



IMO 2020 on MENA: Impacts varied

The impact of new regulations set by the International Maritime Organisation (IMO) will vary across the MENA region. GCC countries are well prepared to deal with the consequences of the regulations which come into effect in 2020. The new regulations require ship-owners to switch away from High Sulphur Fuel Oil (HSFO), and as they do so, demand for diesel will increase. This will enable the likes of Saudi Arabia and the UAE – who added 1.2mb/d of refining capacity over the past five years - to benefit from higher exports of diesel. Reduced usage in shipping will inevitably drive down the price of HSFO, meaning that domestically, Saudi Arabia and Kuwait will also be able to benefit from lower cost HSFO for use in power generation. By contrast, less sophisticated refineries in Iraq will make it difficult for the country to market its HSFO, with little room for domestic consumption, as the power sector is not large enough to absorb the excess fuel.

In an effort to reduce greenhouse gasses (GHGs), the IMO – a specialised agency of the United Nations – introduced new rules in 2016 aimed at reducing the cap on the sulphur content of marine fuel. Beginning 2020, ship-owners will have to comply with a new 0.5% cap on the amount of sulphur in marine fuel, compared with the existing limit of 3.5% that was enforced back in 2012. The immediate impact will be on consumers of HSFO, namely shippers, but also on refineries that produce large quantities of HSFO. Ship-owners will face several options: continue to use non-compliant fuel oil and install scrubbers that clean out exhaust fumes including sulphur content, burn LNG or methanol, or use compliant fuels such as Low Sulphur Fuel Oil (LSFO) and marine gasoil. However, it is unclear which of these options will be the most cost effective, making it difficult for ship-owners to take a firm decision.

In the case of burning gas, the availability of these fuels is restricted to northern Europe, whilst LNG bunkering has not developed globally and the lack of infrastructure will restrict LNG-based power to ships moving on standard and short haul routes. Shippers considering a switch to LSFO will not only have to factor in the higher cost of the fuel, but supply restrictions in the short to medium term will create uncertainty around its availability in bunkering ports around the world. Even in the event that the global market is able to produce sufficient quantities of the fuel, there is no guarantee that machinery on ships designed to run on high viscosity/HSFO can switch to low viscosity/LSFO. As for scrubbers, the technology provides a shorter-term solution but does not guarantee against future changes to other specification requirements. Scrubbers can also be an expensive option. Apart from the huge upfront cost of at least \$4m per vessel, regular maintenance to remove possible saltwater contamination will create difficulties and give rise to additional costs. Moreover, the equipment is heavy and requires dry-dock space for installation; in the event that the uptake of scrubbing technology is high, limited dry-dock space will constrain the number of retrofits that could be carried out.

In 2017, demand for fuel oil averaged 7.5 million barrels per day (mb/d) of which 3.5mb/d was HSFO, used mainly in bunkering.

Going forward, the IMO regulations will reduce demand for HSFO whilst demand for both LSFO and marine diesel will increase. Other things being equal, the differentials between sour-sweet crudes, HSFO-LSFO and distillate-HSFO are expected to widen. In the short term, the ability of the global refining industry to produce an estimated 8mb/d of compliant bunker fuel for the world's ships by the IMO target of 2020 will be tested. Depending on assumptions about scrubber uptake, the resulting boost to demand for marine diesel alone is expected to be around 2.1-2.5mb/d. These fundamentals will place upward pressure on LSFO and marine diesel prices and could encourage the uptake of scrubbing technology, especially if the outlook for HSFO prices remains downwards.

