

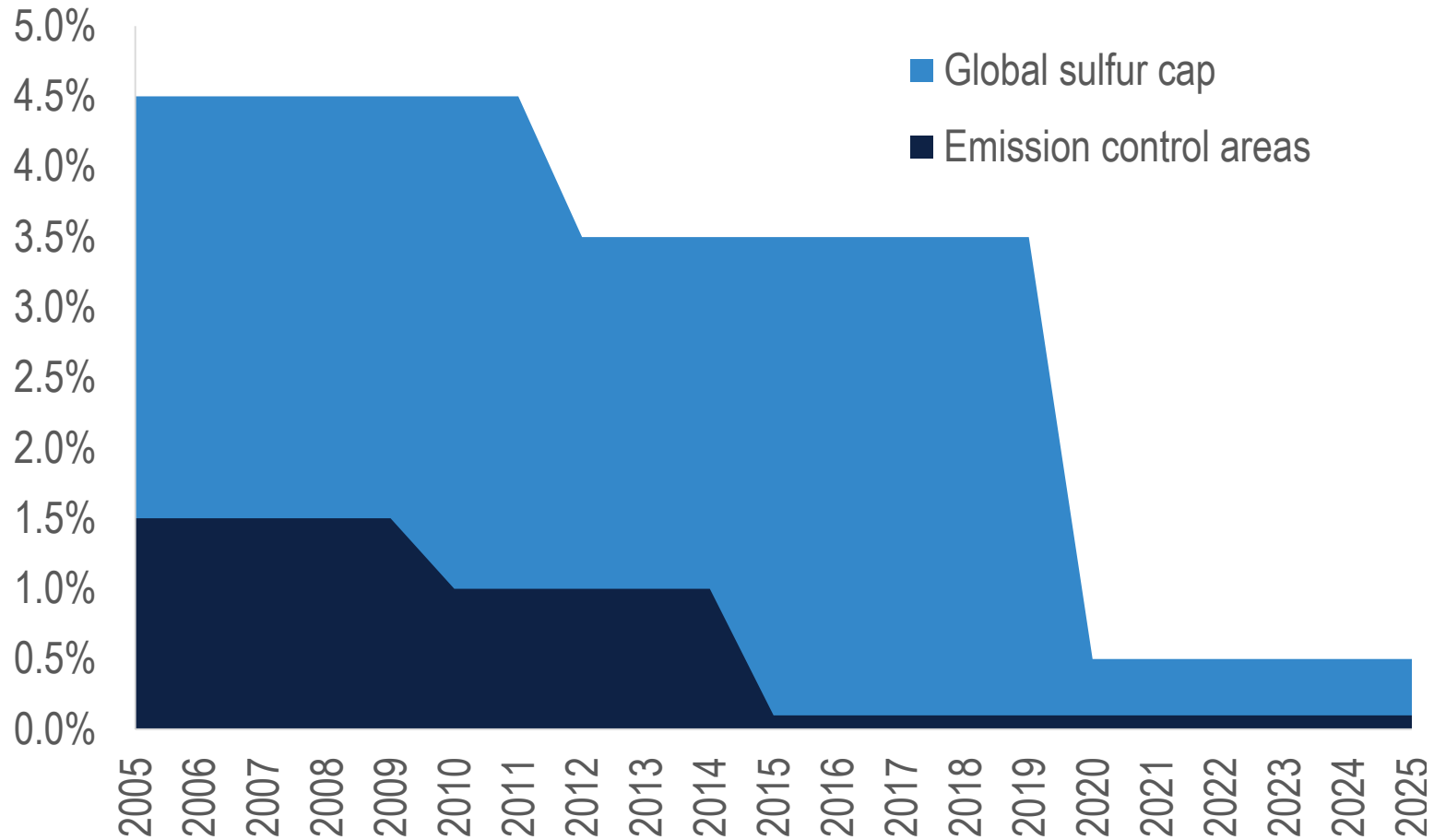
# ***Flame conference 2019***

## *IMO 2020 Regulations Update*

***Dr. Tim Boersma***  
*May 13, 2019*

# The 2020 IMO Sulfur Cap Is Around the Corner

## IMO Sulfur Limits



Source: IMO



# Compliance Options Post-2020

	Pros	Cons
<b>HSFO + scrubbers</b>	<ul style="list-style-type: none"> <li>• Low fuel cost</li> <li>• Existing bunkering infrastructure</li> <li>• No engine operational issues</li> </ul>	<ul style="list-style-type: none"> <li>• Upfront capex</li> <li>• Downtime during conversion</li> <li>• Bans on open-loop scrubbers</li> </ul>
<b>Switch to low-sulfur fuels (LSFO or MGO)</b>	<ul style="list-style-type: none"> <li>• No upfront capex</li> <li>• No extra fuel tanks needed</li> <li>• No additional bunkering infrastructure needed</li> </ul>	<ul style="list-style-type: none"> <li>• High / volatile fuel cost</li> <li>• Fuel availability in question</li> <li>• Potential engine issues with blended LSFO fuels</li> </ul>
