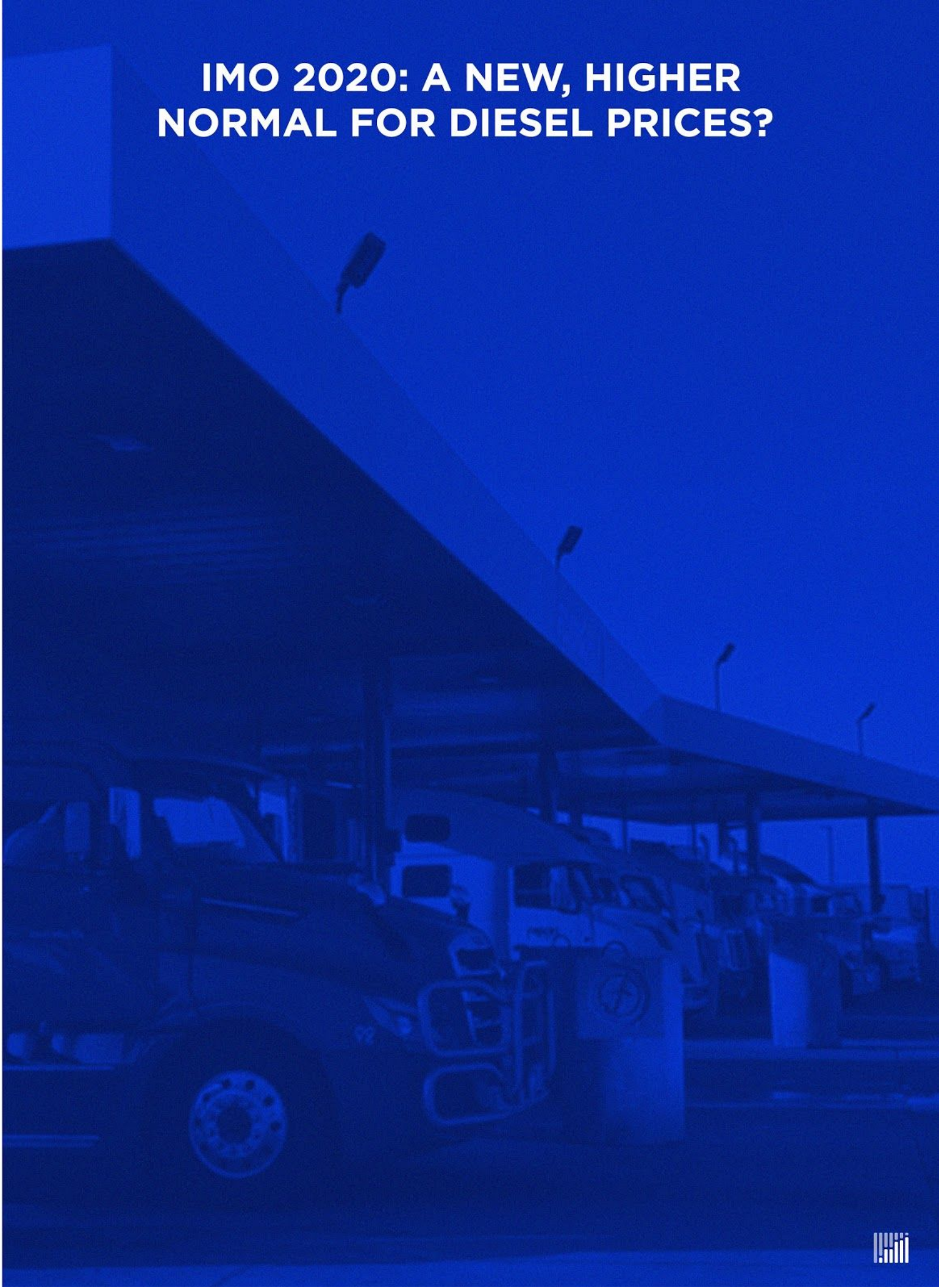
JUNE2019

IMO 2020: A NEW, HIGHER NORMAL FOR DIESEL PRICES?



FREIGHTWAVES FREIGHTINTEL RESEARCH

Executive Summary

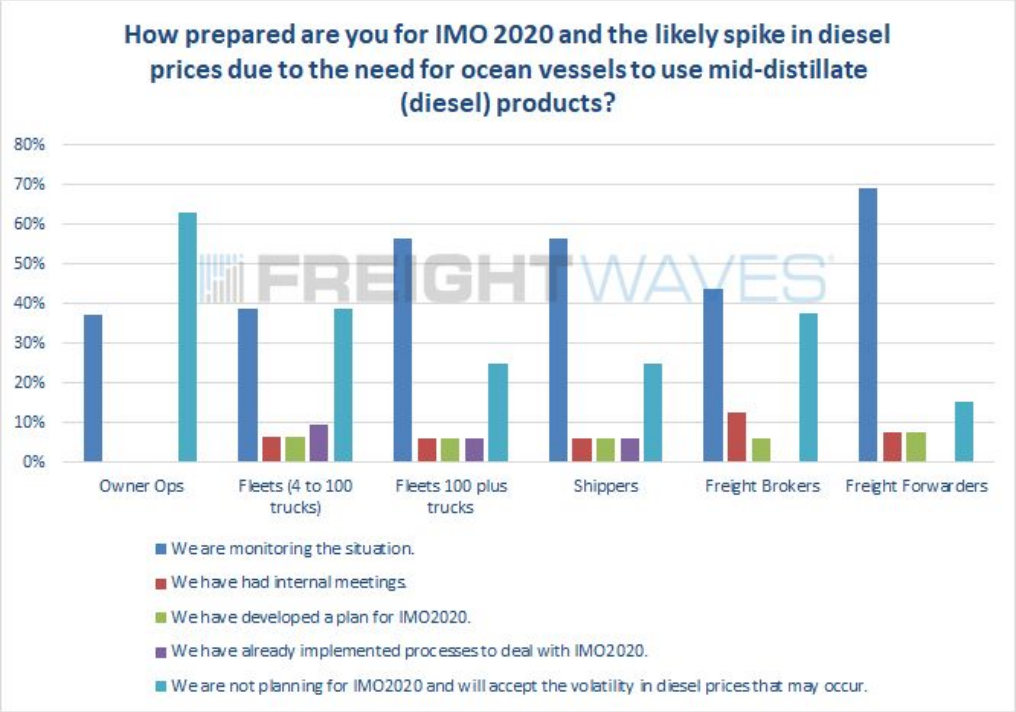
When IMO 2020 goes into effect on January 1, 2020 the domestic U.S. logistics industry, including the shippers it serves, will be grossly unprepared for volatility in the diesel markets.

This report, which builds on the IMO 2020 reporting by FreightWaves, surveys the U.S. logistics industry and shippers to get a sense of awareness of IMO 2020. This includes how the new rules mandating the use of very low sulfur fuel oils (VLSFO) will increase competition for diesel fuels overnight.

Owner-operators (one to three trucks) and small fleets (four to 100 trucks), the most at risk groups to higher diesel prices, have decided to not prepare at all. Three of five owner-operators and two of five small fleets indicated they will not develop any plans or strategies for possible increases in diesel prices in the coming months.

The survey also found that **domestic trucking and transportation professionals were five times more likely to be merely 'monitoring the situation' rather than planning or taking action**.

Figure 1 - The logistics sector plans (or lack thereof) for IMO 2020



Source: FreightWaves IMO 2020 Survey

U.S. shippers are also behind in plans for how to handle rising fuel surcharges from carriers. Seventy percent of respondents assume the first course of action will be to try passing any diesel price increases along to customers. This will likely wind up hitting the wallets of end consumers, much like tariffs.

Any sustained spikes in diesel prices are highly dangerous to trucking companies. Based on analysis by FreightWaves and Michigan State University using two decades of historical trucking company failure rates, **most non-recession trucking company failures occur when diesel prices are rising and spot rates are depressed**. These two conditions are becoming more and more likely for 2020.

The FreightWaves Intel Group also analyzed other industries at risk of higher diesel or jet fuel prices. This includes airlines, cruise lines, railroads and refineries. All spend a significant percentage of revenues on fuel. Railroads have historically had the most pricing power of the three, and this trend should hold. Airlines most likely will fare the worst passing on costs to customers as there are plenty of alternatives to flying.

Refineries should be the clear winners of IMO 2020. The increased competition for diesel distalites will likely widen the crack spread (the difference between the cost to buy oil and the revenue of selling refined products), which will increase refineries profit margins.

Ship owners will feel the pain of IMO 2020 the most. The bad news is VLSFO is a new and untested blend of fuel that as of the date of this writing has no market price. The good news is there is an established and traded low sulfur bunker fuel on the market. It is a class of fuel also made from diesel distillates called Marine Gasoil (MGO). The bad news is **MGO trades at roughly a 60 percent premium to HSFO, which most ships currently use for fuel**.

Other options for ship owners are limited in both scale and scope. All six of these options are detailed in the final third of this report.

In the end, **IMO 2020 could be the next electronic logging device (ELD) scare in the logistics market**. An event with drama leading up to it, short-term chaos, followed by a steady return to a new manageable status quo. Or, it could create not only a short-term spike in diesel prices, but a new long-term higher normal that will be painful for carriers, shippers and ultimately consumers to absorb.

Key Highlights: How IMO 2020 Will Affect the U.S. Trucking and Logistics Sectors

Imagine if one million for-hire interstate trucks suddenly converted from diesel to gasoline on January 1, 2020. It would be pure chaos as trucks would start competing with cars for gasoline. This is what IMO 2020 will do to the diesel market as ocean vessels switch from high sulfur fuel (HSFO) made from residual oils to low sulfur fuel oil (VLSFO) made from the same feedstock as diesel.

While the implementation date for IMO 2020 may be January 1, the reality is that it could begin impacting markets by September. That's because ships are expected to begin cleaning out their tanks with non-compliant HSFO by then and filling them with compliant fuels.

Shippers and the U.S. trucking and logistics sector are not ready for IMO 2020. According to the FreightWaves IMO 2020 survey, 40 percent of the logistics sector and shippers have either never heard of IMO 2020 or have not paid it any attention. When asked about their plan of action, eight of 10 are either monitoring the situation (doing nothing) or have decided to skip the planning and ride out the volatility.

Owner operators (one to three trucks) and small fleets (four to 100 trucks) are most at risk and are doing the least to prepare for a rise in diesel prices. Sixty-three percent of owner-operators and 39 percent of small fleets indicate they are not going to prepare for the effects of IMO 2020 on diesel prices.

Based on historical data there will be a wave of trucking failures if diesel prices spike. Fleet failures are highly correlated with rising diesel prices and falling spot rates. If diesel increases by 10 percent over one quarter with stagnant spot rates you can expect to see trucking company failures to significantly increase.

