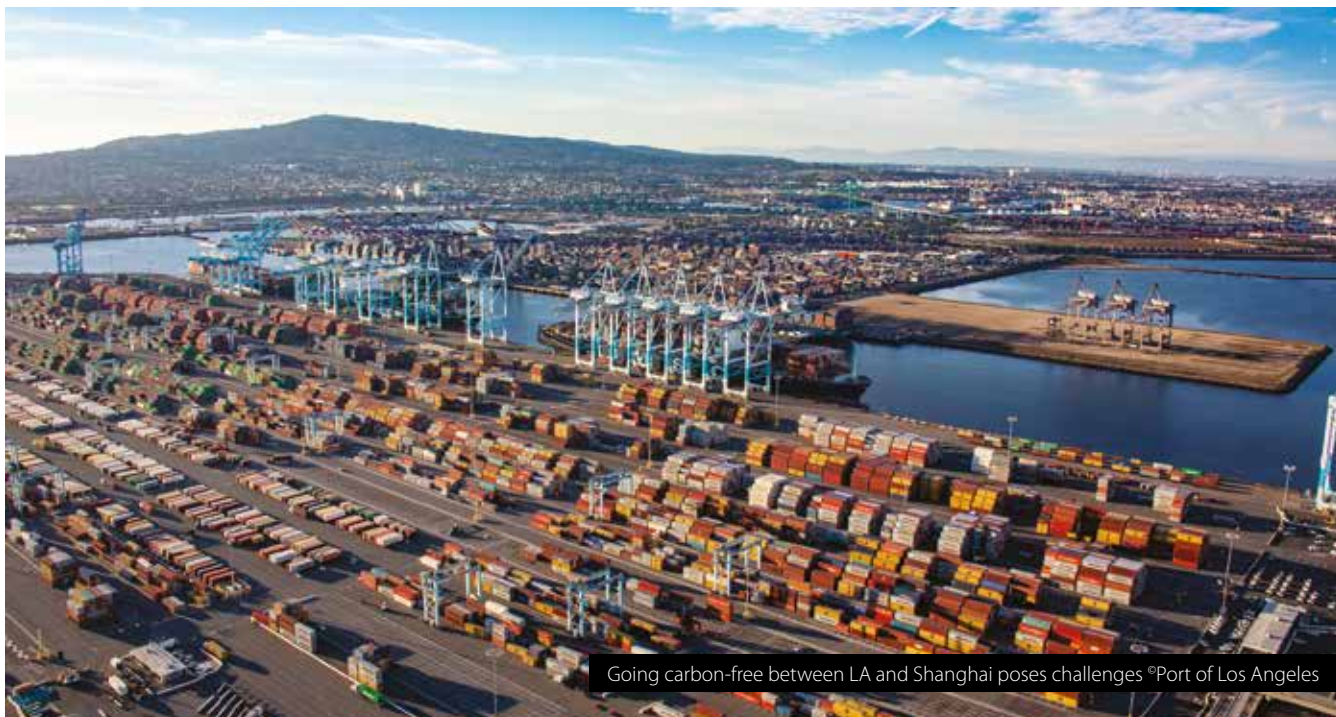
The "First Mover" initiative was launched in May during the International Association of Ports and Harbors World Ports Conference in Vancouver, backed by the Port of Seattle, Vancouver Fraser Port Authority, the City and Borough of Juneau, Cruise Lines International Association members and a string of local environmental groups. It won't be a itself impose rules but is intended to jointly encourage and develop zero-carbon ship measures and regulation - though those ports not looking for a competitive advantage over each other can only help.

"The collaborative effort is aimed at exploring the feasibility of a green corridor

that could accelerate the deployment of zero greenhouse gas emission ships and operations between Alaska, British Columbia, and Washington," said the group in a joint statement. "Nearly 300 ships leave Seattle for Alaska in a six-month cruise season; in total Alaska hosts more than 600 cruise sailings per year."

"These first movers are coming together around the need to address the most pressing issue of our time – climate change," said Port of Seattle Commissioner Fred Felleman. "By exploring the development of a Green Corridor, we're bringing resources and technological advancements to this region where commercially viable zero greenhouse gas emissions ships may sail that much sooner. We're not naïve about the challenges ahead. But we recognize the urgency to act as we transition to an inclusive blue economy that works for the climate, commerce, and communities alike."

"We need to quickly make dramatic reductions in greenhouse gas emissions," said Port of Seattle Commissioner Hamdi



Going carbon-free between LA and Shanghai poses challenges ©Port of Los Angeles

Mohamed. "Achieving a zero greenhouse gas emission shipping corridor and the necessary shore-side infrastructure is a monumental challenge. Ports are up to the challenge to bring partners together and help lead the transformation to a blue economy."

The setting up of maritime green corridors was part of the Clydebank Declaration at COP26 last year - albeit only a minimum of six by 2025 - and this isn't the only one to be found now on the West Coast.

January saw the launch of one on the key Shanghai-Los Angeles routes by the C40 Cities group, the ports of Shanghai and Los Angeles and various shipping interests. The Port of Long Beach came on board in June, with Long Beach Harbor Commission president Steven Neal saying: "The Port of Long Beach has an arsenal of environmental initiatives, with an ultimate goal of reaching zero-emission terminal operations by 2030 and truck operations by 2035. Joining the Green Shipping Corridor extends our influence outside of our own city, seeks to decarbonise shipping operations, and reinforces our commitment to balancing economic activity with sustainability."

"Accelerating efforts to decarbonise the shipping sector is urgent if we are to limit

global heating to 1.5 degrees Celsius," C40 executive director Mark Watts said. "By convening a powerful coalition that includes the San Pedro Bay ports complex, the Port of Shanghai and key maritime industry stakeholders, we hope to be an important catalyst in decarbonising supply chains of all kinds around the world, while also creating a replicable model for other port cities to follow."

Unlike the cruise-orientated PNW corridor, this one is focused primarily on box traffic, with a stated aim of the "phasing in of low, ultra-low, and zero-carbon fuelled ships through the 2020s with the world's first zero-carbon trans-Pacific container ships introduced by 2030 by qualified and willing shipping lines."

A bold aim, to be sure, but not unachievable if the required alternative fuel supply and infrastructure is there - or shipboard carbon capture comes on a remarkably long way in the next few years.

We are seeing early moves towards zero-carbon fuel availability. Late last year, Vancouver's Seaspans Ferries, whose parent group have heavily backed a switch to LNG across their operations, became the first Canadian company to pilot the use of renewable natural gas produced by FortisBC from waste biogas on its ro-ro fleet.

"We know that our future is a renewable one - so when Seaspans approached us about being a part of an RNG pilot for marine LNG vessels, we were tremendously excited," said Mike Leclair, vice-president, major projects and LNG at FortisBC. "Using renewable natural gas (RNG) for marine LNG has the potential to be an emissions game changer for the sector and is yet another example of how renewable gas development is transforming our natural gas infrastructure into a delivery system for carbon neutral energy, supporting B.C.'s climate action goals."

FortisBC tripled its RNG supply last year compared to 2020 and hopes to have tripled it again by the end of this year to 3.9 million GJ, quadrupling again by 2025.

Norway's Corvus Energy announced in May that it's to build a factory just north of Seattle to produce up to 200 MWh of marine batteries to meet demand for low- and no-carbon shipping. "We have seen a significant uptake in orders from the US market as well as a growing commitment from the government and industry players on reducing GHG emissions," said CEO Geir Bjørkeli. "Increased capacity and production flexibility will be key to meeting anticipated growth. The US factory, along with a more robust sales and service organisation, will ensure that we can meet



Could the Aleutians' Dutch Harbor really become a hydrogen hub? ©James Brooks/CC-BY

American shipowners' goals and market demand, providing better services to the US maritime industry."

Rather more speculatively, but certainly indicative of the kind of scales involved, think-tank the International Council on Clean Transportation published an analysis in June looking at the potential for green hydrogen bunkering in the Aleutians - a potential bunkering stop for transpacific ships running on liquid hydrogen (LH2), which could very possibly need more fuel mid-voyage.

According to the study, "latent demand" from the existing fishing fleet and limited cargo traffic would be around 10,000 tonnes annually, with a putative 2035 market value of US\$39 million. However, under a "mature network" scenario, where LH2 infrastructure and wider uptake had been established and diversion to the Aleutians was a standard on the route, demand could be 260,000 tonnes per year, worth US\$1 billion, and 60% higher still with pre-emptive investment in LH2 bunkering in the Aleutians first.

It's very hard to say even what form green hydrogen's main contribution to the fuel mix in ten years will be - LH2, ammonia, green methanol, synthetic LNG, and so on - much less whether the transpacific trade would be a strong candidate for early adoption. But these are still big numbers, and there's nothing quite like the ringing of cash registers to get the attention of commercial and federal investors.



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Crowley's new LNG terminal in Puerto Rico is now open ©Crowley

GASSING UP AND CRACKING DOWN

While some islands shift further towards LNG for energy and bunkers, the Jamaican market has been caught in scandal, as John Rickards reports

With the long-absent cruise sector returning in reasonable strength this year and many of the major lines opting to switch to LNG, there's probably never been a better time to see the Caribbean's slow ongoing move towards gas as a primary fuel source picking up pace. While most of these projects have been and continue to be aimed at shoreside use, it's a fact that accommodation of LNG bunkering is considerably simpler and more appealing to potential suppliers where gas infrastructure already exists rather than needing to be built from scratch.

May saw energy and shipping conglomerate Crowley, which already has two LNG-powered box ships serving the island and loading fuel in the US, open a new LNG terminal in Peñuelas, southern Puerto Rico intended initially to support a revamp to Puerto Rico's creaking energy grid. The company described the move as marking a major milestone and said it would "support the island's economy with full-service, sustainable energy solutions

to industrial and commercial operators in Puerto Rico, Central America and the Caribbean".

"We continue to expand our capacity and investment in Puerto Rico with the opening of this special facility, which enhances Crowley's LNG capabilities across diverse industries," said Crowley CEO Tom Crowley. "Our LNG solutions allow industrial and commercial clients to plan, monitor and produce their own energy while protecting their business from potential threats such as power outages or natural disasters." The terminal will handle more than 94m gallons of LNG annually to be distributed by container, supporting up to 120MW of power generation after regasification at point of use.

"The inauguration of Crowley's new LNG Loading Terminal marks an important step toward the diversification of Puerto Rico's energy industry, allowing us to maximise the use of alternative fuels like LNG to usher the island into a new era of cleaner

energy," said Jenniffer Gonzalez, Puerto Rico Resident Commissioner. "The investment in these state-of-the-art facilities will also afford Puerto Rico the opportunity to play a strategic role in LNG national security efforts while leveraging new LNG technologies and economic development opportunities."

Fellow regional LNG specialist Eagle LNG won a deal in June to exclusively supply Royal Caribbean's new Icon-class LNG-powered cruise ships across the region with gas bunkers. The company said it would be introducing multiple dual-fuel bunkering vessels with the highest possible environmental ship index score, capable of offering supply across the Caribbean - loading fuel from Eagle's Jacksonville terminal in Florida (which, it noted in a sign of things to come, is also capable of handling renewable gas feedstock as it becomes available).

"Eagle LNG is honoured to have been chosen by Royal Caribbean Group as its



LNG bunker partner. Our shared vision for a sustainable future, including achieving net zero emissions by 2050, creates a strong foundation for a long-term partnership," said Eagle LNG's Matthew Fisher. "By introducing these purpose-built bunkering ships for the Caribbean, we are setting that vision into motion while also creating opportunities for island nations to access low-cost, secure, US-produced natural gas for power generation."

As part of its recent "Caribbean LNG" joint venture with Antigua Power Company, the company has also inked a deal with INOXCVa for the construction of a mini LNG receiving and regasification terminal to supply APC's power plant. However, Eagle LNG did add that the terminal will be a future template and anchor plant to service power and "other energy requirements" in the Eastern Caribbean Islands, and INOXCVa's global head of LNG Vijay Kalaria made clear that maritime use is very much on the cards.

"We are excited and honoured to have been given this opportunity to set up this prestigious 'mini LNG terminal' with vacuum insulated storage tanks and a regasification system to feed the gas-based power plant," he said. "Caribbean LNG's terminal will be capable of receiving LNG through smaller ships while provisioning for LNG distribution and ship bunkering in the future."

At the opposite end of the scale, Jamaica is a comparatively mature bunkering hub with an emphasis at present very much on conventional fuel. The sector became embroiled in controversy late last year, though, which has yet to be resolved. A special audit of the Jamaican Customs Agency (JCA) by the country's Auditor General's Department triggered by whistleblower allegations found that a bunker supplier operating out of the country's Special Economic Zone named only as "Bunker Fuel Operator 1" (BFO 1) - though subsequent local press reports claim to have identified the party in question - was recording bunker export sales without proper verification by the JCA that the fuel was going to export rather than being transferred out of the SEZ and into the local market. The company also failed to declare 315,000

barrels of imported fuel in five shipments between February 2018 and February 2020, worth up to US\$12 million in import duty depending on whether it was actually sold for export or not, until January and February 2021 - after the AuGD's request for paperwork, leaving duties unpaid for years.

"The JCA did not provide a reason for the prolonged delay in the importer submitting the IM9 entries, despite our numerous requests," the report said. "JCA maintained that the importer was advised to finalise both import and export entry declarations, as they recognised that the fees remained unpaid. JCA further indicated that they had to resort to 'severe action' by closing both inlet and outlet valves to prevent the importer from 'engaging in any sales transaction' to force the importer to finalise the entries. Based on JCA's Sea Bunkering procedures, two customs officers are required to be present at the SEZ to validate the quantity and type of fuel being bunkered. We saw no evidence that a JCA representative was present at the SEZ when fuel entered the SEZ."

