



# IMO 2020 - value proposition

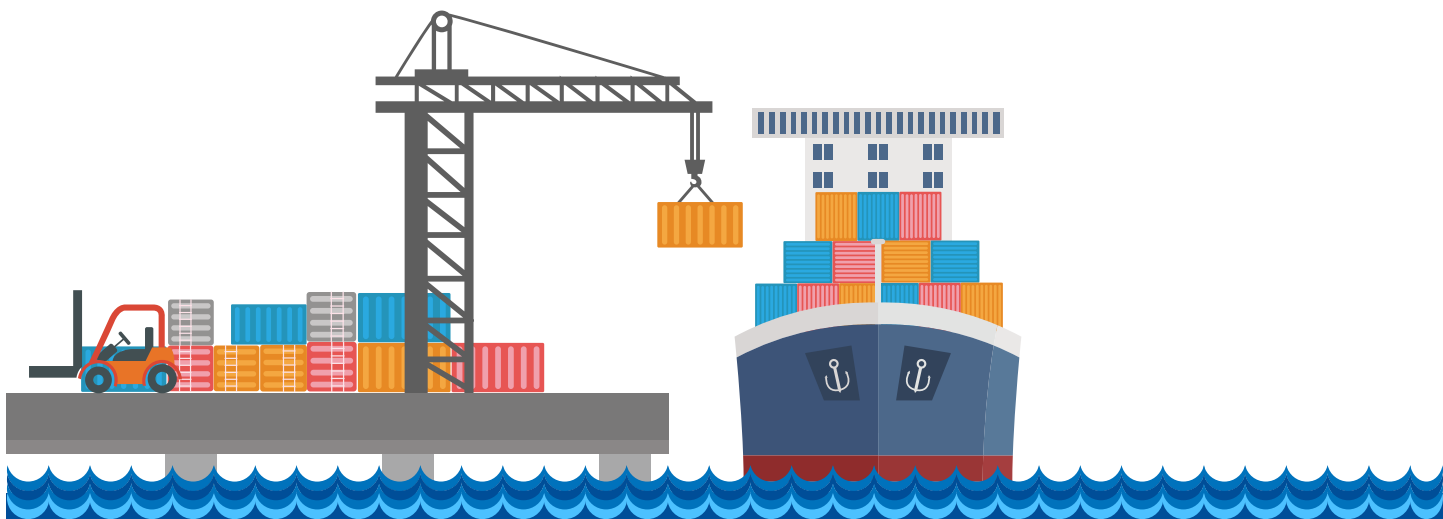
August 2019



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# Background of IMO 2020



**1997**

IMO adopts  
MARPOL  
Annex VI

**2005**

MARPOL  
Annex VI  
takes effect.  
Global  
maximum  
sulfur  
content for all  
marine fuel  
4.5 wt. %

**2008**

IMO  
announces  
timeline  
for marine  
fuel sulfur  
content  
reductions

**2010**

Max sulfur  
content for  
marine fuel  
consumed  
in ECAs  
reduced to  
1.0 wt. %

**2012**

Max sulfur  
content for  
marine fuel  
consumed  
outside ECAs  
reduced to 3.5  
wt. %

**2015**

Max sulfur  
content for  
marine fuel  
consumed  
in ECAs  
reduced to  
0.1 wt. %

**2020**

Max sulfur  
content for  
marine fuel  
consumed  
outside ECAs  
reduced to  
0.5 wt. %

1 <https://stillwaterassociates.com/imo-2020-part-1-marine-fuel-sulfur-content/>

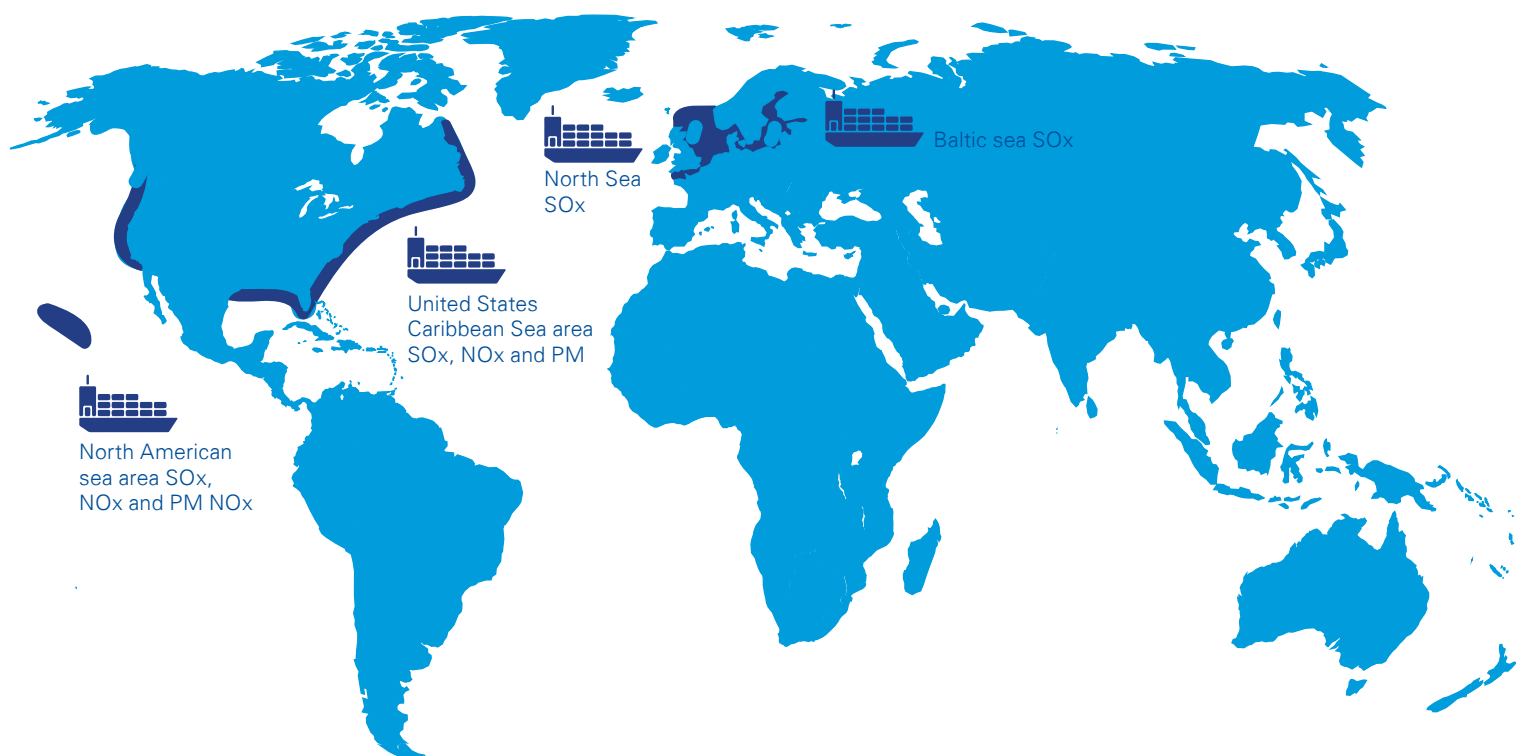
The International Maritime organization (IMO) will introduce its industry wide maximum sulfur content of marine fuel on the 1 of January 2020, known as IMO 2020. IMO 2020 marks the most recent culmination of efforts in decreasing the pollution exhibited by the maritime industry on the ecological life impacted by its day-to-day operations.