With new competition for diesel fuels, the battle for those barrels could become intense. Refiners have added some new capabilities to produce those fuels. But ultimately, the market will respond to economics.

Only a global slowdown or recession should stop diesel prices from moving higher in late 2019 or early 2020. With trade wars, real wars, Brexit, and Italian debt creating headlines, the global economy could hit the skids by the time IMO 2020 goes into effect.

IMO 2020 will ultimately be a tax on consumers. Seventy-seven percent of the logistics sector and shippers expect each will try to pass along fuel surcharge hikes to their customers. This will act like any tax or tariff – it will eventually hit the end-consumer and most likely put a dent into final demand of goods.

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IMO 2020 and the Trucking Industry

The official start date for ocean vessels to comply with IMO 2020 is January 1, 2020.

IMO stands for International Maritime Organization, an agency of the United Nations that is implementing the regulations that have been widely ratified by most countries of the world, including the U.S. Suppliers of bunker fuel – the industry name for marine fuels – will need to begin changing over to low sulfur fuels in early September 2019 to meet the deadline.

Where this is relevant to the trucking industry is that it is expected that most ship owners will turn to two fuels to meet the requirements as they move away from the high sulfur fuel oil now used.

One fuel is known as marine gasoil (MGO), and it is a diesel product. The second is called very low sulfur fuel oil (VLSFO), a mostly new oil industry product that uses intermediate diesel products to reach the final blend.

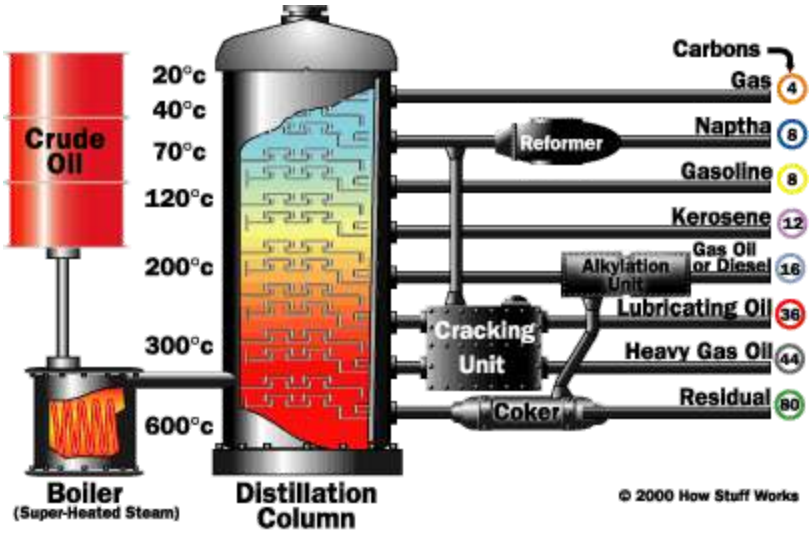
Estimates are all over the place as to the amount of new diesel demand that will flow to the marine market, but 1.5 to 2 million barrels per day seems to be the consensus. That is against current consumption of 35 million to 40 million barrels per day. That impact may not seem like much, but it could be as high as a 5 percent jump in demand. Markets that get hit with sudden movements on either side of the supply/demand balance of 5 percent can be very volatile. This gives all market segments in FreightWaves' IMO 2020 survey a very short window to prepare for the possibility of a chaotic diesel market.

IMO 2020's Short- and Long-Term Effects on the Diesel Market

IMO 2020 is very likely to drive the price of diesel up in the short-term and possibly for two or three years if diesel supply is not increased to meet this new demand. Based on FreightWaves' in-house forecast, which assumes static WTI prices (a big if), the U.S. trucking market could see a $0.20 to $0.25 cents per gallon increase in the retail price of diesel.

It is not just carriers that will be impacted. Jet fuel is made with a middle distillate (kerosene) as well. This means the price of airplane tickets and air cargo are likely to rise significantly in the short- and long-term much like diesel.

Figure 2 – Diagram of a Barrel of Oil – Fuel Sources from the Top, Middle and Bottom

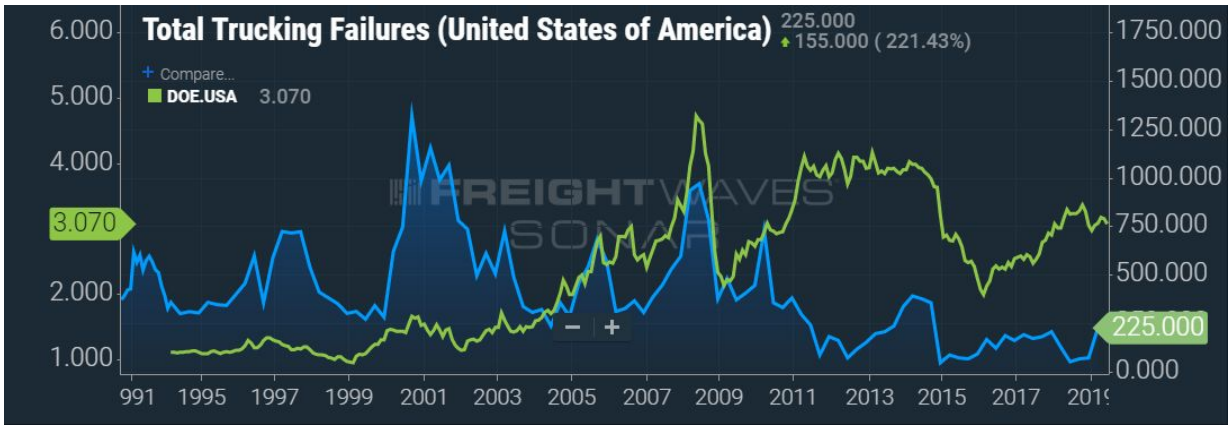


Data Source: How Stuff Works

Short-Term Diesel Price Spikes, Depressed Spot Rates and Trucking Company Failures

A 10 percent increase in the price of diesel combined with flat or lowering spot market rates is likely to lead to an increase in trucking company failures in 2020. This prediction is based on FreightWaves' analysis, along with Michigan State University, of trucking company failures over a span of two decades. This is shown in Figure 3 below.

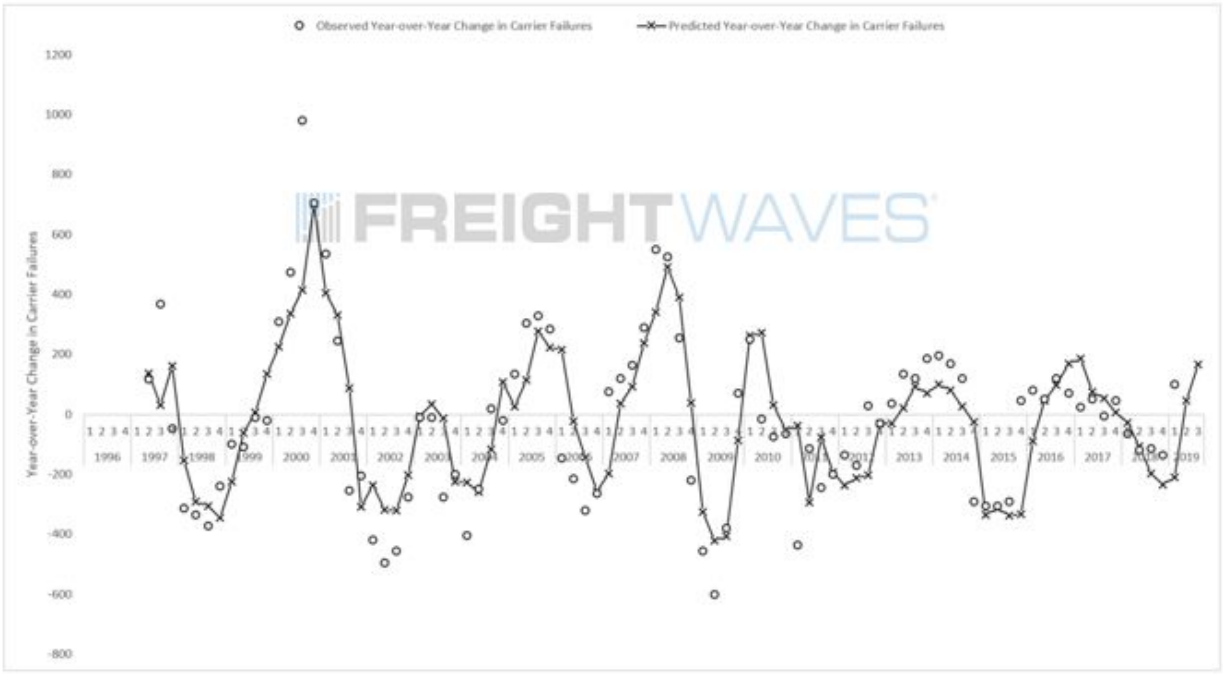
Figure 3 – Trucking Company Failure Rates and Diesel Price Correlation



SONAR tickers: EXIT.USA, DOE.USA
Note: Trucking company failures include fleets with 5 or more trucks.

This analysis indicates that a sustained 10 percent increase in diesel prices over a three-month period will add an additional 70 trucking company failures to the same quarter one year earlier. Based on this analysis we created a model to predict trucking failures for the third and fourth quarters of 2019. What we see is trucking company failures are forecasted to climb the most in two years even without factoring in effects from IMO 2020.

Figure 4 – Forecast of Trucking Failures in 2019



Data Source: SONAR ticker, EXIT.USA, model provided by Michigan State University.

Diesel Prices and Trucking Margins

Large trucking fleets (more than 100 trucks) in the U.S. generally have fuel surcharges in place. This should insulate these larger players from some of the negative effects of IMO 2020. However, it may shrink some of the profits these fleets make from buying wholesale (sometimes below wholesale) diesel prices and charging customers fuel surcharges based on retail prices.

This is not the case for owner-operators (one to three trucks) and small fleets (four to 100 trucks). Both segments are highly fragmented (this includes 90 percent of all for-hire carriers and 40 percent of all active trucks on the road). These segments buy diesel at or near the retail price and have limited pricing power to pass along fuel surcharges. This is particularly true in the spot market where rates often combine line-haul and fuel into 'all-in rates.'

The average retail price for diesel at the time of this writing is $3.15. A $0.25 cent per gallon increase is an 8 percent increase in fuel cost. With an average of 6.5 miles per gallon for U.S. trucks, fleets are looking at a $0.04 cent per truck per mile headwind

to their bottom line. This could easily be a 2 to 3 percent hit to their margins in an industry that often runs on 2 to 3 percent margins.