The report also found that hundreds of bunker sales made by BFO1 were entered and paid months late, contrary to the JCA's procedures, with no bunker surveyor's verification of the type and volume of fuel sold.

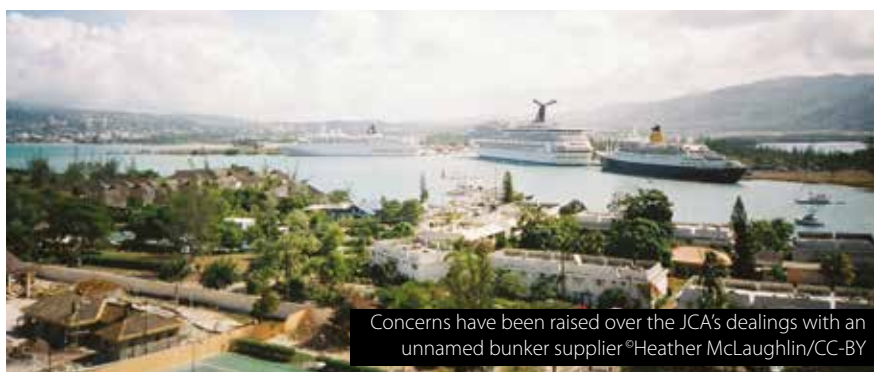
The JCA, which bore the brunt of the AuGD's stinging criticism in the report, has denied wrongdoing and claimed many of the issues identified were down to teething problems with the switch to an automated records system during the period in question and that physical checks and other operational realities when handling bunker sales mean that the discrepancies

look worse on paper than they were in reality.

But it certainly looks bad. The report notes that in the case of Petrojam, who were called out for less severe failures of record keeping since apparently rectified, analysis of its ULSD and MDO figures provided would require it to have exported 40% more marine fuel from its bonded storage than it had received, rather drily noting that this "therefore could not be considered as accurate". Paperwork issues and a lax approach to prompt recording could account for the errors with BFO1 but searching questions are being asked.

The original whistleblower claim cited in the report was that "BFO 1 has been using its status as a Special Economic Zone Operator to import items without the payment of the required Import Duties and GCT and then moving these items into the domestic market without the requisite approvals or taxes and duties, thereby defrauding the government of the required revenue" and that "the company has been submitting export declarations to the Jamaica Customs Agency for fuel claiming that the said fuel is being exported when in actuality the fuel is being moved to the company's port facility in Ocho Rios which is not a SEZ and not manned by Customs".

The AuGD's investigation could not confirm these allegations - citing a lack of transparency around that importer - but nor has it dismissed them. With disputes over the findings still very much ongoing, in May this year, the Jamaican parliament's Public Accounts Committee set a three-month deadline for the AuGD and the JCA to meet and resolve matters to the AuGD's satisfaction. By the time *World Bunkering* goes to press, maybe the picture will be a little clearer.



Concerns have been raised over the JCA's dealings with an unnamed bunker supplier ©Heather McLaughlin/CC-BY



ESTABLISHING A WORLD TRADE HUB

IN EAST AFRICA TAKES PARTNERSHIPS, PATIENCE, AND HIGH REGARD FOR PRESERVATION

Bunker One has long been looking to establish a new major bunkering hub East off the coast of Southern Africa. Expanding into new territory will benefit the level of service the global bunker company can provide clients on one of the world's busiest trading routes and in working together with local partner Vivo Energy Mauritius and in close collaboration with the Mauritian Port Authorities of Port Louis, the stage is set for an environmentally safe and prosperous new hub

Bunker One has for the past year been hard at work bringing its full strength of operation to the strategically important bunker location Port Louis in Mauritius. Establishing a new bunker hub for the physical supplier will allow Bunker One to stay even closer to clients at every step of their journey.

In close partnership with Vivo Energy, who has been present in Mauritius for more than a decade, Bunker One aims to take on the task of making Port Louis the go-to bunker fuel hub of the South-East African coast. The vision is to provide bunker fuel safely and efficiently to ships and clients with the highest industry standards.

"Bringing Bunker One's activities to Port Louis is something that we've been working towards for a long time. We've leased physical storage on land and are looking to establish trading and administration offices, hire office workers and provide traineeships. We're looking forward to making Port Louis the preferred refuelling hub of the East African coast – and we're definitely in it for the long haul," says Peter Zachariassen, CEO of Bunker One.

Bunker One has leased physical tank storage facilities on land in Port Louis, equal to a storage capacity of 20,000 m³ bunker product, on a long-term basis and intends to establish offices and bank connections locally. These commitments underline Bunker One's stake in Port Louis and the willingness to succeed in the long run.

Partnership and local cooperation ensure longevity

Having earlier in 2021 established Bunker One in Djibouti, providing bunkering facilities to the northern passage of Africa, Bunker One has set its sights on Port Louis. This busy location on the global trade route network puts high demands on the bunker suppliers being able to deliver on time and to every measurable quality standard available. While complying with the strictest sets of rules and guidelines set forth both internally and by local and international conventions like the IMO, USA, and EU, Bunker One with its many years of experience in bunker fuel deliveries worldwide, aims to be the ideal partner candidate to the bunker market in Mauritius. But while the establishment of the bunker hub is one thing, environmental

protection is something entirely different – and equally important. This responsibility, however, does not rest with any one entity alone.

"The Mauritian authorities have very high safety and operational demands for all bunkering operations across the island. We applaud how the local government takes all environment matters very seriously, which is why we at Bunker One feel comfortable doing business in Port Louis. Adhering to the strict codes of environmental protection and working together with private and public entities with a common set of laws and guidelines in preserving the local flora and fauna is one of our highest priorities and something we can all agree on the importance of," says Mads Borggaard, Managing Director of Bunker One (Mauritius) Limited, Bunker One's operational subsidiary present on Mauritius.

In cooperating with local authorities Bunker One has among other things taken part in the development of the Mauritius Oil Spill Contingency plan in close connection and dialogue with the



Mauritius Port Authorities (MPA). This deep commitment to safeguarding the environment is also expressed in Bunker One's membership of the Oil Spill Response initiative, a global and industry-funded cooperative aimed at streamlining safety procedures and putting the right tools in the hands of companies and responders to deal with environmental disasters.

Participating in environmental protection projects, however, is only part of ensuring a stable and safe prospect for the new bunker hub, when aiming to perform bunkering operations in Mauritius. Having local partnerships with providers like Vivo Energy who knows the local challenges and possibilities is essential, enabling Bunker One to aspire towards further development of the hub.

Ready to introduce sustainable fuels

In collaboration with our parent company, Bunker Holding, we are already investing heavily in trials, competencies, and capabilities within sustainable marine fuels. Our Group strongly supports the transitions towards low- and zero carbon marine fuels, and the expertise we are currently building is something we want to bring to Mauritius as well.

"Bunker One will from the get-go be offering traditional fuel oil and gasoil and our land storage facilities ensures a steady flow of product enabling our capacity for turning upwards of 20,000 tons of fuel a month. But as soon as the market is mature enough to carry the investment, we are eager to introduce sustainable fuels such as biofuel or methanol to this operation as well" says Mads Borggaard.

"Partnering with Vivo Energy, who not only knows the market, but also knows the people, what to expect, and how to approach the task at hand of establishing a strong fuel supply line here, is valuable. And having the close collaboration with the Mauritius Port Authority to support and challenge our ideas for developing Port Louis as a bunker hub is incredibly valuable. We strongly believe that to succeed, we need to ally ourselves with the best around, and we are proud to partner up with the locally established," says Mads Borggaard.

Recognising Mauritius' role as both an ecologically fragile environment and a strategic location on the global trade route network, Bunker One's experience establishing bunker hubs in an environment of safety and rigorous no oil spill-procedures are essential. Cooperating and providing the highest-level equipment and training in safety responses in case of unlikely events such as accidents and oil spills are key to operating out of Port Louis and something Bunker One is deeply committed to, making the bunker supplier an obvious player of choice for the future of the Mauritian bunker market.

Bunker One and MT Tulip safeguarding and delivering

As part of establishing a new bunkering hub in Mauritius, Bunker One is providing the support of the EIA licensed bunker barge MT Tulip, a 148-meter-long chemical tanker with a dead weight tonnage of 15,551 tons enabling not only ex-pipe delivery when moored next to our land positions but also alongside bunkering on anchorage off the coast.

The vessel is rated best in class and comes equipped with a high pumping rate and three separate line-sets accommodating her three types of carried fuel available for clients: HSFO, LSFO, and gas oil without risking any cross-contamination between fuel types.

In addition to bringing a bunker barge that lives up to all international standards for bunkering, Bunker One has also committed

itself to providing safety equipment needed for a tier 1 and 2 oil spills, such as oil booms and skimmers. Additionally, Bunker One will also enter an agreement with a third-party oil spill response company to ensure all necessary support for a tier 3 oil spill.

Not only for incidents relating to bunker activities, but in case of oil spills of national catastrophe levels off the coast of Mauritius as seen in the past, by any party, Bunker One volunteers all its know-how, personnel and equipment in containment and crisis response. This ensures a safe environment for both ships, people, and wildlife in Mauritius, completely in line with Bunker One and local government guidelines.



BUNKER ONE SUPPORTS ENVIRONMENTAL PROTECTION BY COOPERATION AND PARTICIPATION

BUNKER ONE...

- Follows the group 'No Spill' policy by applying the highest possible standards amongst employees, third party associated with handling the company's products and using only equipment that lives up to exact standards along with providing training in its use.
- Assists the governmental authorities in maintaining an effective national oil spill contingency plan and offers every available assistance in response to major oil spills.
- Endorses and offers assistance for the processes of overall contingency planning, through an open and assistant dialogue between the company's designated personnel and government authorities, clear definition of roles and responsibilities and related activities such as training, exercising, reviewing and plan optimisation.



Shanghai has finally returned to business as usual ©Christopher/CC-BY

TRADING FOR THE FUTURE

Chinese cargo traffic is improving again, and alternative fuels are rapidly gaining ground, John Rickards writes

Chinese bunkering has been hit this year by periodic Covid lockdowns in cities including Shanghai as the country continues to pursue its zero-covid policy in the teeth of variant outbreaks washing through other parts of the world.

First-half figures from the General Administration of Chinese Customs showed VLSFO exports down 7% to 9.09 million tonnes on 2021, while fuel oil imports into bonded storage in June were up on previous months after a hefty slump in April, but still 15% down on the year before, though 2021's figures were aided by Zhoushan taking a hefty chunk of what had been Hong Kong's bunker traffic while the SAR rode out a long Covid quarantine.

The drop in bunker exports matched Chinese refineries' first annual production decline since figures were first released in 2011. H1 processing volumes were 332 million tonnes, down 6% on 2021, and again following a sharp decline earlier in the year due to Covid lockdowns - though in July the country did issue an early round of fuel oil export quotas to boost the sector. China has continued to buy cheap Russian oil barred in the West by sanctions,

and after some initial reservations is now sourcing more crude from Russia than anywhere else, with imports of up to 2 million bpd accounting for 15% of all Chinese crude. Domestic production hit 4.18 million bpd in June this year.

On a wider level, the GACC painted a broadly optimistic picture. "Foreign trade growth in May and June picked up significantly," it said. "Since May this year, China's pandemic prevention and control situation has continued to improve and pro-growth policies have gradually paid off. Foreign trade enterprises have made steady progress in resuming work and production and in particular, imports and exports of regions including the Yangtze River Delta have recovered rapidly, contributing to the rebound of overall growth rate of China's foreign trade. China's foreign trade volume in goods in May was up by 9.5% year-on-year, 9.4 percentage points higher than in April and further increased by 14.3% in June."

"Imports and exports of major products enjoyed steady growth. In the first half of 2022, China's imports and exports of mechanical and electrical products grew

by 4.2% to RMB9.72 trillion, making up 49.1% of China's total foreign trade. Imports and exports of agricultural products grew by 9.3% to RMB1.04 trillion, accounting for 5.2% of China's total. Exports of labour-intensive products grew by 13.5% to RMB1.99 trillion, making up 17.8% of China's total exports. Imports of energy products including crude oil, natural gas, and coal were up by 53.1% to RMB1.48 trillion, accounting for 17.1% of China's total imports."

While bunker sales at the major Chinese hubs should recover - though further periodic lockdown restrictions seem inevitable as Covid waxes and wanes in the rest of the world - in the longer term it seems that investment in LNG infrastructure and bunkering is going to continue and should become a significant factor in the market in the medium term.

Late last year, China Gas inked a 50/50 JV deal with Vitol Asia, whose bunkering arm is active in Zhoushan, to expand gas imports for China Gas by 800,000 tonnes next year, rising to a target of 5 million per year by 2027. The joint venture could also develop gas terminals in the country so



long as conditions are right. At the time of the deal, the plan was for gas imports to arrive via the new LNG terminal at Tianjin scheduled for completion by the end of this year. China Gas's annual sales volumes were up 23% to 23 million tonnes of gas in the last fiscal year, and with Chinese authorities keen on a broad switch to gas from more polluting and carbon-intensive fuels this rise seems likely to continue.

Early this year, CMA CGM Group and Shanghai International Port Group signed their own deal for SIPG to provide CMA CGM's dual-fuel 15,000 TEU vessels operating between China and the US with LNG fuel at Yangshan in Shanghai, using a new 20,000 cbm LNG bunker tanker, reportedly the world's largest.

The 10-year supply deal will see CMA CGM's ships refuelled ship-to-ship during cargo operations (which the two refer to as "SIMOPS"; high demand for capital letters is another cornerstone of the CMA CGM-SIPG partnership), and the first such refuelling took place in March. Both companies hailed it as a watershed moment.

