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Sector update

Oil & Gas and Petrochemicals

HPCL (ADD)

Target price: Rs279

BPCL (BUY)

Target price: Rs412

IOCL (ADD)

Target price: Rs155

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INDIA

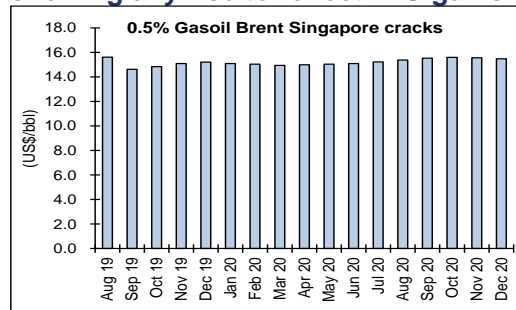
Oil & Gas Weekly

Singapore GRM down 12%, but OMCs' GRM up in last 3 weeks

Key recent developments / data points in the oil & gas sector are:

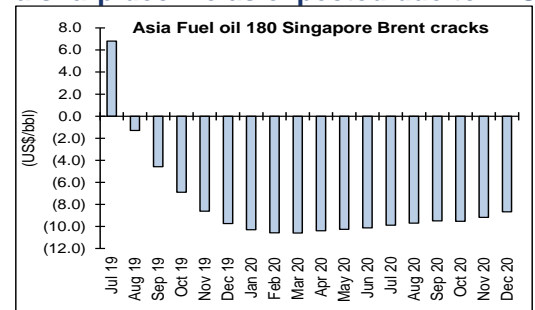
- Singapore GRM at US\$6.83/bbl in Q2FY20-TD is up 12% YoY and 97% QoQ; OMCs' Q2FY20-TD GRM is estimated at US\$6.5-7.3/bbl.
- Net auto fuel marketing margin is super-normal at Rs2.18/l in Q2FY20-TD and at Rs1.87/l in FY20-TD; OMCs' integrated margin is US\$9-9.8/bbl in Q2FY20-TD.
- US oil output was down 26k b/d MoM, but up 1.6mb/d YoY to 12.1mb/d; oil and NGL output was up 25k b/d MoM and 2.2m b/d YoY to 16.9m b/d in May'19.
- LPG and kerosene per unit subsidy in Aug'19 is down 59%-74% YoY. We estimate a shortfall in FY20 budget subsidy provision at Rs76bn-91bn.
- ▶ **Q2FY20-TD Singapore GRM up 1.5% over the last three weeks; OMCs' GRM up 21-23% due to rise in diesel cracks and RTP being higher than international price:** Reuters' Singapore GRM at US\$6.83/bbl in Q2FY20-TD is up 97% QoQ, 12% YoY and at a 6-quarter high. Permanent closure of 335k b/d Philadelphia refinery during peak petrol demand US driving season and plunge in Singapore fuel oil inventory have boosted petrol, fuel oil cracks and GRM in the last few weeks. Singapore GRM has declined by 12% from 47-week high of US\$7.47/bbl in the week ended (W.E.) 12-Jul'19 to US\$6.55/bbl last week. While petrol, naphtha and fuel oil cracks are down, diesel, jet fuel and LPG cracks are up. Q2FY20-TD Singapore GRM is up 1.5% from US\$6.73/bbl as of W.E. 12-Jul'19 to US\$6.83/bbl as of W.E. 2-Aug'19. Q2FY20-TD GRM of OMCs has during the same period surged by 21%-23% to US\$6.5-7.3/bbl from US\$5.3-6.0/bbl. The stronger rise in OMCs' GRM than in Reuters' Singapore GRM is due to: 1) diesel, jet fuel and LPG cracks, which are up in the last three weeks, being 54%-63% of OMCs' product slate vs just 32% of Reuters' product slate 2) refinery transfer price (RTP) of petrol and diesel in 16-31 Jul'19 being US\$2.1-4.5/bbl (3%-6%) and that in 1-2 Aug'19 being US\$5.6-6.1bbl (8%) higher than international prices. RTP is higher than international price in falling price environment due to 15-day lag in RTP vs international price.

