

REFINING TRENDS

Switching to distillate fuels: The refining challenge

The proposal to fuel all ships on distillate bunker grades raises the question of where the fuel will come from. *Bunkerworld* asked Martin Mærsk Suenson, Executive Officer from the European Petroleum Industry Association (EUROPIA) to provide an answer.

In the context of the revision of IMO MARPOL Annex VI, several measures have been proposed to reduce the emission of sulphur oxides (SOx) from ships by implementing world-wide changes to marine fuels qualities. In particular, it has been proposed to make a world-wide switch to distillate fuels for marine use.

Such a switch to distillate fuels would represent a major change to the world energy scene, increasing the world distillate fuels demand by around 200 million tonnes per annum (tpa). To put this into perspective: to produce 200 million tonnes of distillate requires some 600 million tpa of crude, more than the total current crude oil production of Saudi Arabia.

A change of this scale would also have wide ramifications outside the shipping arena and one should ask two key questions when considering such a change. The first question is related to cost-effectiveness: are there better, cheaper ways to achieve the same environmental improvement? The second question is on practical implementation: is it possible to implement this change practically and what are the socio-economic impacts?

The answer to the first question is very likely "yes". Emissions far from land have only a minor impact on the environment and measures closer to the potentially

affected areas, such as the current Sulphur Emissions Control Areas (SECAs), are generally much more cost-effective in tackling local air quality concerns.

The key to the second question is the issue of drivers and time for change. The additional demand for distillate fuels cannot be met with the existing refineries and would therefore require substantial changes to their configuration. Due to several factors, which will be examined later, it would take at least 15 years to realise these changes.

Such a long transition period would not only bring uncertainties with respect to the availability of the distillate fuels, but it

business can therefore only be the result of economic forces that make it attractive to produce them.

measures could be found. To understand the drivers and adaptation possibilities, it is important to examine the constraints of refineries and the considerations that will play a role before companies make substantial investments in refining.

Oil refining - a primer

Crude oil consists of a very wide mixture of components ranging from gases through gasoline and diesel to heavy components such as residual fuel oil for marine or industrial use. The amount of these products that can be

produced is dependent on the origin of the crude oil and the selection of process units in the refinery, i.e. the refinery configuration. Jet-fuel, automotive diesel and gasoil are referred to as 'middle distillates'.

Refining in its simplest form is essentially a distillation of the crude oil into these component streams. Over time, the demand for transportation fuels has increased far more rapidly than the demand for heavy gasoil, so refineries have responded by installing complex conversion facilities to convert heavy gasoil into lighter transportation fuels.

The quantity of the individual products is largely a result of the original distribution in the crude oil and the refinery configuration. Any demand for an increase in production of a certain product will require investment, either to increase the total capacity of the refinery or to install additional process units to increase the conversion capacity.

Replacing residual fuel oil by distillates for marine use represents a substantial change to the product distribution and cannot be met by existing refineries without significant investment.

To understand the drivers and adaptation possibilities, it is important to examine the constraints of refineries and the considerations that will play a role before companies make substantial investments in refining.

would also mean that during a long period relatively cheap residual fuels and substantially more expensive distillate fuels would have to co-exist in the market. This could potentially lead to market distur-

markets, it may be a more attractive alternative than investing. It could also be part of a 'wait-and-see' strategy if the refiner is unsure of the margin outlook for the market. However, if all refineries took the same approach, the market for residual fuels would very quickly be saturated. Consequently, some form of investment would eventually be required to process the surplus of residual fuel oil.

Investment in refining is considered with a particularly long time scale perspective and refineries will in general be reluctant to commit to projects if there is uncertainty with respect to the longer term market situation.

One aspect of the marine fuels issue adds uncertainty: On-board ship abatement technology may prove to be a viable and cheaper alternative to comply with the desired emission levels [see this edition's cover story]. Should that turn out to be the case, the demand for the new marine fuels will be lower and the refiner may be left with an expensive production capacity and no market.

Another important point of uncertainty would be the price structures in the future. It is clear that the price differential between distillates and residual fuels would be even higher than today, otherwise these changes would already be taking place. Moreover, as the prices of the different distillates are closely linked, these changes would have a 'knock-on' effect on all other products, the prices of automotive diesel and home heating oil would also change. Some substitution between fuels would undoubtedly take place, driven by a

To invest or not invest?

