A strategic imperative

Equipping ports with safety tools for new marine fuels

PETER ALKEMA

As global shipping shifts towards decarbonization, the surge of vessels powered by LNG, hydrogen, methanol, ammonia, and other low-carbon alternatives demands not only infrastructure upgrades but also systematic preparation for safe, efficient, and reliable bunkering operations. .

Ports stand at the frontline of this transformation, and the tools developed by the IAPH Clean Marine Fuels Working Group (CMF) through the World Ports Sustainability Program offer a structured path forward. These are not optional extras—they are essential for ensuring safety, operational efficiency, and competitiveness in the new energy era.

The Group came first came together after the IAPH World Ports Conference in Busan in 2011, going into effect in the mid 2010s to look at developing specific safety tools for ports as shipping began to adopt LNG as a fuel. Nearly fifteen years later, the accumulated knowledge developed in that period has been expanded thanks to a significant body of work being prepared by a closely-knit network of industry specialists from IAPH's member ports. It is thanks to them that these sophisticated tools have been become fuel agnostic in a multi-fuel world.

One of the CMF Working Group's most practical contributions is the fuel-agnostic Bunker Operators Audit Tool, which has been launched in October last year for IAPH members. By laying out clear responsibilities for bunker facility operators, it allows ports and relevant authorities to evaluate and validate the safety management systems of candidates applying to operate bunkering facilities across multiple fuel types, including methanol, hydrogen, and ammonia. This kind of screening is a security backbone, ensuring that only operators meeting rigorous safety and sustainability standards are approved. Without such oversight, ports risk safety incidents, regulatory pushback, and reputational damage.

Harmonised bunkering checklists and terminal readiness

Equally important are the harmonised bunkering checklists designed to reduce variability in operational practices. Divergent local regulations can create confusion for ship operators and bunker suppliers. The CMF checklists, which now cover the entire range of alternative and future fuels including liquid gases, alcohol-based fuels and toxic gasses like ammonia, are tailored for the many different ship-to-ship and truck-to-ship scenarios that can be found at different ports. These checklists, available to all parties in the public domain and published following consultation with industry partners, terminal operators, and classification societies alike, offer a level of standardisation that enhances safety and interoperability.

They account for different operational arrangements—such as whether the terminal significantly shares safety responsibility or simply needs to be informed—and allow operators to follow a consistent, familiar process across different ports. Adopting these checklists ensures uniformity, harmonises the way they are performed, reduces misunderstandings, and makes global bunkering operations more seamless.

Infrastructure readiness is another crucial dimension. LNG-capable or alternative fuel-capable ships cannot be served operationally if terminals are unprepared. The CMF's Terminal Readiness Guidance provides a procedural and operational blueprint for aligning safety management systems, training personnel, and reviewing ship-terminal interface protocols. By following such guidance, terminals can systematically address both technical requirements and operational safety for a wide range of fuels.

A suite of tools for ports by ports for a multi-fuel future

These tools matter for reasons far beyond compliance. New fuels introduce unique hazards—cryogenic temperatures for LNG and hydrogen, toxicity or corrosiveness for methanol and ammonia—that require specialised handling and robust safety measures.

Pictured: The IAPH Clean Marine Fuels Working Group met before the 2024 World Ports Conference in Hamburg. Right: The fuel-agnostic Audit tool, one of the Liquid Gases bunkering checklists and the recently developed checklist for ammonia bunkering
Photo: IAPH

PETER ALKEMA is harbour master strategic lead at Port of Amsterdam and has been chair of the Clean Marine Fuels Working Group alongside vice chair and Port of Rotterdam's senior coordinator of harbour master policy Cees Boon (pictured, far left) since its foundation

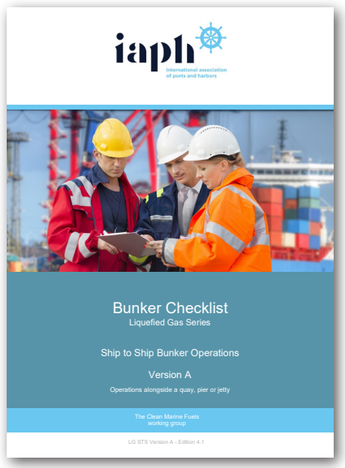
CMF resources help ports anticipate and mitigate these risks, protecting crews, terminal workers, and local communities. By providing a harmonised framework, CMF tools can also increase efficiency, allowing shipping companies to operate under consistent rules from one port to the next.

Regulatory preparedness is another crucial aspect. As environmental regulations for maritime fuels evolve rapidly, ports that align early with CMF guidance are better prepared to comply with regulations. This in turn can potentially attract funding or investment in new infrastructure as this sends a clear signal to industry partners and regulators alike: the port is committed to safe, sustainable growth.

The maritime sector's energy transition is already underway with ports playing a pivotal role as key enablers of a cleaner and more sustainable shipping industry. The IAPH Clean Marine Fuels Working Group's suite of tools developed by ports, for ports, offer a coherent framework to prepare for this future. ■

IAPH Audit Tool
for auditing Bunker Facility Operators

Bunker Checklist
Liquefied Gas Series



Bunker Checklist
Refrigerated Toxic Gas Series