The story of IMO 2020 takes shape in 1997 with the introduction of MARPOL (standing for marine pollution) Annex VI, from the MARPOL agreement, which came into force on the 19th of May 2005.<sup>2</sup> It implemented the first industry wide limit of 4.5% m/m (mass by mass) on sulfur oxide emissions from ship exhausts. Additionally it established individual emission control areas (ECA's) which would exhibit a more stringent sulfur cap of 1.5%.<sup>3</sup> These included the Baltic Sea, the North Sea and Coastal North America, covering the USA, Canada and the Caribbean. Please see map below.<sup>4</sup>

As of 1 July 2010, the limit on the sulfur content in marine fuel exhibited by vessels operating within ECA's

decreased further to 1.00% m/m. Furthermore on the 1<sup>st</sup> of January 2012 the limit outside of ECA's was further reduced to 3.5% m/m. Indeed a further decrease in the sulfur cap, within ECA's would be appointed by the International Maritime Operation on the 1st of January 2015 to 0.1% m/m.<sup>5</sup>

Moreover, in 2008 a timeline was introduced for subsequent reductions in the sulfur content of marine fuels. This timeline included all the stringent sulfur caps mentioned above, as well as the goal of reducing the sulfur content to 0.5% m/m outside of ECA's. The latest date were the implementation of a 0.5% m/m could have been avoided would have been 2018, as IMO decisions require 22 months' notice, but a final decision was issued on the 27 of October 2016 to move forward with the implementation of a 0.5% m/m sulfur cap in marine fuel. In effect it is expected to decrease the sulfur content in marine fuel by 85%.<sup>6</sup> As no further appeals were noted or perceived in subsequent instances, IMO 2020 is set to be globally implemented on the 1 of January 2020.



2 [http://www.imo.org/en/OurWork/environment/pollutionprevention/airpollution/pages/the-protocol-of-1997-\(marpol-annex-vi\).aspx](http://www.imo.org/en/OurWork/environment/pollutionprevention/airpollution/pages/the-protocol-of-1997-(marpol-annex-vi).aspx)

3 [http://www.imo.org/en/OurWork/environment/pollutionprevention/airpollution/pages/the-protocol-of-1997-\(marpol-annex-vi\).aspx](http://www.imo.org/en/OurWork/environment/pollutionprevention/airpollution/pages/the-protocol-of-1997-(marpol-annex-vi).aspx)

4 [http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-\(SOx\)-%E2%80%93Regulation-14.aspx](http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-(SOx)-%E2%80%93Regulation-14.aspx)

5 [http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-\(SOx\)-%E2%80%93Regulation-14.aspx](http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Sulphur-oxides-(SOx)-%E2%80%93Regulation-14.aspx)

6 <https://stillwaterassociates.com/imo-2020-part-1-marine-fuel-sulfur-content/>

7 <https://www.shipownersclub.com/louise-hall-sulphur-requirements-imo-emission-control-areas/>

# Pathway into the new era of shipping

The maritime industry is in the midst of a radical revamp with everything being assessed on its efficiency, profitability and overall necessity. Consequently traditional business models have been radically changed, with a continuous advancement into digitalization and a subsequent implementation of start-ups. This happens with the aim of adapting to an entirely digitalized industry in the future. Companies, within the maritime industry, failing to digitalize would see an initial financial nuisance turn into an existential threat for their operations. This scenario is likely to occur as other members of the industry, who chose to radically adapt their business models, will appear to have overtaken them.

This precarious situation is made more arduous with IMO 2020 presenting an additional regulatory framework which maritime companies have to abide to, parallel to their ongoing efforts in keeping up with the current level of digitalization. In fact, the theory could be stipulated that a large portion of the shipping companies were hoping, until the last moment in 2018, that IMO would be postponed further into the future. Thus, resulting in a negligent stance towards the implementation of preparatory measures, as those command a severe financial investment.

Nevertheless, the ongoing transformation of business models in the maritime industry, with a focus on the customers' needs, is well underway. As a customer centric approach becomes the main determinant for a business success. This customer centric approach does

not only require rigorous digitalization on all levels but also the abiding to the customers' demands at all times. As the issue of air pollution from international shipping becomes apparent with sulfur emissions, there is an increased demand for a regulation by the population on sulfur emissions. Consequently the International Maritime Organization (IMO) has abided to this demand from the general public and has imposed the IMO 2020 regulation with the aim to significantly reduce the sulfur emissions by the maritime industry. As of the 1 of January 2020 the new regulation is implemented on a global scale. Thus, the maritime companies will have no other option than to comply with the new regulations.