It is important to understand that investment decisions will ultimately be driven by economics, not by regulation. Regulation can specify which fuel quality to be used, but cannot mandate refineries to produce them. The supply of distillates to meet the increased demand of the marine

bunkerworld forum **BUNKERSPOT**

Bunker Summit Greece 2007

8-11 May, InterContinental Hotel, Athens

Online: www.bunkerworld.com/greece2007
www.bunkerspot.com/events/athens

Email: conferences@bunkerworld.com
events@bunkerspot.com

Tel: +44 1753 272 250
 Fax: +44 1753 272 251

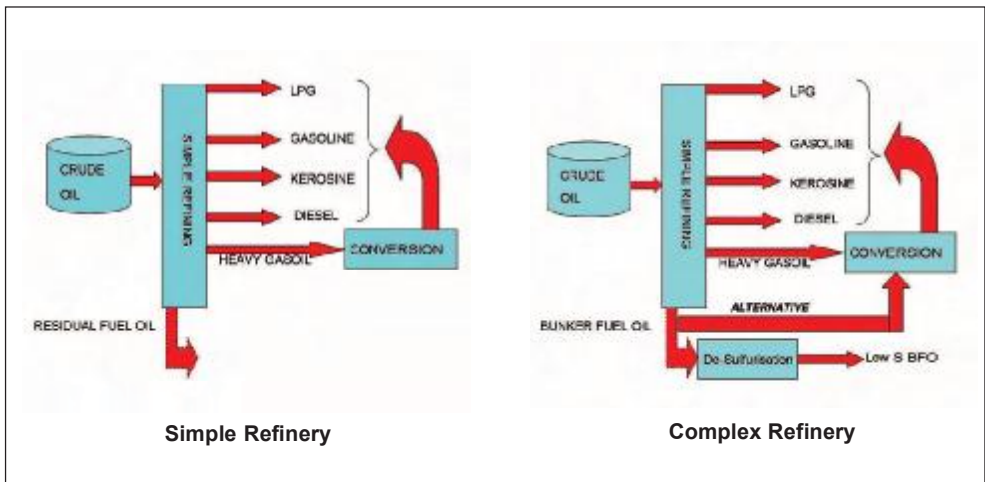
Sponsors:

CHEMOIL, TBE, JET OIL, Petrobras, Petroleum, Lloyds Register, LIFE MATTERS

Supporting associations: IATA, IATA, IATA, IATA

Supporting media: TradeWinds, p1atts, MEDIA

REFINING TRENDS



distillate fuels means that the availability of sufficient distillates cannot be taken for granted and the availability would vary from region to region.

Whether the overall socio-economic impact would be acceptable is outside the subject of this article. However, due to the inter-linkages between fuels and the price difference between residual fuels and distillates, the change would lead to substantial price adjustments in the markets for automotive diesel and domestic heating oil as well as a significant increase in the cost of shipping.

One thing is certain: during a long transition period, residual fuels and distillates would have to co-exist in the market throughout this period. The prices of these fuels will be very different - currently distillates are twice as expensive. Consequently, it would require complex international compensation mechanisms to avoid severe market distortions between ships operating on residual fuels and ships on distillates. This would not be an easy challenge for the regulators.

different price structure. The details of the price changes would depend on the economic drivers in many sectors and would be very difficult to predict with confidence.

These uncertainties, coupled with the presence of an alternative, would most likely lead many refiners to delay their investment decisions.

A long transition.

As we have seen, to accommodate the increased demand for distillates would require a large number of major projects in refining. Each project represents a

major engineering and construction effort, and would require substantial material and people resources that are in limited supply (related to an already high level of construction to meet growing demands in countries such as China and India). To illustrate: a minimum of 4 years is required to take an individual project from initial feasibility study to start-up. In other words, designing and constructing these units around the world would take at least 15 years. As a consequence, the necessary distillates would only become available gradually over a similar timescale.

Consequences

The economic choices faced by individual refiners and the constrained possibilities for responding to an increased demand for

Dr. Martin Mærsk Suenson was seconded from Royal Dutch Shell Group to EUROPIA in 2005 as executive officer responsible for industrial products and issues related to installations, including refineries. EUROPIA is the Brussels-based association representing around 90% of the oil refining, distribution and marketing activities in EU-27, Norway and Switzerland.

AGILEY & INTERACTIVE

(Nautical Coordinates lead the way to Jet Oil)

For over 35 years, nautical coordinates have led a majority of ships sailing the Greek Seas to JET OIL in the country's largest ports. Because for over 35 years, JET OIL has been providing the most reliable service and products of the highest quality, and as a consequence has attained a place among the best. Today, from this position of strength, it continues to offer its customers full support, supplying them with all types of fuels available, with consistency, safety and environmental awareness.



PHYSICAL SUPPLIER AT PIRAEUS

MAMDOU - JETOIL S.A. PIRAEUS: tel +30210 4283201 +30210 4283366, e-mail: jetbunkers@jetoil.gr