In the likely scenario that there will be more reliance on LSFO and marine diesel, the downstream sector will create winners and losers, with simple refineries at most risk. Refineries that failed to invest in cokers and other residue destroying equipment needed to contain HSFO production will find it difficult to market the fuel. On the other hand, more complex refineries will benefit from higher margins. In the highly competitive refining market, this could pave the way for further closures. That said, much of the new refining capacity that has come on stream recently is already geared towards running sour grades and could produce compliant, low sulphur fuel at a profit. Planned new refineries and refinery upgrades, the majority of which are in the Middle East and Asia, will drive production of compliant fuel over the medium term. In the last five years, Saudi Arabia and the UAE brought on line 1.2mb/d of new refining capacity, and the GCC as a whole is expected to add a further 1.5mb/d over the next five years. Geared to producing more diesel, the GCC will be in a good position to adjust to the IMO rules, with opportunities for Saudi Arabia and Kuwait to utilise excess HSFO in their respective power sectors.

MENA is a large producer and consumer of fuel oil

The GCC refining sector has seen tremendous growth over the past few years, driven by significant investments in complex refineries during a period of high oil prices. The completion of

Yasref and Satorp in Saudi Arabia and the expansion of the Ruwais facility in the UAE added approximately 1.2m b/d of new and cleaner refining capacity. Built with an eye on supplying the growing Asian market, these new refineries have contributed to turning the GCC countries into a net exporter of refined products in 2016, particularly in the diesel segment. Over the next 5 years, new capacity will be dominated by the two major additions in Saudi Arabia and Kuwait, as well as clean fuel projects in the region. They will adhere to stringent European requirements for cleaner fuels, and will thus provide GCC refineries with an edge in a more competitive market.

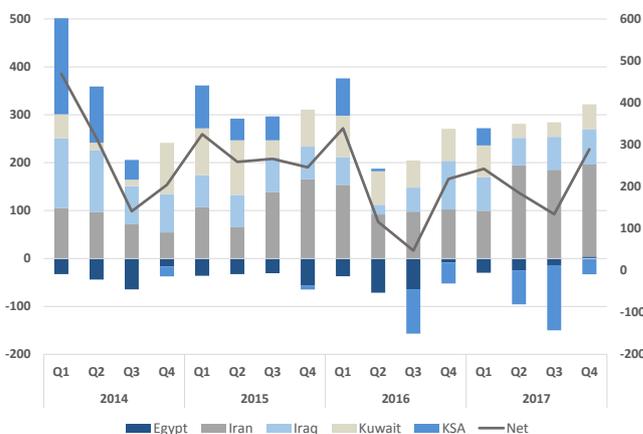
GCC refining capacity (kb/d)

	2017 capacity	2018-2022 additions
Bahrain	267	100
Oman	311	230
Qatar	292	0
KSA	2,907	400
UAE	1,124	70
Kuwait	936	615

Sources: A PICORP Research

For Iran and Iraq, the picture is gloomy. Already struggling to meet domestic demand, the damage to Iraq's Beiji refinery drastically reduced the country's capacity. In addition, the refining sector as a whole is not as sophisticated as those in the GCC, and does not have the ability to produce low sulphur fuel. Worse, with lower demand for HSFO, Iraq will struggle to get rid of the fuel, whilst the domestic power sector is not large enough to absorb higher quantities of HSFO, especially given that the majority of new power generation will be gas-fired plants. In anticipation of sanctions being lifted, Iran made a strategic decision to utilise additional condensate output from South Pars, and commissioned the 480kb/d Siraf Refining Complex in 2014. However, with an additional 360kb/d expected from the Persian Star refinery, the focus was mainly on condensate splitters and naphtha production. Now, the re-imposition of US sanctions will make it difficult to attract investment in the energy sector and particularly the refining sector.

Net supply of fuel oil (kb/d)



Source: JODI Data

The Middle East is the largest consumer of oil for power generation, accounting for 36% of the global share in 2017. The same is true for fuel oil, where the top five consumers in the Middle East (Egypt, Iraq, Iran, KSA and Kuwait) alone account

for a quarter of total global demand, making the region the largest consumer of fuel oil overall. Fuel oil consumption has been increasing in the region driven predominantly by Saudi Arabia, the largest consumer of fuel oil in the Middle-East and second only to China globally. Whilst demand in the rest of the Middle East has been relatively stable, only Iran is exhibiting a fall in fuel oil consumption, declining from 382kb/d in 2014 to 214kb/d in 2017. Nevertheless, the region remains a large consumer at a time where fuel oil consumption is declining globally.