## Current solutions to comply with IMO 2020

### Low sulfur fuel oil (0.5% m/m sulfur content)

These range from low-sulfur distillates (LSD), representing a blend of diesel fuel with high sulfur fuel oil (HSFO) or low-sulfur fuel oil (LSFO). The HSFO component of the blends will most probably be limited to less than 20% in order to safely comply with the IMO 2020 regulations.<sup>8</sup> The most commonly used low sulfur fuel is the marine gas oil (MGO).

<sup>8</sup> <https://stillwaterassociates.com/imo-2020-part-2-shipowners-perspective/>

## High sulfur fuel oil (3.5% m/m sulfur content)

This continued use of HSFO is possible with the employment of a scrubber, which is an exhaust gas cleaning system with the ability to reduce the sulfur content of the emissions from utilized HSFO. Additionally, it is also possible that a vessel issues a "Fuel Oil Non-Availability Reports" (FONAR), which are allowances for the continuous usage of non-compliant fuel, exhibiting a sulfur content greater than 0.5%, granted on the argument that there is no sufficiently available fuel which displays a sulfur content below 0.5%, thus posing as a method to avoid the regulations.

This could result in cases of non-compliance as the possibility cannot be ruled out that some companies may hope to evade IMO 2020s regulations by issuing FONAR's. In order to prevent such a scenario from occurring the IMO committee has issued a guideline that for an "Fuel Oil Non-Availability Report" (FONAR) to be issued, the ship is required to provide detailed documentation in order to explain why it has, knowingly taken onboard sulfur fuel oil exceeding the limits imposed by IMO 2020, 0.1% within ECA's or 0.5% outside of ECA's. The ship must provide evidence that it has made every effort to obtain compliant fuel oil. It also has the option to claim that operational constraints and concerns about the quality of the compliant fuel oil available caused it to take on non-compliant fuel.<sup>9</sup>

Evidently this can be viewed as a severe loophole, as this could be claimed by multiple vessel owners in order to not only breach the regulations in territories with a 0.5% sulfur limit but also within the ECA areas, consequently causing incremental damage to the ecosystem, as well as its inhabitants, not excluding humans.

## Liquefied Natural Gas (LNG)

Liquefied Natural Gas (LNG) is a cryogenically cooled natural gas which is liquefied to reduce the volume for shipping and storage. It regarded as the cleanest fossil fuel, generating 30% less carbon dioxide than fuel oil and 45% less than coal.<sup>10</sup> Its environmental impact is deemed superior as well, as when it is spilled on the ground or water it is claimed to vaporize quickly and leave behind no residues, essentially claiming to not pollute the waterways.<sup>11</sup>

Indeed, for its sustainable ecological impact and its abundant reserves, LNG is perceived as the fuel of the future, at least until a cleaner source of energy is found and utilized. Thus, it poses as a viable alternative to the currently used energy sources. In turn, its viability as a fuel remains to be seen as the European commission is probably going to enforce even greater deterrents against the usage of fuel emitting high volumes of harmful gases. At the Hansa Forum 2018 there was a discussion on a likely scenario, in which a carbon tax would be imposed on the maritime industry, making the use of LNG for entities in the maritime economy which are adapting their business models along LNG at this current point in time, as LNG exhibits a smaller carbon footprint than sulfur fuels.

Consequently one would expect the maritime industry scurrying to own LNG vessels, in fact the currently projected figure until the 1st of January 2020, date of the industry-wide implementation, are that LNG-ready vessels will not amount beyond 500.<sup>12</sup>

The reasons for such a result is the past conformity of the maritime industry, as it hoped IMO 2020 to be postponed or even mitigated. As it became clearer that IMO 2020 was inevitable in its implementation, a change of mind occurred, with the consequence that the order books are currently at an all-time high at the beginning of 2019.<sup>13</sup> Indeed, as reported by Clarksons, 11% of the current orderbooks by capacity pertains to LNG ready vessels, representing about 2.5% of the world merchant fleet.

Consequently, this could result in an increase of freight rates for compliant vessels, as well as a drop in freight rates for non-compliant vessels – which currently are the majority of the world merchant fleet. This could lead to another wave of vessels being deemed obsolete, as the old vessels lose significant value with the inflation of new-builds. Nevertheless, LNG could have the best prospects, with its ecological compatibility and cheaper usage, to be the fuel powering the maritime economy in the years to come.

<sup>9</sup> <https://ibia.net/some-unresolved-issues-remaining-around-imo-2020-non-availability-situations/>

<sup>10</sup> <https://www.elengy.com/en/lng/lng-an-energy-of-the-future.html>

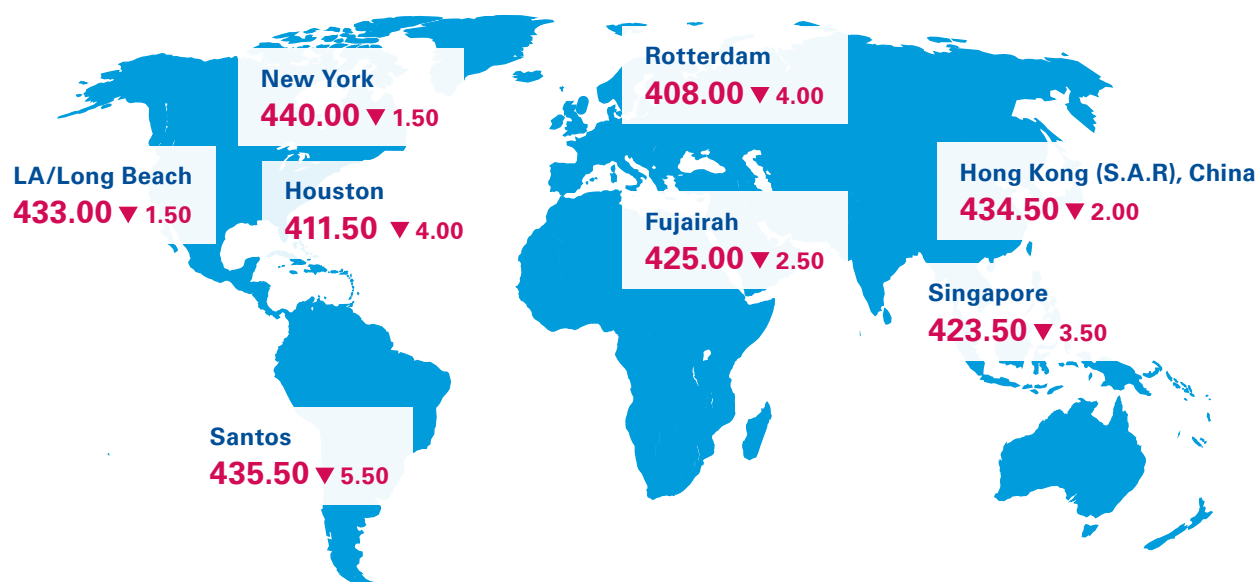
<sup>11</sup> <https://breakingenergy.com/2014/12/22/how-dangerous-is-lng/>