"With the completion of this joint project, our group has become the first shipping line to bunker LNG in China, and the first to offer full LNG-fuelled container service between China and the U.S. West Coast," said Rodolphe Saadé, chairman and CEO of the CMA CGM Group. "By expanding the network of world-class ports offering LNG services, this bunkering marks an important step in the energy transition."

"Today is a historic moment," said SIPG chairman Gu Jinshan. "With the joint efforts of SIPG and CMA CGM, the first bunkering of bonded LNG for ships on international voyages in Shanghai Port was successfully completed today, which is also a first in China."

At the time of the deal's signing, Gu was keen to emphasise the future significance of LNG bunkering for Shanghai, saying: "Shanghai Municipal Party Committee and Shanghai Municipal Government attached great importance to the bonded LNG bunkering for international ships at Shanghai Port, and strong support has been given by relevant departments and

units in Shanghai. Bonded LNG bunkering for international ships is greatly related to fostering the world-class business environment of Shanghai as a harbour city and improving the service functions of Shanghai port. It is of great significance to enhance the overall competitiveness of Shanghai international shipping centre."

Corporate hyperbole aside, the move - and the smoothness with which operations were carried out - is a significant one. Few major cargo lines have bet as heavily on LNG as CMA CGM, which is already labelling its ships as "e-methane ready" for as and when green gas becomes available. SIPG moved very fast to acquire the tanker from Avenir LNG at unspecified but presumably considerable cost and gain certification from China Classification Society for bunkering work. While there's a degree of prestige to being the first and biggest that other projects won't quite be able to tap, it would seem unlikely that this is anything other than a sign of things to come.

Indeed, February saw the delivery of the world's first dual-fuel VLCC for Cosco, which will operate out of Yangpu in the south of the country and in LNG mode has a range of 12,000 nautical miles, enough to operate on round-trip voyages to the Middle East Gulf without needing to bunker outside China.

Other alternative fuels are also taking on importance at various points along the spectrum between class approval for initial designs to first commercial development. An ammonia-powered VLCC design developed jointly by China's Marine Design and Research Institute, Cosco Shipping Heavy Industry and Cosco Shipping Energy Transportation, capable of running on ammonia on the China-Middle East route, was given the green light by CCS and ABS late last year. June saw the delivery of the country's first home-built dual-fuel methanol-powered tanker in Guangzhou. The 49,900 dwt vessel can run on regular fuel, fuel hydrate, methanol or methanol hydrate and was designed with a string of fuel efficiency measures. All told, from testing it's estimated that the design would cut carbon emissions by 75%, nitrogen by 15%, and almost completely eliminate SOx and particulates.

Zhou Xuhui, deputy general manager of shipbuilder CSSC Offshore & Marine Engineering Company, said: "Green ships are a development trend in the shipping market. At present, the number of orders for dual-fuel ships in our hands has reached 38. In addition to methanol dual-fuel, we are also building ships that adopt LNG dual-fuel and battery hybrid power."

Function all the recent - and likely future - interruptions in trade caused by local Covid lockdowns, the longer term picture could be a bright one.



SIPG is now exclusive supplier to CMA CGM's LNG boxships ©CMA CGM



iStock

LAYING DOWN THE LAW WHILE LOOKING AHEAD

Singapore has been reinforcing its reputation for enforcing high standards now, while at the same time policy initiatives are firmly focused on the future

Nobody can be in any doubt that maintaining the island republic's status as one of the top global maritime centres in the long term is a key objective of Singapore's.

Staying ahead as a bunkering hub is of course part of the strategy. That means putting in place policies to adjust and cope as the world's shipping industry moves towards decarbonisation.

However, Singapore's authorities cannot be accused of taking their eye off the here and now. In recent months, the Maritime and Port Authority of Singapore (MPA) has taken firm action following a major quality issue and the courts are taking a dim view of instances of bunker theft.

On 14 March 2022, MPA was notified that a number of ships had been supplied with HSFO containing high concentration levels of chlorinated organic compounds (COC).

The source was identified as fuel supplied by Glencore Singapore and PetroChina International (Singapore) and was traced back to a cargo loaded on to a tanker at Khor Fakkan, UAE. Forensic fingerprinting analysis of the fuel samples taken from the tanker showed a match with samples taken from several affected ships that had taken HSFO from both Glencore and PetroChina.

MPA also established that both Glencore and PetroChina, as MPA-licensed bunker suppliers, had carried out tests on the fuel supplied to ships as per ISO 8217. It found no evidence that Glencore or PetroChina had intentionally contaminated the HSFO.

PetroChina stopped delivery of the contaminated fuel promptly once it received test results indicating contamination and so MPA has therefore decided not to take any action against the company.

With Glencore the situation was rather different. MPA found the company had continued to supply contaminated fuel for over a week after it had received test results showing the presence of COC. A total of 24 vessels were supplied with the affected fuel from 22 March to 1 April 2022, and at least three vessels reported issues with their fuel pumps and engines.

As a consequence, MPA suspended Glencore's Bunkering Licence for two months with effect from 18 August 2022. It has also asked Glencore to improve its internal procedures to ensure that prompt action is taken in future when it becomes aware of, or reasonably suspects, any irregularity in fuel quality.

In a statement, MPA warned that it "takes a serious view of contraventions of the bunker supplier licence terms and conditions, and will not hesitate to suspend or cancel the relevant licences, where necessary".



Meanwhile the country's courts have been dealing with a massive case of theft from the Shell Bukom refinery. In March, a 29-year jail sentence was handed down to Juandi Pungot, one of the master minds in a decade-long conspiracy to siphon off gas oil from Shell's physical bunker operations. The oil major lost an estimated S\$128 million (US\$92 million) worth of gas oil. Justice Hoo Sheau Peng said the offences was "exceptionally serious" and of an unprecedented "massive scale" that had hit "at the heart of the bunkering and petrochemical industry, a key component of Singapore's economy, affecting the nation's reputation as a commercial hub".

Since March, more minor players in the conspiracy have been sentenced. In August, Kumunan Rethana Kumaran, who was one of 12 surveyors charged with taking bribes from former Shell Bukom employees organising the thefts, was jailed for 15 weeks and ordered to pay back S\$16,134 he had taken in bribes or face a

further month in jail. He had been involved in two thefts of gas oil, worth about S\$630,00, in 2016.

Once again, the message has gone out that Singapore will crack down hard on corruption, including in the bunker sector.

Meanwhile a lot of effort has been going into preparing for decarbonisation, with Singapore preparing for most of the potential alternative fuels under development as well establishing LNG bunkering capability.

One indication of this was the recent signing by MPA and Port of Rotterdam of a new memorandum of understanding (MoU) to establish what they describe as the "world's longest Green and Digital Corridor" to enable low and zero carbon shipping. The intention is to see the first "sustainable vessels" sailing on the route by 2027.

An MPA statement reflects its position: "While international shipping currently uses largely marine gas oil (MGO) and low-sulphur fuel oil, sustainable alternatives such as biofuels, including biogases, are increasingly being made available. Other alternatives such as synthetic methane, hydrogen, and hydrogen-based fuels including ammonia and methanol are in various stages of R&D for future trials and deployment."

It continues: "Each alternative fuel has its own challenges relating to costs, availability, safety, and restrictions in range due to lower energy density compared to fossil fuels. To tackle these challenges, the two port authorities agreed to bring together a broad coalition of shippers, fuel suppliers and other companies to collectively work on potential solutions."

MPA says that beyond alternative fuels, the MoU also aims to optimise maritime efficiency, safety, and the transparent



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flow of goods by creating a digital trade lane where relevant data, electronic documentation and standards are shared. This will facilitate the seamless movement of vessels and cargo, and optimise just-in-time arrival of vessels from port to port.

The port authorities will work with the Global Centre for Maritime Decarbonisation and the Mærsk Mc-Kinney Møller Center for Zero-Carbon Shipping as action partners, as well as other industry partners across the supply chain, including bp, CMA CGM, Digital Container Shipping Association, Maersk, MSC, Ocean Network Express, PSA International, and Shell for a start. This is intended to enable the Green and Digital Corridor project to raise investment confidence, attract green financing, and kickstart joint bunkering pilots and trials for digitalisation and the use of low- and zero carbon fuels along the route.

Singapore's Minister for Transport and Minister-in-Charge of Trade Relations, S Iswaran, said: "Decarbonising shipping is an urgent climate action priority, which requires the collective efforts of the entire maritime sector. As a trusted global maritime hub, Singapore contributes actively to IMO's efforts to make international shipping more sustainable, and global supply chains more resilient. This MoU with the Port of Rotterdam

demonstrates how like-minded partners can work together to complement the efforts of the IMO. It will serve as a valuable platform to pilot ideas that can be scaled up for more sustainable international shipping."

Quah Ley Hoon, Chief Executive of MPA, said: "This MoU further strengthens the strong partnership between Singapore and Rotterdam. It reaffirms Singapore's commitment towards facilitating a multi-fuel bunkering transition as part of the Maritime Singapore Decarbonisation Blueprint 2050, and accelerates our digitalisation efforts to optimise maritime efficiency and improve supply chain resilience. The pilot will complement efforts undertaken by the shipping industry, including partners such as Google Cloud, and the IMO to support decarbonisation and digitalisation transition for international shipping, as we work towards developing and scaling up green and digital solutions for wider adoption."

World Bunkering asked Diana Mok, Managing Director of Fratelli Cosulich Bunkers (S) for her views on the Singapore bunker scene

WB: What do you think are the main challenges for the players in the current Singapore bunker market?

DM: Crude oil prices soared to their highest since 2008, due to news that the US and its European allies banned imports of Russian oil, and the market was hit by more uncertainty. Thus, the suppliers in Singapore encountered some tightness in the cargo during this period.

According to the MPA report on Singapore's June bunker volume, 3.7 million tonnes, there was a drop compared to the previous month, 4.1 million tonnes. (Volumes have just been reported as rising again in July – see Industry News inside this issue). It might also be because the bunker prices in China, Korea, and Fujairah were more competitive than in Singapore. With the same credit grants and high fuel oil prices, this is also another challenge for the players in the current bunker market. Nevertheless, the number of vessels calling in Singapore for other operations is still maintained at almost the same number.

WB: Has Singapore peaked as a bunkering hub or do you think it will be able to maintain its position during the transition to alternative fuels?

DM: Singapore has the infrastructure and the bunkering of marine fuel oil should continue in the next few years. I believe MPA and the other work groups in the marine industry will try their utmost effort to maintain Singapore's position as a Bunkering hub.



A container ship taking bunkers in Singapore. ©Cosulich



WinGD's new engine control system limits engine power to meet EEXI design efficiency baselines

EEXI COMPLIANCE SOFTWARE

As the compliance date for IMO's EEXI regulations draws closer major marine engine company WinGD is among companies offering an IR solution

Swiss-based marine power company WinGD has launched a software-based Engine Power Limitation (EPL) system to enable ship operators to comply with IMO's Energy Efficiency Existing Ship Index (EEXI) regulations. These require ships to have EEXI approval once in a lifetime, by the first periodical survey in 2023 at the latest

The solution uses the engine control system to limit engine power to meet EEXI design efficiency baselines and includes a required emergency override capability. It is applicable to all WinGD, Wärtsilä and Sulzer X, X-DF, and RT-flex two-stroke engines operating with UNIC or WECS-9520 engine control systems.

The company says that there have been concerns over yard space as operators rush to install EEXI compliance solutions. It says its system can be installed in a single port stay with no engine downtime.

WinGD Operations Director says: "Some EEXI solutions could involve high retrofitting costs or have a knock-on impact on operations or engine performance. A software-based EPL from the engine designer is the most economical way to meet the new requirements while safeguarding reliability and minimizing disruption to the fleet."

Alternative fuels training

Stream Marine Training (SMT) is launching training courses for seafarers working on vessels using alternative fuels

SMT is offering Bahamas Maritime Authority- (BMA) approved- Basic (BIGF) and Advanced (AIGF) Training for Service on Ships using Fuels covered within the International Code of Safety for Ships using Gas or other low-flashpoint Fuels (IGF Code).

The BMA has approved the UK-based global training course provider to deliver the STCW BIGF and AIGF course by webinar.

The courses are designed to give both basic and advanced training to seafarers responsible for designated safety duties associated with the care, use, and emergency response to the fuels on board ships subject to the IGF Code.

SMT says that seafarers undertaking the basic training course will gain knowledge of the properties of fuels covered within the IGF Code and the hazards associated with their use as a fuel; health, safety and environmental precautions and measures when working on vessels; and the transfer and storage of fuels covered within the IGF Code.

Multi-vessel voyage calculator

AXSMarine, has recently released a new Smart Calculator as an addition to its AXSDry platform. The new tool allows users to run quick voyage calculations against multiple vessels.

The company says the new tool takes essential information for a voyage and returns its results simultaneously for each vessel in a simple grid. It adds: "The users can input commodity type, quantity and tolerance, load and discharge ports & rates, including bunkering operations, waiting times and disbursement accounts, vessel constants, bunker prices, as well as time charter or freight rates."

A CO₂ calculator has been incorporated into the Smart Calculator: AXS Marine says that, in addition to the time charter equivalent (TCE) and freight rate, it also provides an estimate of the total CO₂ emissions for each vessel for the specific voyage, as well as Energy Efficiency Operating Indicator (EEOI) and Annual Efficiency Ratio (AER) values.



POWERED BY PLASTIC

New ship design aims to collect plastic waste from the sea and turn it into “clean fuel”

Hydrogen storage specialist H2-Industries and naval architect Technolog Services are jointly developing 3D designs for a concept ship that will collect plastic waste from the sea and convert it into “clean hydrogen”, allowing surplus hydrogen to be shipped back to shore.

