

## Marpol

# The Economic Impact on Shipping Costs

Presented July 2019

*“At its 70th session in October 2016, the Marine Environment Protection Committee (MEPC) of the International Maritime Organisation (IMO) confirmed that 1st January 2020 is the implementation date for a significant reduction in the sulphur content of the fuel oil used by ships.*

*The decision to implement a global sulphur cap of 0.50% m/m (mass/mass) in 2020 represents a significant cut from the 3.5% m/m global limit currently in place and demonstrates a clear commitment by IMO to ensuring shipping meets its environmental obligations”.*



PetroLogistics was founded in 1995 as an advisor to managers who are involved in the oil industry.

The specialist field is study of the economics of oil refining and supply operations and, based upon such study, the development of strategy for businesses and government in this sector.

PetroLogistics is an associate of The Energy Contract Company (ECC), which is an international firm of consultants to the global oil and gas industry and is based in London.

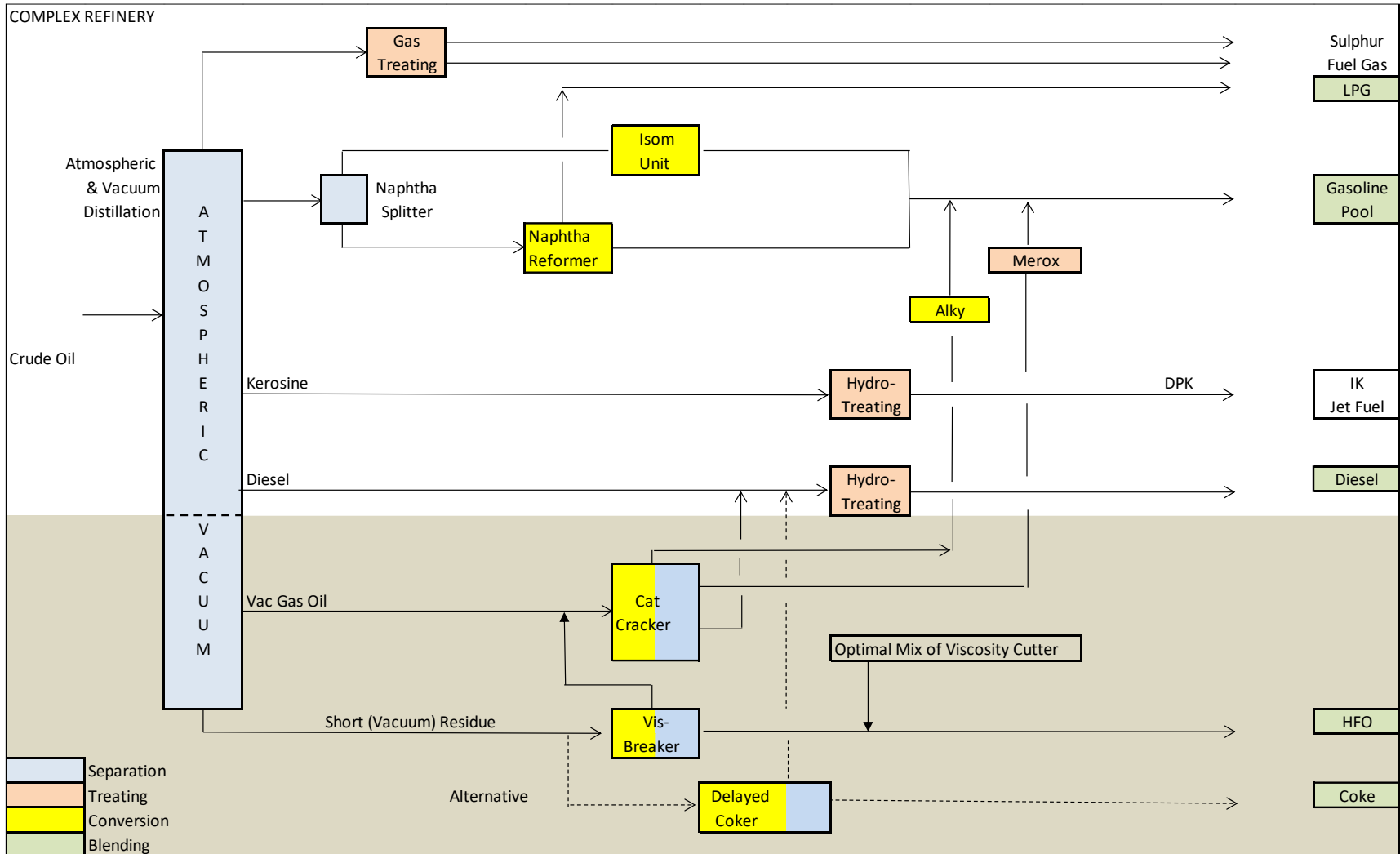
In addition to work under the auspices of ECC, PetroLogistics does work in partnership with other consulting companies and associates as the need arises, but its own expertise is based on the experience of its founding member, Robert Stewart.