<sup>12</sup> <http://www.golng.eu/files/Main/20180417/2.%20Ole%20Vidar%20Nilsen%20-%20DNV%20GL.pdf>

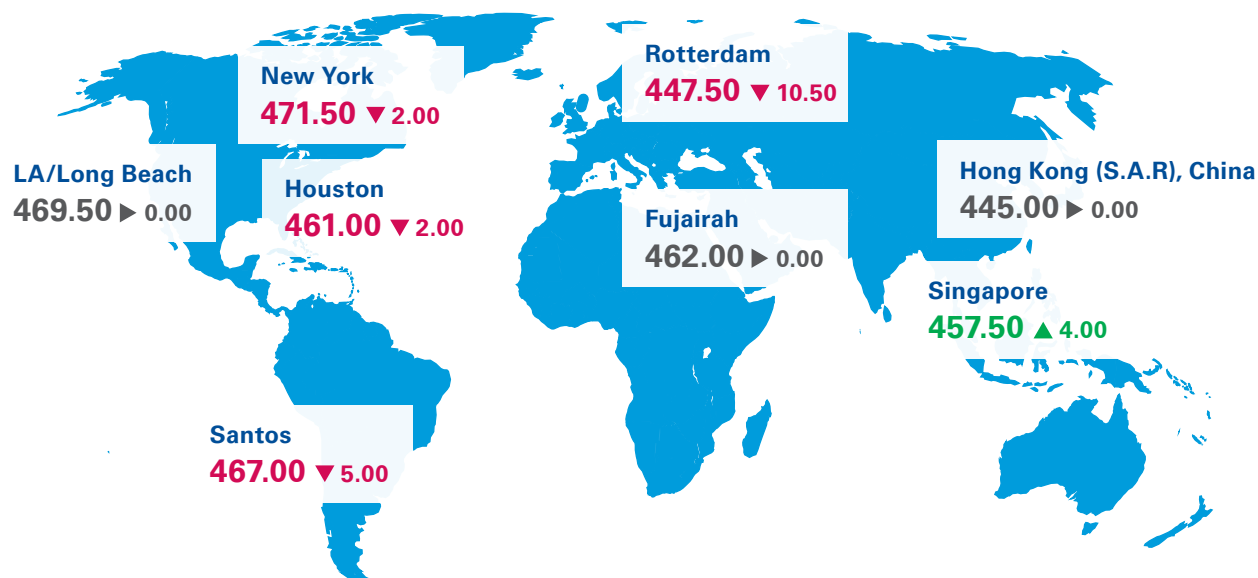
<sup>13</sup> <https://splash247.com/lng-orderbook-at-an-all-time-high/>

## The fuel economy

IFO380<sup>14</sup>

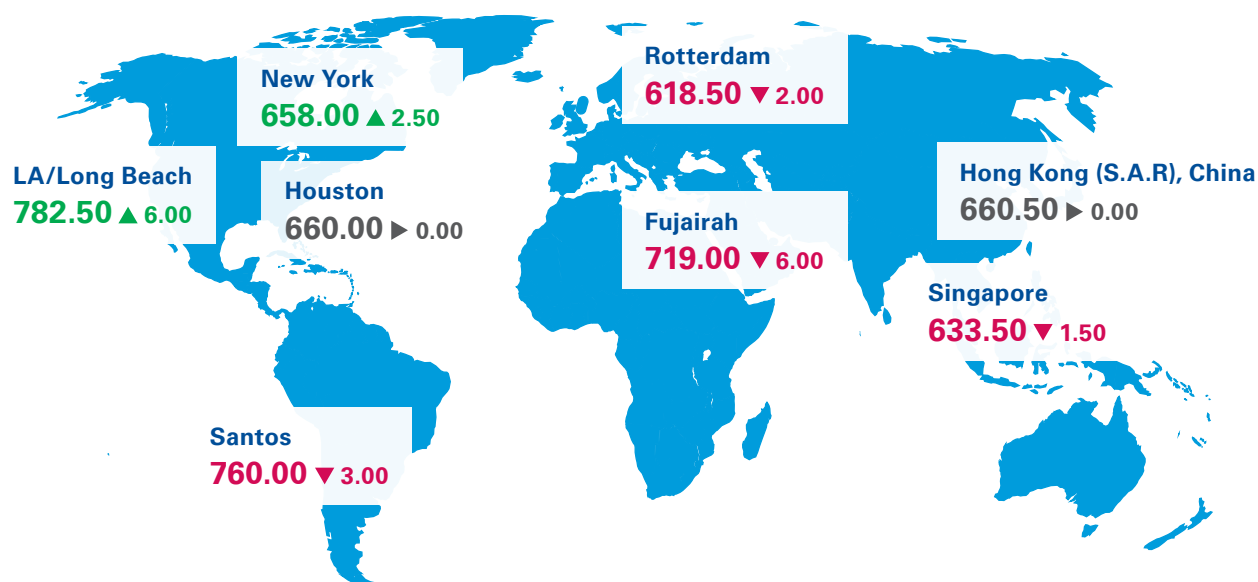


IFO180<sup>15</sup>



<sup>14</sup> <https://shipandbunker.com/prices#IFO380>

<sup>15</sup> <https://shipandbunker.com/prices#IFO180>

MGO<sup>16</sup>

There are incremental price discrepancies between prices per ton (\$/ton) of fuel utilized, displayed by the figures above showing the fuel price per ton, in different global regions. In these figures, the global prices from high sulfur fuel, IFO380 and IFO180 respectively, are on display – culminating in a global average bunker price of \$466/ton and \$490/ton for each. In the continued iteration of this passage the IFO380 and IFO180 will be regarded as HSFO (high sulfur fuel oil).