Figure 5 – How IMO 2020 May Affect Diesel Prices and Trucking Margins

		Owner Operator - 1 Truck		
		Miles per Week		
		1,800	2,000	2,200
Avg Retail Diesel Price	$3.15	$0	$0	$0
	$3.35	$55	$62	$68
	$3.55	$111	$123	$135
	$3.75	$166	$185	$203
Sonar: "DOE.USA"		Additional Cost per Week from IMO2020		

		20 Truck Fleet		
		Miles per Week		
		1,800	2,000	2,200
Average Diesel Price	$3.15	$0	$0	$0
	$3.35	$1,108	$1,231	$1,354
	$3.55	$2,215	$2,462	$2,708
	$3.75	$3,323	$3,692	$4,062
Sonar: "DOE.USA"		Additional Cost per Week from IMO2020		

		100 Truck Fleet		
		Miles per Week		
		1,800	2,000	2,200
Average Diesel Price	$3.15	$0	$0	$0
	$3.35	$5,538	$6,154	$6,769
	$3.55	$11,077	$12,308	$13,538
	$3.75	$16,615	$18,462	$20,308
Sonar: "DOE.USA"		Additional Cost per Week from IMO2020		

		1,000 Truck Fleet		
		Miles per Week		
		1,800	2,000	2,200
Average Diesel Price	$3.15	$0	$0	$0
	$3.35	$55,385	$61,538	$67,692
	$3.55	$110,769	$123,077	$135,385
	$3.75	$166,154	$184,615	$203,077
Sonar: "DOE.USA"		Additional Cost per Week from IMO2020		

*Note: DIesel cost increases are based on a beginning price of $3.15 per gallon.

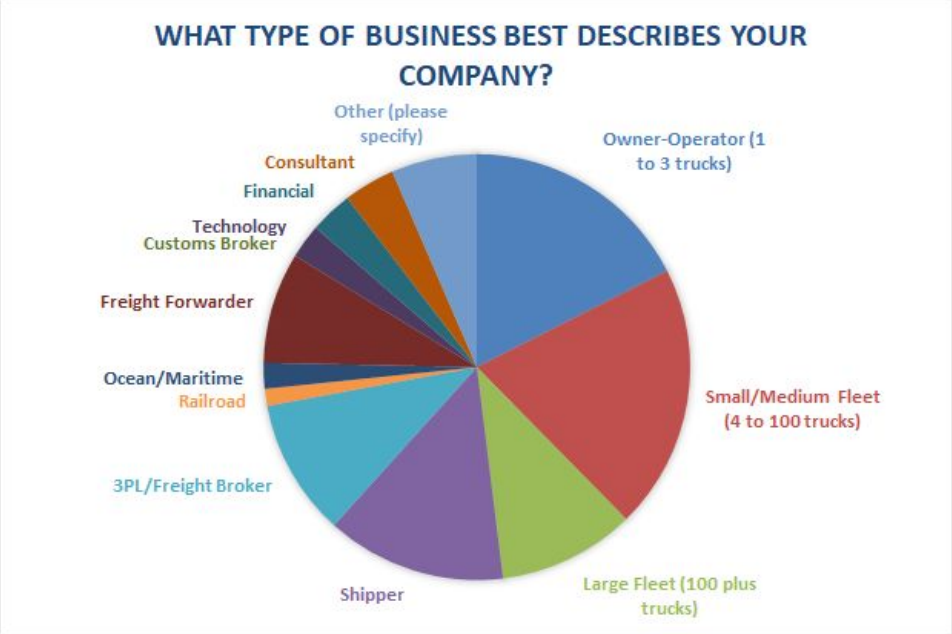
IMO 2020 Survey Methodology

During the period of June 7 to June 14, 2019, FreightWaves Freight Intel Group surveyed trucking, logistics and shipping professionals via email to gauge their awareness of IMO 2020.

Motor carriers are categorized in three segments: owner-operators with one to three trucks; small fleets with four to 100 trucks; and large fleets with over 100 trucks.

The survey had 154 respondents. The market groups for respondents are as follows:

Figure 6 – Survey Demographics – Carriers, Shippers, Freight Brokers and Freight Forwarders



*Data Source: FreightWaves IMO 2020 Survey

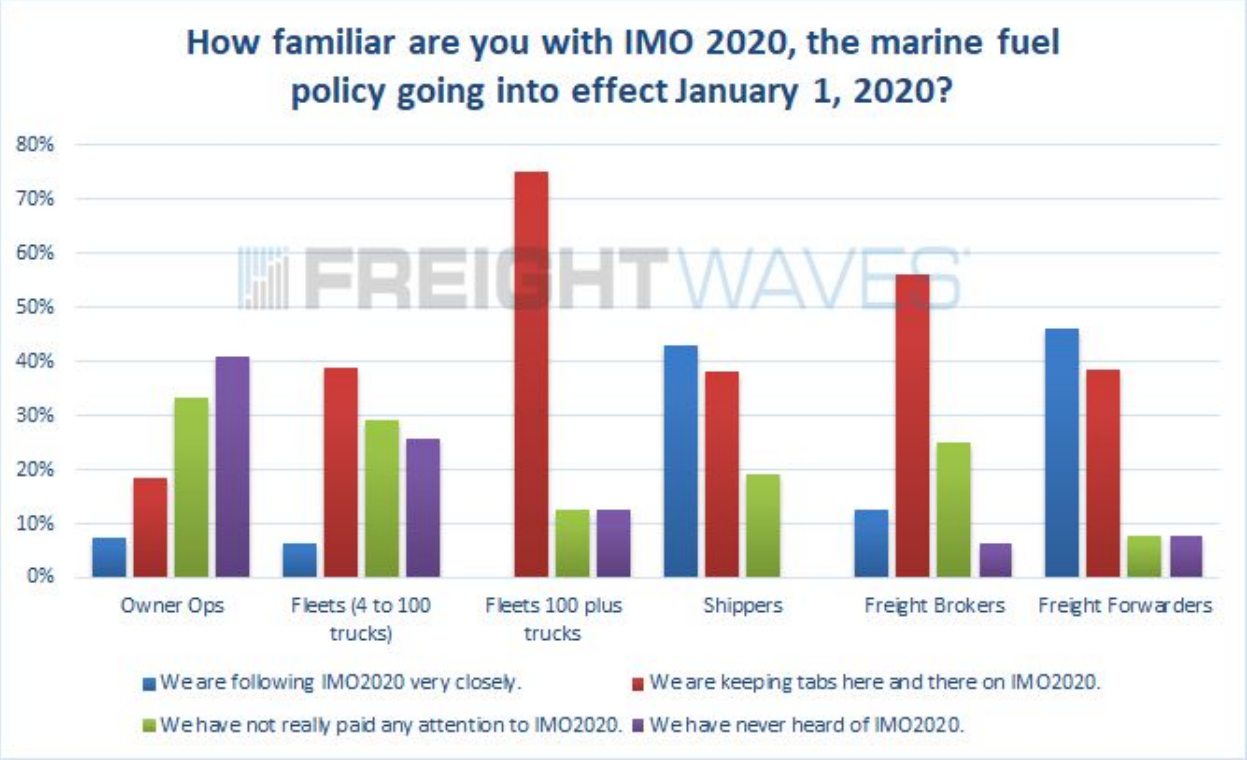
IMO 2020 Survey Results and Analysis

The most at-risk group on January 1, 2020 is owner-operators. It is also the segment that is ignoring IMO 2020 the most. **Seven of 10 owner-operators have either never even heard of IMO2020 or have not paid it any attention. This could be disastrous to owner-operators.** Depressed trucking rates combined with a sharp spike in diesel prices could drive thousands to the point of bankruptcy. (In-depth analysis of margin pressures can be found in Figure 4 [page 8] and Figure 5 [page 9]).

The remainder of trucking fleets surveyed are only paying a bit more attention to the dangers of IMO 2020. **Seven of 10 large fleets and two of five small fleets are only keeping tabs here and there.**

Shippers and freight forwarders are the only two groups closely watching IMO 2020. This makes sense as both groups are much more involved in ocean shipping than carriers and freight brokers.

Figure 7 – Who Has Been Studying Up on IMO 2020?



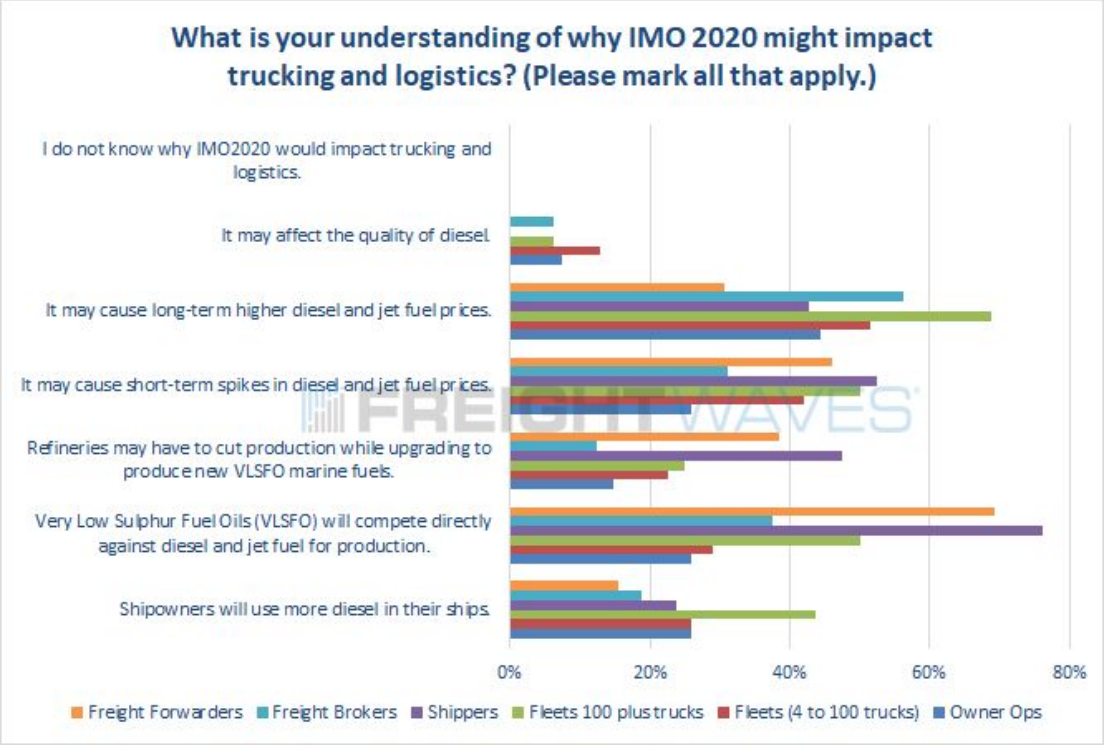
*Data Source: FreightWaves IMO 2020 Survey

- Seven of 10 owner-operators have either never heard of IMO 2020 or have paid it zero attention.
- Shippers and freight forwarders are the only two groups keeping close tabs on IMO 2020.
- Seven of 10 large fleets say they are only keeping tabs here and there on IMO 2020.
- This is well above the 40 percent of small fleets and 20 percent of owner-operators that are paying attention to IMO 2020.

