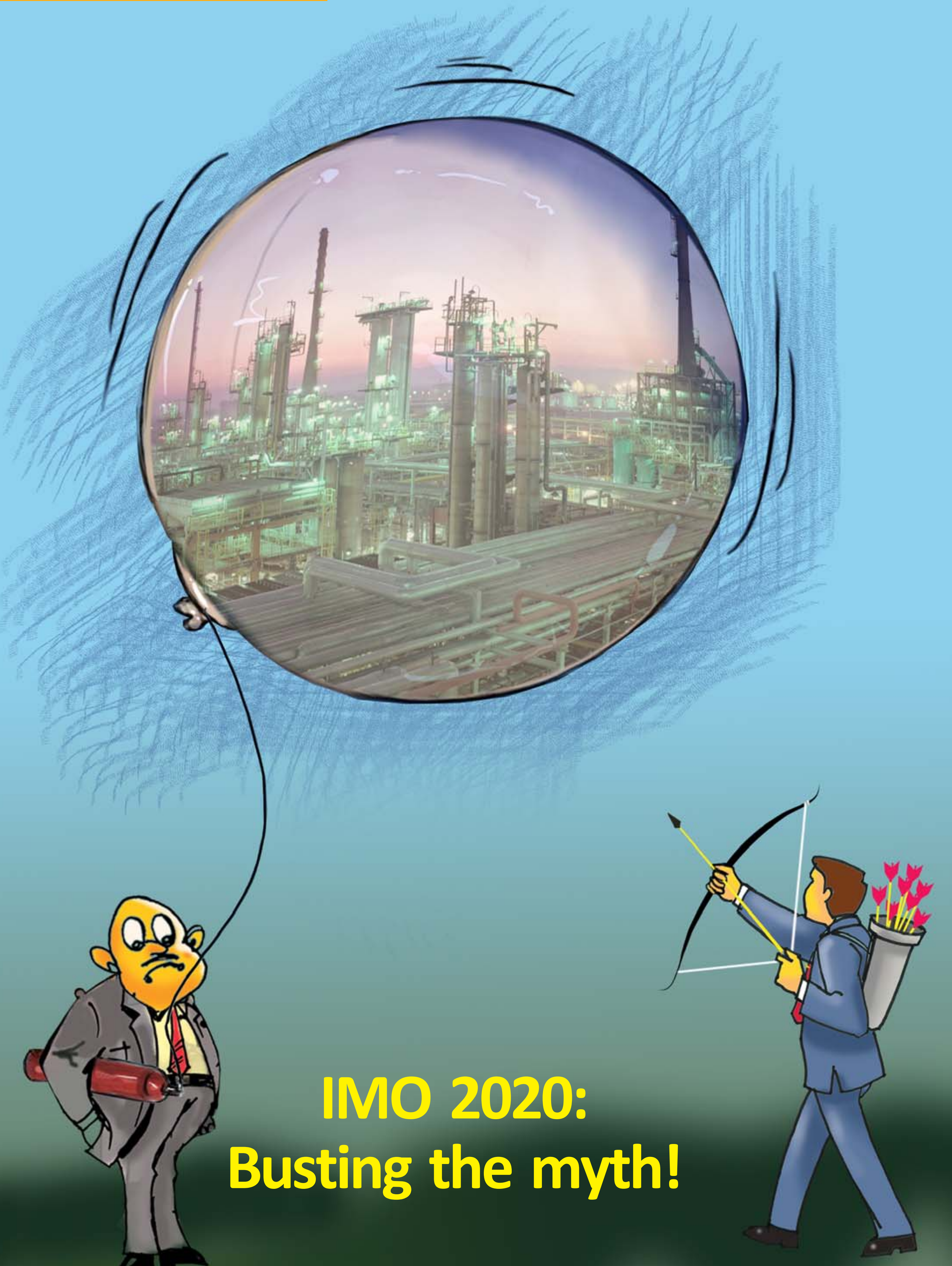
Thematic | August 2018

Oil & Gas



IMO 2020: Busting the myth!

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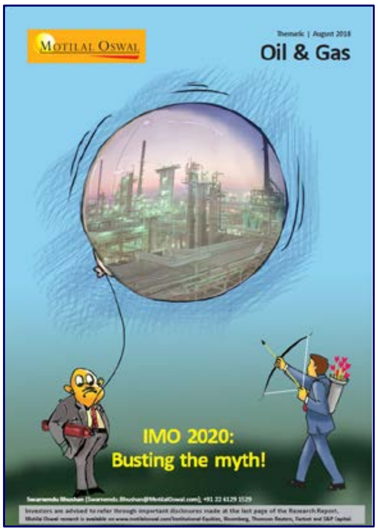


IMO 2020: Busting the myth!

Diesel cracks may improve, but overall refining margins still may not

- **International Maritime Organization (IMO) has mandated a lower sulfur content of 0.5% in marine fuels, down from 3.5% currently, with effect from January 2020.**
- **Various reports suggest that diesel offers the best alternative to high sulfur fuel oil (HSFO) and refineries may not be able to match this increased demand, resulting in spike in diesel cracks, and hence, refining margins.**
- **Our research busts this myth. We believe there would be no significant impact on GRMs.**

Replacement demand of 2.6mnbopd in 2020

- Consumption of diesel as marine fuel is likely to rise from 0.75mnbopd in 2019 to 3.3mnbopd in 2020. This would result in additional demand of 2.6mnbopd of diesel, almost 6x the average annual incremental demand since 2000.
- Even after knocking off ~1mnbopd of incremental production from new hydrocrackers, cokers and FCCUs globally, we would still need to fulfill 1.6mnbopd of demand. Add to this 0.8mnbopd of demand growth excluding marine.
- This calls for 90.2% of global capacity utilization, ~4% higher than the maximum utilization witnessed since the data available in BP's Statistical Reviews.

Diesel cracks could get wings, but others?

- There has not been a commensurate investment by refineries in hydrocrackers which could have maximized production of diesel or desulfurization units for removing sulfur from HSFO over past few years.
- This would certainly result in higher refinery runs in 2020. To prepare for the challenge, we also expect planned shutdowns to increase significantly in 2019.
- However, higher refinery runs in 2020 would also mean higher production of other products like LPG, naphtha, petrol, ATF among others. While diesel cracks could benefit GRMs, oversupply of other products could well negate the overall effect.

Other significant nuances

- Lower sulfur in marine fuel would lower demand for high sulfur crude oil. This could widen light-heavy differentials. However, decline in production from Venezuela and Iran, two big sources of heavy oil, could tighten supply.
- Fuel oil (FO) cracks would nosedive. Chinese teapot refineries, which have traditionally used FO as feedstock but recently changed to consuming crude oil, may see reversal in feedstock.
- There would be increased push towards usage of LNG as marine fuel.

What it means for Indian companies

- Due to increased shutdowns in 2019, benchmark refining margins would rise in 2019. 2020 may witness a marginal increase in refining margin.

- Standalone refiners like MRPL IN and MRL IN (not under coverage) could benefit the most. The contribution of refining to overall consolidated EBITDA is 33%, 35%, 39%, and 34% for RIL IN, IOCL IN, BPCL IN, and HPCL IN, respectively.
- Due to increased supply of products other than diesel, cracks of those products would suffer. Decline in naphtha crack spreads would mean better margins for naphtha-based petchem producers like IOCL IN and RIL IN, which use naphtha in addition to other feedstock for petchem.