Diesel cracks forward curve not showing any rise to reflect IMO gains



Source: Bloomberg, I-Sec research

Fuel oil cracks forward curve showing a sharp decline as expected due to IMO



Source: Bloomberg, I-Sec research

- ▶ **Q2-TD diesel cracks at 3-quarter high but forward curve does not show rise; FO cracks forward curve reflects fall as expected due to IMO:** Diesel cracks have recovered to a 3-quarter high of US\$14.9/bbl in Q2FY20-TD and was at US\$15.3/bbl last week. However, the forward curve for diesel does not as yet reflect the gains expected due to IMO, which IEA estimates would boost diesel demand by 0.83-0.9m b/d in Q4CY19 and CY20. Fuel oil cracks are currently strong, but forward curve does reflect the steep fall expected due to IMO. **US refiner Valero, in its Q2CY19 earnings call, said "a fairly significant step change in diesel demand" is expected due to change in IMO marine fuel specs though it is not yet reflected in the forward curve.**
- ▶ **Integrated refining and marketing margin up QoQ and YoY in Q2FY20-TD given super-normal auto fuel margin and GRM strength:** Net auto fuel marketing margin is super-normal at Rs2.18/l in Q2FY20-TD. OMCs' Q2FY20-TD GRM is estimated at US\$6.5-7.3/bbl. OMCs' integrated refining and marketing margin at US\$9.5-10.4/bbl is estimated to be up 21%-70% YoY and 56%-68% QoQ.

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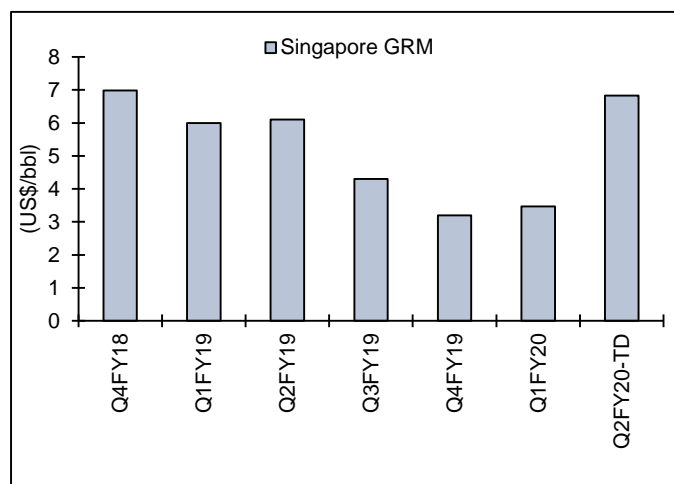
IMO to help sustain Q2FY20-TD GRM strength

Singapore GRM at 6 quarter high after three quarter weakness

Q2-TD Singapore GRM US\$6.8/bbl vs US\$3.2-4.3/bbl in last 3 quarters

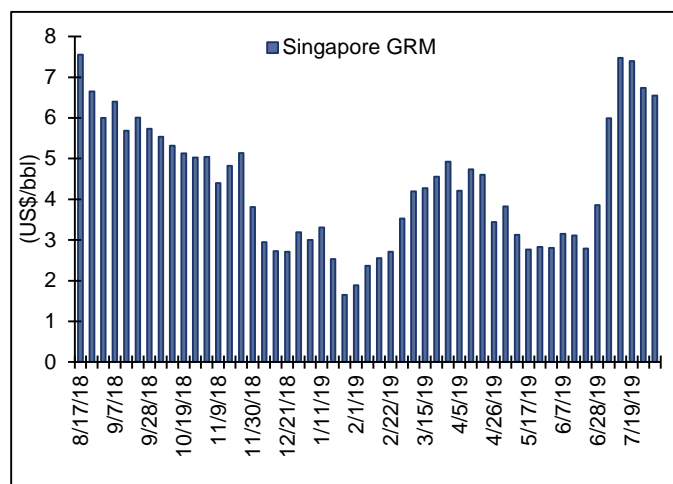
Reuters' Singapore GRM was at a 9-year low of US\$4.9/bbl in FY19 and at 33-37 quarter lows of US\$4.3-3.2/bbl in Q3FY19 and Q4FY19. Singapore GRM rebounded modestly to US\$3.5/bbl in Q1FY20. It has surged in Q2FY20-TD to a 6-quarter high of US\$6.83/bbl. Q2FY20-TD