Shippers, freight forwarders and large fleets seem to have the deepest knowledge of how and why IMO 2020 may disrupt the diesel markets. Almost eight of 10 shippers and one of two large fleets understand the change to VLSFO will increase competition for diesel.

Owner-operators, small fleets and freight brokerages understand IMO 2020 the least. Only one-third at best could identify any of the three main reasons why IMO 2020 is likely to cause volatility in diesel prices.

Figure 8 – IMO 2020 and Diesel Prices at the Pump

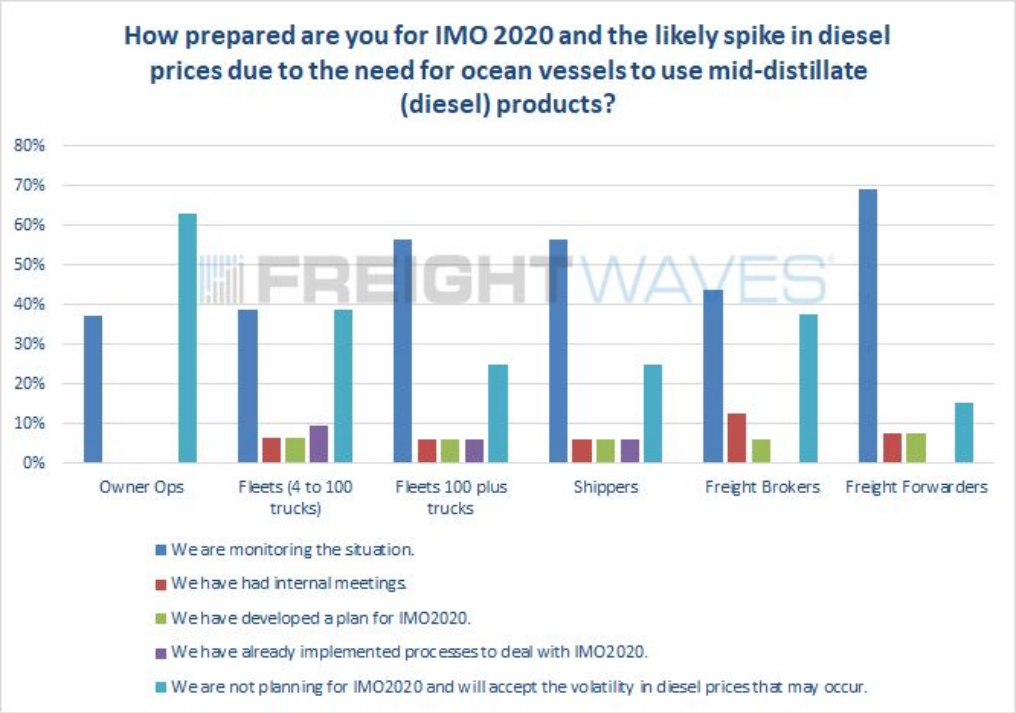


*Data Source: FreightWaves IMO 2020 Survey

- All three fleet categories along with freight brokers understand IMO 2020 might increase diesel at the pump in both the long- or short-term.
- However, large fleets have a better understanding of why and how this will happen because shipowners will be competing for the same distillates used to make diesel.
- Shippers and freight forwarders have the best understanding of the changeover to VLSFO and how this will compete against diesel.

Shippers' and freight forwarders' attention to IMO 2020 has not translated into action. Less than 10 percent of any group have said they have taken any action beyond monitoring the situation. The most popular strategy beyond monitoring IMO 2020 (48 percent) here and there is to completely ignore it all together (33 percent).

Figure 9 – The IMO 2020 Preppers



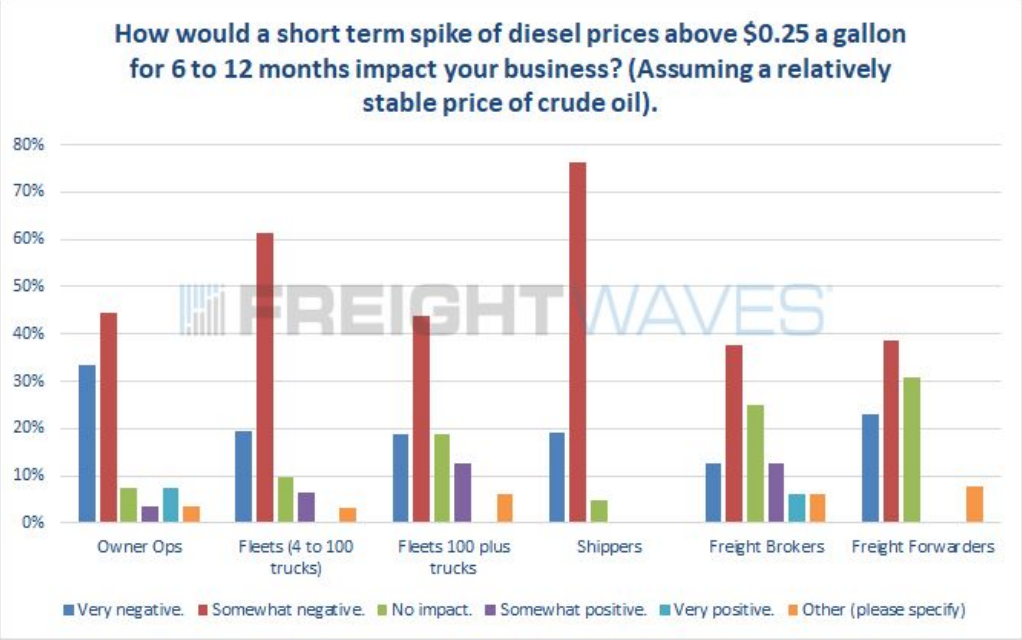
*Data Source: FreightWaves IMO 2020 Survey

- All groups are at least five times more likely to be merely monitoring the situation rather than planning or taking action yet.
- Three of five owner-operators will not plan for IMO 2020. Apparently they have decided to roll the dice and accept any volatility in the diesel market.
- Only 10 percent of respondents (mostly shippers) have developed or implemented to strategies to deal with the possibility of a spike in diesel prices.

One would think the lack of planning means the domestic transportation market feels a possible $0.25 to $0.50 per gallon spike – crude prices otherwise being steady in that scenario – in diesel rates is acceptable.That is until the question is directly asked.

Shippers are by far the most concerned. One of the likely reasons is that large fleets and third-party logistics providers (3PLs) believe they can pass price spikes in diesel on to their customers via fuel surcharges. The smaller the fleet, though, the more difficult this is to achieve. Most small fleets and owner-operators buy diesel close to the retail price and use all-in rates instead of line-haul plus fuel surcharges, especially when negotiating with freight brokers in the spot market.

Figure 10 – Short-Term Diesel Price Increases of $0.25 to $0.50 Per Gallon



*Data Source: FreightWaves IMO 2020 Survey

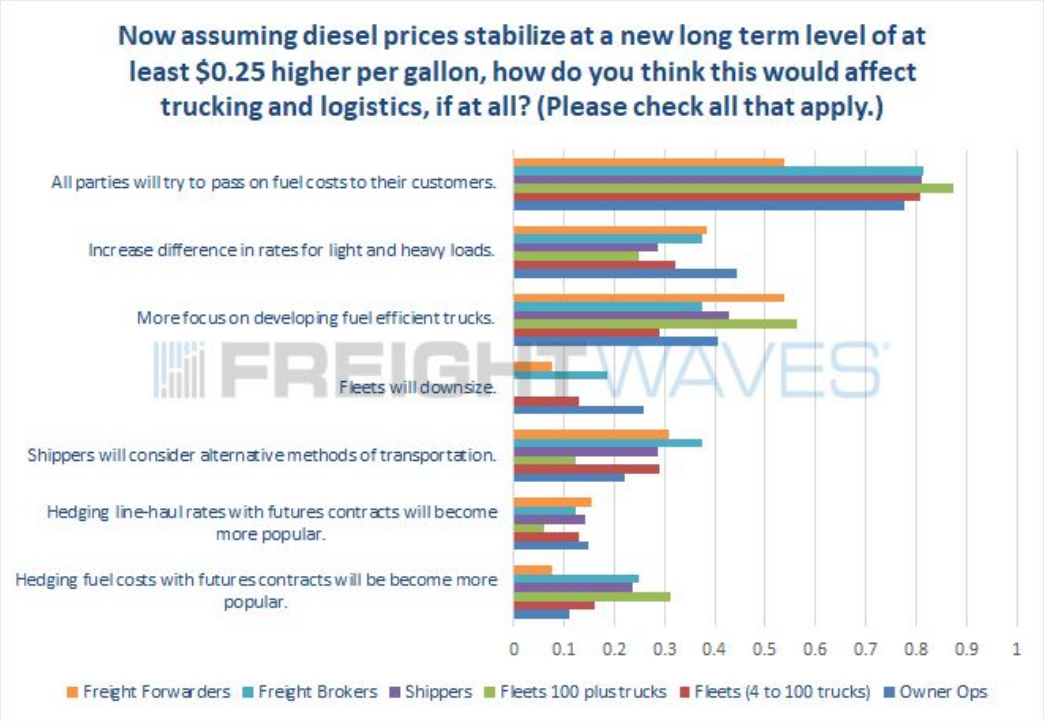
- Shippers are most nervous about short-term spikes in diesel; 95 percent of shippers think it will be negative.
- Large fleets are less negative on the impacts to business.
- Owner-operators and small fleets are more negative than large fleets. This is likely due to much more use of all-in rates rather than standard fuel surcharges.
- 3PLs (freight brokers and forwarders) are the middle men in transactions and can increase their take with increases in freight costs.

Speaking of passing along diesel costs to customers, this is the precise strategy all five groups are likely to try first. By a factor of two to one over other answers, respondents believe they will all try to pass along costs to their customers first.

On a macro level, 45 percent of respondents also agree a new higher normal for diesel prices will accelerate the push to develop trucks with even better fuel efficiency standards.

Pricing strategies are also likely to change as one-third of respondents believe the difference in rates between light and heavy loads will expand as it takes more fuel to haul heavier loads.