Valuations and recommendations

- General belief is that IMO 2020 would result in better refining margins due to increased demand of diesel. We conclude that while diesel cracks might increase, higher refinery runs to satisfy the increased diesel demand would also increase production of other refinery products. The excess supply would result in decrease in cracks of other products. As a result, overall refining margins may not change significantly. Due to the complex interplays, we still do not change our GRM assumptions.
- However, we highlight that *ceteris paribus*, USD5/bbl change in diesel cracks would change conso EBITDA by 21.3%, and 15.7% for BPCL IN, and HPCL IN, respectively. MRPL would witness highest increase of 44% on its standalone EBITDA.
- Ceteris Paribus, RIL's conso EBITDA would increase by 6.6% if diesel cracks increase by USD5/bbl. RIL is trading at 13.5x FY20E EPS and 9.1x consolidated EV/EBITDA. We increase our valuation for RIL from INR1,301 to INR1,477 primarily realigning our valuation for its retail segment with peers and recommend Buy.
- Ceteris Paribus, IOCL's conso EBITDA would increase by 22.7% due to increase of USD5/bbl in diesel crack. IOCL IN is trading at 8.2x FY20E EPS and 5.7x consolidated EV/EBITDA. We value it using SOTP at INR252 and recommend Buy. BPCL's conso EBITDA would increase by USD21.3% for USD5/bbl change in diesel crack. BPCL IN is trading at 7.3x FY20E EPS and 6.6x consolidated EV/EBITDA. We value it using SOTP at INR534 and recommend Buy. HPCL's conso EBITDA would increase by 15.7% for USD5/bbl increase in diesel crack. HPCL IN is trading at 5.1x FY20E EPS and 5.2x consolidated EV/EBITDA. We value it using SOTP at INR426 and recommend Buy.
- MRPL's standalone EBITDA would increase by 44% for USD5/bbl change in diesel crack. MRPL is trading at 6.9x FY20E EPS and 3.1x FY20E EV/EBITDA. We value it at 5.0x FY20 EV/EBITDA and reiterate our Neutral recommendation with a target of INR88.

Relative valuation of Indian refining companies

	CMP (INR)	Target (INR)	PE (x)			EV/EBITDA (x)			PBV (x)			ROE (%)			ROCE (%)		
			FY18	FY19E	FY20E	FY18	FY19E	FY20E	FY18	FY19E	FY20E	FY18	FY19E	FY20E	FY18	FY19E	FY20E
RIL IN	1,278	1,477	21.0	16.7	13.5	14.6	10.9	9.1	2.6	2.2	1.9	13.0	14.3	15.4	8.8	10.5	11.5
IOCL IN	154	252	6.4	8.6	8.2	5.0	5.5	5.7	1.3	1.2	1.2	21.0	14.5	14.4	14.4	10.6	10.2
BPCL IN	358	534	7.2	7.4	7.3	7.0	6.4	6.6	1.9	1.7	1.5	29.0	24.4	21.6	13.7	12.5	11.2
HPCL IN	259	426	5.5	5.5	5.1	5.5	5.1	5.2	1.5	1.3	1.2	31.0	26.2	24.2	15.8	12.6	12.2
MRPL IN^	82	88	6.4	8.2	6.9	4.2	4.2	3.1	1.3	1.2	1.0	21.2	15.0	15.9	15.7	12.5	13.4

^Standalone

Source: Bloomberg, MOSL

IMO 2020: Busting the myth

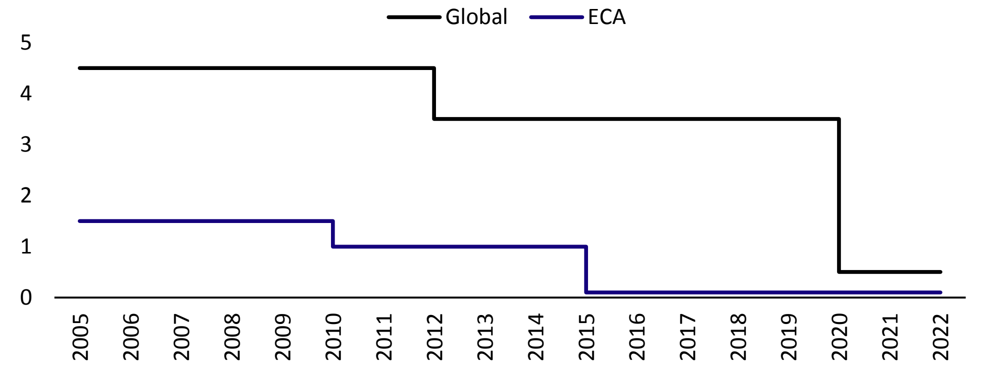
Diesel cracks may rise, but others could face a decline

- **Sulfur restriction of 0.5% in marine fuels from January 2020 by IMO 2020 could result in incremental demand of 2.6mnbopd of diesel, 6x the average growth since 2000.**
- **~1.5mnbopd expansion in hydrocracker, coker and FCCU would add ~1mnbopd of incremental diesel supply.**
- **Refining utilization needs to stretch to never-seen levels of ~90.2% to supply additional diesel demand.**
- **Diesel cracks may increase, but other refining products would face oversupply.**

2020: Death of HSFO

- From January 2020, IMO mandates a maximum content of 0.5% sulfur in marine fuels. The existing sulfur limit of 0.1% for four emission control areas would remain unchanged.
- Reports suggest that out of ~4mnbopd of marine fuel consumed currently, 0.75mnbopd is diesel while the rest is HSFO (3.5% sulfur).
- From January 2020, as HSFO goes out, alternatives could be very low sulfur fuel oil (VLSFO), diesel oil, LNG or HSFO, with a scrubber installed on the carrier.
- IMO's decision in 2016 was based on the exhaustive study of Delft, which suggested that there would not be a dearth of marine fuels in 2020. It does not appear that IMO would change its regulation. If push comes to shove, it may though give certain waivers for a steady transition.

Exhibit 1: Sulfur norms for marine fuel (%)



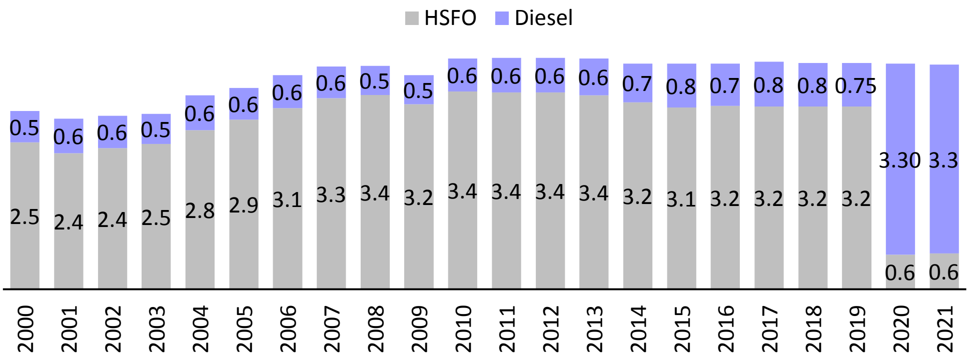
Source: IMO, MOSL

Diesel: Mr Fallback!

- 20% of the shippers control ~80% of the shipping business. Additionally, scrubbers would occupy substantial amount of space and compliance would always be limited to the intent of the vessel owner. Hence, we do not believe that this could find substantial usage.
- LNG provides the best alternative and we see that several key ports are coming up with bunkering facilities for LNG. However, this would also take time to fructify, since it would be limited mostly to new ships.
- VLSFO is also an alternative. However, HSFO is high in other impurities like metals, asphaltenes, sediments, etc, which make desulfurization difficult.
- The best alternative is either to blend HSFO with diesel or to use diesel oil itself to comply with 0.5% sulfur restriction.

- Various studies suggest incremental demand of 2.6mnbopd of diesel in 2020 due to IMO regulation. This acquires significance, as this is almost six times the average annual growth in global consumption since 2000. To get a sense of the magnitude, India consumed ~1.6mnbopd of diesel in 2017, while China consumed 3.5mnbopd.

