

Congressional Testimony of

Jamie Webster

Senior Director, BCG's Center for Energy Impact

Fellow at Columbia's Center on Global Energy Policy

Before the

Committee on Energy and Natural Resources

United States Senate

1st Session, 116th Congress

Chairman Murkowski, Ranking Member Manchin and Members of the Committee, thank you for inviting me here today to discuss the upcoming implementation of the International Maritime Organization's new global standards for marine fuels.

My name is Jamie Webster, and I am a Senior Director at BCG's Center for Energy Impact. I also serve as a fellow at Columbia University's Center on Global Energy Policy.

On January 1, 2020, new restrictions will reduce the allowable percentage of sulfur in fuel for ships from 3.5% to 0.5%. These global changes are mandated by the International Maritime Organization (IMO), a specialized agency of the United Nations tasked with multiple missions, including managing marine pollution. The IMO does not have any enforcement mechanism, but is instead dependent on its 174 Member States, one of which is the United States, to enforce its rules through its coast guard, environmental agencies and/or port authorities.

This rule was developed and tested over multiple years. In 2008, IMO's revised Annex VI mandated a review and decision to reduce sulfur levels in fuel to 0.5% on a global basis in 2020, with a potential to delay to 2025 if insufficient fuel was available. In October 2016, after an outside review found that enough compliant fuel would be available, the IMO affirmed that the rule would go into effect January 2020. Unlike most other fuel specification changes, the rule will be enforced at the consumer level (ships) rather than the producer level (refiners).

This new rule will reduce ship sulfur emissions by as much as 80%. Sulfur, when combined with air and water, creates sulfuric acid, the primary component in acid rain. The rule will also create pricing impacts on the fuel that ships use, as well as knock-on effects to other companies and consumers dependent on related refined products. BCG estimates that compliance will result in an additional \$25-30 billion in fuel costs for liners from 2020 to 2023. These costs will be borne across the ecosystem¹, to include shipping liners, freight forwarders, cargo owners and finally end consumers, as shown in the graphic below.

¹ See BCG report: "[Sharing the Costs of IMO 2020 Across the Ecosystem](#)"



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While we anticipate that nearly all costs will eventually be borne by global consumers, this increase will not be meaningful given it will be spread over several years and across all purchases.

The length and magnitude of this disruption will be influenced by several factors³, to include:

- **Compliance with the mandate.** At present, BCG anticipates high compliance, likely in excess of 90%. This is driven by the consolidated nature of the shipping industry (8 companies operate 78% of ships) and the fact that 85% of global trade involves a participant from a developed market, markets that have clearly shown a willingness to enforce compliance. The IMO’s carriage ban, which prohibits non-compliant fuel to be onboard a ship that does not have a scrubber, will limit opportunities for switching between compliant and non-compliant fuel as of March 1, 2020. According to Argus Media, as of November, IMO compliant fuel sales were already at 65%. **The less compliance, the less prices will react from the changed supply/demand balance.**
- **Number of installed scrubbers.** Scrubbers are equipment fitted on ships that allows sulfur in high-sulfur fuel oil to be stripped out before the fuel is used. This incurs a capital cost to install, but allows the shipping company to continue to use high-sulfur fuel oil at a discount to low-sulfur fuel oil. After relatively little interest from ship owners, this option is now increasingly sought out. It was estimated that the queue for ships interested in a scrubber would stretch in excess of 300 miles if the ships were laid end to end. At present, BCG expects about 4,000 ocean-going vessels (out of ~60,000) to be fitted with scrubbers by January 1. Constraints on installing scrubbers include berthing space, specific metal alloys needed for the containment vessels, and available qualified personnel. **The more scrubbers are installed, the less 0.5% sulfur fuel will be needed, reducing pricing impacts.**

² The reference to “BAF” in the graphic is referring to a “Bunker Adjustment Factor” – a mechanism to adjust pricing based on a formula that takes into account bunker fuel prices

³ See BCG’s report: [“Just how disruptive will IMO 2020 be?”](#)

- **Available fuel from refiners.** BCG forecasts that approximately 3 million barrels per day (mmb/d) of compliant 0.5% sulfur fuel will be needed in 2020 vs 2019, as high sulfur fuel oil demand declines by the same amount. This compliant fuel will be made up of approximately 1.5 mmb/d of middle distillates (to include diesel) and the remainder will be very low sulfur fuel oil. To make this fuel, refineries have increased capacity in desulfurization and sweet crude topping units, as well as shifting yields, increasing utilization and expanding facilities. **Refiners are working to ensure fuel is available volumetrically as well as in the right locations, but pricing effects will still occur as supply/demand balances shift.**
- **Global economic growth.** The pace of global GDP growth impacts global trade volumes. Should the global economy speed up or slow down markedly, this will impact the volume of compliant fuel oil needed, impacting pricing spreads.

Shipping companies have 3 primary methods to comply with the new rules.

- **Maintain current equipment and use newly available low sulfur fuels**
 - Capex impact: none
 - Opex impact: 1.5 to 1.8 times the 2018 high sulfur fuel oil cost⁴
- **Install scrubber**
 - Capex impact: \$4-7 million installation cost per scrubber⁵
 - Opex impact: ~25% savings from 2018 high sulfur fuel oil cost
- **Use an alternative fuel (LNG or other)**
 - Capex impact: \$20 million for a retrofit, new ship is 20-40% more than conventionally fueled ship
 - Opex impact: ~60% of the 2018 high sulfur fuel oil cost

Using new compliant fuel will be the option most ships use in 2020, with an estimated 92% of ships taking this option. Scrubbers are expected to be approximately at 7% of the fleet at the beginning of 2020, but this could feasibly double if price spreads encourage more retrofits. LNG-fueled ships are currently less than 1% of the global fleet. In the future, the number of ships may increase as the IMO examines options to reduce greenhouse gases. With current technology and costs there are few cases that are economic for companies to use LNG ships.

This fuel spec change on close to 4% of global demand is a significant challenge for both refiners and ship owners. But it also provides useful learnings as the industry faces other energy transitions in the future, particularly as this one should be one of the easiest, with its clear standard and date set out plainly more than 3 years ago⁶. Even now, less than 30 days before the switch, uncertainty on its impact continues and shows the scale of the challenge. Industries will need to communicate more with one another to better understand actions as well as impacts to those actions across sectors. Governments and policymakers will best serve their aims with consistent clarity on their policies.

⁴ Unless stated otherwise, BCG used an assumption of \$60/b for oil prices for all IMO analysis

⁵ As scrubber installation capacity is installed and installers go down the experience curve, BCG expects this cost to fall in subsequent years. The \$4 million figure is for a scrubber on a new ship, while \$7 million is a retrofit.

⁶ See also FT article; [“What we can learn from the 2020 shipping fuel switch”](#)