Figure 11 – Long-Term Higher New Normal Diesel Price Scenarios



*Data Source: FreightWaves IMO 2020 Survey

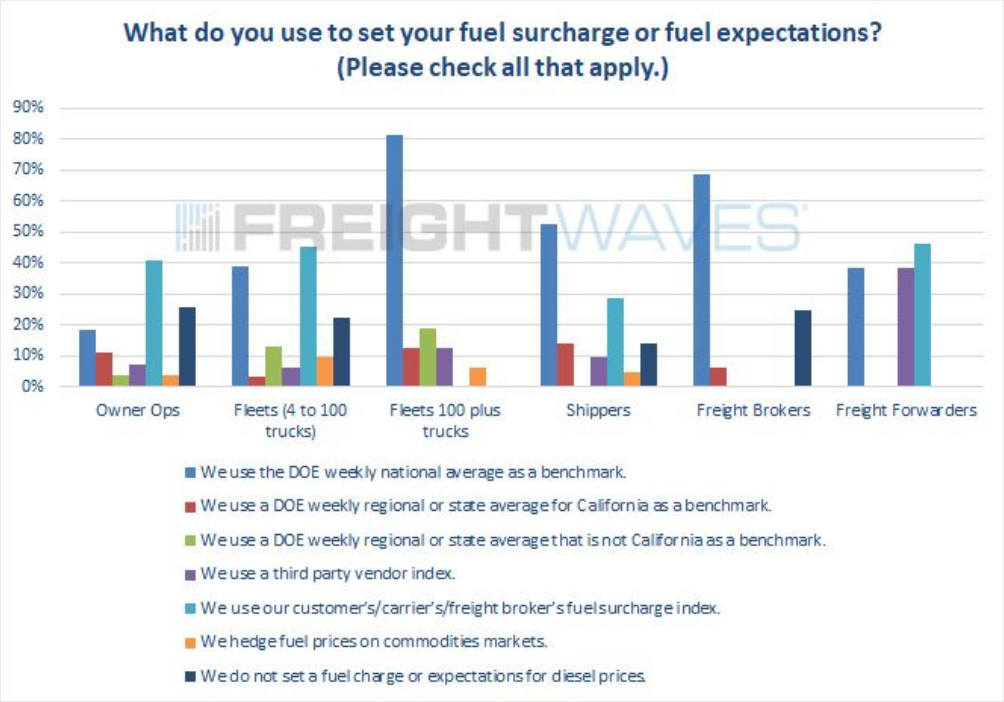
- By a factor of almost two to one, all groups agree each will try to pass along any long-term diesel rates to their customers.
- All segments also believe a long-term increase in diesel prices would push the industry to develop trucks with better fuel efficiency.
- Heavier loads would also demand more of a premium with higher diesel prices.
- Rather surprisingly, less than 30 percent of respondents believe shippers will consider alternative methods of transportation like intermodal.

Since most market segments expect to push any diesel price increases to customers it becomes even more important to build a fuel surcharge that can keep up with daily volatility.

The U.S. Department of Energy (DOE) national average remains the most popular method for calculating fuel surcharges. It is most popular among large fleets (82 percent), freight brokers (68 percent) and shippers (52 percent).

Surprisingly, none of the methods for building fuel surcharges with near-time data sources cracked 10 percent. These include using third-party vendors; hedging fuel or line-haul rates; or using regional indexes from the DOE.

Figure 12 – What is the Most Popular Method for Determining a Fuel Surcharge?



*Data Source: FreightWaves IMO 2020 Survey

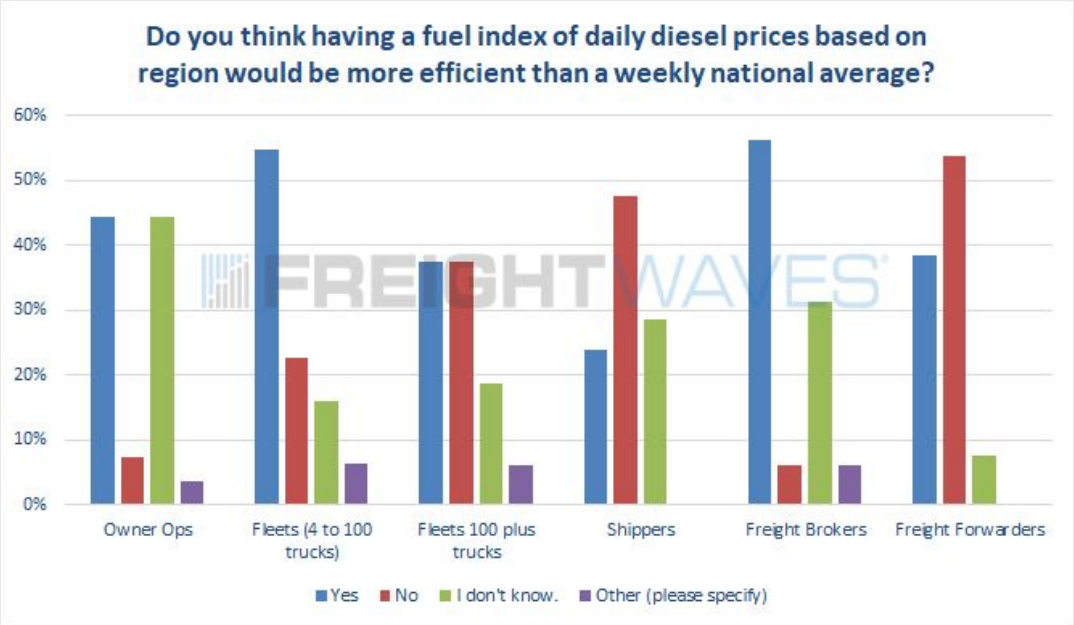
- DOE national average remains the most popular method for calculating fuel surcharges.
- The second most popular method is to simply use a customer's/carrier's/broker's standard fuel charge.
- Not setting or using a fuel surcharge is twice as likely than using a third party or regional fuel index.

While the DOE national diesel index continues to be the most popular, many think using daily diesel prices based on region would be more accurate.

Large fleets are evenly divided on using daily diesel prices at 38 percent for both yes and no. One likely reason is the attitude of "Why fix something that isn't broken?" Large fleets have converted fuel surcharges into profit centers over the years. By buying fuel well below retail and charging DOE national averages, large fleets can earn a nice spread in all market conditions.

The most skeptical of using daily diesel prices are shippers (47 percent) and freight forwarders (53 percent). Both are the traditional payers of fuel surcharges. Using much the same logic as large fleets, shippers may also be hesitant to adopt a new fuel index fearing they may get an even shorter end of the stick.

Figure 13 – Is There a Better Way to Create a Fuel Surcharge?



*Data Source: FreightWaves IMO 2020 Survey

- Small fleets (56 percent) and freight brokers (55 percent) are the most apt to believe fuel surcharges based on an index of daily diesel prices are more accurate.
- Owner-operators are evenly split between 'yes' and 'I don't know' as 44 percent chose one or the other.
- Large fleets are also evenly split between 'yes' and 'no' at 38 percent each.
- Shippers (47 percent) and freight forwarders (53 percent), who pay these surcharges, are the most skeptical of using daily diesel prices.

Options and Implications for Ocean-Going Ship Owners

Experiencing a material spike in the price of bunker fuel as a result of IMO 2020 is a major issue for ships. HSFO is low-priced and yet still represents between 30 and 50 percent of the total operating cost of a ship.

The most straightforward option is to switch from cheap HSFO to a more expensive low sulfur fuel oil. However, VLSFO is a new and mostly untested fuel. There are major concerns about engine failures and maintenance problems. Other options do exist for ocean vessels. Each option is detailed in the following sections.

1. Scrubbers
2. Marine Gas Oil (MGO)
3. Liquified Natural Gas (LNG)
4. VLSFO
5. Non-compliance
6. Slow speed

Scrubbers – scrubbers allow a ship to still use HSFO by removing the sulfur to ensure compliance with IMO 2020. Scrubbers cost between $2 million and $6 million. Most estimates peg overall global installation rates by ship owners at only 5 to 10 percent. This certainly eliminates scrubbers from being a cure-all.

The primary projected benefit from scrubbers is that most experts believe HSFO prices will crash after the implementation of IMO 2020. HSFO will likely only save a fraction of its market size of 3.8 million barrels per day in 2020 and beyond. Without the ocean vessel market, HSFO will be confined to limited low use purposes like emerging market power generation and asphalt. This should more than halve HSFO prices, which will make it a very affordable fuel source for vessels with scrubbers.

There are three major problems with scrubbers. The first is limited capacity and a backlog for installation, which will take years to work through. The second is scrubbers have an uncertain payback and return on investment (ROI). Ship owners do not know whether they will be able to recoup their outlay in the form of higher rates. The third is ship owners are not guaranteed whether HSFO or scrubbers will be completely regulated away in the future.

Figure 14 – Ship Owners Options for Switching to VLSFO Fuels

Ship Owner Options for IMO2020	Freight Intel Group's Estimate	Description
Scrubbers	5%	Scrubbers allow ships to continue to burn HSFO by cleaning emissions but are expensive, require significant downtime and shipyards are very backed up making this a low probability option for most.
Marine Gas Oil (MGO)	40%	MGO is a pre-existing low sulphur fuel oil that Freight Intel believes many ships will be comfortable with as their first option for IMO2020 compliance. Should its price rise too high, usage could increasingly divert to VLSFO or make scrubbers more economical.
Liquified Natural Gas (LNG)	10%	LNG is rising in popularity and is the cleanest option, but due to its premium cost and limited infrastructure, Freight Intel estimates low near-term penetration. LNG has a bright medium to long-term future.
Very Low Sulfur Fuel Oil (VLSFO)	20%	VLSFO is an unknown entity with an unknown price. Once price is known and comfort with usability is achieved, Freight Intel believes it will become the second most common option for compliance.
Non-Compliance / High Sulfur Fuel Oil (HSFO)	10%	Due to insurers refusing coverage, access to financing being cut off, many ports discontinuing HSFO carriage and heavy fines if you are caught, Freight Intel estimates non-compliance to be quite low.
Slow Speed	15%	Slow steaming is more of a back-up option should ship owners not be able to recoup the cost of new, expensive low sulphur fuel oils.

*Data Source: FreightWaves

Marine Gas Oil (MGO) – is a low sulfur fuel oil that is already used in ocean-going vessels. This is a positive attribute in that it is a known entity. The down side is the current price of MGO is roughly 60 percent more than HSFO (using global average bunker prices from shipandbunker.com). Switching to MGO would result in a hefty increase in a ship owner's fuel cost. This spread between MGO and HSFO is expected to widen even further once IMO 2020 goes into effect if HSFO prices crash. It is thought that MGO will have a cost advantage to VLSFO though it is impossible to know as of this writing as VLSFO will not start trading until toward the end of 2019.

Liquified Natural Gas (LNG) – is the cleanest option for ship owners. It is estimated LNG emissions are 90 to 95 percent less compared to HSFO. LNG also generates 10 to 20 percent lower sulfur emissions than VLSFO. It is the most expensive low sulfur fuel option. Availability and infrastructure remain limited, as do the costs of LNG fueled ships.