Exhibit 2: Diesel demand to rise by 2.6mnbopd in 2020 (mnbopd) due to IMO restriction

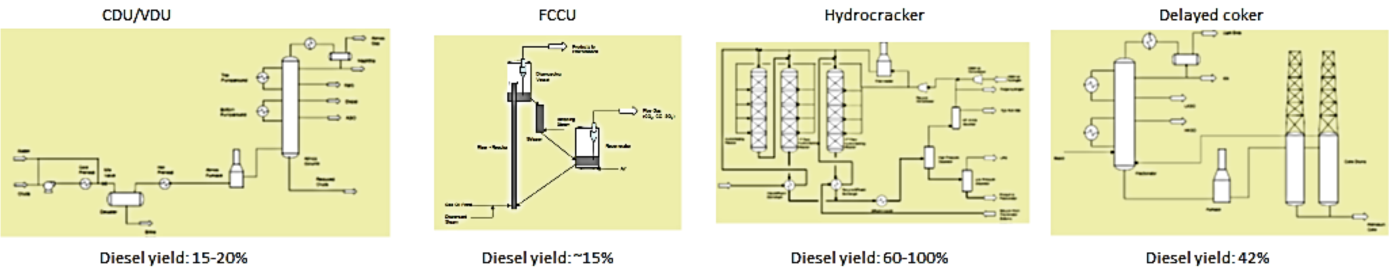


Source: IEA, MOSL

Diesel cracks to go through the roof

- In addition to 2.6mnbopd diesel required for marine fuels in 2020, we require 0.8mnbopd of diesel at 1% growth in global consumption. So, supply of incremental 3.4mnbopd has to be fulfilled by 2020.
- Global refining utilization in 2017 stood at 83.5%. Global consumption of diesel stood at 27.8mnbopd, a yield of 33.9% on refining throughput of 81.9mnbopd in 2017.
- A simple refinery can give only 15-20% of diesel yield. Hydrocracker is the technology used to maximize diesel yield in a refinery. Typically, yield of diesel in a hydrocracker ranges from 60% in older configurations to 100% for newer configurations. Additionally, other secondary units like coker and fluidized catalytic cracking unit (FCCU) also yield 42% and 15% diesel, respectively.
- It is estimated that a total of ~1.6mnbopd of new hydrocracking, coking and FCCU capacities may come up by 2020. These would generate a total of ~1mnbopd of incremental diesel demand.
- We would still require fulfilling 2.5mnbopd of incremental diesel demand. If nothing comes from other sources like coal-to-liquids (CTLs), condensate splitters, higher runs of simple refiners, revival of mothballed refineries and debottlenecking of existing refineries to increase diesel yield, then global refining utilization has to rise to ~90% in 2020, a level unseen in the data available in BP Statistical Reviews (since 1980).
- Futures reflect a crack spread of ~USD20/bbl for diesel. We see exciting times for diesel, but nuances of demand and supply need to be studied.

Exhibit 3: Diesel yields from refinery units (%)



Source: www.processengr.com, MOSL

Exhibit 4: Demand for diesel going forward

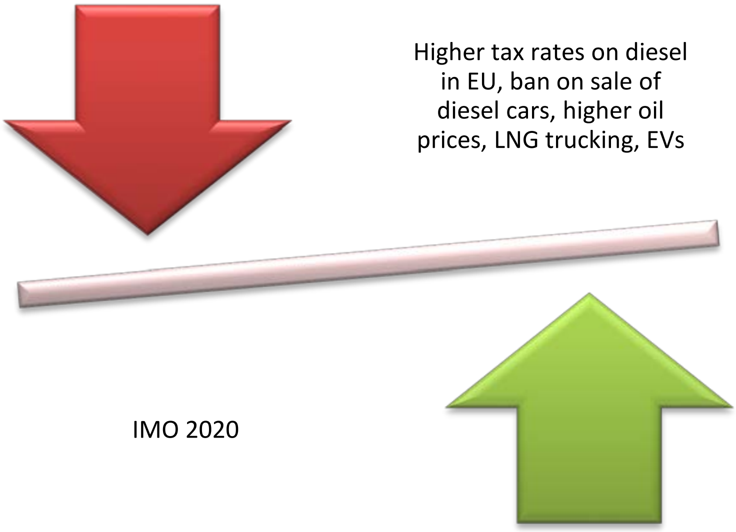
	mnbopd	Diesel Yield (%)
Incremental demand over 2017 excluding marine application	0.8	
Incremental diesel demand for marine fuels in 2020	2.6	
Total incremental demand of diesel	**3.4**	
Incremental secondary capacities		
Hydrocracking	0.7	90
Coking/visbreaking	0.5	42
FCCU	0.4	15
Incremental diesel supply from above	**0.9**	
Leftover demand to be fulfilled	2.5	
Incremental refining capacity required	6.9	
Increase in refining utilization (%)	6.8	
Refining utilization in 2017 (%)	83.5	
Refining utilization in 2020 (%)	**90.2**	**4.2% higher than max utilization witnessed since 1980**

Source: MOSL

What could hamper diesel demand by 2020?

- Since the scandals in compliance data of major automobile manufacturers in Europe, there has been an outcry for levying higher taxes on diesel. Few countries like France and Britain have banned the sale of diesel cars by 2040. Norway and Germany are also thinking on similar lines. This may slow down consumption of diesel.
- With transportation accounting for 30% of total greenhouse emissions, focus on zero emission electric vehicles has been increasing. Sale of battery electric vehicles (BEVs) / plug-in hybrid vehicles (PHEVs) has been growing at a CAGR of 116% in the last decade. Further decline in battery cost may adversely impact diesel consumption growth.
- Higher crude, and thereby, diesel prices would anyway slow down consumption of diesel globally. Global economic growth may also be hampered with increasing rift between the US and China.
- After successful application of LNG trucking in China, Europe seems to be ramping up its Blue LNG Corridor project. India has also approved LNG as a transportation fuel and several companies like Shell, Petronet, and H-Energy have been working upon plans for LNG trucking.

Exhibit 5: Demand/supply nuances for diesel going forward

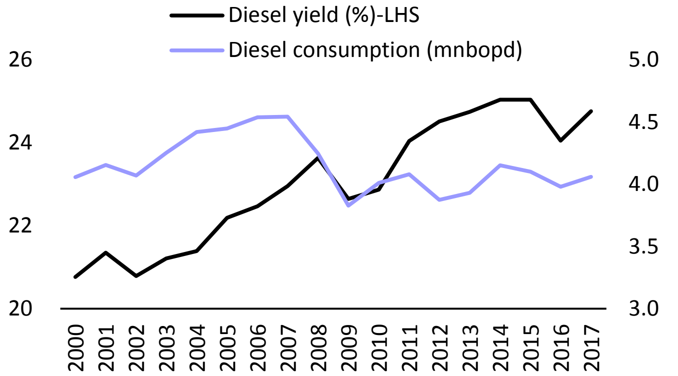


Source: MOSL

What could aid diesel supply by 2020?