## Introduction

- My consulting expertise is in refinery and supply economics
- I therefore understand the fundamental relationships linking the value of clean fuels with the value of BFO and the value of the various grades of crude oils
- In my early experience in production planning and economics, I gained a particular understanding of optimal blending of BFO/HFO.

## Feedstock Selection and the Value of BFO

### Flow Sheet of the Typical Coastal Refinery



## Scrubbers on Ships

- Why did IMO allow for scrubbers? Based on IMO's subsequent further plans to clean the environment, would the same decision have been made?
- Scrubbers have been mooted as the means to continue to burn the cheaper HSFO grade, and provide ship owners with an investment opportunity, with the savings in fuel price providing the return on investment.
- Nevertheless, I understand that certain major fleet owners have foregone the opportunity for this investment.
- I believe that IMO made a mistake in allowing ships to install scrubbers. The action in my view should have been left with the oil industry but, as a consequence of the decision, both the oil industry and the shipping industry in the meantime have to a large extent adopted a wait and see approach. As a result time has been lost.
- ***I think that concerns for the marine environment will halt the move to scrubbers, and that the needed action by the oil industry will belatedly proceed at pace.***

## Impact on Freight Rates

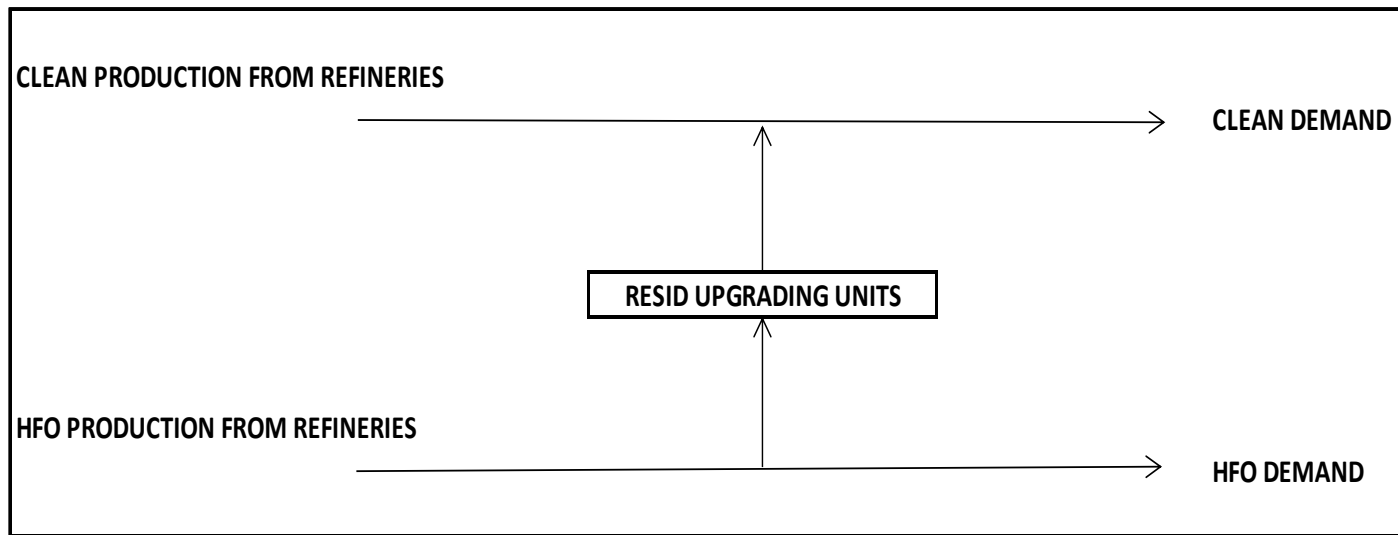
- The elimination of HFO as a bunker fuel is going to have a major and immediate impact on marine shipping costs, and in my view the major part of this will be a permanent shift.
- For example, there's a 50% increase in moving from HFO at say 400 \$/ton to marine gas oil at say 600 \$/ton
- But shifts of this magnitude have been experienced before (witness the doubling of crude oil price) and the shipping industry has had no option but to pass on the costs.
- The cost of marine freight comprises three components
  - The cost of the ship (charter hire)
  - Port charges
  - Fuel
- Through time and depending on the service, the relative proportions of these three components will change. People in the room will have rules of thumb for their own types of ships and their type of deployment. But if fuel makes up say 30% of the total, then a 50% increase in fuel translates to a 15% increase in the freight rate. This, arguably, would not be a disaster.