The ship is being designed to be more than 150 metres in length, “the exact size to be clarified at the design stage, depending on optimal storage capacity”. The plan is for the ship to travel at four knots with the waste plastic collected by two smaller vessels towing a two-mile net that funnels the waste from the surface and up to ten metres below it. The vessel will incorporate an open bow design to allow the collected plastic waste to be fed onto conveyors and into the storage hold.

This waste will be converted into hydrogen by the same thermolysis process that the H2-Industries’ plants will be using on shore. For every 600 kg of waste collected, approximately 100 kg of hydrogen can be produced and, then, stored in 20-foot containers using a liquid organic hydrogen carrier (LOHC) which the company describes as “a special liquid that can carry hydrogen”. These containers will be transferred to smaller vessels by onboard cranes for delivery to shore. H2-Industries asserts: “Because of the benefit of removing

harmful plastic waste from the ocean, hydrogen produced in this manner can be classified as ‘beyond green’ or ‘greener than green.’”

LOHC carrier fluids bind hydrogen chemically and, within H2-Industries’ process, the stored hydrogen is neither volatile nor capable of self-discharging. The company says that the LOHC can be hydrogen-charged and discharged only in combination with a certain catalyst, infusing and releasing hydrogen, as often as needed making it remarkably cost-effective. H2-Industries storage solutions work by charging (hydrogenation) and discharging (dehydrogenation) the LOHC. The charging and discharging are independent processes using proprietary catalyst technology.

The ship will be designed to run on electric motors using the LOHC produced, on board, as its fuel and creating electricity using H2-Industries’ 19-inch eRelease racks. Each rack will hold 48 KW of installed power and there will be multiple racks to deliver the approximately two MW that a ship of this size will require. This is the same technology H2-Industries has developed and which it intends to deploy in cruise ships, tankers and large container ships. The company says it has received preliminary approval to build its first LOHC

hub in East Port Said in Egypt and is currently in discussions with more than 20 countries and, as well, with several ports worldwide.

Michael Stusch, CEO of H2-Industries says: “It is becoming increasingly clear that the shipping industry can make a positive impact on reducing global emissions. At H2-Industries, the plan is to help decarbonise industry and power generation, while cleaning up our water resources and converting pollutants into an energy source. To achieve this, we are looking for investors. Once the investment is in place, we expect each ship will be built within roughly 24 months.”

One constraining factor for production is the volume of plastic feedstock. One rotary kiln can handle 600 kgs of waste every hour and that will generate approximately 100 kgs of hydrogen. Each ship will be designed to be fitted with multiple kilns to match the speed of plastic collection. It is envisaged that each ship will collect plastic for around a year in one location before moving on to another water waste site. To ensure no marine wildlife is endangered during the waste collection process, the vessel will employ industry tested technology developed for the seawater intake for desalination plants designed to protect wildlife and habitats.



MSC has published its Sustainability Report 2021 ©MSC

ENVIRONMENTAL NEWS

Our regular round-up of shipping's 'green scene'

MSC Cruises slows down

Major passenger ship operator MSC Cruises cut the average speed of its fleet in 2021, according to the company's 2021 Sustainability Report.

MSC notes: "Speed has a major impact on emissions. In 2021, we carried out a thorough review of our itineraries, resulting in an average speed reduction of over two knots, compared to 2019."

MSC Cruises' Sustainability Action Plan, developed with the active engagement of employees and external partners, establishes six key work streams across the business: transitioning to net-zero emissions, scrutinising resource use and waste, supporting our people, investing in sustainable tourism, building greener terminals, and procuring sustainably.

The report says: "In 2021, we conducted advanced trials of energy efficiency measures on MSC Grandiosa, cutting emissions by 8% compared to design performance. We are committed to replicating these measures across the rest of the fleet."

It continues: "We aim to limit SOx, NOx and particulates, particularly in ports. By the end of 2021, 14 of our vessels were fitted with hybrid exhaust gas cleaning systems, reducing SOx by 98%. Our three newest ships have selective catalytic converters, which convert NOx into harmless nitrogen and water. By the end of 2021, seven of our 19 ships, including all our new ships, had been fitted with shore power capability. This enables onboard engines to be switched off, cutting emissions. We are committed to using these systems whenever shore power is available."

According to MSC, a key step in its "net zero journey" is collaborating with technology providers to support and test new energy systems, as well as new lower or zero emissions fuels. It adds: "We are also working closely with governments to encourage effective policy measures to support an industry-wide transition."

Transporting CO₂

If carbon capture is to become a viable option, at sea and ashore, on the way to zero carbon it is likely that liquid carbon dioxide (LCO₂) will need to be transported in significant amounts. Korean Register (KR)

and Hyundai Heavy Industries (HHI) have conducted a joint development project to develop 40,000 cubic metre LCO₂ carriers fuelled by LNG.

Transporting CO₂ in a liquid state requires a pressure C-Type cargo tank capable of withstanding a high vapour pressure of over 5 atmospheres or greater. However, this type of cargo tank is usually used for smaller carriers and there are technical difficulties in enlarging the size of the tank to meet the market need to transfer a larger amount of CO₂ to storage facilities.

In addition, the tanks and supporting structures of LCO₂ carriers must be designed with the greatest care because of the high specific gravity of liquefied CO₂.

HHI carried out the basic and structural design of the 40K CBM LCO₂ carrier, while KR verified the safety and conformity of the design against class rules and international conventions. The resulting concept design has now been awarded Approval in Principle (AIP) by KR.



Evergreen Marine obtains double certification for its GHG emissions inventory

New CO₂ and ocean freight benchmarks

Benchmark provider, General Index, and maritime data specialist and software platform, Signal Ocean, have agreed to publish a set of ocean freight and CO₂ benchmarks. The two companies say that the new benchmarks will provide a series of unique indexes which combine Signal's vessel and voyage data with General Index's quantitative and well-established methodologies.

It is intended to provide market participants with an accurate view of fluctuating freight rates as well as allow them to monitor their historical and estimated vessel emissions and quantify the financial cost of these emissions.

Using its tuned models, Signal will provide detailed estimates of greenhouse gases emitted on a vessel-by-vessel basis.

The service will cover the key global trading routes for crude oil and refined products, starting in the Atlantic Basin. General Index will operate the benchmarks via its tech-native methodologies and production systems, incorporating trade information from its data contributors.

The move comes ahead of the expected entry of shipping into the European Union's Emissions Trading System in

2023. The companies say that their collaboration will provide the industry's first normalised emissions benchmark, allowing shipowners and charterers to trade CO₂ emissions.

Evergreen's GHG certification

Evergreen Marine Corp has completed an inspection and calculation of greenhouse gas (GHG) emission inventories relating to its business operations, including its global operating fleet, office buildings and container terminals in Taiwan. The methodology and results of the survey were certified by the British Standards Institution (BSI) in compliance with ISO14064-1:2018 and the GHG Protocol.

Taiwan's Financial Supervisory Commission (FSC) has also launched its "Sustainable Development Roadmap for Listed Companies" in March this year, requiring companies to disclose their GHG emission inventories in stages. Listed companies such as Evergreen Marine, with capital of more than NTD 10 billion (US\$33.2 million) must complete the survey of its GHG emission sources and inventories in 2023 and obtain third-party verification by 2024. In addition, surveys and verification of its subsidiaries must be completed in 2025 and 2027, respectively.

"To comply with relevant regulations and meet various information needs about greenhouse gas emission of customers and other stakeholders," Evergreen Marine says it has established a task force responsible for the inspection of its GHG inventory and the design of a carbon footprint platform.

Big players back start-up

Start-up venture Everimpact says that an oversubscribed US\$1.6 million investment 'seed round' will boost the development of what it describes as the "only hardware that can measure real carbon emissions on board vessels and at ports". It is collaborating with Wilhelmsen and Mitsubishi Corporation so that its "urban-proven sensors can withstand the harsh conditions on board vessels and ports".

The investment consortium has been led by Motion Ventures and has also included Asian Development Bank's venture arm (ADB Ventures), MOL Plus, IMC Ventures, Blue Star Group, Rainmaking and others.

Everimpact says that more than 100 of its sensors, paired with software, have been used to measure the carbon footprint of eight cities across Europe. It adds that Dijon, France, became the world's first city to track live air quality and CO₂ footprint at an urban scale by using Everimpact's technology in digital hubs, which replaced telephone booths.



Volumes are on the rise at Singapore ©Fratelli Cosulich Bunkers

INDUSTRY NEWS

Latest developments from around the global marine sector

Singapore and Fujairah volumes up in July

The Maritime and Port Authority of Singapore has published preliminary data showing 4.121 million tonnes of bunker fuels were delivered in July, up 9.8% month on month, 1.4% higher than in July 2021 and the highest monthly figure so far this year.

Deliveries of HSFO were up nearly 16% to 1.3 million tonnes while VLSFO continued to account for the biggest share of the market at 2.5 million tonnes though that was smaller rise compared to June, of 6.5%.

Fujairah Oil Industry Zone data shows that bunker sales at Fujairah, the world's third-biggest bunkering hub, gained 2.7% month on month to 669,992 cubic metres in July, but were down 2.9% year on year, according to an S&P Global Commodity Insight report.

Hapag-Lloyd reports massive bunker cost rise

German container shipping company Hapag-Lloyd saw its revenues soar by \$10 billion to \$18.5 billion in the first half of 2022 compared to the same period last year, but its bunker costs rose by 67% year on year. The average price the company paid for bunkers increased to \$703 per tonne, compared to \$421 per tonne in 2021.

"We have benefited from significantly improved freight rates and look back on an extraordinarily strong business

performance on the whole in the first half year. At the same time, a steep rise in all cost categories is putting increased pressure on our unit costs," said CEO Rolf Habben Jansen.

The higher earnings can mainly be attributed to a much higher average freight rate of US\$2,855 per TEU compared to US\$1,612 per TEU a year earlier, and to a stronger US dollar.

New bunker procurement venture

Signal Group, which includes Aframax and MR tanker pool operator Signal Maritime, has launched a bunker procurement company. Shipergy is led by former LQM CEO, Daniel Rose, and operates from offices in London and Athens.

The company says it will start operations with the bunker requirements of the Signal Maritime pools. It adds: "Taking advantage of economies of scale and operational efficiencies, the new entity will also look to extend procurement services to selected third parties."

Rose says: "Sourcing on-spec bunkers at the right place, at the best price, is critical to the success of Signal's pools. Looking to the future, we see challenges and opportunities from the decarbonisation and digitisation of the shipping industry. The bunkering sector is still adapting to these challenges, but by building a bunker procurement business within the domain of one of the shipping industry's most prestigious and forward-thinking groups,

we intend to be a catalyst for change over the coming years."

TFG pushes for mass flow meters

Major bunker supplier TFG, majority-owned by commodities giant Trafigura, says it has joined with 50 other major industry participants representing 2,000 vessels to appeal to the Rotterdam and the Antwerp port authorities to follow Singapore's lead and introduce mandatory mass flow meter (MFM) delivery in their jurisdictions.

In a statement, TFG says: "The experience of the Maritime Port Authority of Singapore, which regulates the world's largest bunker market, has already shown what can be achieved."

It adds: "Mandating MFM usage was transformative for Singapore. With analogue and manual processes increasingly consigned to the past, it is now viewed as the world's most trustworthy bunker location. Singapore will continue to benefit from being a frontrunner in bunkering technology. It's time for the rest of the world to follow suit."

Vitol Bunkers enters Jebel Ali bunker market

Vitol Bunkers is now supplying bunkers at Jebel Ali, Dubai's major container port. The company is supplying fuel produced at FRCL, the Vitol-owned refinery in Fujairah. Vitol says it can supply a range of marine fuel grades as well as bio-marine fuels.



IBIA LOOKS TO THE FUTURE

IBIA's Future Fuels Working Group has been hard at work on its first major project, a comprehensive assessment of the main alternative fuels

The Working Group's Chairman, and IBIA Board Member, Constantinos Capetanakis explains that its members have voluntarily assigned themselves to one or more sub-groups, each of which assumed the task of populating and replying to a detailed questionnaire, which was compiled "through a massive collaboration of all WG members".

The questionnaire attempted to cover as many angles as practically possible, including: availability and production, regulatory framework, environmental impact, green production levels, bunker infrastructure, pricing, technological developments, operational considerations, and a "vast array of further considerations".

The WG considered the following fuel options and alternatives: Efficiency and emission reduction methods (i.e. without using alternative fuels, focusing on technology and various technical and operational energy efficiency measures); fossil fuels (same as above, focusing on carbon capture systems); LNG; methanol; hydrogen; ammonia and biofuels.

Key findings of IBIA study

Efficiency/emission reduction methods

Multiple well-developed options are already proven are available, offering reduced fuel consumption ranging from just 2% to as much as 20% when used in combination.

Fossil fuels

Today's dominant fuels for shipping have high energy density, well-known engine technology, fuel standards, and technology to reduce air pollution. Onboard carbon capture & storage (CCS) using scrubbers could potentially offer a cost-effective solution.

LNG

Clean-burning fuel, but due to potential methane slip overall onboard GHG reduction potential estimates range from a bit worse to 20% better than MGO. Life cycle analysis (LCA) is also complicated, but bio-LNG holds promise. Mature engine technology. Used on all ship sizes despite lower energy density than MGO/HFO. Regulated by the IGF Code.

Biofuels

Non-toxic, biodegradable, similar energy density and handling as conventional oil-based fuels. No sulphur, but CO₂ and NO_x emissions similar to MGO. Potential net-zero fuel depending on production pathway. Price and sufficient availability the main obstacles.