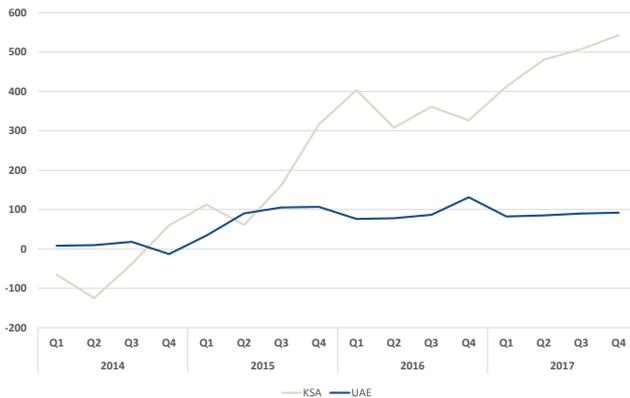
But the Middle East is also a large producer of fuel oil owing to the nature of their refineries, and because they process larger quantities of heavy-sour crude. The vast majority is consumed domestically by the power sector. In 2017, the region produced 1.6mb/d of fuel oil, over 20% of global supply. In 2016, Saudi Arabia became a net consumer of fuel oil particularly in the summer where it imports more fuel oil to meet peak demand in the power sector. Overall, the Middle East remained a net exporter of the fuel, supported by a net increase in Iranian supplies rising from 82kb/d in 2014 to reach 168kb/d in 2017.

Saudi Arabia has options

On a supply and demand basis, Saudi Arabia is set to be shielded from the impacts of the IMO regulations. The swathe of complex refining capacity that has come on line since 2014, with further additions due over the medium term, as well as its domestic consumption patterns means that Saudi Arabia will be able to adjust to the needs of the global market. In the event that scrubbing technology uptake is high, then the impact will be quite negligible, with the Kingdom operating business as usual; whereas if compliance takes the form of fuel switching that results in higher demand for LSFO and marine diesel, then Saudi Arabia should benefit in two ways. First in the export of diesel, of which the Kingdom is a net exporter, and second from the import of cheaper HSFO to replace crude burn in the power sector.

Saudi Arabia has gone from being 95kb/d net short in diesel in the first half of 2014 to 486kb/d net long in 2017. This was driven predominantly by the new diesel geared refineries that came online; but domestic demand for diesel has also been contracting since 2015, declining by more than 10% in 2016 and more than 15% in 2017. There are several reasons behind this decline. First, the relatively higher cuts in diesel subsidies that were implemented in early 2015 drove prices up by nearly 80%. Second, the contribution to real GDP of the construction sector contracted by 3.3% in 2016 and a further 3.2% in 2017 against a backdrop of more general slowdown in economic activity. By extension, demand for transportation diesel – particularly for trucks and other heavy goods vehicles – declined. Third, diesel consumption in the power sector declined, displaced by greater use of fuel oil, which in 2016 grew by 16% compared with 5% the year before. But diesel in the power sector also declined due to the Saudi Electricity Company (SEC) relying more on gas thanks to the ramp up of the 26 billion cubic meter (bcm) Wasit gas facility. Nevertheless, if oil prices remain in the current range, and economic activity recovers, demand for diesel should return, but this would not affect the country's balances significantly especially over the medium term, as further refining capacity comes on line.

Net supply of fuel oil (kb/d)



Source: JODI Data

At the same time, Saudi Arabia's net balance of fuel oil is on a downward trajectory. Supply has remained relatively stable since 2014, averaging 460kb/d whilst demand for the fuel – used almost entirely in the power sector – increased by more than 34% since 2014 to reach 516kb/d in 2017. This has been partially due to higher demand in the power sector, with the first phase of the 2.6GW Jeddah South heavy-oil power plant coming on line in the second half of 2016.