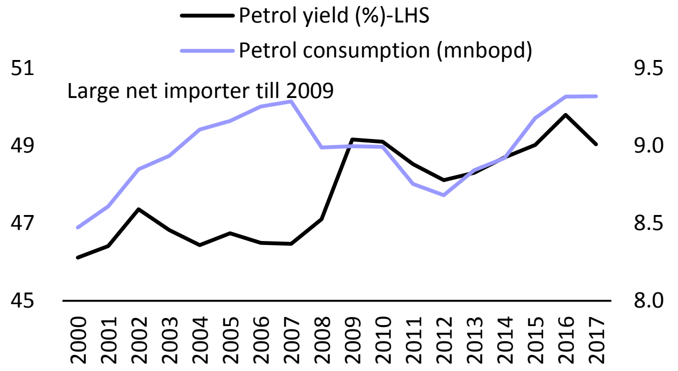
- Even without adding big projects like hydrocracking, FCCU and cokers, refiners have shown the tendency to materially alter their yield profile as per market requirements.
- In addition to the US refinery yields mirroring demand, we also see that with debottlenecking and smaller projects, Indian refineries have also been able to improve their yield significantly. We present two major examples: MRL IN improved its diesel yield by ~4% in FY14 without any major projects listed in the annual report. Similarly, Numaligarh Refinery (NRL) showed ~6% improvement in petrol yield without any major project mentioned in the annual report.
- The yields of other Indian refineries have also gone through major changes, but it is difficult to judge what improvement has been only on the basis of small projects and not bigger ones with long lead times. We have deliberately not presented change in yields of MRPL IN, as it has been stabilizing its big expansion of INR150b, which would have majorly contributed to yield change.
- Out of 14.5mnbopd of refining capacity in China, ~4.2mnbopd is of teapot refineries. Historically, they used to take FO as feedstock. Utilization levels of these refineries used to be below 40% prior to 2015 due to limited access to crude oil. From mid-2015, the Chinese government has been awarding them crude import quotas, which has helped in increasing the utilization to ~60% in 2016. Since then, their utilization appears to be 60-70%. In 2017, China witnessed an overall utilization level of 80% – independent refiners at ~70% and national oil refiners at ~85%.
- Although the Chinese government has been increasing crude oil import quotas for independent refiners in 2018, few of them have already started sourcing FO. Come 2020, since HSFO demand would be absent, FO cracks would sink. There is a high possibility that the teapot refiners would start processing FO. They could then send their products as intermediates to the larger refineries for further processing or blending, thereby increasing diesel demand in a big way.

Exhibit 6: US diesel yield has mirrored demand



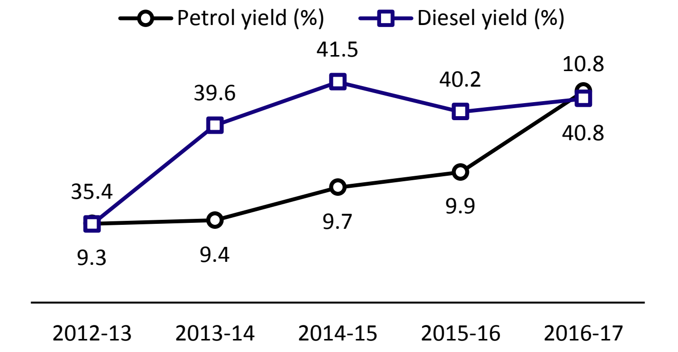
Source: EIA, MOSL

Exhibit 7: US petrol yield has broadly mirrored demand



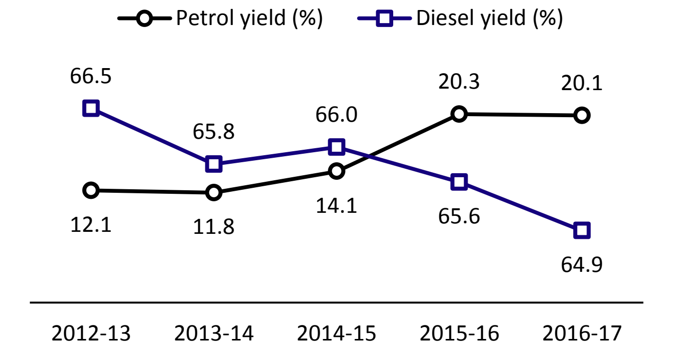
Source: EIA, MOSL

Exhibit 8: Petrol & diesel yields of MRL IN



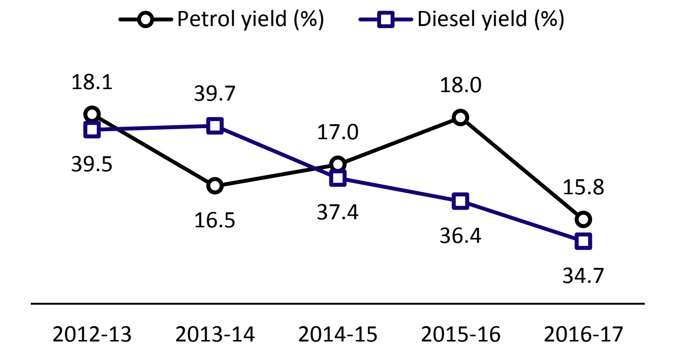
Source: PNGSTAT, MOSL

Exhibit 9: Petrol & diesel yields of NRL



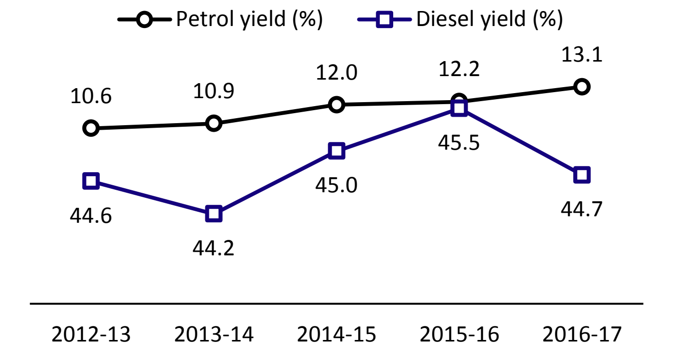
Source: PNGSTAT, MOSL

Exhibit 10: Petrol & diesel yields of RIL IN



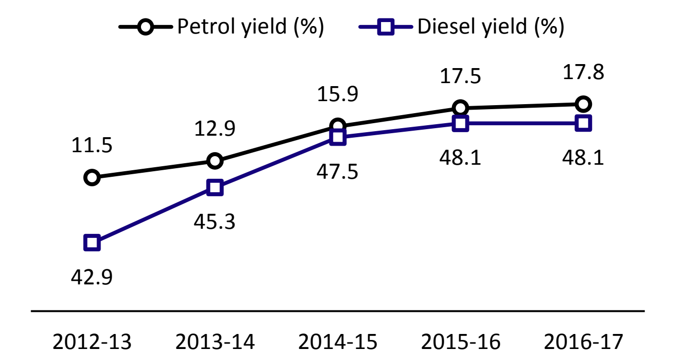
Source: PNGSTAT, MOSL

Exhibit 11: Petrol & diesel yields of IOCL IN



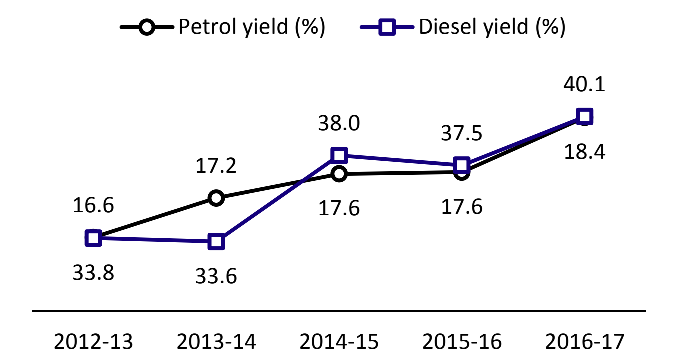
Source: PNGSTAT, MOSL

Exhibit 12: Petrol & diesel yields of BPCL IN



Source: PNGSTAT, MOSL

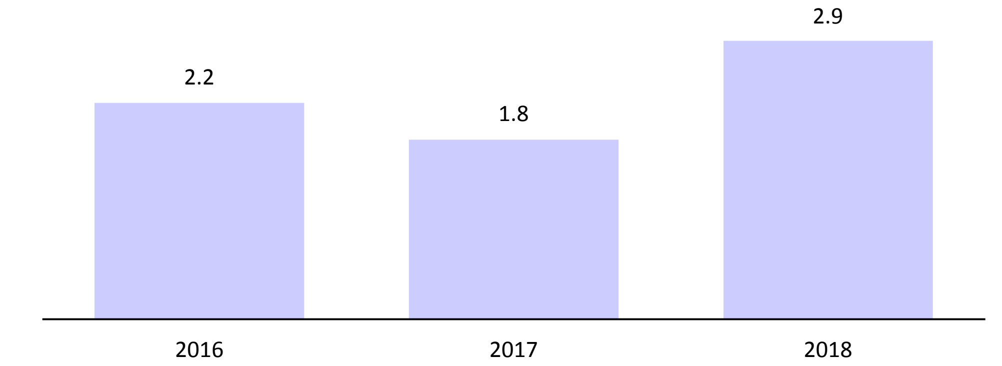
Exhibit 13: Petrol & diesel yields of HPCL IN



