

Introducing maritime technology to the bunker supply chain



Bunkering is one of the most common shipping operations occurring daily worldwide, irrespective of the type or size of the vessel. Supplying or receiving fuel happens on every single sea voyage but despite it being such a routine operation, there are still several disputes arising from it, especially with regards to the quality or quantity of the bunkers stemmed.

The possibility of placing off-spec bunkers onboard the vessel remains a constant worry for shipowners and the ship's charterers, as its consequences can be detrimental. Burning off-spec bunkers raises immediate safety concerns and leaves the owners facing not only fuel system failures and engine breakdowns, but also loss of time, underperformance and delay claims, arrests, and the eventual cost of de-bunkering.

Bunker quality and quantity claims are usually quite complex and fact sensitive, so owners must be vigilant and act fast. Preserving evidence such as the consumption documentation, the relevant logbooks and checklists, the damaged parts and most importantly the fuel samples, is essential; cases are won or lost on evidence and the owners' ability to prove a sufficient causal link between the bunkers and the damage to their vessel. Accurate and complete documentation is, therefore, crucial.

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Georgia Maltezou

Furthermore, owners and charterers will be aware that bunker supply contracts are typically drafted on the bunker suppliers' terms and conditions which limit or even exclude entirely the supplier's liability for quality or quantity claims. Bunker supply contracts often impose a very short timeframe for notification of claims (sometimes as short as seven days from the day of the supply of the bunkers) and failure to notify the potential quantity or quality issue within this timeline means that the claim is deemed waived. Whilst these short time frames can be contested in some jurisdictions, they may leave the owners or their time charterers with no avenue of recouping their losses.

In the event of a bunker related dispute, we recommend Members approach the Club's LCC Team at an early stage. The team has considerable experience in handling these types of claims and will be able to provide prompt and accurate guidance to Members on how to deal with what can be time-consuming and challenging disputes.

In the following article, the latest in our [Technology in Shipping series](#), the Club has invited [FuelTrust](#), a GreenTech SaaS Company, who say they can assist shipowners and charterers to ensure the quality, quantity and compatibility of the fuel purchased, to explain how they feel they can harness technology to reduce the financial impact of bad fuel, mitigate the regulatory risk and empower greener fleets.



Innovation is the lifeblood of the shipping industry, which has evolved over 5000 years. In recent years, digitalisation has become increasingly prominent across the maritime world, providing data to explore new possibilities.

At the beginning of the 21st century, the idea of tracing fuel origins by measuring molecules seemed inconceivable. However, today we not only know it is possible, but also that there's significant value in examining the digital DNA of fuels. Understanding carbon intensity by individual parcels of fuel can help predict a vessel's emissions based on its unique engine combustion. This information is crucial for calculating potential taxes and credits, which have financial implications for ship owners and charterers.

Equally relevant is the issue of fraud, which has been prominent throughout maritime history. Advanced technology now allows principals to detect fuel quality disparities before making a purchase, minimising harm. If a problem arises after receiving the fuel, they can resolve it swiftly using machine learning atop lab analyses for evidence.

To address these concerns, FuelTrust has patented AI technologies that create chemical digital twins to track fuel lifecycles and identify molecular disparities. Certificates of quality reports from accredited labs ensure integrity for the machine learning and reliable data-driven calculations.

Modelling of fuels is key to reducing instances where contaminated fuels impact the market. FuelTrust's research reveals that between 2019 and 2022, over 39% of fuels globally had a content difference of 2% or more when comparing lab reports to delivery receipts. The primary

cause was water introduced during delivery, resulting in average losses of US\$ 14,910 per affected delivery. At scale this is costing the industry hundreds of millions of dollars, the majority of which is avoidable.

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Darren Shelton

Although the implementation of electronic mass flow meters has fortunately curbed fraud in the paper trail, the introduction of transitional and alternative fuels has created new challenges. FuelTrust's technology offers new confidence to principals, ensuring that sourced fuels are not only suitable for the engine but also align with what was paid for. When purchasing premium fuels to achieve sustainability goals, it's critical buyers receive exactly what they ordered.

Fuel quality assurance is achievable and risk can be mitigated, without question, by using the right solutions to source fuels from transparent suppliers. If a claim does arise, stakeholders can resolve it quickly by working with a single, unbiased source of truth.

Detecting fraud remains a concern due to human predictability. Dilution of fuels, whether by water or some form of chemical contaminant as seen in recent cases in Houston and Singapore, will unfortunately continue. FuelTrust technology identifies fuel supply chains that introduce risks, enabling informed buying decisions by operators. Prudent procurement processes can safeguard against questionable suppliers and facilitate deals with trustworthy ones, benefiting everyone involved.

In the event contaminated fuel enters the market, FuelTrust's software alerts operators immediately if the AI detects a disparity in a lab analysis. Whether it's an alarming level of metals, a surprising amount of water or a significant disparity between side-by-side supplier and ship certificates of quality, this tool is considerably valuable for risk-averse buyers.

For this to work, fuel suppliers can seamlessly share their lab reports with buyers on the FuelTrust platform. This not only helps clients clearly identify fuel qualities but also validates the value of the suppliers' products. It's a win-win situation, preventing fraud, helping achieve Net Zero goals and supporting transparent suppliers of low-carbon fuels.

Many fuels that are considered "on-spec" still have quality issues that harm engines. Due to the broad nature of fuel specifications, numerous ships have suffered losses as a result of on-spec products, impacting the global supply chain. Ensuring fuel quality is a massive burden on the ship's crew and shore staff, made more challenging by the difficulty of detecting disparities and filing related claims within contract deadlines.

A large portion of P&I claims are categorised as “machinery” issues and damage to main engines caused by off-spec bunkers has been identified as a common root cause for those claims. Reducing these impacts benefits all stakeholders in the supply chain.

Not only can fuels be sourced with minimal risk of fraud, but savvy buyers can also employ this technology to reduce their risks and improve their emissions profiles. This presents a new challenge for stakeholders: how to compare different fuels effectively.

Many alternative fuels that are being marketed show growing promise, but shipowners struggle to decide which dual-engine combination is the best investment. FuelTrust's technology enables a side-by-side comparison of fuel types and utilises existing data on a ship's historical performance to offer true by-ship, by-fuel, by-voyage insights taking into consideration carbon intensity, consumption and compliance. This detailed exploration helps owners determine the best path forward for their vessels.

Tracing a fuel's lifecycle solves major problems in the shipping industry. FuelTrust's patented technology allows a fuel to be tracked digitally, through its unique DNA, using lab data from stakeholders along the energy supply chain. It can be safely shared cryptographically offering transparency and provenance.

In addition to mitigating risks and resolving disputes, traceability provides much needed visibility into the Scope 3 supply chain, addressing a significant problem for the shipping and energy industries. FuelTrust's blockchain solution allows principals to see beyond the limitations of Scope 1 and 2 datasets, providing robust metrics to meet sustainability goals while satisfying regulators, boards and consumers' concerns.

Through the invention of new technology, organisations like FuelTrust are not only helping shipowners to solve an age-old problem but also assisting the shipping industry as a whole to achieve Net Zero goals while mitigating risk from fraudulent fuels.