Infrastructure challenges include a limited number of bunker barges. This forces LNG ships to either run static lanes with LNG facilities or to install a secondary engine that runs bunker oil fuels. This is of course more expensive and leaves less room for cargo.

LNG is promising but it is at least a decade away from being common. In fact, according to Clarkson's Research Services – the world's largest ship broker – only 86 ships out of more than 4,000 on order right now are powered by LNG (under 2 percent).

Very Low Sulfur Fuel Oil (VLSFO) – is a wildcard because it is a new type of fuel oil that has hit the market over the past 12 months. What we know with a high degree of certainty is that ship owners will have to switch to some type of low sulfur fuel oil. All of these are likely to be more expensive than the old HSFOs. VLSFO is tricky in that shipping fleets have never used it as a bunker fuel. This makes ship owners hesitant to make a changeover to VLSFO as a primary fuel source given that it could disrupt operations with higher downtime and maintenance costs (on top of more expensive fuel costs).

Non-Compliance – Compliance with IMO 2020 is estimated by industry experts at 90 percent or higher. Non-compliance is getting tougher and tougher the closer it gets to January 1, 2020. Non-compliant fuels will not be available at some ports; insurers and financing firms are hesitant to take the risk, and the fines are steep as seen in Figure 15 below.

Figure 15 – IMO 2020 Value of Fines by Country

Country		Maximum Financial Penalty
Belgium	€	6,000,000
Canada	CAD	25,000
Denmark		No Maximum
Finland	€	800,000
France	€	200,000
Germany	€	22,000
Latvia	€	2,900
Lithuania	€	14,481
Netherlands	€	81,000
Norway		No Maximum
Sweden	SEK	10,000,000
UK	GBP	3,000,000
USA	$	25,000/day

Source: Platts, Wells Fargo Securities, LLC

Slow Down – is the strategy ship owners use when volumes and rates are low. Taking longer to make a voyage reduces capacity, which in turn pushes up rates. This strategy is also useful when fuel prices are high. According to Platts, tankers can save 20 to 40 percent in fuel costs by simply slowing from 13 knots to 11 knots. These figures vary and are dependent of course on the size and age of the vessel.

Simply by slowing down ship owners can solve two problems at once. The first is to reduce the higher costs of low sulfur fuel oils along with raising shipping rates by cutting capacity.

Ship Owners' Ability to Pass on Higher Fuel Costs

This is the billion dollar question that will determine whether IMO 2020 is a positive for the tanker and shipping industries. **This answer all depends on supply and demand.** Bunker adjustment factors (BAFs) – similar to fuel surcharges in trucking – are already commonplace in the industry. However, this go-around is likely to involve much tougher negotiations and will come down to leverage.

Many in the industry have concluded that if ship owners are not able to pass on the higher fuel costs to their shipping customers, then they are likely to pull capacity from the market by docking ships. This tactic achieves the same effect of higher prices to compensate for their rising fuel costs. Alternatively, the most viable immediate remedy is to slow down their fleet's average speeds, generating estimated fuel cost savings of 20 to 40 percent.

Refineries Could Very Well Be the Only Winners

Refineries will benefit if the spread between HSFO and VLSFO widens out. Then refiners with complex coking/hydrotreating technology will be able to capture upside from much higher utilization and crack spreads.

HSFO has traditionally served a beneficial purpose when refining a barrel of crude. The marine segment used the "bottom-of-the-barrel" high-sulfur content crude that no one else wanted or used. This raises the question of what to do with all that HSFO now that it will no longer be in demand despite it remaining a natural byproduct of the refining process.

There are a few options for what to do with all the displaced HSFO that is likely to have little demand after IMO 2020. The two primary options are that HSFO can be used to produce asphalt or for emerging market power generation (although the price will have to drop significantly to compete with lower cost coal). Second, the HSFO can be stored in either ground storage or floating storage in the ocean. It can

also be reprocessed and refined again to yield more middle distillates if the refinery in question is a complex refinery with coking capacity. Last, but certainly not least, it can be disposed of (most likely dumped into the ocean).

While the complex refining option sounds ideal in theory, in order to increase yields to more distillates, an upgrade of the refinery is necessary which costs $1 billion or more and is a multi-year capital investment. But for the complex refineries (many of which are located along the U.S. Gulf Coast) with this technology either already in place or on the way, they are likely to experience a big boost in business because of IMO 2020.

IMO 2020 Impact on Fuel-Intensive Industries

FreightWaves' analysis shows IMO 2020-exposed companies will try to pass on higher diesel (or respective middle distillate) prices to consumers, resulting in yet another tax to consumers in addition to tariffs. Our survey work largely confirms this.

There are some specific industries that we believe are heavily exposed that will have difficulty passing along higher fuel costs, which we mention below, but we view this as a low probability outcome.

Airlines Appear to Have the Most Downside Risk from IMO 2020

In regard to IMO 2020 potentially leading to higher jet fuel prices, three of the top four airlines employ limited to no hedging. This leaves them unprotected if they cannot pass higher fuel costs on by raising ticket prices. Airlines also spend approximately 20 percent of their revenue on fuel, an unparalleled level relative to all other industries.

Historically, airlines have been very poor investments due to high capital intensity, intense competition and little to no pricing power. However, the industry has undergone a wave of mergers over the past decade that has concentrated market share. The top four airlines in the U.S. now have nearly 65 percent market share by passenger count. This has led most investors to conclude that airlines will fare far better in the next cyclical downturn, recession or the next big spike in fuel costs. This assumption is untested and mostly unproven conjecture at this point. Time will tell and perhaps IMO 2020 will be the first litmus test.

Warren Buffett nicely summarized the history of airlines as investments in his 2007 shareholder letter below. Ironically, Berkshire Hathaway now counts several airlines among its holdings.

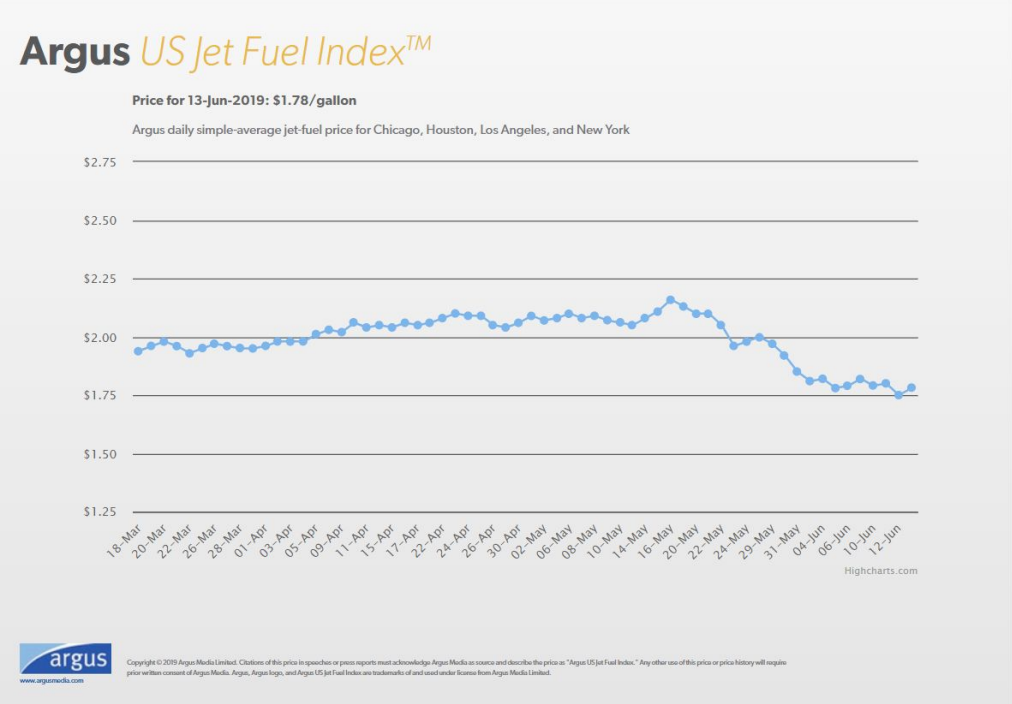
"The airline industry's demand for capital ever since that first flight has been insatiable. Investors have poured money into a bottomless pit, attracted by growth when they should have been repelled by it. And I, to my shame, participated in this foolishness when I had Berkshire buy U.S. Air preferred stock in 1989. As the ink was drying on our check, the company went into a tailspin, and before long our preferred dividend was no longer being paid. But we then got very lucky. In one of the recurrent, but always misguided, bursts of optimism for airlines, we were actually able to sell our shares in 1998 for a hefty gain. In the decade following our sale, the company went bankrupt. Twice. To sum up, think of three types of 'savings accounts.' The great one pays an extraordinarily high interest rate that will rise as the years pass. The good one pays an attractive rate of interest that will be earned also on deposits that are added. Finally, the gruesome account both pays an inadequate interest rate and requires you to keep adding money at those disappointing returns."

Should airlines not be able to pass on the cost of higher jet fuel prices to customers as a result of IMO 2020, we suspect that American Airlines (AAL) could fare poorly because it does not hedge the 20 percent of revenue it spends on aircraft fuel.

If we assume that IMO 2020 leads to a 10 percent increase in diesel prices, we need to also assume diesel is on a one-to-one increase basis to jet fuel prices (for simplicity's sake given they are both middle distillates). With all other variables being constant, then AAL would see a 30 percent hit to its earnings per share (EPS).

An increase of 10 percent in jet fuel prices seems reasonable based on the U.S. Energy Information Administration's (EIA) forecast. Expectations are for jet fuel prices to rise by 18 cents a gallon or 10 percent based on the Argus U.S. Jet Fuel Index which stood at $1.78 per gallon at the time of this report.