Chart 1: Singapore GRM at 6-quarter high of US\$6.83/bbl in Q2FY20-TD



Source: Reuters, I-Sec research

Chart 2: Singapore GRM up 135% over the last six weeks to US\$6.55/bbl; down 11% in last 2 weeks



Source: Reuters, I-Sec research

Q2FY20-TD Singapore GRM at US\$6.8/bbl up 12%-97% YoY and QoQ

Q2FY20-TD Singapore GRM of US\$6.83/bbl is up:

- 12% YoY vs US\$6.1/bbl in Q2FY19.
- 97% QoQ vs US\$3.47/bbl in Q1FY20.

Table 1: Singapore GRM was down 3% WoW to US\$6.55/bbl, but Q2FY20-TD GRM at US\$6.83/bbl is up 12% YoY and 97% QoQ

(US\$/bbl)	Week ending (W.E.)				Month				Quarter		
	WE Aug-2	WE Jul-26	WE Jul-19	WE Jul-12	Aug'19	Jul'19	Jun'19	May'19	Q2FY20	Q1FY20	Q2FY19
Reuters' Singapore GRM	6.55	6.74	7.40	7.47	6.42	6.86	3.23	3.00	6.83	3.47	6.1
Key variables:											
Product cracks											
Diesel	15.33	15.41	14.89	14.42	15.4	14.8	12.6	12.8	14.9	12.4	14.3
Petrol	8.89	9.33	11.91	11.47	8.7	10.3	5.7	6.7	10.2	7.6	11.5
Naphtha	(8.2)	(8.3)	(7.8)	(7.1)	(7.9)	(7.8)	(10.2)	(9.4)	(7.8)	(9.1)	(1.4)
LPG	(21.7)	(21.5)	(22.1)	(23.0)	(20.9)	(22.0)	(20.5)	(28.4)	(21.9)	(26.4)	(23.2)
Jet fuel	15.7	15.6	15.4	15.3	15.6	15.2	12.8	12.1	15.2	12.2	14.5
Fuel oil	0.5	1.0	1.1	2.4	0.1	0.9	(4.1)	(7.0)	0.9	(5.8)	(6.2)
Petroleum coke	(47.6)	(47.4)	(47.9)	(48.7)	(46.8)	(47.8)	(45.4)	(53.0)	(47.8)	(50.8)	(53.4)
Propylene	39.3	39.5	38.4	37.5	40.1	37.4	36.0	25.5	37.6	29.0	45.9
Crude spreads											
Arab Heavy-Dubai spread	(1.1)	(1.2)	(1.1)	(0.6)	(1.2)	(1.1)	(0.5)	(0.2)	(1.13)	(0.15)	0.4
Venezuelan-Dubai spread	1.8	1.3	2.2	7.2	1.4	2.2	6.9	6.9	2.09	6.93	5.7
Basrah Heavy-Dubai spread	0.6	0.7	0.7	0.7	0.6	0.7	1.4	2.2	0.69	2.01	3.0

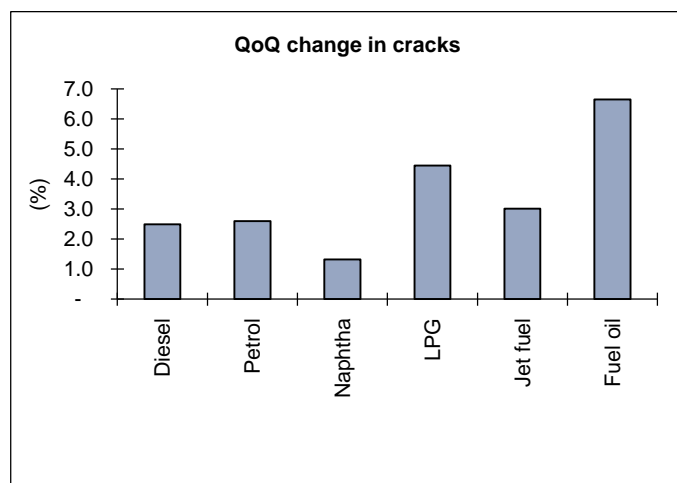
Source: Reuters, Bloomberg, I-Sec research