Source: PNGSTAT, MOSL

Despite higher quotas, higher crude oil price has forced teapot refineries to revert to FO (link)

Exhibit 14: Chinese government has raised quota for teapot refineries in 2018 (mnbopd)

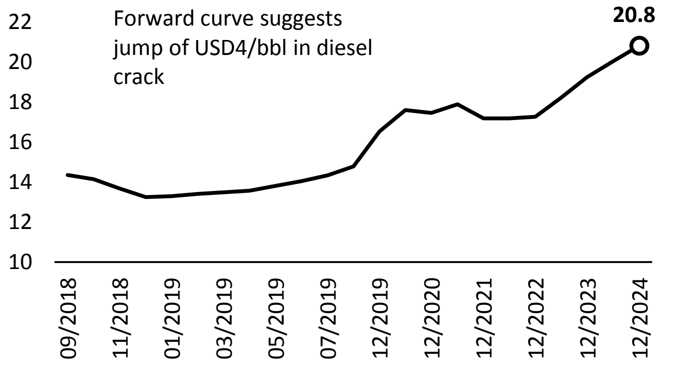


Source: PPAC, MOSL

Diesel cracks would climb, what about others?

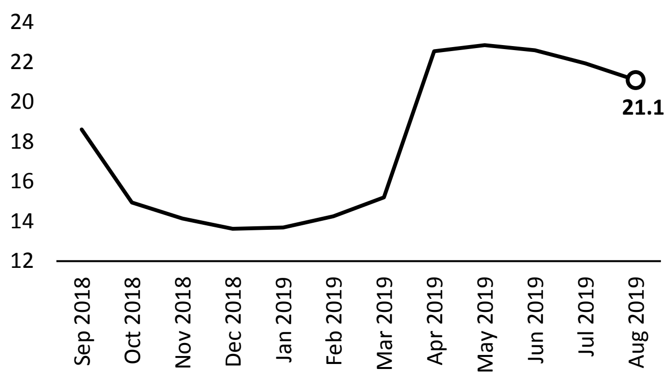
- Out of total consumption of 98.3mnbopd of petroleum products in 2017, 27.8mnbopd or 28% was diesel. Futures reflect diesel cracks of USD20/bbl in 2020.
- Our analysis suggests that refinery utilization would rise to 90% in 2020 to fulfill incremental demand of diesel.
- However, this higher utilization would also produce extra barrels of other products, thereby creating a glut of other products.
- This would mean that while diesel cracks would rise sharply, those of other products would decline sharply in 2020.
- What is more plausible is, that to prepare for higher runs in 2020, the refining industry would see a high level of planned shutdowns in 2019. Hence, the possibility of GRMs rising in 2019 is much higher than in 2020.
- Indian refiners have a diesel yield of 42.4%. Overall impact on GRMs would depend on the rise in diesel cracks versus decline in cracks of other products.

Exhibit 15: Forward curve for diesel crack (USD/bbl)



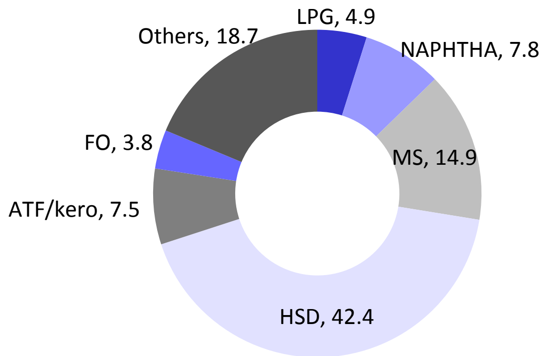
Source: Bloomberg, MOSL

Exhibit 16: Forward curve for petrol crack (USD/bbl)



Source: Bloomberg, MOSL

Exhibit 17: Yield of Indian refineries in FY18 (%)

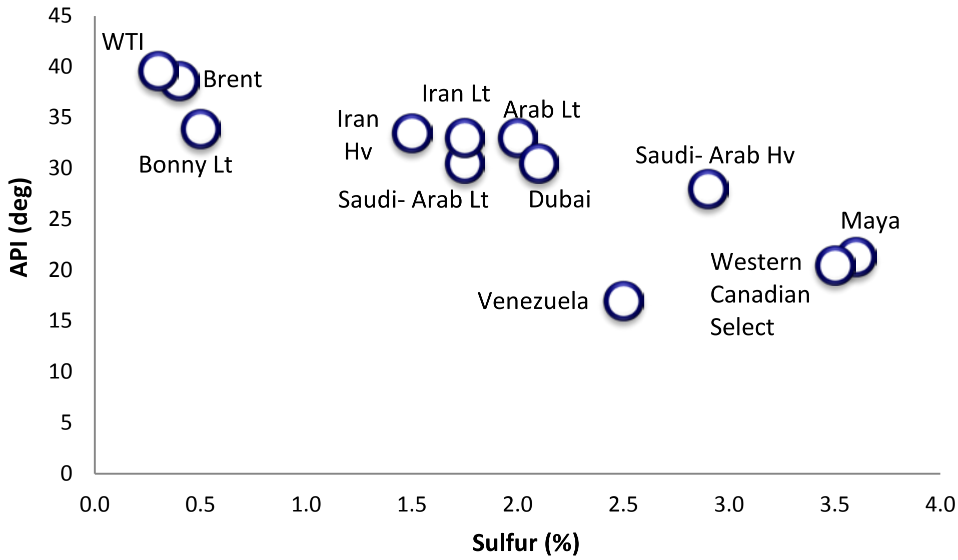


Source: PPAC, MOSL

Impact on light-heavy differentials

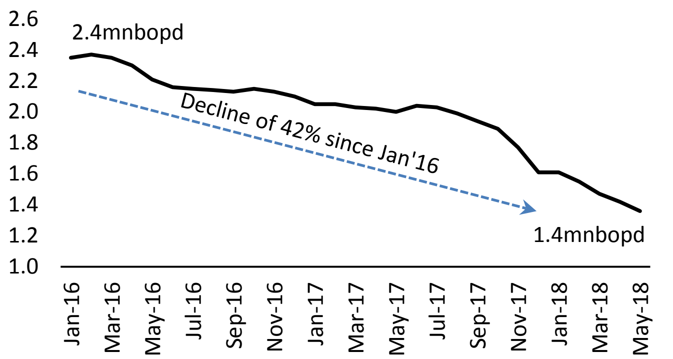
- Elimination of HSFO would weaken demand for high sulfur crude oil in favor of sweeter crude oil grades. Low demand for high sulfur crude should push prices down. Lower prices of high sulfur crude would mean wider light-heavy differentials. Wider differentials would help complex refiners like RIL.
- However, Venezuela and Iran, two significant high sulfur crude producers face increased uncertainties. If exports from these countries are adversely impacted, then supply of high sulfur crude itself would come down, thereby negating the weakness in demand.