Methanol

Clean-burning fuel reducing SO_x, NO_x and PM. Potential CO₂ reductions depending on production pathways, but no overall GHG emission reductions yet. Specific safety requirements due to toxicity and low flashpoint. Already in use on large ships

despite low energy density. Traded globally, but limited bunkering infrastructure.

Hydrogen

Zero emissions when used, but extremely limited 'green' hydrogen available so far. Low energy density. Limited to short sea operations at present. Interim guidelines for the safety of ships using fuel cell power installations do not cover bunkering, storage, and handling of hydrogen as fuel.

Ammonia

Ammonia contains no carbon or sulphur, but will produce NO_x. LCA issues same as hydrogen (limited 'green' ammonia available so far). Needs pilot-fuel which will produce some CO₂. Specific safety concerns (IMO to initiate work on non-mandatory guidelines). First ammonia-enabled engines expected 2024. Low energy density.



Constantinos Capetanakis



Together in Safety report assessed the risks of different future fuels

WEIGHING THE RISKS

Operational scenarios used in cross-industry study to evaluate the risks of alternative fuels

As shipping moves to transition from existing energy sources, the industry must pro-actively develop standard safeguards and control measures for the deployment of future fuels, according to Together in Safety. The non-regulatory shipping industry safety consortium, set up the Future Fuels Risk Assessment, is a cross-industry study with nine partners to evaluate potential operational risks of LNG, methanol, hydrogen and ammonia.

The study partners comprise APM Terminals, Carnival Corp, Chevron, Euronav, Lloyd's Register, Maersk, MSC Ship Management, the Oil Companies International Marine Forum (OCIMF) and Shell.

The collaborative study involved a series of hazard identification (HAZID) workshops across a set of operational scenarios based on a standard tanker design. It found that of the four fuels reviewed, methanol poses the least overall risk, followed by LNG, hydrogen and ammonia.

The HAZID risk ratings of the fuels were assessed from a series of "What if" scenarios within four categories: navigation, external events, ship operations and bunkering.

Methanol scored the lowest risk ratings within navigation-related scenarios, such as loss of manoeuvrability, excessive motions or a black-out at sea, as well as in scenarios related to ship operations (other than bunkering), notably cargo operations in case of damage to equipment or vent mast and crew changes during vessel handovers. Methanol also scored the lowest (that is, "broadly acceptable") risk ranking in the external event scenario of hull breach from ship collision. However, within bunkering scenarios, such as leaks or loss of containment, LNG and hydrogen held "broadly acceptable" risk scores.

Both LNG and hydrogen scored nearly identical risk rankings in all scenarios studied by the HAZID team, with none falling within the "intolerable risk" domain. LNG fared better than hydrogen in one navigation scenario of vessel abandonment due to loss of tank pressure control, tank breach or loss of propulsion. It should also be noted that there are well established international regulations for the use of LNG as fuel on board ships, whereas for hydrogen, no such regulations or guidance are available for either its usage as fuel or storage in the marine environment. For the purpose of the study, the HAZID team only

considered cryogenic liquid hydrogen. Across all the fuels there are several medium risk ratings accepted as "tolerable", but the study indicated that efforts must ensure that risks are reduced to 'as low as reasonably practicable' (ALARP).

Ammonia scored "broadly acceptable" risk as a potential source of ignition in the scenario of tug support or third-party vessel attendance at sea. However, some risks for ammonia as a fuel are classified as high (or 'intolerable') in navigation scenarios like grounding or collision leading to a hull breach, cargo operations in case of damage to equipment or vent mast, and leaks or loss of containment during bunkering. To bring these hazards down to medium or a low-risk rating, the study offers recommendations for ammonia usage. These include safety equipment for seafarers if there is a risk of gas pocket formation; dedicated emergency training for crew on fuel system safety devices and mitigating damage to fuel system scenarios; and guidelines on fuel system designs that mitigate risks from grounding or collisions.



The W-Max class LNG carrier Lagenda Suria was delivered to Petronas LNG by Hudong-Zhonghua Shipbuilding earlier this year ©K Line

MAKING THE CASE FOR LNG

Pro-LNG lobby group SEA-LNG argues that other alternative fuels have higher well-to-wake carbon footprints

As shipping companies increasingly look to a range of alternative fuels to take them towards zero carbon, SEA-LNG has released a framework for comparing the emissions and cost implications of adopting future fuel pathways. It is urging the shipping industry to make like-for-like comparisons, which it says favour LNG, when discussing alternative marine fuels.

In a statement, SEA-LNG says: "The industry is making investment decisions now on newbuilds that will impact greenhouse gas emissions today and for the next 25-30 years, the typical lifetime of a vessel. It is essential the assessments of alternative marine fuel pathways are made on a like-for-like, or "apples with apples", basis. Discussion of alternative fuels too often compares the green versions of ammonia and methanol with fossil, or grey, LNG. These green versions of ammonia and methanol are still some years away from commercial readiness, and should rightly be compared with green versions of methane, such as bio-LNG or e-LNG (also known as renewable synthetic LNG)."

The lobby group notes that all alternative fuels share a common pathway, starting

at fossil-based versions and ending at low and zero-emission hydrogen-based, synthetic fuels. It asserts: "These synthetic fuels will only become widely available when sufficient renewable electricity and electrolysis capacity comes online to produce them. Adoption of zero-emission renewable fuels will not occur in a 'big bang'. It is much more likely to take place incrementally as fuels are gradually decarbonised by blending with increasing amounts of low and zero-emission drop-ins."

Almost all alternative fuels today, including LNG, are fossil-based, SEA-LNG notes. "In fact," it adds, "most are produced from natural gas. LNG is simply natural gas that has been cooled to the point it liquefies. Natural gas, and sometimes coal, is also the feedstock for almost all methanol, ammonia and hydrogen production. While LNG offers significant greenhouse gas emissions reduction when used as a marine fuel compared with VLSFO, fossil methanol, ammonia and liquid hydrogen have far higher emissions on a well-to-wake basis. This will delay their adoption until a synthetic or biogenic version is available."

Controversially, SEA-LNG argues: "Committing to solutions which rely on alternative fuels that will not be available at commercial scale in a renewable form for the foreseeable future, means owners locking in higher-emission and higher-cost decarbonisation pathways. LNG as a marine fuel delivers immediate GHG benefits and a lower risk, lower cost, incremental pathway to zero emissions."

Steve Esau, Chief Operating Officer, SEA-LNG comments: "When looking at the advantages and disadvantages of alternative fuels, we should be assessing the characteristics of each fuel type on a like-for-like basis. Greenhouse gases in the atmosphere are a stock problem as well as a flow problem. The industry needs to consider the pathway to decarbonisation, not just the destination. There are consequences to delaying the shift from fuel oils, which will cause faster rising cumulative emissions. Shipping needs to assess fuel pathways based on how they can deliver decarbonisation benefits now, and in the future, and also the likely cost of these pathways."



SOLID SAILS FOR BIG BULKER

Using the wind could cut emissions by up to 30%

Major bulk carrier operator Berge Bulk is to equip its 210,000 dwt Newcastlemax bulk carrier Berge Olympus with four BAR Tech WindWings made by Yara Marine Technologies in the second quarter of 2023.

"This partnership with BAR Tech and Yara Marine is a great step towards our transition to zero-emissions operations. Preserving our planet's resources is fundamental to Berge Bulk's sustainability vision and goals," says James Marshall, CEO of Berge Bulk.

"At Berge Bulk, we believe in the results that can be achieved by harnessing wind power. Evaluating this groundbreaking technology, the estimated impact on reducing emissions can be at least as significant as transitional fuels. We look forward to continuing our collaboration with BAR Tech and Yara Marine to install the first WindWings on board Berge Olympus and for the optimisation needed when deploying such innovative technologies."

The bulk carrier operator Berge Bulk says the company will be an early adopter of wind-assisted propulsion technology, evaluating a pivotal technology to reduce the emissions of their bulk carrier fleet. It owns and manages a fleet of over 80 vessels, totalling more than 14 million dwt and ranging from handy-size to cape-size.

"A successful transition to a lower-carbon future can only be achieved through an inclusive approach. I strongly believe that many valuable solutions deserve greater attention, and wind-assisted propulsion is one of them. This collaboration between Berge Bulk, BAR Technologies, and Yara Marine skyrockets the momentum for wind propulsion," adds Thomas Koniordos, CEO of Yara Marine Technologies.

The large, solid wing sails on board these bulkers will be up to 50 metres high and it is intended they should be capable of reducing CO₂ emissions by as much as 30% through a combination of wind propulsion and route optimisation.

"Berge Bulk's decision to invest in our WindWings technology is a clear endorsement of their commitment to moving to decarbonise their vessel fleet and be one of the leaders of sustainable change in shipping," says John Cooper, CEO of BAR Technologies.

He adds: "By retrofitting WindWings technology to existing vessels, firms like Berge Bulk can begin to make an immediate impact on decarbonising their fleets while at the same time seeing significant efficiencies in current fuel use."

BAR Technologies announced in November 2021 an Approval-in-Principle (AiP) by DNV for BAR Tech WindWings by Yara Marine Technologies. This AiP applies to the practicality and safety of the technology and follows a comprehensive assessment of the system's design specifications, safety and usability considerations, and general applicability to sea-going vessels. The AiP also examines the deployment and functionality of WindWings in operation, use in extreme weather conditions, and system redundancy.



Havila Castor is the first passenger ship to sail silent and emission free into a world heritage fjord. © Havila Kyststruten

BATTERY PACK POWERS CRUISE SHIP

First "silent and emission-free" sailing into a world heritage fjord claimed

In June, Havila Kyststruten's passenger ship newbuilding Havila Castor sailed in and out of Norway's Geiranger fjord with zero emissions, powered by what is described as "the largest battery pack installed onboard a commercial vessel".

"This is a milestone for Corvus Energy and a big step for the decarbonisation of shipping," says Geir Bjørkeli, CEO of Corvus Energy. "For the first time in history, a large passenger ship has sailed this route silent and emission-free. This proves that technology is ready even for large ships to operate in zero-emission mode for longer periods of time."

Havila Castor is one of four identical ships built for Havila Kyststruten to operate on the coastal route between Bergen, and Kirkenes in the North of Norway. The full round trip takes 11 days and offers passengers trips into scenic but sensitive areas of natural beauty without normal engine noise or emissions. Corvus has delivered a 6.1 MWh Orca battery system for each of the vessels.

"The world's most beautiful coastline now has the world's most environmentally friendly coastal ship," says Bent Martini, CEO in Havila Kyststruten. "By continuous focus on the environment and the best passenger experience, we have managed to set a new standard for the cruise and passenger industry. The first trip on battery alone went exceptionally well and we see that we can achieve even more by testing and fine tuning all the systems onboard. Feedback from our customers has been

phenomenal: Sailing in complete silence and hearing the waterfalls and birds singing whilst entering the fjord with steep mountains on every side was for all an amazing experience."

According to Corvus, energy efficiency has been key through the entire design phase. Ship design, equipment and smart control systems are mainly delivered by the HAV Group and its subsidiaries:



The "largest battery pack installed onboard a commercial vessel" © Corvus Energy



HAV Design designed the ships, Norwegian Greentech delivered the low energy, low footprint ballast water cleaning system, Norwegian Electric Systems has been system integrator and supplied the hybrid gas-electric propulsion system inclusive battery system, generators with complete switchboards, transformers, frequency converters and control systems in addition to the new Raven INS.

The Raven INS is a fully integrated bridge system including smart features such as data hoarding and analysis to continuously develop better and more efficient operations.

Anticipating further technological improvement, Corvus says that the propulsion system onboard all four sister vessels are also prepared for the installation of next-generation technology using hydrogen and fuel cells by HAV Hydrogen.

The trip from the city of Ålesund and back took nine hours with "more than three hours" on battery only. Feedback from Havila technical personnel on board was that the battery performed beyond expectations. After three hours on battery only, they had close to 40% of the battery capacity left which means four hours operation would be no problem.

Corvus says that the energy storage systems along with all other environmental technologies on the ship reduce CO₂ emissions by around 30% and NOx emissions by 90%. With the gradual blending of biogas, emissions of CO₂ will be reduced to 50% in 2023 and 80% in 2024.

Electric tug for Tokyo Bay

Japanese tug company Tokyo Kisen has ordered what is said to be the country's first electric harbour tug from Kobe's Kanagawa Dockyard Co, for operation in Tokyo Bay. Delivery of the Taiga is scheduled for December this year.

IHI Power Systems Co has contracted Swiss-based technology company ABB to install its Onboard DC Grid power system platform.

The project is the result of a collaboration between Tokyo Kisen Co and e5 Lab Inc, a Japanese consortium with the purpose of planning and developing fully electric vessels.

CLASS APPROVAL FOR METHANOL DUAL-FUEL VLCC DESIGN

Korean Register says interest for methanol as a ship propulsion fuel is growing

Classification society Korean Register KR describes a positive future for methanol as a marine fuel in a statement announcing Approval in Principle (AIP) for a 300 dwt VLCC.

The methanol dual-fuel VLCC, which was developed under a joint project between KR and Hyundai Heavy Industries (HHI), is powered by methanol and marine gas oil (MGO). HHI has developed the vessel so that the methanol fuel tank can be placed in either the open deck or the cargo area and KR has verified the safety and suitability of the vessel's design, ensuring it

complies with domestic and international regulations.

KR says interest in methanol is growing as "more of the world's leading shipping companies place orders for vessels that use methanol as a dual fuel".

