



SEMAPHORE

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Two-Pronged Approach to Decarbonisation

“Decarbonising shipping – we must start today” was the aspirational title of a well-received seminar LNG Marine Fuel Institute chief executive Margot Matthews recently delivered via the MLAANZ Western Australia Branch.

Ms Matthews opened her presentation by posing the question “why do we need to decarbonise shipping?” which she largely answered by simultaneously asking “why do we need shipping?”.

The statistics reveal:

- 90% of global goods are transported by ship
- shipping is the most efficient form of transport
- nonetheless, shipping emits ~2.9% of global greenhouse gas (GHG) emissions
- unchecked, shipping GHG emissions will increase by 130% by 2050

However, despite the latter two stark facts, Ms Matthews observed that there are several notable challenges to decreasing global shipping emissions.

These include the long asset life of existing vessels (over 25 years) and commercial arrangements that often provide conflicting drivers (for example, an owner pays for the vessel but a charterer is responsible for the fuel, with debate then raised as to who pays for fuel versus investment in retrofitting). Additionally, many markets are currently depressed which dampens spending, the shipping industry is also not used to change and the sector has likewise become used to a single source of fuel.

Nonetheless, the industry is inevitably being driven to change by international pressures, as per the International Maritime Organization (IMO) drafting regulations on the fundamental principle of “no more favourable treatment” (NMFT).

Whether a developing or developed flag state, its targets for the global fleet (from a 2008 base) entail:

- 2030 – 40% reduce in carbon intensity (determined by grams per cargo tonne nautical mile)
- 2050 – 70% reduce in carbon intensity
- 2050 – 50% reduction in GHG emissions overall

“It is expected in 2023, that the IMO will set regulations that will become law, ratified in the various different countries, to drive the achievement of these targets – and everyone is watching very closely to see what will happen in this space,” said Ms Matthews.

Providing an historical context, Ms Matthews recounted that heavy fuel oil (HFO) has been used to fuel vessels since the early 1900s and has the advantages of being relatively inexpensive and readily available throughout the world.

However, with HFO also being a waste product from crude oil processing, it is of tar-like consistency and contains high levels of pollutants such as heavy metals, sulphur and nitrogen. Additionally, its combustion results in high emissions of GHG, sulphur oxide (SOx), nitrogen oxide (NOx), particulate matter and heavy metals – and if spilt, results in significant water, flora and wildlife impacts.

Ms Matthews noted that LNG is currently the cleanest alternative marine fuel, as it contains virtually no sulphur or metals. As an aside, she observed that Australia also happens to be the world's largest LNG exporter.

Combustion of LNG produces 33% less GHG emissions than HFO, no SOx or particulates and significantly-reduced NOx. Also, it presents no risk of water contamination from spills.

Furthermore, fuelling vessels with LNG is cost competitive to the use of very low sulphur fuel oil (VLSFO) or HFO with scrubber installation – the two options available to signatory nations following the January 2020 enacting of IMO regulations on low-sulphur fuel. Supply is also becoming readily available around the world.

Ms Matthews is adamant that through the use of LNG fuel alongside evolving vessel design/operation efficiencies, the global fleet “can in fact achieve the IMO’s targets”.

While acknowledging that LNG is nonetheless a fossil fuel, she lamented the reality that currently “there are no zero-emissions fuels available today for the maritime industry”.

Although such potential zero-emissions fuels as biofuel/synthetic, hydrogen, ammonia, methanol and batteries are all under development, they face a range of barriers such as technical maturity, feedstock availability, infrastructure, rules, capital expenditure, cost and volumetric energy density.

Nonetheless, the landscape is expected to evolve. According to a 2019 projection released by DNV GL, the main alternative fuel use trends through until 2050 are expected to entail:

- HFO/scrubbers initially being the hugely dominant source then dropping suddenly to ultimately finish the period as the third-largest
- LSFO/marine gas oil (MGO) quickly becoming hugely dominant then gradually easing back to ultimately be the fourth-largest
- LNG progressively ramping up to become the most dominant
- ammonia developing later to ultimately become second-largest
- electricity from grid progressively developing to almost ultimately match LSFO/MGO

In light of such forecasting, Ms Matthews expressed the “strong belief” there is only one best way to move forwards on decarbonising shipping in order to be efficient, environmentally-sustainable and meet the IMO’s targets – “we must take a two-pronged approach”.

“That is, grow the LNG ship fleet and bunkering capacity while at the same time working relentlessly on developing zero-emission fuels.

“It’s not a case of doing one or the other – we have to do both.”

Emphasising that “waiting is clearly not an option”, Ms Matthews examined the three most likely future scenarios for the global maritime fleet:

- business as usual – GHG emissions will continue to “significantly increase”
- business as usual until the commercial availability of zero-emissions fuels (which some project as 2030, but there is debate) – however, due to such issues as shipyards not having the capacity to turnaround new fleet in the remaining time and shipowners not wanting to



prematurely scrap vessels with significant operational life remaining, this approach will mean “we will not be able to meet the IMO’s targets”

- the two-pronged decarbonising approach – “we will be able to achieve the IMO targets, if not exceed them”

“From today we [must] start growing our LNG ship capacity, start reducing our GHG emissions while working on the zero-emissions fuel and – when they become available – start bringing in the zero-emissions-fuelled ships.

“The IMO’s 2050 goal of a 50% reduction in GHG emissions and 70% energy efficient intensity is achievable by applying LNG as a marine fuel and then using design and operating efficiencies.

“If we do the dual-pronged approach – LNG now and work on the zero-fuel emissions – we will be able to achieve the IMO targets, if not exceed them.”

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