

# **IMO 2020 AND LNG SHALL WE CHILL OUT?**

**Presentation to the  
Energy Policy Research Institute  
Workshop on U.S. Transportation Fuels  
February 20, 2019  
Rick Smead  
RBN Energy, LLC**

# IMO 2020—Then And Now

- From 3.5% Sulfur to 0.5%
- That's 85%--A big deal?
- Yes, globally, no for the US

# CRS Report Released Feb 5



## LNG as a Maritime Fuel: Prospects and Policy

**Paul W. Parfomak**  
Specialist in Energy and Infrastructure Policy

**John Frittelli**  
Specialist in Transportation Policy

**Richard K. Lattanzio**  
Specialist in Environmental Policy

**Michael Ratner**  
Specialist in Energy Policy

February 5, 2019

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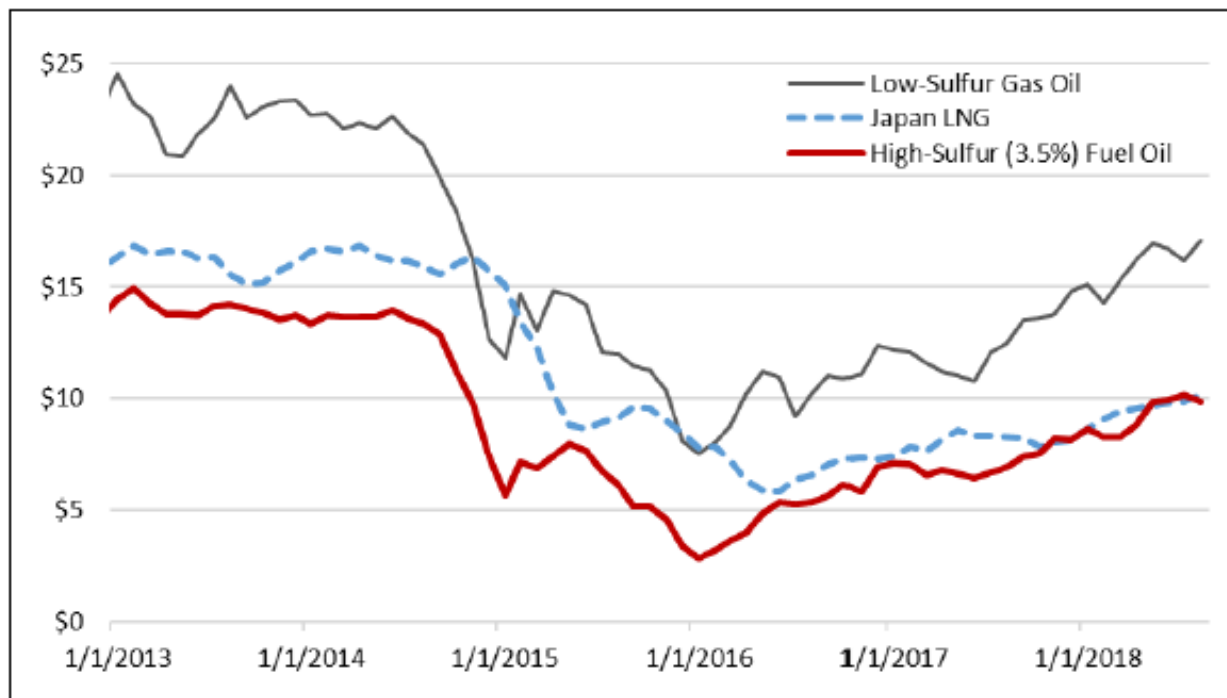
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# What about LNG--a Cost Advantage--Sure

Figure 2. Maritime Fuels Cost Comparison

Dollars per MMBtu



Source: Bloomberg commodity price data, CRS calculations.