Figure 16 – Jet Fuel Spot Prices in 2019



*Data Source: airlines.org

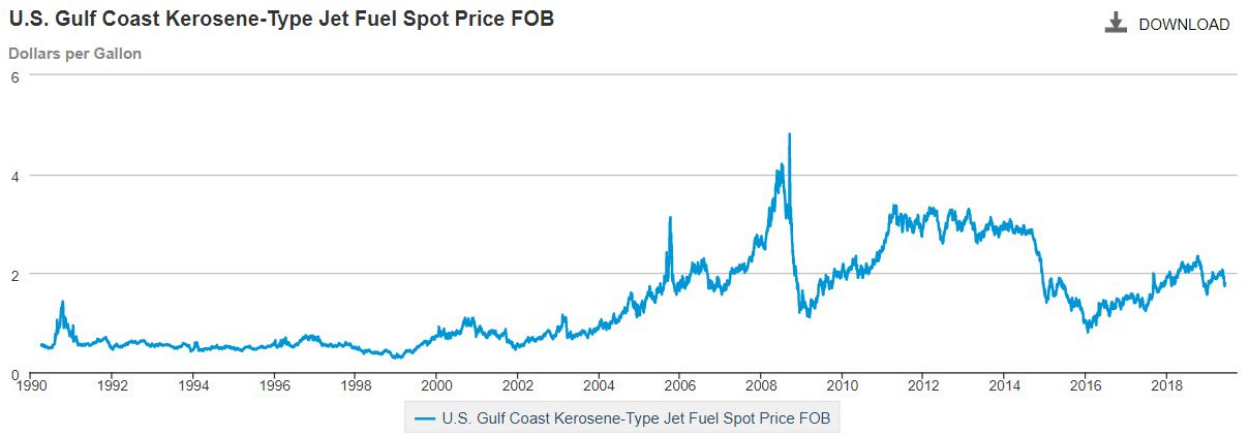
With a more severe but possible 20 percent increase in jet fuel prices, and all the same assumptions above, then AAL would see a 60 percent drop in its EPS.

We believe AAL could experience a three-to-one downside ratio to rising jet fuel prices because it does not hedge the $11 billion per year it spends on fuel. Moves of 20 percent or more in magnitude are fairly rare but not unprecedented. A spike of 20 percent in jet fuel would mean an average price of approximately $2.20 per gallon. This is a level that was sustained from 2011 to 2014, along with three other times in the past decade as seen below in Figure 18.

Figure 17 - Downside Scenario for American Airlines with Increase in Jet Fuel Prices

American Airlines (AAL) Earnings Sensitivity to IMO2020	FY19	FY20	y/y increase
Consensus EPS (Source: Reuters)	$5.06	$5.75	13.6%
EPS if jet fuel prices spike 10% due to IMO2020	$5.06	$4.03	-20.5%
Decrease relative to FY20 consensus		-30.0%	
EPS if jet fuel prices spike 20% due to IMO2020	$5.06	$2.30	-54.5%
Decrease relative to FY20 consensus		-60.0%	

Figure 18 – Historical Jet Fuel (Kerosene-Type) Spot Prices



*Data Source: EIA

The downside scenario for airlines, and American Airlines in particular, would only happen if (and only if) AAL is not able to pass on the higher fuel cost to customers. We caveat this analysis by not saying AAL will or will not be able to pass on higher jet fuel prices to customers.

There is a strong argument that AAL very well may be able to pass along costs to passengers. Our analysis simply demonstrates AAL's business model of not hedging is sensitive to spikes in jet fuel prices. Whether airlines can pass on higher jet fuel prices is difficult to forecast and depends largely on competitive game theory – if one company caves then others will feel pressure to match.

Cruise Lines Also Appear to Have Some Downside Risk from IMO 2020 (But Less Than Airlines)

Cruise lines also spend a great deal on fuel, averaging just under 10 percent of their revenue. A key difference between cruise lines and airlines is cruise lines tend to hedge (according to Securities and Exchange Commission [SEC] filings). Most cruise lines also have a history of instituting per-person fuel surcharges when the price of fuel rises. Cruises also "have clauses that state they reserve the right to reinstate fuel surcharges should the price of oil surpass a certain level," according to cruisecritic.com.

In addition, the rising cost of fuel is often offset by foreign currency gains for cruises as the industry derives a large proportion of its revenue internationally. U.S. dollar and energy prices are often inversely correlated to these international revenues. When the inverse fuel and foreign exchange relationship diverges with acute fuel price increases, cruises can turn toward fuel surcharges as an option.

As an example, Carnival Cruise Lines (CCL) spends 8 percent of revenue on fuel (approximately $1.7 billion in 2020 per Wall Street consensus). Should the cost of diesel rise by 10 percent, CCL's EPS would fall by 5 percent to $4.78 in 2020 compared to the consensus of $5.05. If cruise lines cannot pass this cost through in the form of higher ticket prices, the impact would at least be far less than airlines.

Figure 19 - Downside Scenario for Carnival Cruise Lines with Increase in Jet Fuel Prices

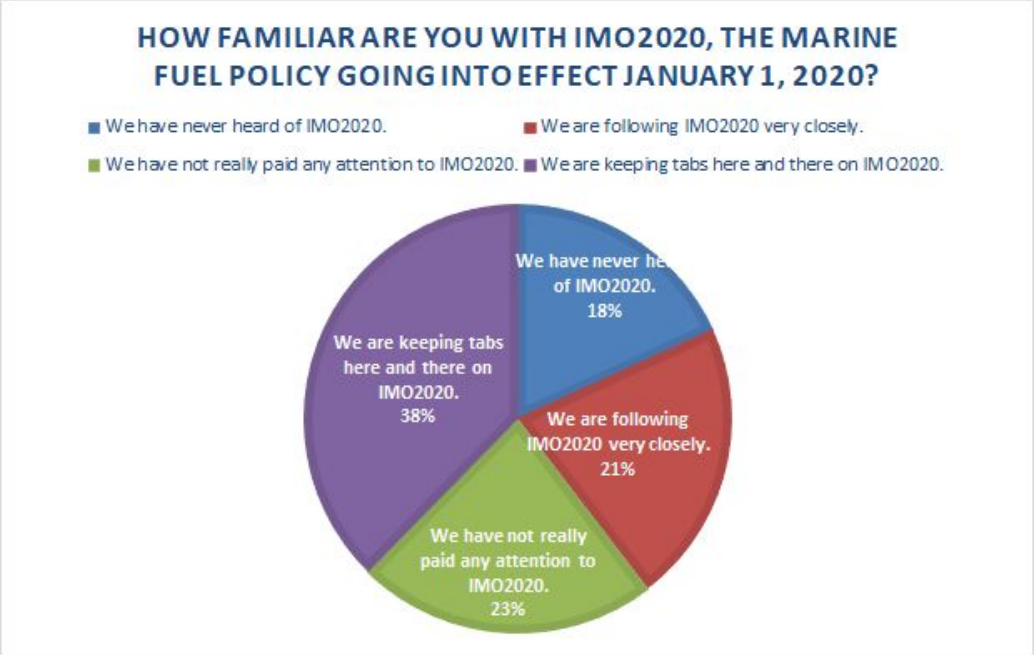
Carnival Cruiselines (CCL) Earnings Sensitivity to IMO2020			
	FY19	FY20	y/y increase
Consensus EPS (Source: Reuters)	$4.38	$4.84	10.5%
EPS if jet fuel prices spike 10% due to IMO2020	$4.38	$4.60	5.0%
Decrease relative to FY20 consensus		-5.0%	
EPS if jet fuel prices spike 20% due to IMO2020	$4.38	$4.36	-0.5%
Decrease relative to FY20 consensus		-10.0%	

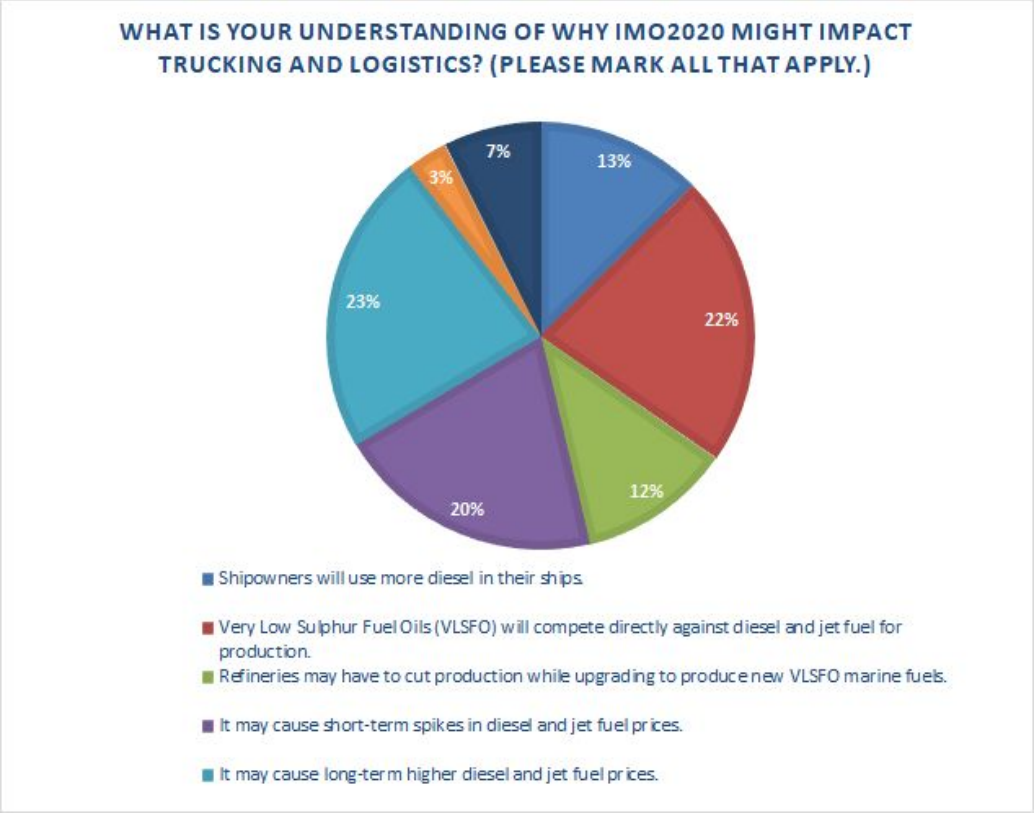
Railroads Have Little Downside and Potential Upside with IMO 2020

Railroads have well-established fuel surcharge programs. We believe railroads would be insulated from any spike in locomotive diesel fuel prices caused by IMO 2020. This is counterintuitive at first blush given that the railroads spend on average roughly 10 percent of revenues on diesel. Unlike airlines and trucking companies, railroads have a history of strong pricing power. For example, railroads such as Union Pacific (UNP) were able to double fuel surcharges in 2018 based on a 27 percent rise in diesel prices.

Railroads also have a natural hedge in place in that higher energy prices means higher rates for shipping energy- and petroleum-related products. Finally, and most importantly, rails will benefit on a relative basis versus trucking when diesel prices rise because it becomes more attractive and cheaper to ship by rail rather than truck.