The Korean classification society notes: "Methanol is considered to possess high potential for commercialization because it offers fewer technical difficulties than LNG and relatively less toxicity than ammonia. Methanol can be stored in a liquid state at room temperature, similar to bunker

oil, making it easier to store and transport compared to LNG, hydrogen and ammonia, which turn into liquid state at -162°C, -253°C, and -34°C respectively."

Although most methanol produced today is derived from fossil fuels, KR says that the proportion of e-methanol is expected to increase as its fuel supply sources continue to expand, making it a much more competitive next-generation marine fuel along with green ammonia.



The Heroic Ace was refuelled by TotalEnergies-supplied biofuel via ship-to-ship transfer

BOOST FOR BIOFUELS

As IBIA director and IMO representative Unni Einemo reports, the UN agency has removed a regulatory stumbling block for the wider use of biofuels

Interest in biofuels is growing due to its environmental benefits and potential GHG savings, but there have been doubts about a potential increase in NOx emissions and compliance with MARPOL Annex VI and the NOx Technical Code. Biofuels and biofuel blends have to comply with MARPOL Annex VI.

Regulation 18 of MARPOL Annex VI, "Fuel Oil Availability and Qualities", applies to fuels derived from petroleum refining and also fuels derived by methods other than petroleum refining. Apart from limits on sulphur content, Regulation 18.3.2.2 of MARPOL Annex VI requires that such fuels shall not "... cause an engine to exceed the applicable NOx emission limit..."

Meeting applicable sulphur limits is normally not a challenge for biofuels; however the nature of the NOx Technical Code has been problematic as engine certification and the associated IAPP-certificate requires that the parent engine test is undertaken on a DM-grade (distillate) marine fuel in accordance with ISO 8217:2005.

To demonstrate that biofuels do not "cause an engine to exceed the applicable NOx emission limit" has been a challenge. It would require either on-board emission testing and monitoring, or engine and fuel-specific NOx emissions validation testing, with the added complexity of not being able to define a reference biofuel.

Alternatively, ships have been able to apply for an exemption from Regulation 18 of MARPOL Annex VI in line with MARPOL Annex VI Regulation 3: "Trials for Ship Emission Reduction and Control Technology Research". Exemptions for the testing of the biofuels can be granted up to 18 months for smaller engines, and up to five years for larger engines with cylinder displacements over 30 litres, subject to the flag Administrations decision.

This regulatory hurdle is now set to be cleared thanks to a new "Unified Interpretation (UI)" approved by the IMO's Marine Environment Committee in June 2022 on the application of regulation 18.3 MARPOL Annex VI in relation to biofuels.

This UI means that biofuel blends up to 30% (B30) will be regarded in the same way as regular oil-based fuels.

It also allows the use of B30 to B100 biofuels for "engines certified in accordance with regulation 13 of MARPOL Annex VI which can operate on a biofuel or a biofuel blend without changes to its NOx critical components or settings/operating values outside those as given by that engine's approved Technical File."

The UI will be issued as MEPC.1/Circ.795/Rev.6, replacing MEPC.1/Circ.795/Rev.5 but is essentially already in effect. There may be a delay in taking this new UI into account in some countries, so owners planning

to use biofuels should contact their flag Administration about their formal position in applying this UI.

The UI will come as a relief to owners who want to use biofuels without having to undertake onboard NOx measurements, which has – from all accounts – been a complex and onerous exercise representing a substantial extra workload compared to normal service.

Bio-fuel bunkering in Singapore

TotalEnergies Marine Fuels and Mitsui O.S.K. Lines (MOL) recently carried out the first biofuel bunker operation for a vehicle carrier in Singapore, with the support from the Maritime and Port Authority of Singapore.

The MOL-operated car and truck carrier *Heroic Ace* was refuelled by TotalEnergies-supplied biofuel via ship-to-ship transfer, while the carrier performed cargo operations simultaneously. The biofuel was consumed during the carrier's voyage to Jebel Ali, in the United Arab Emirates.

The biofuel blend used in this trial was composed of VLSFO blended with 20% second-generation, waste-based and ISCC-certified UCOME (Used Cooking Oil Methyl Ester). TotalEnergies says that, from a well-to-wake assessment, the biofuel will reduce approximately 17% of Greenhouse Gas (GHG) emissions compared with conventional fuel oil.

USING AMMONIA SAFELY

Classification societies focus on risk mitigation as ammonia comes into use as a marine fuel

French classification society Bureau Veritas (BV) says it has carried out a study aiming at de-risking the use of ammonia as a marine fuel, with a specific focus on leak mitigation and treatment, in collaboration with the global energy major TotalEnergies.

In a separate development, Japanese classification society ClassNK has issued an approval in principle (AiP) for an ammonia-fuelled tug (A-Tug) jointly developed by Nippon Yusen Kabushiki Kaisha (NYK Line) and IHI Power Systems.

ClassNK says ammonia is expected to be used as a marine fuel in moves to achieve decarbonization since it does not emit CO₂ when combusted. However, it stresses adequate safety measures are imperative as ammonia is toxic to humans and corrosive to materials. It says that it has been involved in projects aiming for zero-emission ships using ammonia fuel in terms of safety assessment, and has issued its "Guidelines for Ships Using Alternative Fuels" as a necessary standard to minimise the risks related to ammonia-fuelled ships for the ships, crews, and environment by stipulating requirements for installation, controls, and safety devices.

ClassNK reviewed the design of the A-Tug, following Part C-1 of its guidelines, and issued the AiP on verifying that it complies with the prescribed requirements.

Meanwhile, BV says its joint preliminary study has evaluated the health and safety risks from ammonia leaks for crew and passengers and pinpointed key safety criteria, broadening the shipping industry's understanding of ammonia as a marine fuel.

So far, the study has examined different leak scenarios for single-wall and double-wall containment, as well as during bunkering operations – also providing key insights on the efficiency of ventilation and vapour processing systems, the size of safety zones needed, and the health risks to people exposed to leaks.

Because of the risks inherent in the use of ammonia, BV says a key challenge for ship owners and designers is to prevent accidental ammonia leaks during ship operations and bunkering.

BV says that to help de-risk ammonia as a fuel, it is building on "a tried-and-tested approach that was used in the last decade to propel the development of LNG as fuel". BV's Rule Note NR 671 was also used as a guideline, given its focus on preventing ammonia leaks and requirements for onboard vapour processing systems.

As ammonia-powered engines and propulsion systems are still being developed, BV and TotalEnergies began by assessing what concentrations of ammonia in the air would be problematic, and compared those levels to LNG. The LNG-fuelled tanker served as the model for the comparison, showing a stark contrast between the two fuels. LNG becomes dangerous at around 50,000 parts per million (ppm), while ammonia starts to have health effects above 30 ppm when permanently exposed, or around 300 ppm when exposed for one hour.

Based on this, BV noted that unless modifications are made to design, safety

distances should be much greater for ammonia than LNG. This confirmed the approach outlined in BV's NR 671, which includes more stringent leak management on-board and vapour gas processing to avoid even small leaks reaching manned areas.

Laurent Leblanc, BV Marine & Offshore's Senior Vice President Technical & Operations comments: "While further experimentation and analysis are required to reach definitive conclusions, this preliminary study helped identify future areas to explore for de-risking ammonia as fuel. Additional tests could be performed for leak design scenarios, bunkering safety zones, bunkering arrangements, and the effect of weather conditions, for example.

"Until technology developments can eliminate ammonia leaks completely, leak mitigation and treatment remain the best course of action for ship owners and designers. Our preliminary study with TotalEnergies forms a strong basis for future industry collaboration. By pairing the right questions with the right tests, marine stakeholders can begin the journey to de-risking ammonia as fuel, as they did for LNG."



Model of ammonia-fuelled harbour tug ©NYK Line



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NO OBJECTIONS

Lubricant manufacturers meet engine maker's new standards

Lube oil producers Castrol and Chevron Marine Lubricants have both announced that new products have received Category II No Objection Letters (NOL) from MAN Energy Solutions (MAN ES).

Castrol says its new cylinder oil, Cyltech 40 XDC (eXtra Deposit Control), has successfully undergone extensive field testing and will be available later in 2022.

MAN ES introduced the new performance category for mark 9 and above 2-stroke engines after these engines were recognised to require cylinder oils with excellent overall performance and a special focus on cleanliness. Category II NOLs were first awarded to the 100BN and 140BN cylinder oils.

Castrol has Category II NOLs for Cyltech 100 and Cyltech 140. It says that the introduction of Cyltech 40 XDC completes the portfolio of Cyltech Category II cylinder oils for use across the marine fuel sulphur content range.

The extensive testing included over 2,000 hours running on a MAN BW 7G80ME-C9.2-TII engine burning < 0.5% sulphur VLSFO. It confirmed that the new oil has, Castrol notes "excellent overall performance and cleaning ability, making it suitable for all MAN B&W two-stroke engines and recommended for mark 9 and higher using 0 to 0.5% S fuel".

Cassandra Higham, Marketing Director, Global Marine and Energy, at Castrol said: "Gaining confirmation of Cyltech 40 XDC's performance is another example of Castrol's ongoing efforts to support customers dealing with industry uncertainties and challenges. Engines are critically important and valuable assets, which is why Castrol experts are accessible to support customers, not only with the right lubricant to protect against engine wear, but also to interpret marine manufacturers' trends."

Higham says that despite the many unknowns relating to the direction of future fuels, optimum engine efficiency,

which could be supported by Cyltech 40 XDC, remains a constant requirement in today's operating environment: "As shipping transitions from a period of relatively predictable, commoditised products to a more complex array of alternative fuels, lubricant choice has reached a new level of importance."

Chevron, meanwhile, notes that since the 0.50% sulphur limit came into effect on 1 January 2020, the engine designer has defined two performance standards for lube oils intended for use in their two-stroke engines. Category I oils are for MAN ES Mk 8 and earlier engines, category II oils are higher performance for their Mk 9 and later engines.

It says that 100BN and 140BN cylinder oils meeting Category II for use with HFO are already available, but lower BN, specifically 40BN cylinder oils for use with VLSFO meeting Category II have proved more challenging and are taking longer to develop and commercialise.

Taro Ultra Advanced 40 was tested extensively on vessels with MAN 8G80ME-C9.2 in conjunction with shipowners including Greece's Cape Shipping.

Elias Soulis, Technical Manager Cape Shipping SA, explained; "We were

operating our engines on 40BN cylinder oil and VLSFO, however, we had to run alternating with 100BN oil to keep our MAN G80ME-C9.2 engine clean. We have now operated for extended time, on Chevron's new high-performance 40BN cylinder oil and have seen a significant improvement. We no longer have to alternate between the two products to have excellent looking engine cylinder conditions. Having a single product for all our operational conditions reduces greatly the complexity of the operations for our crew."

The new lubricant is designed for use with a range of low and zero sulphur fuels including VLSFO, ULSFO, LNG and methanol.

Luc Verbeeke, Senior Marine Engineer stated that it is vital for cylinder oils that have Category II status to have excellent performance, centred on their cleaning ability, which should either be the same as a 100 BN cylinder lubricant or even better. "The performance requirements of Category II are considerably higher than those of a Category I oil," he said, "and their testing process ensures that their formulation is suitable for the application and meets MAN ES latest requirements."

Taro Ultra Advanced 40 is also being put on the market in the second half of 2022.



Chevron says it is vital for cylinder oils that have Category II status to have excellent cleaning ability ©Chevron

LEGAL FIRM ADVISES ON DUAL-FUEL VESSEL ORDER

WFW involved in combined newbuilding ordering and long-term chartering deal

Solicitors Watson Farley & Williams (WFW) has advised MPC Container Ships ASA (MPCC) on its order for two 1,300 TEU dual-fuel methanol newbuild vessels in partnership with chemical group Elkem ASA (Elkem) and North Sea Container Line (NCL) which will charter both vessels for 15 years.

Costing US\$39 million each, the vessels are intended to operate in the North Sea and are expected to enter service in the second half of 2024.

The vessels will be equipped with a dual-fuel engine setup which enables operation on methanol as well as conventional MGO. According to WFW, in addition to an advanced hull design, optimised for economic sailing speeds, there are several onboard solutions contributing to the vessels' overall efficiency including shore power connection, battery packs, shaft generators and twisted edge flap rudders.

Highlighting the numbers of players involved, the project has been developed with Topeka Holding AS (part of the Wilhelmsen group) and MPC Capital AG, supported by Enova, a Norwegian decarbonisation company, the Electrification of Maritime Transport Company which is owned by Norway's Ministry of Climate and Environment, and the NOx fund run by the Norwegian business sector to reduce emissions.

MPCC owns and operates one of the largest feeder container ship fleets worldwide.

Elkem is an Oslo-listed producer of silicones and alloys for the foundry industry. Elkem owns a 40% share of NCL, an integrated container logistics company with a large and well-connected network in Europe and Norway.

The new ships will replace three of NCL's diesel-powered vessels which will be phased out and will make NCL the first container ship operator in Norway to operate methanol-powered ships.

The cross-border WFW team that advised MPCC was led by Maritime Partner and Germany Corporate Services Group Head Dr Christian Finner, supported by Senior Associate Peter Graß and Associate Marc Großmann. They worked closely throughout the transaction with London Partners Robert Platt and Charles Buss.

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Axiom Global is an energy trading & bunkering company headquartered at Dubai, United Arab Emirates. The personnel at the helm at Axiom Global have over two decades of experience in energy trading, risk management and bunkering especially in the Indian subcontinent, Southeast Asia, Middle East and Africa region. Recently they started commencing bunkering operations in UAE Ports of Dubai (Mina Al Rashid, Jebel Ali), Sharjah (Hamriyah, Khorfakkan), Abu Dhabi (Mina Zayed), etc.