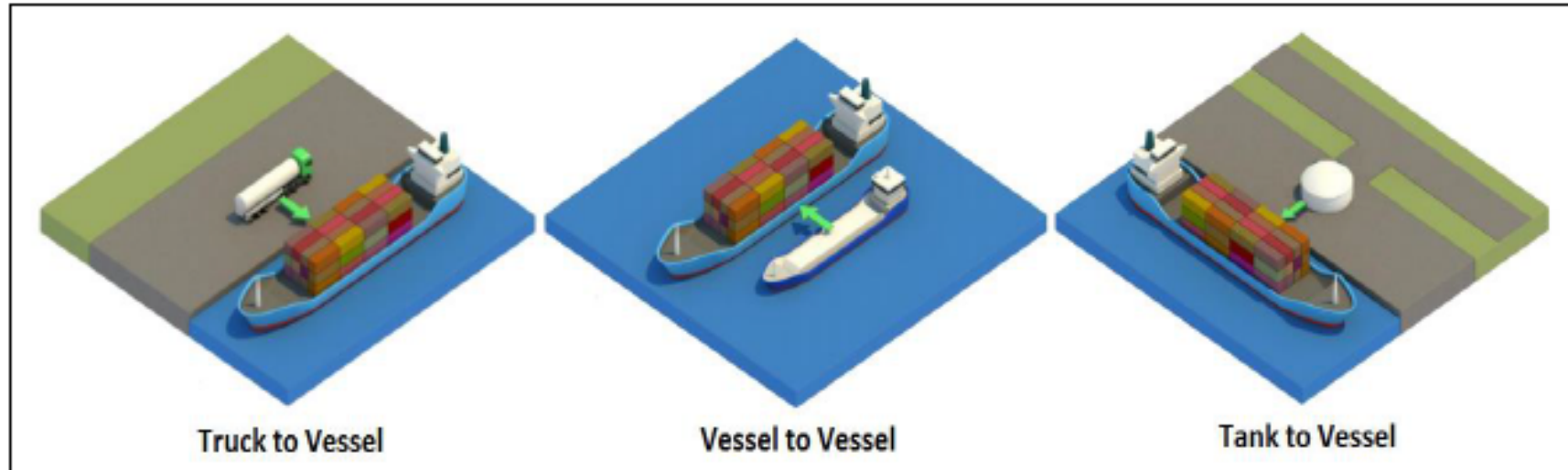
Notes: The values represent the first month futures contract price at the end of each month. They are not monthly averages. Natural gas prices typically are quoted in \$/MMBtu vs. \$/metric ton for the other two fuels. The prices for gas oil and fuel oil are converted to \$/MMBtu for direct comparison based on energy content.

- » Per MMBtu, LNG has gotten as cheap as high-sulfur oil—with a couple of caveats.
- » First, Japan LNG in 2018 was wildly underpriced.
- » Second, you gotta buy the ship!



# There are Several Ways to Enjoy LNG...

Figure 3. LNG Bunkering Options



**Source:** Adapted from: Danielle Holden, *Liquefied Natural Gas (LNG) Bunkering Study*, DNV GL, No. PP087423-4, Rev. 3, prepared for the U.S. Maritime Administration, September 3, 2014, pp. 15-17.

**The predominant method of bunkering today with to replace high-sulfur fuel is vessel to vessel, either by a tank barge or smaller tanker.**