As IMO regulations come into effect, Saudi Arabia will not only be able to consider the option of supplying more diesel due to its complex refineries, but also divert fuel oil towards the power sector. Over the next four years, Saudi Arabia is expected to add more than 25GW of generation capacity, of which around 9GW of oil-fired capacity will come on line in the next two years. This includes the Jizan megaproject which comprises a 4GW power plant and the 400kb/d integrated refinery. Saudi Arabia has ample options to utilise fuel oil in the domestic power sector. With the Kingdom expected to become a net importer of fuel oil due to rising power demand, lower demand for HSFO will mean that Saudi Arabia can also benefit from cheaper HSFO.

GCC well prepared for IMO

The GCC as a whole has embarked on many initiatives across the oil value chain that has helped them adapt to global developments. Some of these investments, such as additional refining capacity were built with an eye to supplying a growth in Asian demand for diesel driven by China. But the decision taken by the Chinese government to rebalance the economy and shift away from manufacturing and more towards consumer goods and services dampened the prospects for diesel imports. Luckily, the timely changes in IMO regulations will provide the GCC with an alternative market for diesel exports. Furthermore, Saudi Arabia is already ramping up production of light sweet crude from the Sheybah and Khurais fields that would limit high sulphur yields. In 2016, the Sheybah field, with total proven reserves of 14.3bn barrels, boosted its production of Arab Extra Light by 250kb/d to reach a total production capacity of 1mb/d, whilst the next phase of the Khurais expansion will see production increase from 1.2mb/d to 1.5mb/d by the end of this year.

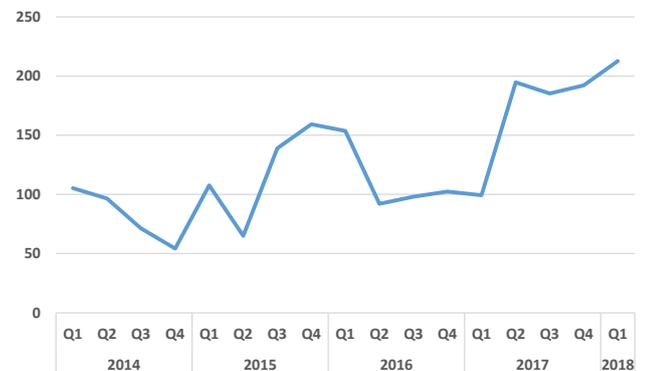
Kuwait has embarked on a series of clean fuel initiatives that will cost in excess of \$16bn. This will see the retirement of processing facilities at Shuaiba refinery, and major upgrades to Mina Al Ahmadi and Mina Abdulla to integrate into one refining complex. Like Saudi Arabia, Kuwait – a big user of HSFO - is also able to absorb fuel oil in the power sector in the run up to

and beyond the implementation of IMO 2020. Refinery upgrades and the new high specification 650kb/d Al Zour refinery, slated for 2021, will also position the country well in the production of LSFO and the exports of diesel. Bahrain, the GCC's smallest economy, is practically immune to changes in IMO regulations. The country does not consume fuel oil in power generation, whilst investments in the BAPCO refinery over the past few years have configured it more towards middle distillates and limited the production of fuel oil to near zero. The UAE are only marginally net long on fuel oil if we exclude bunkering demand, which is also expected to decline once the regulations take effect. Nonetheless, Takreer's carbon black and delayed coker project at the Ruwais refinery is designed to eliminate fuel oil production and should come on line in 2019.