Axiom Global is built with a mission to offer and build a sustainable and profitable relationship with their stakeholders and trading partners in the field of energy trading, bunkering and risk management. As bunkering industry is under constant pressure due to its very nature, Axiom Global, strives to "deliver more for less" by offering customized solutions for specific markets with a motto of "Our Word is Our Bond".

Axiom Global strives to offer best and competitive trading experience to their trading partners by controlling the entire supply chain from procurement, storage, blending, shipping, and hedging and simultaneously keeping social responsibility and environment at its core at all stages of the supply chain.

The strength of Axiom Global lies in its team. They believe in "happy employees, even happier customers". Axiom Global believes and practices the philosophy that an engaged team helps in establishing better relationships with customers, suppliers and other channel partners and stakeholders.

Axiom Global offers bunker fuels that meet the unique needs of their customers at affordable rates through multiple distribution points (in-port and out-of-port limits) in all major and minor ports in India, Sri Lanka and Iraq.

Axiom Global promises to provide services through its progressive and innovative approach to delivering energy. They offer a broad range of marine fuels which comply with international standards like ISO,

MARPOL as well as localized requirements to meet customer satisfaction.

Based on this principle "our word is our bond", Axiom Global's team, over a period of time have developed a satisfied clientele of ship owners, oil majors, government shipping companies, OMC's, bunker buyers and bunker traders who look upon us for meeting their bunker requirements for their ships calling in Indian sub-continent, Middle East and other ports like Egypt, Singapore, etc.

Axiom Global has working offices in Dubai, Singapore and India and soon will be establishing an office in London to increase closeness with our customers and stakeholders.

www.axiomglobaltrading.com





THE PORT OF CHOICE

Gibraltar's strategic location at the crossroads between the Mediterranean Sea and Atlantic Ocean has made it the port of choice of many vessels

An average of 60,000 vessels pass through the Straits annually and Gibraltar works extremely hard on making it attractive for them to stop at the port for different services.

Gibraltar has developed into the largest bunkering port in the Mediterranean. Not only has the attractive price been the reason for this but the high safety standards in place too. Being able to provide other services like spare parts and provisions has contributed to this. From tankers to super yachts to cruise ships, Gibraltar has seen an increase year on year.

During the pandemic the Port of Gibraltar was open for business as usual. While other nearby ports closed down Gibraltar rolled up its sleeves, put in the right safety protocols and kept on providing the best service possible to its clients. With the airport only 5 minutes away from the port and having a 4 weekly flights to London at

the height of the pandemic ensured that Gibraltar could maintain contact with the outside world.

No doubt, the main business for the Port is bunkering. 2021 showed an increase of bunkering vessels calling at Gibraltar by 6.54% compared to 2019, the last pre pandemic year. The port has also granted its first LNG bunkering license two years ago. This is a market that Gibraltar is keen on developing. There is already interest from cruise lines who have introduced LNG vessels in their fleet. This could be very good business for Gibraltar at the same time as showcasing its green credentials.

Interest in Gibraltar continues to grow on wanting to provide further bunkering services. The Port Authority is studying all these proposals and only wants to grant licenses to the best operators. It is looking to protect its reputation as the preferred port in the Mediterranean.

The Government of Gibraltar has set a net zero target of 2050, with the port being included in this. A lot more needs to be done and there is substantial work going on in the background to make sure that this is achieved.

Alternative fuels is only one aspect but Gibraltar is also looking at shore power. This has to be the target if Gibraltar wants to show its true ambitions in the maritime industry.

As Gibraltar looks ahead, it is clear that it does so with great optimism. In these challenging times one needs to have targeted initiatives. Gibraltar certainly has that and coupled with its proactive people it will no doubt achieve its goals.

www.gibraltarport.com

QUALITY AND SERVICE

from Oil Marketing & Trading International D.M.C.C. (O.M.T.I.)

Fujairah Engineering Company LLC (FECO), which was established in 2004 in Oman and has since been operating the ex BP Bunkering facility of 110,000 cubic meters storage capacity, has reached an agreement with Salalah Port Services Company SAOG (SPS) to operate the now called FECO bunkering facility. Under this agreement, FECO has been licenced to supply bunkers at Salalah Port.

M/T Sea Dweller will be stationed at Salalah Port to perform bunker deliveries. With a 400MT per hour pumping capability, and 3,420 DWT, the 2002 built tanker will initially supply Low Sulphur (0.1%) Marine Gasoil ISO 8217 with plans to introduce Very Low Sulphur Fuel Oil (VLSFO) ISO 8217 within a month. In addition to deliveries by barge, FECO has the ability to deliver Marine Gas Oil via road tankers at certain Salalah Port berths.

Marketing of the products will be done exclusively by Oil Marketing & Trading International D.M.C.C. (O.M.T.I.) and all customers' enquiries will be handled by Mr Dimitri Martinuzzi available at the following contact details:

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A few miles south of Lisbon the deep waters Port of Sines can receive for bunkers only call almost all type of vessels.

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CRITICAL STEPS TO DELIVERING EFFECTIVE MARINE ENGINE LUBRICATION

Lubmarine – a division of TotalEnergies Lubrifiants – explains the 3 steps of effective engine lubrication including engine oil selection, proper monitoring strategies and the role of data and the human element

The use of low sulfur fuels has clear benefits on emissions reductions, but what has been proven is that challenges around fuel quality - especially early 2020 - have brought real issues for modern 2-stroke marine engines.

Sensitivities to corrosion and increased risk of engine deposit build up can potentially lead to problems such as ring pack damage.

Selecting the right cylinder oil in tandem with a properly managed Monitoring Programme in the post IMO2020 landscape has never been more important than it is today.

Selecting the Right Lubricant

Here at Lubmarine we have developed a range of tailored lubrication formulations designed specifically to manage today's modern marine engines, for all IMO2020 compliant fuels including LNG.

Our premium product Talusia Universal is a fully OEM approved cylinder oil with a patented chemistry, proven with over 125,000,000 successful operating hours.

Tests show that Talusia Universal demonstrates a significant cleaning ability (detergency) and provides higher residual BN, enabling ship operators to optimize their feed rate and maintain the lube oil into the safe limits determined by the OEM's. Talusia Universal has been approved by WinGD as a "Dual Fuel validated" product, one of the few cylinder oils on the market to have obtained this achievement.

The latest entry in the Lubmarine Talusia range of cylinder lubricant is Talusia HD 40 for which MAN ES has granted a NOL Category II. The product has excellent overall performance with a special focus on cleaning ability and is applicable for all engine types and is recommended for MAN B&W two-stroke engines Mark 9 and higher, providing operators with increased safety margins for very demanding engines.

"We are delighted with this latest recognition from MAN ES and we believe this new generation of cylinder lubricant will provide added safety margin for ship operators," said Stuart Fuller, Lubmarine's Market Liaison & Product Manager responsible for MAN ES.

Taking a Multi-Layered Approach to Engine Cleanliness

Using the right lubricant in the right amount to deliver optimum performance and effective engine cleanliness is just one piece in the puzzle.

Rising to the challenge requires an understanding of the multiple operating parameters of the engine, combined with smart engine monitoring and drain oil analysis and interpretation - something that can only be achieved with the support of a lubricant specialist.

By carefully and regularly monitoring lubricant and vessel machinery condition, ship owners together with their oil supplier can proactively detect and react to any abnormalities.

All OEM guidelines recommend careful engine monitoring and a sophisticated intelligence-led approach allowing for the most prudent management of two stroke marine engines. Implementing an effective Drain Oil Analysis Programme is a reliable and a proven way of helping optimize operations through lubricant consumption and component wear analysis.



Tapping into Digital: the Benefits of A New Range Services

A new range of fully digitalized services to offer onboard vessel equipment and engine performance insights, engineer support, as well as a dedicated portal to access vessel and business data are now launched. The platform is easy-to-use and provides intelligent online insights that can be used both by onshore staff and offshore crew at the same time.

The new suite of services include:

LubPortal: offers a central resource for all stakeholders on every vessel asset to help manage and optimize vessel operations, from equipment monitoring to lube oil procurement.

LubInsight: helps vessel owners and operators to improve the way they manage their equipment and engine lubrication.

LubDiag: offers a range of in-depth assessments on lubricant condition and how your equipment and engine is performing with laboratory analysis.

LubSkills: offers a range of support services and technical expert insights from engine inspection and issue investigation, through to bespoke training for better lubrication and equipment knowledge-share.

Data is helping to ensure faster and more accurate decision-making to better support how vessel owners and operators manage their fleet.

"These latest solutions are all designed to guarantee optimum efficiency and provide peace of mind for our customers. It also reduces the risk of human error in procurement," says Olivier Suming, Service Product Manager at TotalEnergies Lubrifiants.

The Human Element - Specialist Knowledge and Interpretation

The third layer in achieving optimum engine performance including its cleanliness profile is to enlist the support of highly experienced engineers to assist with lubrication optimization and any

lubrication issues vessel operators might be experiencing.

This level of support can include:

- Ship engine inspections and trouble-shooting
- Lubrication survey and technical investigations
- Shipyard and switchover support
- Crew and onshore teams training from lubrication basics to high level lubrication strategies

There is no single solution to achieving the benefits that LOFR optimization can deliver. It takes a multilayered approach, using the tools and knowledge with the support of a technical team and the infrastructure of a specialist lubricant manufacturer with the range of services available to support vessel operators.





AT YOUR SERVICE!

Come with us as we continue to fulfill our dreams

ORGANIZACIÓN TERPEL is a company that sells Fuel in Colombia for automobiles, aircraft and vessels. It also produces lubricants with international operations in Panama, Ecuador, Peru and the Dominican Republic in the aviation market.

In Colombia, we are market leaders in liquid fuels and natural gas retail. We also have the largest chain of gas stations and network across the whole nation.

We have a highly qualified team that makes our operations fast and safe for every customer.

The team of Terpel gathers 3,000 partners in five different countries: Colombia,

Peru, Ecuador, Panama and Dominican Republic who commit every day to hard work and service, to keep industry and transportation moving. Our team is highly qualified and specialized in making our operations reliable, fast and secure for each of our customers.

Our team is constantly innovating our products to offer the best quality and price for you at all time. Therefore, we offer proposals that provide value to our customers at each service station, airport and maritime ports.

Our bunker business is located in Colombia and Panama where we deliver by barge, truck and pipeline. We provide marine diesel for passenger ships, fishing vessels,

tuna seiners, dredges, general cargo ships, tugboats, and logistics support vessels on the high sea.

We offer Marine Gas Oil and marine lubricants with the best quality and the best prices, in the principal terminals in Colombia and in Panama.

We are proud to have earned the trust of our customers by offering quality products as well as constant innovation at the best price for you.

If you need us, please contact us at bunkers@terpel.com and check our web page www.terpel.com

AT YOUR SERVICE!

Come with us as we continue to fulfill our dreams





MARINE & ENERGY TRADING CORP

Maritime services with excellence!

MARINE & ENERGY TRADING CORPORATION (otherwise known as M&E Trading Corp.) is an integrated marine and energy trading company based in Delaware, USA.

M&E undertakes worldwide trading and physical supply of marine fuels (bunkers), marine lubricants and stores. We have very reliable associates around the globe who can supply bunkers and lubricants on our behalf with guaranteed excellent services tailored to our clients' (shipowners and traders) needs at any particular location and time.

M&E has also invested on equipment and capacity for physical bunker and lubricant deliveries around North America (Houston, Long Beach, Vancouver etc), West Africa (Nigeria, Rep. of Benin, Togo, and Ghana). And we guarantee "peace of mind" in bunkering.

M&E Corp. facilitates the acquisition of sweet crude oil and LNG lifting licenses and also trades on crude oil and LNG cargos.

M&E provides state-of-the-art maritime safety equipment; and in collaboration with reputable associates delivers training programs on diverse maritime areas.

M&E Corp. also organizes and represents a group of investors on sustainable maritime projects around the globe especially for West Africa and other developing countries; arranging and providing finance, consultancy and logistics for sustainable maritime projects.

As part of our mission, M&E intends to sponsor research and development (R&D) on marine renewable energy especially offshore wind power around the Gulf of Guinea.

M&E cooperates with other companies to guarantee first class services to clients worldwide.

M&E Trading undertakes the following services:

- MARINE FUELS AND LUBRICANTS
- MARITIME ENERGY
- MARITIME INFRASTRUCTURE
- WORLDWIDE ENERGY TRADING
- MARITIME SAFETY AND EQUIPMENT

For more information please contact us on:

Phone: +1 857-207-7999

Email: info@marine-energycorp.com

Address: 1201 N. Orange St #7106, Wilmington, DE. 19801

For Marine Bunkers and Lubricants Enquiries please email: bunkers@marine-energycorp.com

Or visit <https://marine-energycorp.com>

ENACOL, CONNECTING CONTINENTS

Based in Cape Verde, strategically located on the main maritime routes between Europe, West Africa and the Americas

ENACOL, offers high quality fuels and lubricants and ensures efficient delivery service to all types of vessels:

Guaranteed Marine fuels quality according with ISO 8217: 2017 standards:

- LS MGO Max 0,1%S (constant availability)
- IMO 2020 Compliant Fuel Oil with max 0.5% Sulphur Content
- Competitive prices in the region
- Safe and efficient supply service
- Fleet compliant with international standards: MARPOL, SOLAS, ISPS and ISM
- High quality lubricants in partnership with GALP-LUBMARINE

Enacol can deliver bunker fuels to international fleets in Cape Verdian main ports of **Mindelo** (alongside berth and anchorage) and **Praia** (service alongside berth only) by barge, truck or pipeline.