Exhibit 18: Various crude oil grades



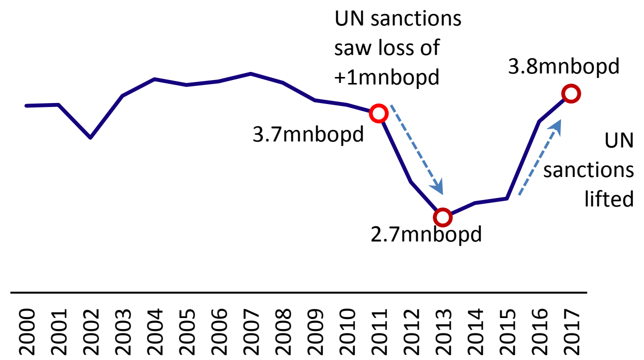
Source: EIA, MOSL

Exhibit 19: Production of Venezuelan crude oil (mnbopd)



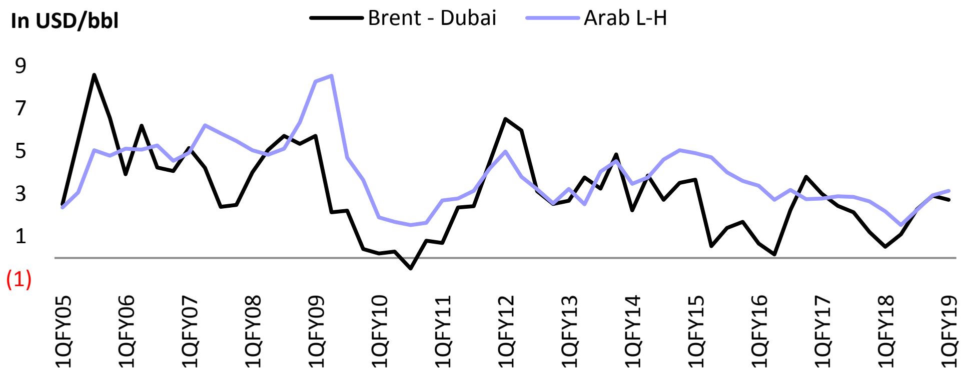
Source: IEA, MOSL

Exhibit 20: Production of Iranian crude oil (mnbopd)



Source: IEA, MOSL

Exhibit 21: Arab Light-Heavy differentials (USD/bbl)



Source: Reuters, MOSL

Indian refiners and IMO 2020

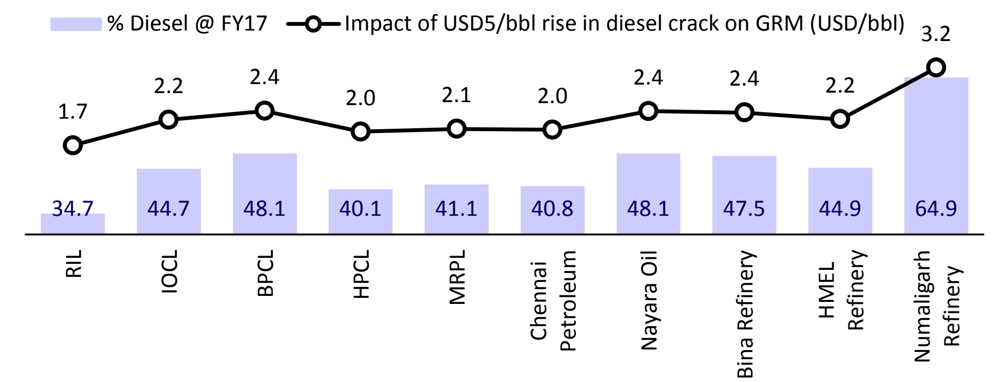
Ceteris paribus, diesel cracks would boost OMCs/MRPL the most

- **OMCs have a diesel yield of 40-48% and RIL has a diesel yield of 35% as per PNGSTAT data.**
- **Ceteris paribus, rise of USD5/bbl in diesel crack would increase EBITDA by 7-44%.**
- **Complex refiners like RIL would benefit from widening light-heavy differentials.**

Impact on Indian refiners

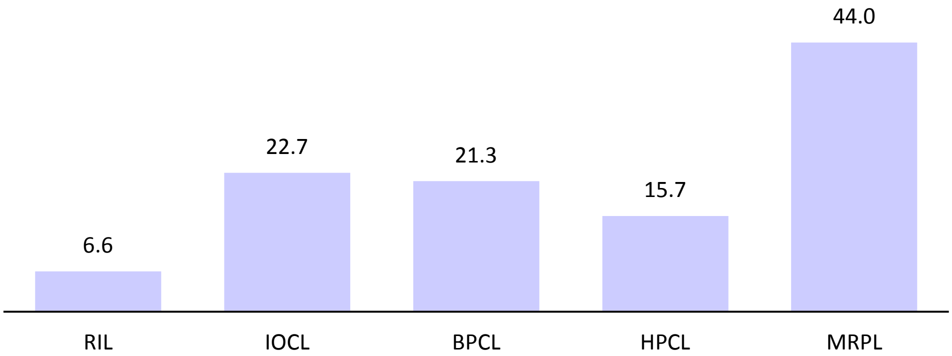
- Our thesis is that there may not be significant expansion in GRMs in 2020, as rise in diesel cracks would be broadly matched by decline in cracks of other products.
- Petroleum and Natural Gas Statistics presents data on yields of individual refineries in India. The 2018 publication is yet to come. To keep the source same, we refer to the 2017 publication for yields of all Indian refiners.
- Amongst all Indian refiners, the Oil Marketing Companies (OMCs: IOCL IN, BPCL IN, HPCL IN) have a diesel yield of 40-48%. Independent refiners, MRPL IN and MRL IN have diesel yields of 41% and 40%, respectively. Nayara (erstwhile Essar) Oil has a diesel yield of 48%. Joint venture refineries, HMEL and Bina have diesel yields of 44.9% and 47.5%, respectively. Numaligarh Refinery appears to have the highest yield of 64.9%.
- Ceteris paribus, increase of USD5/bbl in diesel crack would raise the GRMs of OMCs by USD2-2.4/bbl and RIL by ~USD1.7/bbl. All other refiners would see an increase of USD2-2.4/bbl, except NRL, which would witness an increase of USD3.2/bbl.
- We further estimate that ceteris paribus, rise of USD5/bbl in diesel crack would increase consolidated EBITDA of OMCs by 15-22% and that of RIL by 7%. Standalone EBITDA of MRPL would increase by 44%.

Exhibit 22: Impact of rise in diesel crack on GRMs, ceteris paribus



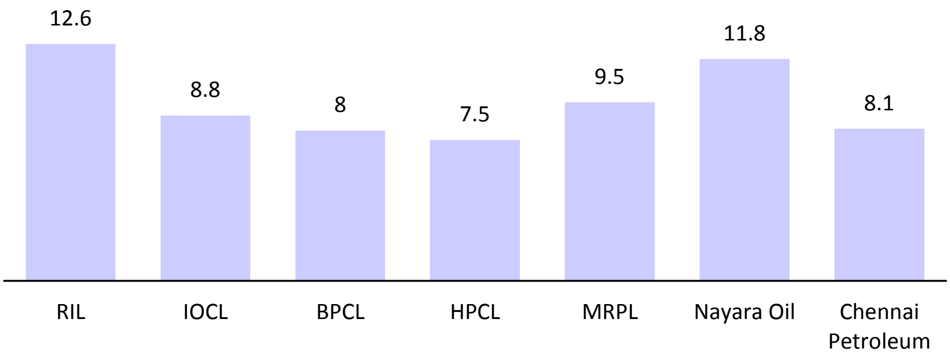
Source: PNGSTAT, MOSL

Exhibit 23: Impact of USD5/bbl rise in diesel crack on consolidated EBITDA (%)



Source: MOSL

Exhibit 24: Any expansion in light-heavy differential could benefit complex refiners more



Source: Industry, MOSL

Exhibit 25: Impact of USD5/bbl change in diesel crack

		Impact of USD5/bbl rise in diesel crack on GRM (USD/bbl)	Standalone Throughput (mmt)	Exchange rate (INR/USD)	Impact on FY20 Conso EBITDA (INRmn)	EBITDA (INRmn)	% of conso
Yield of diesel in Indian refineries	% Diesel @ FY17	5					
RIL	34.7	1.7	70.0	70.9	63,093	952,466	6.6
IOCL	44.7	2.2	72.0	70.9	83,521	367,649	22.7
BPCL	48.1	2.4	28.9	70.9	36,082	169,257	21.3
HPCL	40.1	2.0	17.5	70.9	18,215	115,753	15.7
MRPL^	41.1	2.1	16.0	70.9	17,096	38,857	44.0

^Standalone

Source: PNGSTAT, MOSL

Valuations and recommendations

- While we believe that overall refining margins would be strong in 2019 due to increased global shutdowns, several Indian refiners may also schedule their shutdowns in 2019.
- Hence, while GRMs may improve, lower throughput may neutralize the impact.
- RIL is trading at 13.5x consolidated FY20E EPS and 9.1x consolidated FY20E EBITDA. We value RIL using SOTP, giving 7.5x EV/EBITDA multiple to its refining and petchem business. We increase our target price from INR1,301 to INR1,477. The change is primarily to realign our valuation of its retail segment with peers. Earlier, we were valuing retail segment at 1x its FY20 sales. However, we see that peers with 11-30% CAGR in sales in FY18-20 are trading at an average 2.9x FY20 sales. However, we note that RIL's retail segment has a much lower

EBITDAM of ~4-5% compared with ~10% for the peers. We raise our P/S for RIL's retail segment from 1x to 2.5x FY20 sales. With a target price of INR1,477, we reiterate Buy.