Iran and Iraq will struggle to market HSFO

Uncertainty around Iran's future output remain, following the re-imposition of US sanctions. Although a relatively heavy user of fuel oil, consumption over the past three years has been declining, supporting the overall balance for fuel oil in the region. This decline is due to a greater displacement of fuel oil with gas in the power sector, as the country aims to retrofit existing fuel burning power plants and increase gas fired capacity. With the launch of five phases of the giant South Pars field back in 2017, the expectation was that the increase in gas production would continue to fuel the power sector, and in turn increase the surplus of fuel oil over the medium term. In 2017, demand for fuel oil decreased by 35% year on year compared with a 3% decline the year before. By April 2017, consumption of gas in the power sector had grown 18% year on year.

Net supply of fuel oil (kb/d)



Source: JODI Data

Iran's Exports of fuel oil grew by more than 50% in 2017 to average 168kb/d, whilst exports of the fuel in the first quarter of 2018 rose to 213kb/d compared with 99kb/d for the same period last year. Much of this surplus is exported to Fujairah to be sold as bunkers with the remainder going to other Asia Pacific markets. Although Iran's production of fuel oil has decreased, it remains large, and with the 2020 target looming, Iran will struggle to market HSFO especially with fuel switching in the domestic power sector. Few refineries in the country have the ability to produce compliant fuel oil. The Abadan refinery produces valuable fuel oil, used as a viscosity-reducing blendstock in the bunker trade, but it will not be able to comply with the low sulphur regulation. However, upgrades to the refinery are expected to reduce fuel oil yields from 40% to less than 20% although in absolute terms, the decline will be small as the refinery is running at less than half its 360kb/d capacity.

In Iraq, the picture is very similar. Fuel oil consumption in 2017 reached 200kb/d, a 20% increase compared with 2016 demand, but the country was still 67kb/d net long. The downstream sector has been a priority for the government with over 500kb/d of capacity expected shortly after the medium term. This could mean that the country's surplus of fuel oil will continue to increase; and, with new refineries such as Missan – expected to run on heavy sour crude coming online, the production of HSFO could rise. Iraq will therefore struggle to market its fuel oil. The refining sector in the country is not as sophisticated as its GCC peers, and with a power generating capacity equivalent to that of neighbouring Kuwait, it will not be able to absorb excess HSFO. As Iraq aims to increase gas production and progress with projects aimed at capturing flared gas, gas-fired plants will dominate the majority of new power generating capacity. In effect, fuel oil will either have to compete with more efficient and less carbon emitting gas in the power sector, or be exported at a heavy discount.

Conclusion

IMO regulations will create winners and losers across the industry. Uncertainty around the availability of LSFO, HSFO prices and scrubbing technology makes it difficult for ship-owners to take a decision on what outlet to adopt for IMO compliance. What is more clear is that demand for HSFO is likely to decline, whilst demand for compliant fuels such as marine diesel and LSFO will increase. This means that refineries that have the means to reduce fuel oil production, or that are geared to producing middle-distillates such as those across the GCC will benefit from the additional demand.

Saudi Arabia invested heavily in large complex refineries and has several mega projects in the pipeline to integrate the supply chain. Whilst its pursuit of higher light sweet crude production will help curb the fuel oil supply. Similarly, the UAE has further plans to increase the output of its Ruwais refinery, which fully ramped up production in 2015. More, the bunkering port of Fujairah, set to be the second largest in the world, will provide an outlet for blending and storage of compliant fuel oil and marine diesel for shippers. Bahrain and Kuwait have both undertaken comprehensive clean fuel initiatives enabling them to produce products that adhere to the highest global standards, thus positioning them well for the future.

But Middle East countries are expected to continue producing HSFO by nature of their geology and higher production of heavy grade sour crude. As a result, countries without a large enough power sector, such as Iraq, will not be able to absorb excess supplies of fuel oil, especially given that the sector is increasingly gearing towards gas-fired power plants, a visible trend in neighbouring Iran. Going forward, these countries will need to focus investments in the downstream sector on limiting fuel oil production, whilst new refineries will need to match the sophistication of new refineries across the GCC that will enable them to be flexible in the production of refined products and adapt to what is a dynamic and constantly changing market.

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