# But... There Have to be Vessels

**Table 1 - World fleet : total number of ships, by type and size**

Ship Type	Small <sup>(1)</sup>		Medium <sup>(2)</sup>		Large <sup>(3)</sup>		Very Large <sup>(4)</sup>		Total	
General Cargo Ships	4,367	13.6%	11,729	30.6%	222	2.0%			16,318	18.7%
Specialized Cargo Ships	8	0.0%	211	0.6%	65	0.6%	3	0.1%	287	0.3%
Container Ships	16	0.0%	2,269	5.9%	1,605	14.2%	1,284	23.6%	5,174	5.9%
Ro-Ro Cargo Ships	30	0.1%	645	1.7%	613	5.4%	201	3.7%	1,489	1.7%
Bulk Carriers	310	1.0%	3,770	9.8%	5,596	49.5%	1,613	29.7%	11,289	12.9%
Oil and Chemical Tankers	1,854	5.8%	6,749	17.6%	2,517	22.3%	1,601	29.4%	12,721	14.6%
Gas Tankers	39	0.1%	1,096	2.9%	275	2.4%	397	7.3%	1,807	2.1%
Other Tankers	318	1.0%	538	1.4%	7	0.1%			863	1.0%
Passenger Ships	3,729	11.6%	2,577	6.7%	272	2.4%	163	3.0%	6,741	7.7%
Offshore Vessels	2,612	8.1%	5,339	13.9%	112	1.0%	169	3.1%	8,232	9.4%
Service Ships	2,466	7.7%	2,441	6.4%	25	0.2%	6	0.1%	4,938	5.7%
Tugs	16,387	51.0%	987	2.6%					17,374	19.9%
<b>Total</b>	<b>32,136</b>	<b>100%</b>	<b>38,351</b>	<b>100%</b>	<b>11,309</b>	<b>100%</b>				

87,233 Total Vessels Worldwide

Source: Equasis (1) GT<500 - (2) 500≤GT<25,000 - (3) 25,000≤GT<60,000 - (4) GT≥60,000

Through May 2018, there were 122 LNG-powered vessels in operation and another 135 ordered or under construction.

$122 + 135 = 257 / 87,233 = 0.29\%$ --it's not a lot.

# Who's Affected and by How Much?

- » Domestic Shipping already takes place in Environmental Compliance Areas (ECAs), where sulfur had to be held to much less than the new half-percent level under IMO2020.
- » So any incremental impact on US gas is in the use of LNG for international shipping.
- » It's *de minimis*—The grand total of all international bunker fuel provided in the US is about the output of a single LNG facility—about 2.5 Bcfd equivalent-.
- » EIA estimates that by 2030, (reference case), LNG will capture only 7 percent of the load. That's rounding error.
- » So it's not a lot, although in the “High-Oil-Price” case, LNG does leap out to 50% by 2025, reaching 54% later. But even that's easy to supply without distorting gas markets.
- » So the bottom line is, if ships are configured to use it, the US industry can supply it.


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And then there's xPortCon, May 21<sup>st</sup>:

What's next for U.S. Crude, LNG, and NGL Exports?  
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**★UNCLE KRACKER★**  
**GOOD TO BE ME**  
**FEATURING KID ROCK**

**Good to Be a Gas Processor - The Rejuvenation of Natural Gas Processing Economics, Part 4**  
Thursday, 02/15/2018  
Category: Natural Gas Liquids

With ethane prices remaining below 30 c/gal, making it only slightly more valuable than natural gas at Henry Hub on a Btu equivalence, most natural gas processors/producers can earn a greater profit when ethane is sold with natural gas (rejected) than when it is extracted and sold with the NGLs. How much more money you may be wondering? The answer is — it depends. Are there downstream pipeline contracts and sunk costs impacting the decision making? Are the contracted volumes on an ethane-only pipeline or a raw mix pipeline? How far away is the producing basin from the Gulf Coast market? How do all these factors come together to determine whether ethane is produced or rejected and the value created? Today, we continue our discussion of the MQQV gas processing model — this time focusing on the Value principle. This is our final blog focusing on the [MQQV model](#) and, with it, we are making it available to all [Backstage Pass](#) holders should you want to run scenarios of your own.

[Read Article](#)

**THE EAGLES**  
**ON THE BORDER**

**On the Border - Capacity, Demand Constraints Throttle Canadian Gas Imports to Chicago Area**  
Wednesday, 02/14/2018  
Category: Natural Gas

Canada's natural gas exports — which have been pushed out of the supply-rich U.S. Northeast in recent years — are also facing challenges in Western U.S. markets.

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