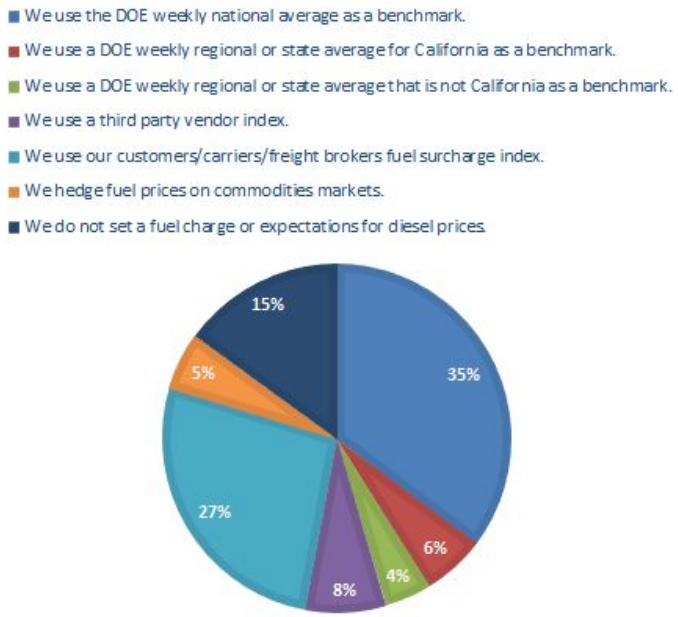
Appendix A – Survey Graphs for All Respondent Categories

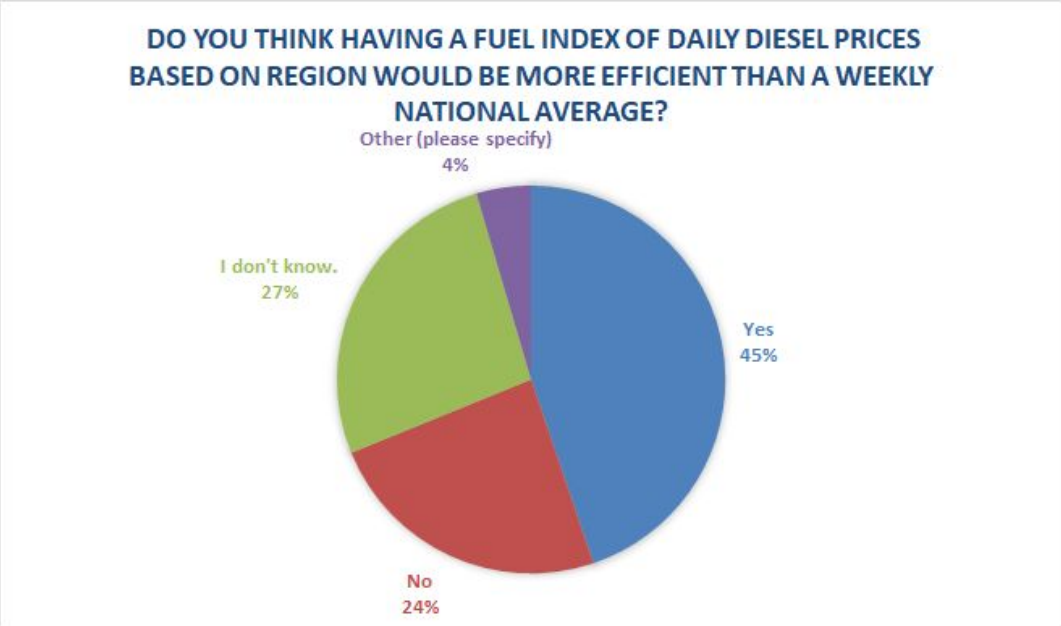


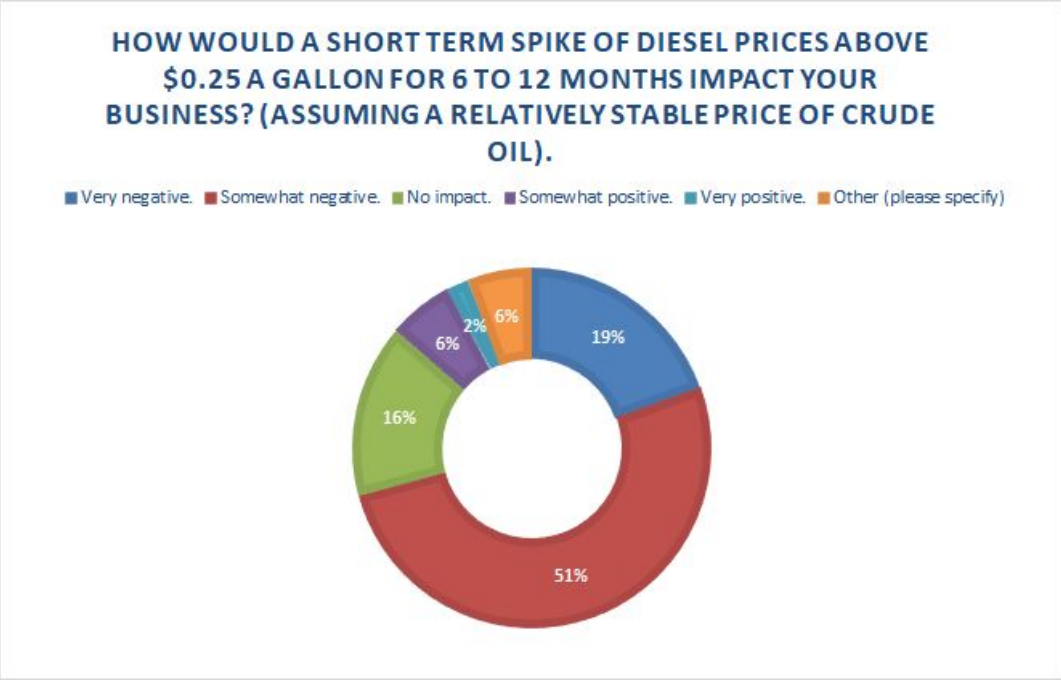


HOW PREPARED ARE YOU FOR IMO2020 AND THE LIKELY SPIKE IN DIESEL PRICES DUE TO THE NEED FOR OCEAN VESSELS TO USE MID-DISTILLATE (DIESEL) PRODUCTS?

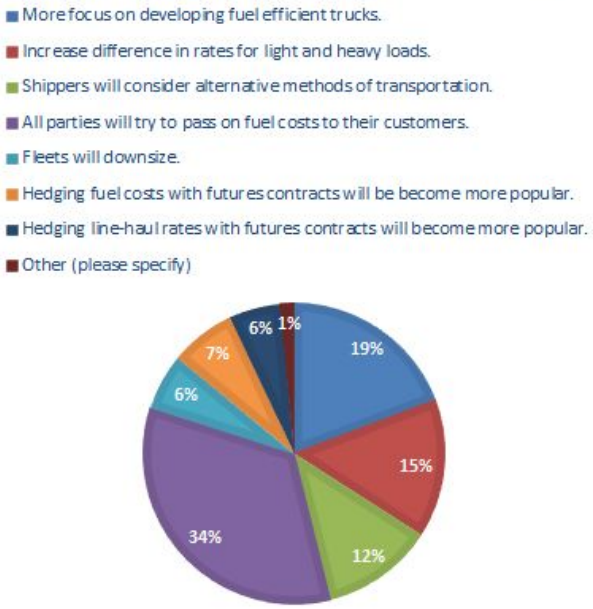
WHAT DO YOU USE TO SET YOUR FUEL SURCHARGE OR FUEL EXPECTATIONS? (PLEASE CHECK ALL THAT APPLY.)



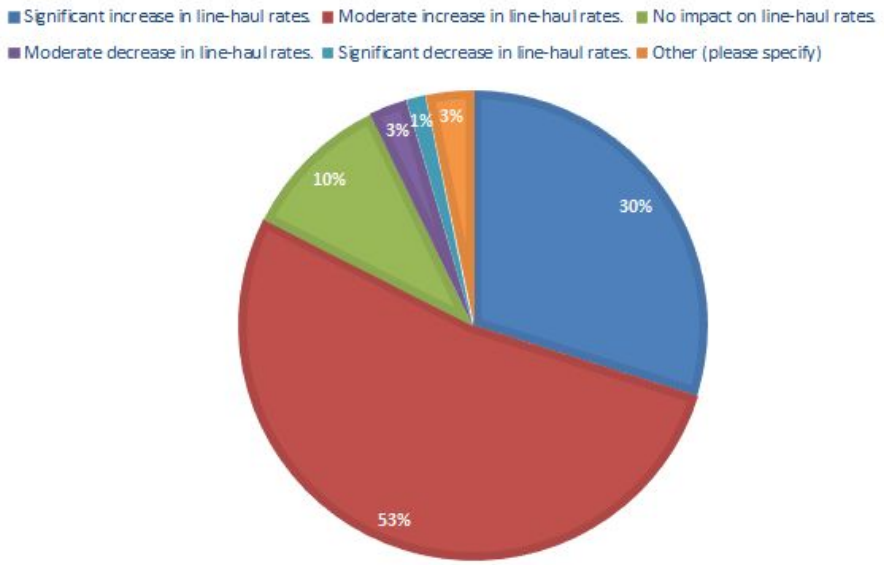

DO YOU THINK HAVING A FUEL INDEX OF DAILY DIESEL PRICES BASED ON REGION WOULD BE MORE EFFICIENT THAN A WEEKLY NATIONAL AVERAGE?
Other (please specify)
4%
I don't know.
27%
Yes
45%
No
24%


HOW WOULD A SHORT TERM SPIKE OF DIESEL PRICES ABOVE $0.25 A GALLON FOR 6 TO 12 MONTHS IMPACT YOUR BUSINESS? (ASSUMING A RELATIVELY STABLE PRICE OF CRUDE OIL).
Very negative.
Somewhat negative.
No impact.
Somewhat positive.
Very positive.
Other (please specify)
19%
51%
16%
6%
2%
6%

NOW ASSUMING DIESEL PRICES STABILIZE AT A NEW LONG TERM LEVEL OF AT LEAST $0.25 HIGHER PER GALLON, HOW DO YOU THINK THIS WOULD AFFECT TRUCKING AND LOGISTICS, IF AT ALL? (PLEASE CHECK ALL THAT APPLY.)



WHAT TYPE OF IMPACT DO YOU THINK A SHARP SHORT-TERM SPIKE (6 TO 12 MONTHS) IN DIESEL PRICES WOULD HAVE ON LINE-HAUL RATES?



Appendix B – Recommended Reading

S&P Global Platts, May 2019, Tackling 2020: the impact of the IMO and how shipowners can deal with tighter sulfur limits

Wood Mackenzie, February 2019, All scrubbed up and ready to go

McKinsey & Company, September 2018, IMO 2020 and the outlook for marine fuels

FreightWaves, June 2019, Where will all the residual fuel go after ships barred from using it?

FreightWaves, March 2019, IMO2020: Compliance a key; IEA gives some hard numbers on distillate impact

VIDEO: FreightWaves Now, June, 10, 2019, https://www.youtube.com/watch?v=Z4j0qtuv1QA

VIDEO: FreightWaves Transparency 2019 Conference - Sector Talk 2 IMO2020, May 2019, https://www.youtube.com/watch?v=arGcL27ROjo&t=2s