All product cracks up US\$1.3-6.7/bbl QoQ in Q2FY20-TD

Reuters' Singapore GRM at US\$6.83/bbl in Q2FY20-TD until W.E. 2-Aug'19 is up 97% QoQ as all product cracks are up. Rise in Singapore GRM has been driven by QoQ increase in:

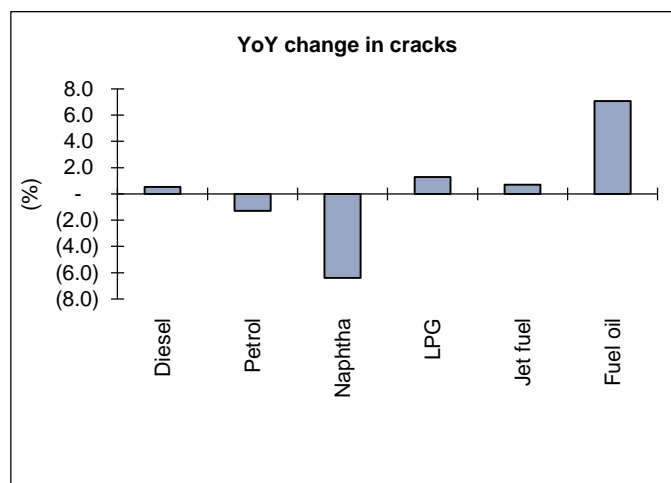
- Petrol cracks by US\$2.5/bbl (34%) from US\$7.6/bbl to US\$10.2/bbl; it is 32% of Reuters' product slate.
- Fuel oil cracks by US\$6.7/bbl from minus US\$5.8/bbl to US\$0.9/bbl; it is 23% of Reuters' product slate.
- Jet fuel cracks by US\$3.0/bbl (25%) from US\$12.2/bbl to US\$15.2/bbl; it is 19% of Reuters' product slate.
- Diesel cracks by US\$2.5/bbl (20%) from US\$12.4/bbl to US\$14.9/bbl; it is 16% of Reuters' product slate.

Chart 3: All product cracks up US\$1.3-6.7/bbl QoQ in Q2FY20-TD



Source: Reuters, I-Sec research

Chart 4: All product cracks except petrol and naphtha up YoY in Q2FY20-TD



Source: Reuters, I-Sec research

All product cracks except petrol and naphtha up YoY in Q2FY20-TD

Reuters' Singapore GRM at US\$6.83/bbl in Q2FY20-TD till W.E. 2-Aug'19 is up 12% YoY as all product cracks except petrol and naphtha are up. Rise in Singapore GRM has been driven by YoY increase in:

- Fuel oil cracks by US\$7.1/bbl from minus US\$6.2/bbl to US\$0.9/bbl; it is 23% of Reuters' product slate.
- Jet fuel cracks by US\$0.7/bbl (5%) from US\$14.5/bbl to US\$15.2/bbl; it is 19% of Reuters' product slate.
- LPG cracks by US\$1.3/bbl from minus US\$23.2/bbl to minus US\$21.9/bbl; it is 3% of Reuters' product slate.
- Diesel cracks by US\$0.5/bbl (4%) from US\$14.3/bbl to US\$14.9/bbl; it is 16% of Reuters' product slate.

Petrol and naphtha cracks are down by US\$1.3-6.4/bbl YoY in Q2FY20-TD.