The additional figure exhibits the global prices of low sulfur fuel (LSFO), which here is marine gas oil (MGO), by region, culminating in a global average bunker price of \$730/ton.

What comes to mind when comparing these figures is the premium of beyond \$200/ton which is paid by vessel owners or charterers of vessels, in order to utilize MGO with a sulfur content of below 0.5%, therefore using compliant fuel, over the ongoing use of

HSFO. This may be the result of the economies in Asia widely engaging in natural gases, diverting from the ongoing use of coal or fuel oil heavy fuels – significantly decreasing its carbon dioxide pollution<sup>17</sup> – consequently this development would affect their maritime industry as well, as this ecologically friendly approach is implemented and encouraged across multiple Asian industries and infrastructures.

The utilization of scrubbers is projected to also have an impact on the fuel prices, the adoption is set to reach its peak in response to finding a short-term solution and with the payback periods become shorter, more manufacturers entering the market and the cost of the technology falling.<sup>18</sup> Indeed the premium, projected to go as high as \$300/ton, could fall from an expected \$300/ton in 2020 to around \$90/ton in 2023. In turn the savings, which vessel owners hope to sustain by utilizing scrubbers over LSFO, are projected to decrease by 2/3 from around \$5.5 million to \$1.6 million annually.

<sup>16</sup> <https://shipandbunker.com/prices#MGO>

<sup>17</sup> <https://www.reuters.com/article/china-japan-lng/china-overtakes-japan-as-worlds-top-natural-gas-importer-idUSL4N1XN3LO>

<sup>18</sup> <https://blogs.platts.com/2018/09/10/asia-bunker-industry-imo-2020-sulfur-deadline/>



There still remains an uncertainty regarding the widespread adoption of scrubbers, as they have only been used by cruise liners and short sea ferries, not large container ships. Additionally there are two ways of operation. On the one hand there is the open-loop mode, where scrubbers remove pollution from exhaust gases and subsequently flush the discharge into the sea instead of into the atmosphere. On the other hand, there is the closed-loop mode where scrubbers keep the waste in tanks on board the ship.

This is not the most practical option for a long-distance voyage, with the additional factor that space onboard of a merchant ship is of significance as every little amount of space counts and could be used for the transportation of cargo instead. There also is the risk of regulations changing in the upcoming years, prohibiting flushing the pollution into the sea.

Additionally when studying the figures regarding bunker prices, one can observe that the Bunker prices, from the Hong Kong Special Administrative Region of China and Singapore, are both well below the global averages of HSFO and MGO, serving as a signal to the remainder of the maritime industry that the new go-to fuel is LNG. This is a likely scenario to happen, even though the cost of retrofitting an existing vessel with an LNG-ready engine is between 6 and \$22 million USD.<sup>19</sup>

This signal is of significance as the Asian maritime industry represents up to 50% of the global merchant fleet, inferring that the economical interdependencies with Asian economies, represent a crucial element in the business model of major shipping companies and with them entire western economies.

In the light of the significant assertiveness displayed by governments of Asian economies, in their respective industries, it is plausible that the enforcement will be stringent and in force, discouraging any non-compliance in their maritime regions. For instance, in Singapore, captains and owners of the vessels found to not comply with the regulation face up to two years in jail.<sup>20</sup>

Moving on to MGO, the increase in demand, in combination with its current scarcity, for low sulfur fuel originating from the rush in preparations with IMO 2020's implementation date, 1 of January 2020, is on the horizon in half a year, displaying an industry wide acceptance of the new regulations.

The effects of these developments are already evident, as it is possible that due to the global shift away from heavy fuel oils towards the adoption of LNG as a new power source may have a ripple effect in countries which in the past benefitted largely from oil being a fundamental factor in most economical processes, powering the global industries.



<sup>19</sup> <https://www.rivieramm.com/news-content-hub/new-is-better-in-lng-propulsionconcludes-major-study-22165>

<sup>20</sup> <https://gcaptain.com/singapore-imo-2020-low-sulphur-fuel-penalties/>



## Biggest crude oil exporters<sup>21</sup>

|     |                      |                                                    |
|-----|----------------------|----------------------------------------------------|
| 1.  | Saudi Arabia         | \$182.5 billion (15.9% of total crude oil exports) |
| 2.  | Russia               | \$129 billion (11.3%)                              |
| 3.  | Iraq                 | \$91.1 billion (7.9%)                              |
| 4.  | Canada               | \$66.9 billion (5.8%)                              |
| 5.  | United Arab Emirates | \$66.8 billion (5.8%)                              |
| 6.  | Kuwait               | \$49.8 billion (4.3%)                              |
| 7.  | United States        | \$47.2 billion (3.8%)                              |
| 8.  | Iran:                | \$45.7 billion (4%)                                |
| 9.  | Nigeria              | \$43.6 billion (3.8%)                              |
| 10. | Angola               | \$38.4 billion (3.4%)                              |
| 11. | Kazakhstan           | \$37.8 billion (3.3%)                              |
| 12. | Norway               | \$33.3 billion (2.9%)                              |
| 13. | Libya                | \$26.7 billion (2.3%)                              |
| 14. | Mexico               | \$26.5 billion (2.3%)                              |
| 15. | Venezuela            | \$26.4 billion (2.3%)                              |



The biggest exporters of crude oil appear to, by the year 2025, having to fight for their revenue's to remain as high as they are, due to the fact that LNG is expected to satisfy for 25% of the world's energy demand by 2035.