Mindelo have been reinforcing its position as a recognized and specialized "bunker-only" port due to its perfect anchorage conditions for a safe and efficient quick turnaround bunker operation without congestion, bad weather or security risks.

The port, supported by an international airport nearby and quality hotels for accommodations, offers a wide range of

maritime services, such as crew changes, spare parts supply, ship chandling, sludge disposal, fresh water, among others.

We look forward for your enquiries!

Phone: (+238) 5346065;

Mobile: (+238) 9968405; (+238) 991 5964

E-mail:

bunker@enacol.cv | energia@enacol.cv

www.enacol.cv



GOIL COMPANY LIMITED (GOIL)

GOIL Company Limited (GOIL) is a Public listed Oil Marketing firm



The company is ISO 9001:2015 as well as ISO 14001:2015 Certified. GOIL has as its subsidiaries, GO Energy, a Bulk Distribution Company Limited and GOIL Offshore Limited to cater for its upstream business.

GOIL is currently the market leader in additivated premium quality fuel (Super XP RON 95 and Diesel XP) and has the largest and growing retail network in Ghana with over 400 stations. The marketing arm is represented in seven zones country-wide. GOIL also supplies Mining Diesel to mining firms in the country and the leading LPG marketer in Ghana.

GOIL presently supplies MGO ex-pipe and RTW from three main ports, Tema and Takoradi Ports as well as the Sekondi Naval Base and markets premium Lubricants some of which are blended locally.

The rest are imported. GOIL also supplies aviation fuel to major airlines.

www.goil.com.gh





POWERING GLOBAL TRADE!

KMC Marine Energy ... powering global trade!

KMCMC Marine Energy is physical (bunkers and lubricants) around West African ports of Lagos, PortHarcourt, Warri, Calabar, Cotonou, Douala, Lomé, Tema and OPLs. We also deliver lubricants and marine in other ports in Africa via our trusted local partners.

As part of an international trading group, KMC Marine Energy services over 70% of ports globally.

As brokers, we facilitate large volume trading of LNG, crude oil and refined products.

Our Singapore office (KMC Marine Energy Pte Ltd), beginning from last quarter of 2022, shall begin to engage in worldwide trading of bunkers, lubricants and oil and gas cargoes (including LNG).

On marine lubricants, we are working on sealing a contract with a world class oil major to handle and distribute their OEM approved marine grades at some selected port locations in West Africa and nearby Central Africa.

We guarantee efficient and reliable services on competitive levels.

Contact us for guaranteed services with peace of mind.

**KMC Marine Energy ...
powering global trade!**

www.kmcmarine-energy.com



Kelvin U Chukwujekwu,
MIMarEST
Chief Executive Officer



PROVIDING THE BEST SERVICES



Big enough to be powerful, small enough to be agile

Our aim, at Bunkeroil, is to offer our clients a truly competitive advantage by providing the best services in terms of maritime transport, delivery & sale of oil products and the relationship between shipowners and port operations.

We offer bespoke solutions with a high added value when it comes to operational flexibility and financial conditions.

Since the company was founded in Livorno in 1980, our history has always been marked by constant growth and focus on the quality of our products and services, as well as on client satisfaction. This has made us one of the key players in bunker and marine lubricants sale, both nationally and in the Mediterranean.

From the port of Livorno, our marine fuel and lubricant distribution operation began to expand into all Italian ports, in order to meet the diverse needs of our clients in an increasingly comprehensive way.

From the outset, our shipping activity in the transportation of petroleum products in the Mediterranean has run alongside the Bunker service, and in the early 2000s we upgraded our fleet.

During the same period, we launched the Clearing and Shipping Agency service in the port of Livorno,

whilst our international expansion in the lubricant sector began in the second half of the 2000s. Today, we cover all of the world's main ports as bunker and lubricant traders, of course with a greater focus on the Mediterranean Sea.

In 2018 we launched a constantly stocked lubricants storage service as leading ExxonMobil Distributors for local market in the territories of Italy and Malta.

The cornerstones of our work.

Being a supplier is not enough, and that is why we strive to form partnerships with our clients, through:

- the best products in terms of quality;
- maximum operational flexibility;
- problem solving;
- bespoke financial solutions.

With years of experience in the industry, we have developed a well-established network that enables us to respond to client requests promptly. We offer our clients:

- availability of the product or equivalent alternatives;
- 24/7 service;
- the most competitive price on the market, thanks to our greater purchasing power.

BUNKEROIL CONTACTS:

Address: Via Pietro Paleocapa 11, 57123, Livorno, ITALY.

Phone: + 39 0586 219214

Bunker enquiries: bunker@bunkeroil.it

Lubricant enquiries: lubricant@bunkeroil.it

Please visit: www.bunkeroil.it

Follow us on LinkedIn: Bunkeroil



DIARY 22/23

13-15 SEPTEMBER 2022

**IBIA MEDITERRANEAN ENERGY
AND SHIPPING CONFERENCE
MALTA**

IBIA goes to Malta. Malta's rich and vibrant history sets us firmly on a path to a greener future. A host of prominent speakers will explore the benefits of green alternatives and environmental technologies which will carry the bunkering industry into the future and beyond. Malta's Maritime history stretches back over 7000 years. Its strategic location has meant that it always played a central role in shipping and trade in the region. Should you wish to attend or know more please email sofia.konstantopoulou@ibia.net
For more information: www.ibia.net

28-29 SEPTEMBER 2022

**TRANSPORT EVOLUTION AFRICA
DURBAN, SOUTH AFRICA**

Now in its 10th year, Transport Evolution Africa Forum & Expo is Africa's largest transport event and is the annual meeting place for the region's port, rail and road transport professionals. The strategic Forum will tackle AfCFTA implementation, infrastructure investments, and cross border trade policies head-on while the B2B expo will give solution providers the opportunity to showcase their global innovations. Transport Evolution African Forum & Expo will be held from 28 – 29 September 2022, at the Inkosi Albert Luthuli ICC Complex (Durban ICC), South Africa and is co-located with The Big 5 Construct KZN, The Transport CEO Forum, Women in Transport Awards, Trade & Logistics Evolution and the Roads Evolution Forum & Showcase.
To find out how you can get involved – contact Natalie Kruger on +27 21 700 5506.

4-6 OCTOBER 2022

SIBCON 2022 - SINGAPORE

Organised by the Maritime and Port Authority of Singapore, the Singapore International Bunkering Conference and Exhibition (SIBCON) has a proven track record. Powered by a Steering Committee of senior decision makers from industry, the event will bring to you unparalleled knowledge, engagement and collaboration opportunities.
For more information: <https://www.sibconsingapore.gov.sg/>

7 OCTOBER 2022

IBIA GOLF DAY ASIA - SINGAPORE

IBIA will be bringing back the IBIA Golf Day Asia in conjunction with SIBCON 2022. Members can expect a lovely day out on the greens followed by a networking lunch. Further information will be shared in due course and should you wish to know more, please email: siti@ibia.net
For more information visit: www.ibia.net

19-21 OCTOBER 2022

**ARGUS FUEL OIL AND ALTERNATIVE MARINE FUELS
US SUMMIT - MIAMI, FLORIDA**

Bringing together America's fuel oil and alternative marine fuels markets for insight on the future of fuelling the bunker industry. After a couple of years apart, we are excited to reunite with the fuel oil and marine fuels sector in Miami at the 2022 Argus Fuel Oil & Alternative Marine Fuels US Summit, October 19 – 21. New for the 2022 event, the Argus Fuel Oil Summit will provide you with critical insight on the future role of alternative marine fuels in the bunker industry as the sector moves full steam ahead towards decarbonization.

For more information:
<https://www.argusmedia.com/conferences-events-listing/fuel-oil>

15-17 NOVEMBER 2022

**IBIA ANNUAL CONVENTION 2022
HOUSTON, USA**

The need to reduce emissions of air pollutants like SOx and NOx has been driving the industry toward new types of cleaner-burning fuels. Going forward, the decarbonisation drive will have an even bigger impact. Which alternative fuels are currently in favour? How long will LNG remain part of the picture? When will we see the first large zero-carbon cargo ships, and how long will it take for these ships to become the majority? Join industry experts introducing what we should expect in the years ahead, how the new fuels will work in engines and what preparation needs to be done for the zero-carbon transition. Should you wish to attend or know more please email sofia.konstantopoulou@ibia.net

For more information: <https://www.ibiaconvention.com/>

1-2 DECEMBER 2022

**BARCELONA BUNKER FUEL CONFERENCE
BARCELONA, SPAIN**

Prepare for growth in the European bunker market while investing in the shift to low and zero-carbon fuels. With Europe shunning Russian energy, bunker prices have soared, entering four digits for the first time in history. This comes, just as fundamentals were hinting towards the end of COVID-19 and recovery for the global markets. How will Europe's cutting of the cord on Russian energy impact the bunker market and what does this mean for the energy transition? Will progress for alternative fuels accelerate in the bunker market? Join the world's leading bunker suppliers, refiners, traders, brokers, and ship owners/operators to reassess the outlook for the European bunker market.

For more information:
<https://plattsinfo.spglobal.com/Barcelona-Bunker-Fuel-2022.html>

27 FEBRUARY 2023

**IBIA ANNUAL DINNER 2023
LONDON, UNITED KINGDOM**

Join IBIA as we celebrate 30 years as an association. The much-anticipated IBIA Annual Dinner finds a new home for 2023, at the elegant and modern Park Plaza Westminster Bridge for an unforgettable celebration and black-tie evening shared with our members and their guests. As a well-established fixture in the bunker industry's calendar, we are looking forward to welcoming you for an evening of networking and sharing our very special anniversary with our valued members.

Should you wish to sponsor or know more please email:
tahra.sergeant@ibia.net
For more information:
<https://ibia.net/event/ibia-annual-dinner-2023/>

All dates were correct at time of going to print but may be subject to change, please review the related websites

WORLD BUNKERING

Q4 2022... NOW OPEN FOR BOOKINGS

Q4 2022 SPECIAL FEATURES:

Bunker Traders

After an unprecedented period of turmoil due to the pandemic and the Russian invasion of Ukraine, we look at how the traders are faring. Is it still possible to draw clear distinctions between traders, brokers and suppliers?

.....

Biofuel

We turn the spotlight on the rapidly growing biofuel sector. How big a role will it play in shipping's decarbonisation and are environmental cost to heavy reliance of biofuels?

.....

Fuel Additives

The development of biofuel poses challenges for ships' engineers and machinery manufacturers. However, it has also opened up a new market for additive producers. We look at how the sector is responding.

.....

Scrubbers

The use of scrubbers is controversial but ship operators continue to choose this option as an alternative means for meeting sulphur limits. We look at the debate surrounding their use and how authorities around the world view the use of this technology.

GEOGRAPHICAL FOCUS:

Northern Europe

The European Union is poised to impose new regulatory measures to reduce GHG emissions from shipping, most notably bringing shipping into the EU Emissions Trading System. Meanwhile the issues of licensing and the possible mandatory use of mass flow meters have become hot topics in the ARA region.

.....

Middle East

We look at developments around the region's bunkering hubs at a time of global political turmoil and rapid change in the marine fuels market. Are the suppliers keeping up with the demands of the shipping industry?

.....

Australia

With a change of government, some observers are looking for a change of emphasis in policy on both shipping and environmental issues. We report on developments around the coasts of this major bulk cargo and agricultural products exporter.

.....

Regular Features

News, Views & Analysis

Plus: Interview, Industry News, Environment, Testing, LNG, Lubricants, Innovation, Legal News, Equipment and Services, Diary, Event Previews & Reviews





WORLD-CLASS BUNKERING SERVICES FOR OCEAN-GOING VESSELS

IMO 2020 COMPLIANT MARINE GAS OIL AND LUBRICANTS



Takoradi Port MGO Facility

GOIL BUNKERING

GOIL supplies Marine Gas Oil (MGO) to ocean-going vessels in Tema, Takoradi and Sekondi. In the provision of these services the Company lays emphasis on Product Quality, Product Availability and stringent Environmental, Health & Safety (EHS) standards.

Our MGO meets the requirements of our esteemed clients in accordance with ISO 8217-2010 fuel standard. GOIL is IMO 2020 Low Sulfur Fuel (0.5% Max) compliant.

TEAM OF EXPERT

GOIL BUNKERING is a team of highly skilled professionals with expertise who work passionately to give you a world class satisfactory service.

QUALITY AND QUANTITY

We don't compromise on the quality of our products. Delivering premium quality and equitable distribution (quantity) is our mantra.

GOIL OFFSHORE TANKER FOR FAST AND FLEXIBLE DELIVERY

You don't have to sweat when you're in Ghanaian waters, GOIL Offshore Tanker is very close to serve you. We are able to guarantee fast delivery and large volumes of fuel with our tanker. We save you time because we know you don't have time for berthing.

EFFICIENT, RESPONSIVE, RELIABLE AND AVAILABLE

You can always rely on GOIL Bunkering for high premium quality fuel. If reliability is your challenge, then that is our drive. We are always on our toes to keep you moving. We are always happy to keep you going.



LONG TERM BUSINESS RELATIONSHIP IS OUR PRIDE

We take pride in personalizing and customizing bunkering. Customers' expectations drive us to always do more and better. Our aim is to establish and maintain long term business relationships. We have a continuous focus on delivering value for money. GOIL Bunkering is the solution to your bunkering needs.

HEALTH, SAFETY AND ENVIRONMENT

We believe that, safety and security don't just happen; they are the result of collective consensus and public investment. For safety is not a gadget but a state of mind. Therefore our team of expert prepares and prevent, they don't repair and repent.

24-hour Contact on:

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LET'S DO BUSINESS TOGETHER

Get expert advice on
your bunkering needs

**Bunker
One**