<b>Switch to LNG</b>	<ul style="list-style-type: none"> <li>• Lower maintenance cost (due to cleaner burning)</li> <li>• Meets all emission standards (including NOx)</li> </ul>	<ul style="list-style-type: none"> <li>• High upfront capex</li> <li>• Double storage required</li> <li>• Limited bunkering infrastructure</li> <li>• Does not meet IMO 2050 goals</li> </ul>

# The Industry Response So Far

## Refiners

- New complex refining capacity additions (mostly in China and Middle East)
- Increased refinery runs, yield shifts, higher coker utilization planned
- New compliant VLSFO grades (Exxon, BP, etc.)

## Fleet operators

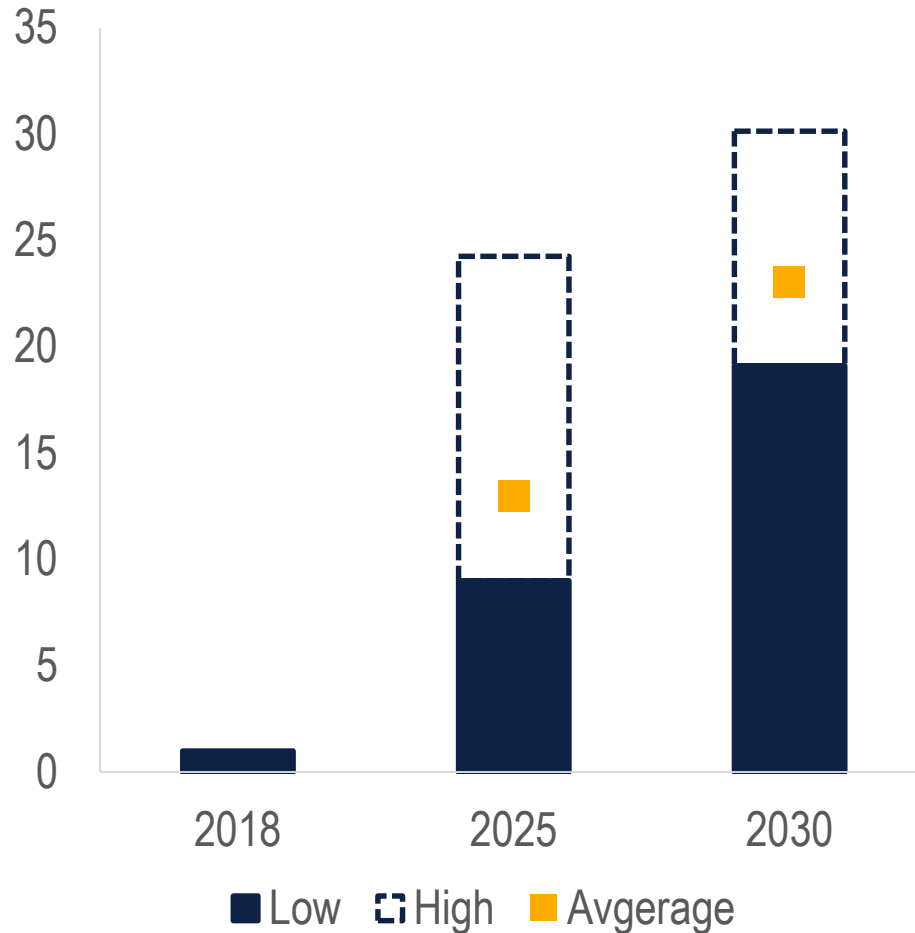
- Wait and see until mid-2018
- Scrubber orders now stand at over 2,000 units
- Selective commitments to LNG (e.g. Carnival, CMA-CGM, etc.)