- High crude oil prices have been weighing on the OMCs. They have witnessed decline of 18-35% since January 2018, with Brent rising by USD6/bbl and rupee depreciating ~10%. Although they have been managing auto fuel gross margins well (currently petrol at INR1.8/liter, diesel at INR2.5/liter), lack of clarity on crude oil prices amidst upcoming elections is likely to keep stocks under stress for some more time.
- Stock prices imply no valuation for IOCL's marketing segment and 64-68% discount to BPCL and HPCL's marketing EBITDA.
- We value OMCs using SOTP, valuing refining at 6.0x FY20E EBITDA, petchem at 5.0x FY20E EBITDA, pipeline at 7.5x FY20E EBITDA, and marketing at 6.0x FY20E EBITDA.
- We reiterate our Buy recommendations for all the OMCs. Our preference stays with IOCL IN with a target price of INR252 due to strong cash flow of INR30/share during FY18-20. Adjusted EPS CAGR during FY18-20 is expected at 3.4%. Commissioning of polypropylene plant and Ennore LNG terminals would also result in better profitability, although in late FY20 (not included in our estimates).
- BPCL is likely to witness another quarter of disappointment, as it continues to stabilize the INR160b expansion at Kochi. We reiterate Buy, with a target price of INR535.
- HPCL is likely to have free cash flow of INR36/share during FY18-20. We reiterate Buy with target of INR426. However, we are concerned on the expansion at Vizag refinery. The slurry technology being deployed by the company does not have much precedence, globally. Lack of sufficient data may result in elongated stabilization of the expansion, thereby adversely affecting performance and financials. Additionally, risk of crude oil price and narrower marketing margin is the highest on HPCL.

Exhibit 26: Relative valuation of Indian refining companies

	CMP	Target	PE (x)			EV/EBITDA (x)			PBV (x)			ROE (%)			ROCE (%)		
	(INR)	(INR)	FY18	FY19E	FY20E	FY18	FY19E	FY20E	FY18	FY19E	FY20E	FY18	FY19E	FY20E	FY18	FY19E	FY20E
RIL IN	1,278	1,477	21.0	16.7	13.5	14.6	10.9	9.1	2.6	2.2	1.9	13.0	14.3	15.4	8.8	10.5	11.5
IOCL IN	154	252	6.4	8.6	8.2	5.0	5.5	5.7	1.3	1.2	1.2	21.0	14.5	14.4	14.4	10.6	10.2
BPCL IN	358	534	7.2	7.4	7.3	7.0	6.4	6.6	1.9	1.7	1.5	29.0	24.4	21.6	13.7	12.5	11.2
HPCL IN	259	426	5.5	5.5	5.1	5.5	5.1	5.2	1.5	1.3	1.2	31.0	26.2	24.2	15.8	12.6	12.2
MRPL IN^	82	88	6.4	8.2	6.9	4.2	4.2	3.1	1.3	1.2	1.0	21.2	15.0	15.9	15.7	12.5	13.4

^Standalone

Source: Bloomberg, MOSL

Exhibit 27: Major assumptions

Major assumptions	FY15	FY16	FY17	FY18	FY19E	FY20E
Exchange rate (INR/USD)	**61.2**	**65.4**	**67.1**	**64.5**	**68.2**	**70.9**
Brent (USD/bbl)	86.0	47.8	49.0	57.6	71.3	70.0
SG GRM (USD/bbl)	6.4	7.5	5.8	7.3	6.0	6.0
RIL IN						
Refining						
Throughput (mmt)	67.9	69.5	70.1	70.0	69.1	70.0
GRM (USD/bbl)	8.8	10.8	11.0	11.6	11.3	11.5
Petrochem						
Vol (mmt)	7.5	8.2	8.1	10.9	12.0	12.0
EBITDA/mt (USD)	256	266	315	361	375	375
IOCL IN						
Refining						
Throughput (mmt)	53.6	56.7	65.2	69.0	71.6	72.0
GRM (USD/bbl)	0.3	5.1	7.8	8.5	7.0	6.0
Marketing						
Vol (mmt)	68.5	72.7	74.1	77.1	80.1	83.3
Gross margin (INR/lit)	4.6	3.7	4.2	4.4	4.0	3.6
Petrochem						
Vol (mmt)	2.4	2.5	2.5	2.4	2.5	3.2
EBITDA/mt (USD)	233	366	451	400	358	370
Pipeline						
Vol (mmt)	75.7	79.8	82.5	85.7	91.4	95.4
EBITDA/mt (INR)	725	737	742	777	816	816
BPCL IN						
Refining						
Throughput (mmt)	23.4	24.1	25.4	28.5	29.4	28.9
GRM (USD/bbl)	3.6	6.6	5.3	6.9	7.5	6.4
Marketing						
Vol (mmt)	34.5	36.5	37.7	41.2	43.4	45.1
Gross margin (INR/lit)	4.4	4.0	4.2	3.9	3.8	3.6
Pipeline						
Vol (mmt)	11.6	11.6	11.6	11.6	11.6	11.6
EBITDA/mt (INR)	499	533	548	526	556	578
HPCL IN						
Refining						
Throughput (mmt)	16.2	17.2	17.8	18.3	17.6	17.5
GRM (USD/bbl)	2.8	6.7	6.2	7.4	6.6	6.3
Marketing						
Vol (mmt)	32.0	34.1	35.1	36.9	38.5	39.8
Gross margin (INR/lit)	3.9	3.4	4.0	3.6	3.9	3.9
Pipeline						
Vol (mmt)	14.9	17.6	17.9	20.1	21.2	22.0
EBITDA/mt (INR)	524	560	575	552	584	607
MRPL IN						
Refining						
Throughput (mmt)	14.7	15.7	16.3	16.0	16.0	16.0
GRM (USD/bbl)	3.4	6.9	6.0	6.4	5.7	6.0

Source: Company, MOSL

Exhibit 28: Valuations

Valuation	CMP (INR)	Target Price (INR)	Upside (%)	Valuation methodology
RIL IN	1,270	1,477	16	SOTP, refining & petrochem at 7.5x EV/EBITDA, retail at 2x revenue, Jio equity valuation of INR255
IOCL IN	155	252	63	SOTP, refining & marketing at 6x, petrochem at 5x, pipeline at 7.5x
BPCL IN	356	534	50	SOTP, refining & marketing at 6x, pipeline at 7.5x
HPCL IN	258	426	65	SOTP, refining & marketing at 6x, pipeline at 7.5x
MRPL IN	83	88	6	Refining at 5.5x EV/EBITDA