When comparing the fuel prices of MGO and HSFO to the LNG prices, which are currently pending around \$450/ton, it cannot be ignored that the price for LNG is much cheaper than the alternatives, originating from a lower share of LNG vessels in the industry, which increases their value significantly as their operational costs are significantly lower than vessels running on sulfur fuel.

Indeed the entities standing to benefit significantly from this are:

- Owners chartering out their LNG vessels to charterers, looking to acquire charter rates of up to \$200,000 a day, as previously displayed in November 2019.<sup>22</sup>
- EEnergy groups such as Shell, BP, China National Offshore Oil Corp. (CNOOC), Cheniere and Gazprom, as well as trading firms such as Gunvor and Trafigura could theoretically attain a new business model with

the acquisition of LNG Bunker Vessels via new build or embark into a long-term charter of such vessel, thus consequently chartering them out to other entities, with a possibility of acquiring very high profits.

- This could lead to a speculative nature arising within the industry in accordance to an expected rising value of LNG powered vessels, due to their current scarcity and unparalleled profitability.

The situation with the fluctuating fuel prices, with multiple new reports emerging ahead of IMO 2020, with the addition of companies benefitting from this situation possibly gaining a too high advantage and the subsequent collateral coming from such occurrences is indeed a highly precarious situation for multiple companies within the maritime industry.

A possible solution for a company within the maritime industry, to combat fluctuating prices for fuel, is to acquire a shipping futures contract which allowing them to set in a price for a future charter without taking a physical vessel, something similar was developed for the oil tanker market in the 2000s.

<sup>21</sup> <http://www.worldstopexports.com/worlds-top-oil-exports-country/>

<sup>22</sup> <https://www.hellenicshippingnews.com/lng-transport-is-where-the-big-money-is/>

## The impact of IMO 2020 on Asia

Asia, which inhabits an incremental role in the shipping industry, has come to engage IMO 2020 with an established LNG-ready infrastructure with import- and export terminals, as shown below on the map. Indeed, the presence and geological advantage of vast LNG resources in the region, together with an increased demand played a significant role in building an economy around LNG, in preparation for IMO 2020.

In the figure, the Asian LNG infrastructure is presented which has been in place since 2013, in comparison to Europe just now adopting new standards. In the figure the blue squares represent LNG export terminals and the red triangles represent LNG import terminals, displaying an already in-place adaptation of a continental region adopting LNG as a fuel on which to power its industries on. This is made even more significant by the fact that Asia, the region exhibited, is able to sustain its demand

by itself. Thus it attains the ability to emancipate itself from regional conflicts, such as the one along the Strait of Hormuz, which would normally have an effect on the costs of transport resulting in a chain reaction affecting the global economy. This allows economies from Asia, engaging themselves with LNG fuel, to acquire a clear advantage over European economies and industries.

Indeed the majority of export terminals are located in between Indonesia, Malaysia and Australia, which are among the leading exporters of LNG with annual exports of 16.6<sup>24</sup>, 25<sup>25</sup> and 44.3<sup>26</sup> million tons respectively.

Adding to its significance, is that the five top-ranking countries in terms of LNG imports are all based in Asia. Among these China stands out with an increase of 11 bcm (billion cubic meters) in 2018.<sup>27</sup>



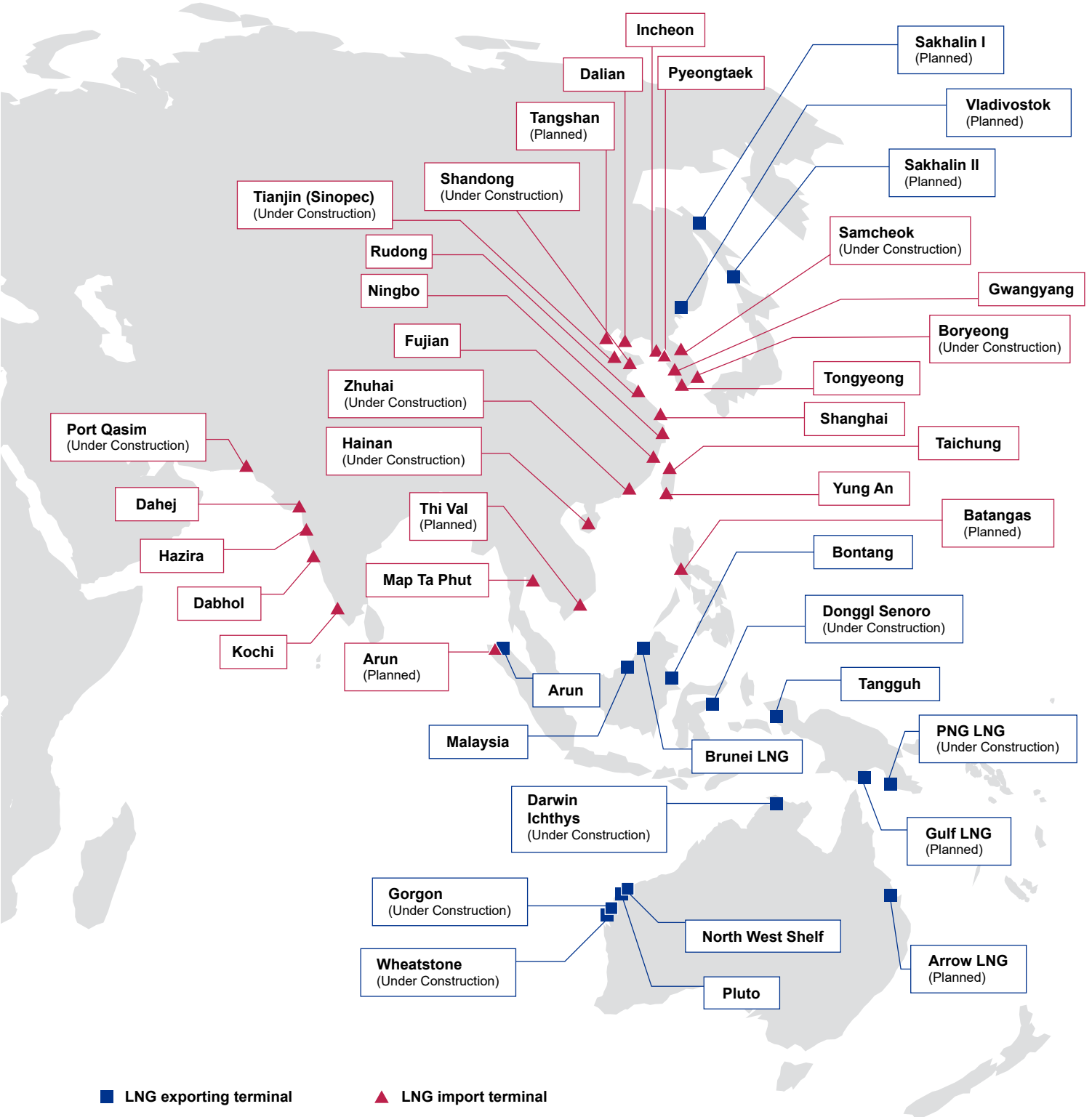
23 <http://www.jesco-jp.com/en/business/lngbase/>