## More Detailed Analysis

- There are two shifts that will increase the cost of bunkers (and thus freight)
- The first shift is the one already mentioned, i.e. from HFO to MGO. I believe this shift is permanent because I do not believe that scrubbers will be deployed to an extent that significantly reinstates the HSFO market
- Traditionally the linkage of the value of these two fuels is illustrated in the following slide

## The Value of BFO

Illustration of the **Traditional Global S&D** for the Refinery Residue



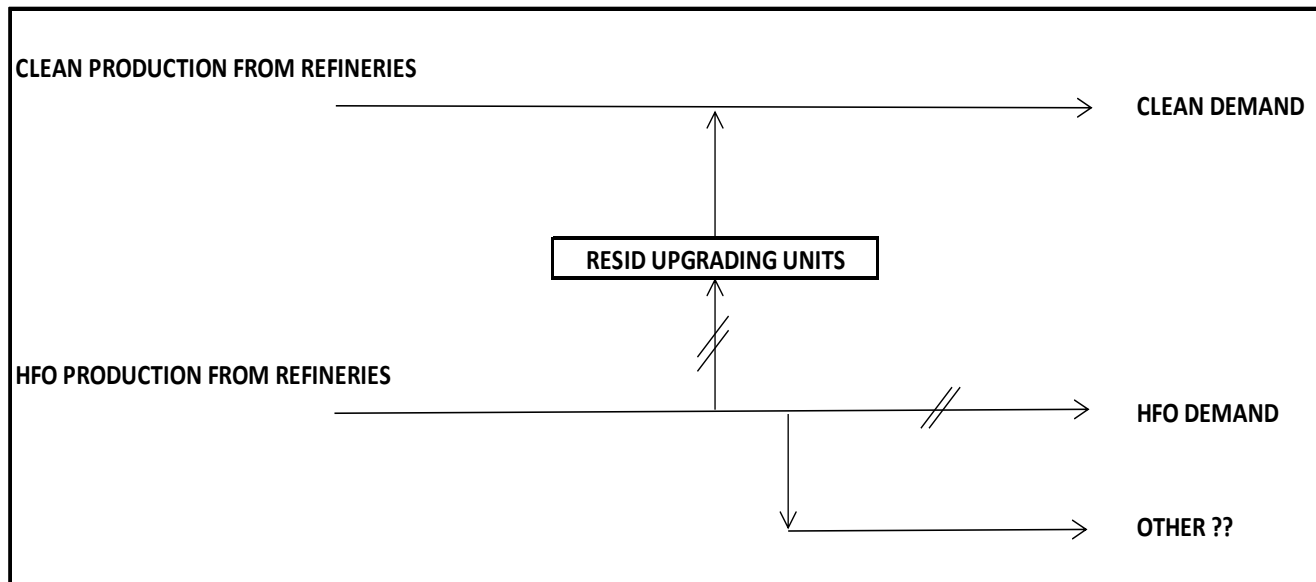
The relative global demand for clean product and heavy fuel oil is balanced on the available capacity to destroy heavy residue in the refineries, using residue-upgrading technologies such as Cokers.

The resultant value of the residue as Coker Feed sets the global price of heavy fuel oil at its maximum value.



## The Value of BFO

Illustration of the **Post-Marpol Global S&D** for the Refinery Residue



Post Marpol we will have a different situation, with a large reduction in the value of refinery residue (the main component of the BFO)

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As in 2008 (when there was insufficient residue-upgrading capacity in the global refining system and insufficient bunker demand to consume all the residue) the residue will have to be put to bed in competition with other fuels in other services. The eventual net back value to the refineries from these non-traditional markets will depend on the amount of surplus and the locations where it will be consumed.

Now, when a refinery that produces saleable residue sees the value of that residue drop then the break-even cost of production of the clean fuels increases. Such refineries will seek to maintain the margin they have hitherto enjoyed (as they must do in order to continue to supply the market for clean fuels) and so the selling price of the clean fuels will increase.

This is the second shift affecting the shipping costs, but it is not so severe as the first and prevails only through a transition period of several years until the time comes where there is sufficient residue upgrading capacity in the global refining system to end the distress in the value of residue by retrieving the balance of supply and demand.

## The Value of BFO and MGO

Illustration of the Change in Value of HFO and MGO  
The two shifts are shown in the following table

		PRE-MARPOL		POST-MARPOL	
		\$/TON	\$/BBL	\$/TON	\$/BBL
HFO SELLING PRICE	A	400	63	265	41
MGO SELLING PRICE	B	600	82	C	670
DELTA		200	20	405	50
SHIFT 1	B - A	200	20		
SHIFT 2	C - B	70	10		

## Notes on the previous slide

These numbers have been derived from PetroLogistics' own modelling and analysis of the economics of refining , but they will be fairly recognisable to those who have read the publications of various consulting companies and market researchers. They nonetheless do reflect a set of basic assumptions about the scenario that will come to pass. The assumptions may well vary.

## Advice

If I were the ship-owner or charterer with the responsibility for choosing the type of low sulphur fuel, I think I would try to keep life simple for myself by avoiding any risk related to bunker quality, at least until the dust has settled. I would use MGO as a fuel which is readily available and of consistent quality in all of the ship-bunkering markets, passing the incremental cost through to the shipper.

As a refiner I would be happy to meet that demand for MGO. I acknowledge that there may be comparatively simple trade-offs by which I could optimise for myself the offering to my customers, but ultimately I must supply what the customer wants.

But my main problem as a refiner is not to supply compliant fuel, it is to secure an alternative market for the residue I produce during the above-mentioned transition period, and the closer to my refinery that market can be, then so much the better.

I would also be expecting the global oil industry to seek to reduce the amount of residue in the crude oil feed to refineries, not only to solve the problem at hand, but also in the interests of combatting GHG.

However, the GHG issue is another matter not in the scope of this presentation.