## Others

- Insurance: loss of coverage for non-compliance
- Major ports: cautious rollout of LNG bunkering infrastructure, bans on open-loop scrubbers
- OEMs: new entrants to scrubber manufacturing market

# LNG Demand in Marine Transportation

## Projections of LNG Demand for Bunkering (Mtpa)



Forecaster	Date	2025 Mtpa	2030 Mtpa
Total SA	Jan-19	10	20
IEA WEO 2017 (NPS)	Nov-17	12	19
IEA WEO 2017 (SDS)	Nov-17	24	30
Shell LNG Outlook 2019	Feb-19	10	20
S&P Global Platts	Jul-18	9	29
Barclays Research	Jul-18	-	20

Source: CGEP based on industry sources

# LNG as a Bridging Fuel in Shipping?

## Lifecycle GHG Emissions of Various Fuels in Shipping



Source: Speirs et al. (2019), "Can Natural Gas Reduce Emissions from Transport?," Imperial College London, January 2019

**Shipping giant Maersk lays out plans to be carbon neutral by 2050**


PUBLISHED WED, DEC 5 2018 • 6:17 AM EST

Anmar Frangoul

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**KEY POINTS**

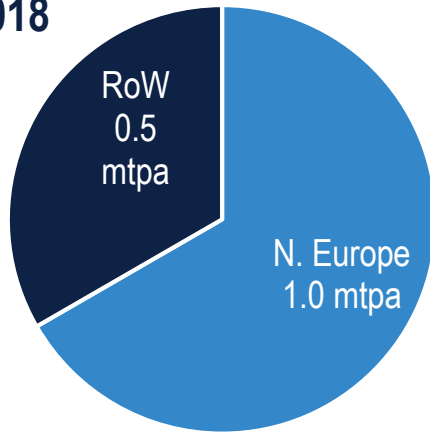
- Maersk says that to achieve its target, carbon neutral vessels need to be commercially viable by 2030.
- Several ideas, such as rotor sails, have been developed for the shipping industry over the last few years.



**IMO 2050 GHG strategy needs 50% GHG cut, and 70% lower GHG-intensity by 2050. LNG can deliver 10-25% GHG reduction vs. HSFO, max. 35% if combined with efficiency.**

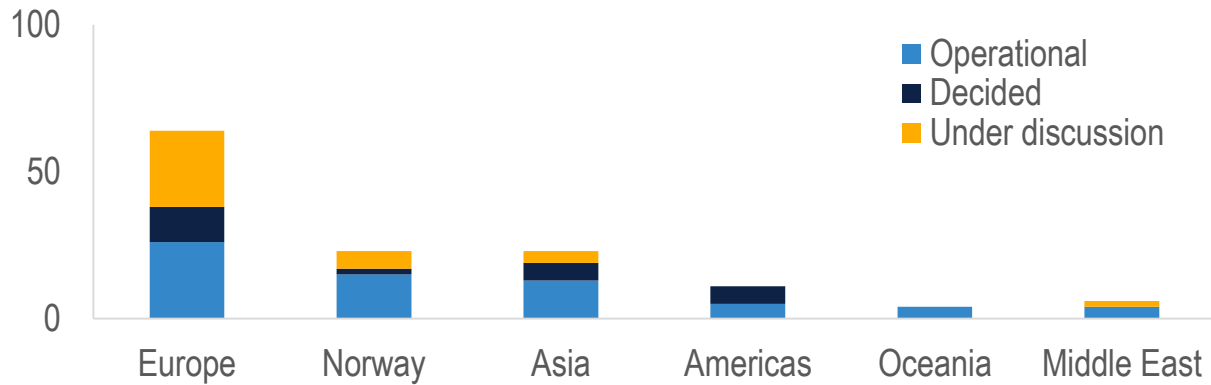
# LNG Bunkering in Europe

## LNG Bunkering Demand in 2018



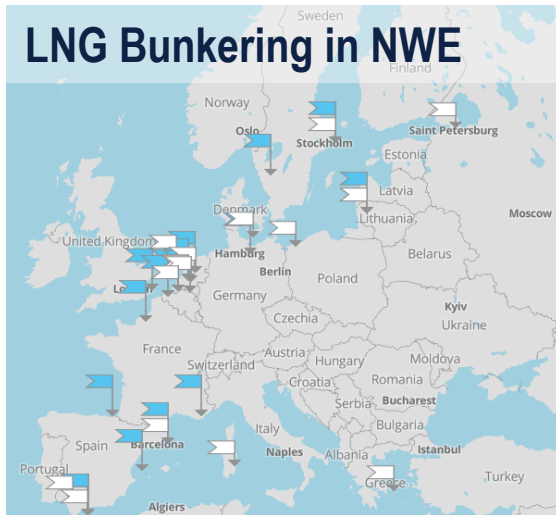
Source: Estimates by Jack Sharples, OIES