24 <https://www.energydigital.com/top10/top-10-largest-exporters-liquid-natural-gas>

25 <https://www.energydigital.com/top10/top-10-largest-exporters-liquid-natural-gas>

26 <https://www.energydigital.com/top10/top-10-largest-exporters-liquid-natural-gas>

27 <https://www.mckinsey.com/solutions/energy-insights/global-gas-lng-outlook-to-2035/-/media/3C7FB7DF5E4A47E393AF0CDB080FAD08.ashx>

Southeast Asia<sup>23</sup>



Overall the volume of LNG imported increased to an annual rate of over 10% in 2018.<sup>28</sup> This can be interpreted as a global signal for the shipping industry, exhibiting a clear orientation towards an industry wide shift to LNG.

When looking at the other seafaring nations, most are already setting the logistical framework for a future with LNG. For the ones which do not yet display the capacities, in terms of LNG storage facilities, they turn to the utilization of bunker ships which can prove very expensive in the long-term as the chartering of these vessels can rise to over \$200,000 a day.<sup>29</sup> Indeed, utilizing LNG bunker ships instead of on-land storage facilities are only viable as a short-term solution until planned LNG Terminals are completed.

Furthermore, the market for LNG has grown significantly in the last few years as Asian countries, particularly China and Japan, turn to LNG.

In fact, multiple indications are pointing towards an industry wide utilization of LNG fuels, in the long-term. In the short-term scrubbers and LSFO will help the shippers uphold ongoing operations until LNG ready vessels become available to them and their operations. Indeed, the industry wide application of LNG is dampened by the slow adaptation of the shipping companies and the filled order books as everyone is now rushing to prepare for a future beyond IMO 2020, as there is definitely more to come.

### List of planned LNG import terminals in European countries that do not have an existing large-scale LNG import terminal<sup>30</sup>

| Country | Proposed Terminal   | Developer                  | Initial Capacity | Possible Start-up year |
|---------|---------------------|----------------------------|------------------|------------------------|
| Albania | Eagle LNG FSRU      | Gruppo Falcone             | 8 bcm/year       | -                      |
| Croatia | Krk Island FSRU     | LNG Croatia                | 2 bcm/year       | 2019                   |
| Cyprus  | Vassiliko FSRU      | OceanFinance               | -                | 2019                   |
| Estonia | Padalski LNG        | Balti Gas                  | 2.5 bcm/year     | 2020                   |
| Estonia | Mugga (Tallinn) LNG | Vopak                      | 4 bcm/year       | 2019                   |
| Germany | brunsbüttel LNG     | Oiltanking, Vopak, Gasunie | 5bcm/year        | 2022                   |
| Ireland | Shannon LNG         | Shannon LNG                | 2.7 bcm/year     | -                      |
| Ireland | Cork LNG Terminal   | NextDecade                 | -                | -                      |
| Latvia  | Riga LNG Terminal   | AS "Skulte LNG Terminal"   | 5bcm/year        | 2025                   |
| Russia  | Kaliningrad LNG     | Gazprom                    | -                | 2019                   |
| Ukraine | Odessa LNG          | KOLIN                      | 5 bcm/year       | -                      |

28 <https://www.mckinsey.com/solutions/energy-insights/global-gas-lng-outlook-to-2035/-/media/3C7FB7DF5E4A47E393AF0CDB080FAD08.ashx>

29 <https://www.hellenicshippingnews.com/lng-transport-is-where-the-big-money-is/>

30 [https://www.kslaw.com/attachments/000/006/010/original/](https://www.kslaw.com/attachments/000/006/010/original/LNG_in_Europe_2018__An_Overview_of_LNG_Import_Terminals_in_Europe.pdf?1530031152)

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## Capacity management

The global logistical supply chain is a complex interdependencies between various entities, striving to achieve the utmost efficiency. This network is at a potential ordeal with IMO 2020 on the horizon and its impact on the fuel economy of the maritime industry.

The Maritime Industry currently retains a fleet of 50,000 exhibiting a demand for HSFO of 3.5 million barrels per day (bpd).<sup>31</sup> This demand will have to be covered by the new IMO 2020-compliant alternatives available to the vessel owners.

In reality the suppliers are estimated to deliver a mere 700,000 bpd of compliant LSFO fuel, which only covers 14% of the demand.<sup>32</sup>

The scrubbers are currently installed on 10% of the world fleet which is 5000 Vessels, covering another 10% of demand.<sup>33</sup>

Thirdly, there is the option of utilizing IMO-compliant marine gas oil (MGO). It is estimated to cover around 1.5 million bpd when IMO is implemented.<sup>34</sup>

Indeed, the demand which is left uncovered by the IMO-compliant alternatives is close to 1 million bpd. This likely scenario could result in a precarious situation for the maritime industry.