Source: MOSL

Exhibit 29: Valuation of retail peers

	EBITDAM (%) @ FY20	EBITDA CAGR FY18-20E (%)	PAT CAGR FY18-20E (%)	ROE (%)	P/E (x) FY20	EV/EBITDA (x) FY20	P/S (x) FY20E
Avenue Supermart	9.4	28.4	32.0	21.8	70.0	42.0	4.0
Titan	11.6	30.7	27.2	28.0	42.6	29.6	3.0
Shoppers Stop	7.7	11.0	(1.3)	13.7	32.0	14.0	1.0
Trent	10.8	22.4	70.1	13.9	47.5	35.0	3.8
Average	**9.9**						**2.9**

Source: Bloomberg, MOSL

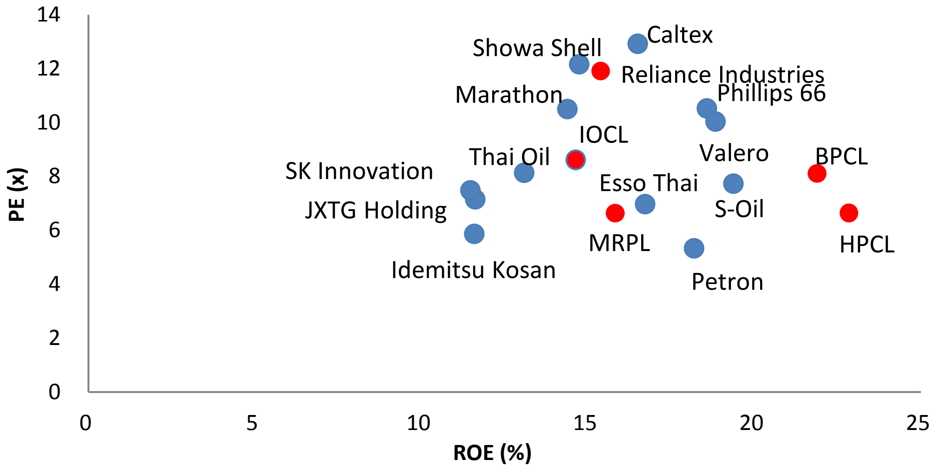
Exhibit 30: Increasing the target price of RIL from INR1,310 to INR1,477

Sum of the parts (on FY20 basis)				**Remarks/Methodology**
Core business	**FY20 EBITDA**	**EBITDA multiple**	**INR/share**	
Refining (INR m)	309,674	2,322,554	393	7.5x FY20 EBITDA
Petrochem (INR m)	353,508	2,651,307	448	7.5x FY20 EBITDA
E&P			67	
KG D6			5	DCF
PMT			7	DCF
NEC-25			2	USD 5/boe
CBM			4	USD 5/boe
Shale			-36	7x EV/EBITDA FY20
KG basin exploratory upside			86	USD 5/boe
Investments				
RGTIL			3	Book value
Reliance Retail			295	2.5x FY20 sales (earlier 1x)
RJio			255	DCF
Total			**1,461**	
Net debt / (cash) standalone			-17	
Target price			**1,477**	

Source: MOSL

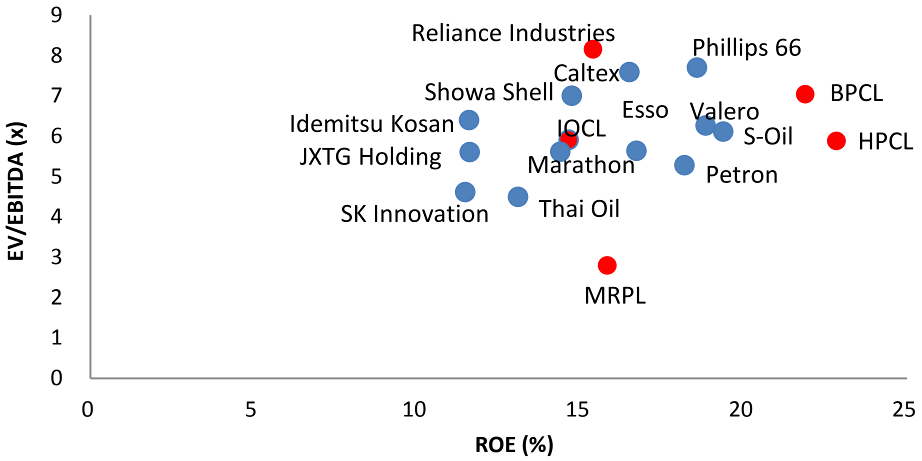
Appendix

Exhibit 31: Valuation of global refiners - RoE vs P/E



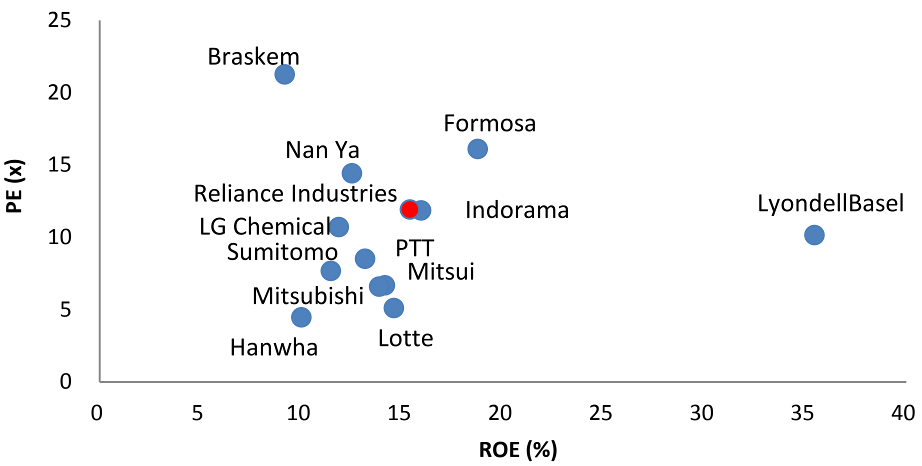
Source: Bloomberg, MOSL

Exhibit 32: Valuation of global refiners - RoE vs EV/EBITDA



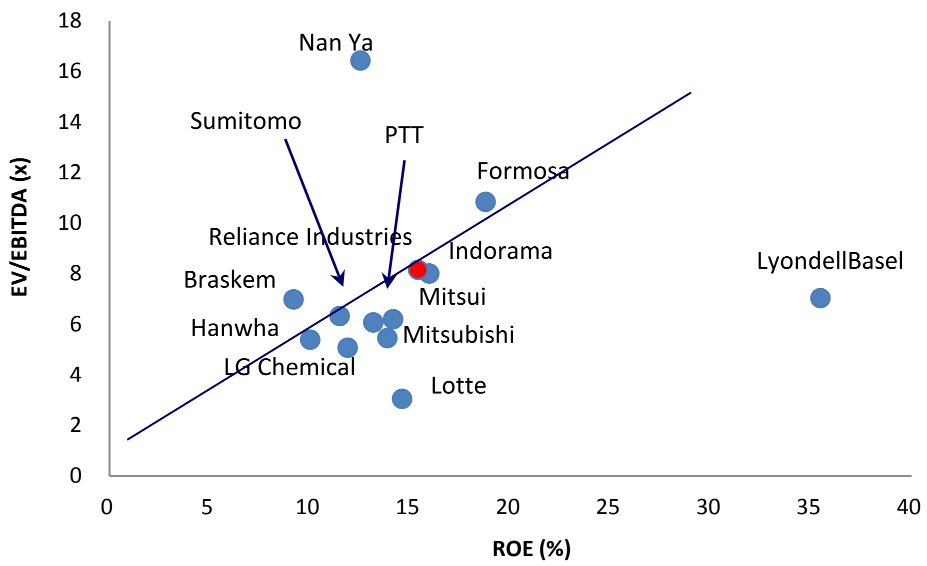
Source: Bloomberg, MOSL

Exhibit 33: Valuation of global petchem - RoE vs P/E



Source: Bloomberg, MOSL

Exhibit 34: Valuation of global petchem - RoE vs EV/EBITDA



Source: Bloomberg, MOSL

Explanation of Investment Rating	
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