## LNG Supply Locations for Ships by Region



Source: DNV GL, updated on April 2018

## LNG Bunkering in NWE



Bunkering port



Bunkering vessel

## EU Commission Support for LNG Bunkering

(Total: EUR 8.8 million)

Project	Member states	EU funding	Objective
CYnergy	Cyprus	EUR 4.5 mn	Development of LNG INTRAMED market using small-scale LNG bunkering vessels
Go4Synergy in LNG	Belgium, Sweden	EUR 2.6 mn	Study of a sea link between Zeebrugge and an LNG bunkering facility in Gothenburg
LNG bunkering in Malta	Malta	EUR 0.6 mn	Technical study and cost-benefit analysis of LNG as a marine fuel in Malta
LNG bunkering in Gdansk	Poland	EUR 1.1 mn	Feasibility study of a small-scale LNG bunkering port in Gdansk

Sources: SEA\LNG, EU Commission

# LNG Bunkering in China

## Government Policies

- China has ambitious plans for LNG shipping, but limited progress so far
- 13th Five Year Plan called for 200 LNG bunkering facilities by 2020
- As of May 2018, only 18 LNG bunkering facilities, just 4 operational due to inspection-related barriers
- In Aug 2018, Min. of Transport announced plans to promote LNG: 15% of new gov't-owned vessels and 10% of inland waterway vessels will be LNG-fueled by 2025

## Remaining Obstacles

- Safety concerns by local authorities
- Lack of clear business model for commercial operations

## ECAs in China

- 2016: Yangtze river delta, Pearl river delta, Jing-Jin-Ji region (0.5)
- 2019: Salt water 12 nautical miles within China's coastline (0.5)
- 2020: Vessels anchoring coastal harbors (0.1)



# LNG Bunkering in the US



## Trump weighs Jones Act waivers for LNG shipments



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### LNG as a Maritime Fuel: Prospects and Policy

February 5, 2019

#### LNG Bunkering in the United States

LNG bunkering in the United States currently takes place in two locations—Jacksonville, FL, and Port Fourchon, LA—with a third bunkering facility under development in Tacoma, WA. The LNG facilities in these ports serve the relatively small U.S.-flag domestic market. Bunkering of LNG-fueled cruise ships also is planned for Port Canaveral, FL. However, ports in North America have significant potential to expand the nation's LNG bunkering capability.

The Jones Act prohibits the transport of goods between two US ports by non-US flagged vessels.

No US-flagged LNG carriers currently exist.



Sen. Wesley L. Jones in 1920

# The Trump Administration Remains a Wildcard

## \$200 Crude, the Economic Crisis of 2020, and Policies to Prevent Catastrophe

Philip K. Verleger, Jr.  
July 2018

**S&P Global**  
Platts

**Insight from Washington: US refiners worry about White House wild card as IMO 2020 nears**

**Forbes**

Billionaires Innovation Leadership Money Consumer Industry

779 views | Apr 9, 2019, 09:48am

**IMO Low Sulfur Rule Could Mean Bumpy Road Ahead For Trump, Truckers**



REUTERS

**Trump administration wants phase-in of U.N. rules on maritime fuel**

## THE WALL STREET JOURNAL.

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POLITICS

## U.S. Seeks More Time for Ships to Switch to Cleaner Fuels

Trump administration worries that costs for consumers and businesses will be driven up by a requirement that ships use cleaner fuels by 2020

**S&P Global**  
Platts

**US senators urge White House to stay out of IMO 2020 implementation**

# Conclusions



- *IMO 2020 implementation proceeding, market is adapting*
- *Not clear whether LNG can be long term solution for shipping sector*
- *EU ground zero LNG bunkering, but potential elsewhere*
- *Early days for LNG bunkering in the US, but receiving more attention.*

# Thank You

For more information contact

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