This situation may result in a larger number of non-compliance, this is made possible by the lack of uniform global enforcement of IMO 2020. One scenario could see vessel owners move on to ports of countries exhibiting relatively low 'penalties' in cases of non-compliance when compared to their daily revenue (imagine a vessel acquiring revenues exceeding \$10,000 per day) – making the necessity for a strong global enforcement obsolete in order to deter such behavior.

Additionally, one could assume that the biggest companies, within the maritime industry, probably have agreements with suppliers in order to ensure fuel availability for their respective merchant fleets. The entities which are most probably going to struggle with the shortage in fuel are the smaller companies who are not able to conduct such agreements, potentially leading to a continuous depletion of companies within the maritime industry with the market leaders gaining additional market shares, shaping the industry into an oligopoly.



31 <https://www.mckinsey.com/industries/oil-and-gas/our-insights/imo-2020-and-the-outlook-for-marine-fuels>

32 <https://www.hellenicshippingnews.com/oil-firms-struggle-to-meet-imo-2020-clean-fuel-for-ships/>

33 <https://www.hellenicshippingnews.com/scrubbers-share-reaches-10-of-existing-fleet-and-31-of-worlds-orderbook-says-clarkson/>

34 <https://www.mckinsey.com/industries/oil-and-gas/our-insights/imo-2020-and-the-outlook-for-marine-fuels>



# Enforcement

The subject of non-compliance is present nonetheless. It still remains unclear as to what fines or penalties will be imposed. In fact, at present there is no established fine or sanction set by IMO, it leaves it to the individual flag and port states to enforce the regulation and impose penalties.<sup>35</sup> In turn, the question pertains if holding the flag and/or port states accountable is the right way forward as their vested interest are in the well-being of their clients and not in enforcing draconic measures.<sup>36</sup> On the contrary, major shipping companies have formed the Trident Alliance (TA). It is an organization of whom its members comprise the world's largest container shipping operators such as Hapag Lloyd, Maersk and Hamburg Sued, bulk carriers such as J Lauritzen and ferry companies such as Stena Line. Their aim is to ensure a level playing field, as not lose any market shares from companies who hope to acquire such with non-compliance.

There are indeed large differences between the penalties imposed on non-compliant vessels in various ECA zones. The harshest penalties are in North America where the US coast guard has the right to seize the vessels which breach the regulations imposed, in addition to owners being liable for a significant fine.

In the northwest European ECA there is a less clear enforcement, as Latvia and Lithuania impose comparatively low fines of EUR 2,900 and EUR 14,481 respectively, in contrast to Norway's non-existent maximum financial penalty which could prove very costly for vessel owners breaching the regulations. The unclear enforcement within EU states must be addressed and corrected, otherwise loopholes are possible in the future. A viable solution to suppress such loopholes would be a joint global resolution establishing a mandatory penalty to encourage a homogenous adoption of IMO 2020 from all members within the maritime industry.

| Penalties for Non-compliance with IMO 2020 by Country <sup>37</sup> |                                            |
|---------------------------------------------------------------------|--------------------------------------------|
| Country                                                             | Maximum Penalty                            |
| Belgium                                                             | EUR 6 Million                              |
| Denmark                                                             | No Maximum                                 |
| Finland                                                             | EUR 800,000                                |
| France                                                              | EUR 200,000                                |
| Germany                                                             | EUR 22,000                                 |
| Latvia                                                              | EUR 2,900                                  |
| Lithuania                                                           | Eur 14,481                                 |
| Netherlands                                                         | EUR 81,000 + gains                         |
| Norway                                                              | No Maximum                                 |
| Sweden                                                              | SEK 10 Million                             |
| UK                                                                  | GBP 3 Million                              |
| Canada                                                              | CAD 25,000                                 |
| USA                                                                 | USD 25,000/ Seizure of Vessel              |
| Singapore                                                           | Jail time for owners and captain of Vessel |

<sup>35</sup> <https://shipandbunker.com/news/world/913755-feature-are-authorities-ready-to-enforce-imo2020>

<sup>36</sup> <https://www.platts.com/IM.Platts.Content/InsightAnalysis/IndustrySolutionPapers/SR-IMO-2020-Global-sulfur-cap-102016.pdf>

<sup>37</sup> <https://gcaptain.com/singapore-imo-2020-low-sulphur-fuel-penalties/>

<http://www.weltinnenpolitik.net/wp-content/uploads/2018/06/IMO-2020-Global-Shipping-Blue-Sky-Moment.pdf> (Page 11, Exhibit 11)

# Future outlook

As IMO 2020 regulations are approaching with increasing velocity, the European ports are modernizing their maritime infrastructure with LNG Terminals which is perceived as fuel on which the majority of ships will run on in the future. The costs are projected to be between 60 and 80 billion USD. No exact figure, as to the total cost, due to the IMO 2020 regulation cannot be pinpointed exactly. In fact, it is dependent on the price discrepancies between low and high sulfur fuel, which is also largely affected by the developments along the Strait of Hormuz and the international trade tensions.

This is undertaken with the scenario at the back of their mind, initially proposed on the Hansa Forum 2018, that all the developments incurred by IMO point to a carbon tax, which would make HSFO ineffective from a cost perspective. The regulations impacting the maritime industry will not stop there, for example, green ship recycling is acquiring increased attention.

The maritime industry seemingly has embraced LNG as its fuel of the future as it is creating an infrastructure in which LNG is stored in Terminals. This happens with the aim to sustain relevance in the modern supply chain. Due to the increased volatility of fuel prices, the vessel owners need to strategically plan their next steps and their financial options, which may lead to an increased financial burden of the customer.

In conclusion, the maritime industry is being impacted by the overarching subject, taking it into an environmentally friendly future of sustainability which is shaping up to not only impact the maritime industry but the entire logistical supply chain and the industries embedded within it.



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