GRM boosted by US refinery shutdown and FO inventory fall

Singapore GRM has been mainly boosted by:

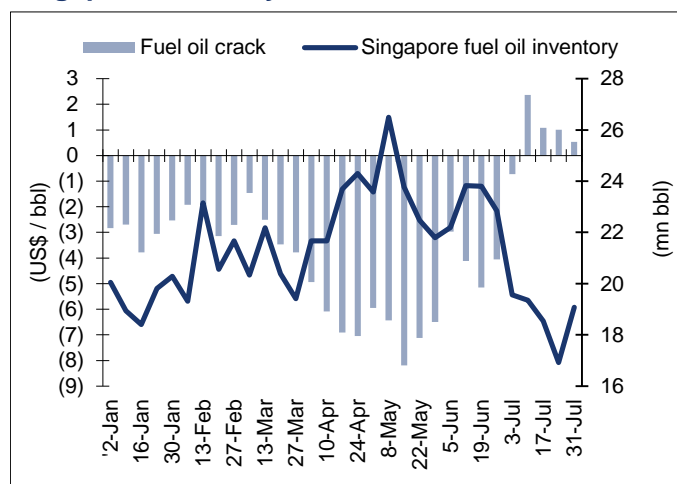
- Accident on 21-Jun'19 followed by announcement of permanent closure of 335k b/d Philadelphia refinery during US driving season (when petrol demand is at its peak), which boosted petrol cracks
- Rise in fuel oil cracks due to 29% fall in Singapore (world's biggest bunker port) inventories over the last five weeks due to clearance by suppliers ahead of the IMO-mandated cut in sulphur content from Jan'20. Surge in demand from Middle East power plants to meet rising cooling demand also boosted fuel oil cracks.

Singapore inventory fall & Middle East demand rise boost FO cracks

HSFO cracks have been boosted by:

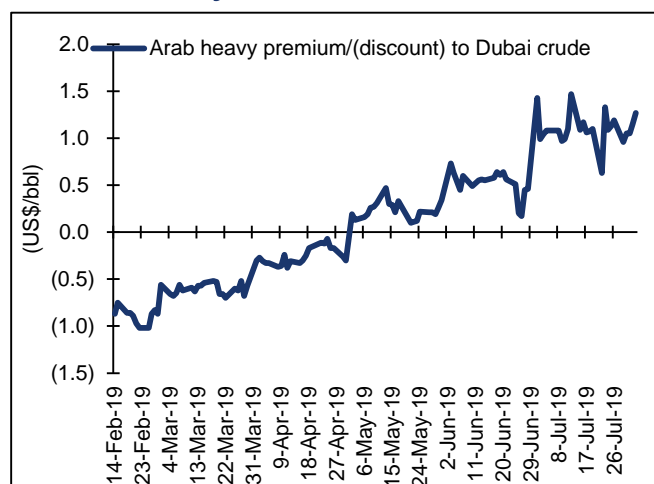
- 20% fall in Singapore (world's biggest bunker port) inventories over the last six weeks due to clearance by suppliers ahead of the IMO-mandated cut in sulphur content from Jan'20. Given the likely steep fall in HSFO cracks once IMO-compliant fuel use starts, refiners have reduced HSFO supply before the HSFO demand falls leading to tightening of supply.
- Seasonal surge in FO demand from power plants in the Middle East to meet the rising demand for cooling.

Chart 5: HSFO cracks boosted by 20% fall in Singapore inventory over the last six weeks



Source: Reuters, Bloomberg, I-Sec research

Chart 6: Arab heavy at premium to lighter Dubai crude since May'19



Source: Bloomberg, I-Sec research

Arab heavy crude at premium to Dubai; steady rise in premium

Decline in heavy crude supply from Iran, Venezuela and strong FO cracks have led to Arab heavy crude trading at premium to lighter Dubai crude. Arab heavy premium to Dubai has expanded from US\$0.2/bbl in May'19 to US\$0.5/bbl in Jun'19 and US\$1.1/bbl last week. **This does not augur well for GRM of complex refineries.**

Singapore GRM down but OMCs' GRM up over the last 3 weeks

Singapore GRM down 12% over the last three weeks

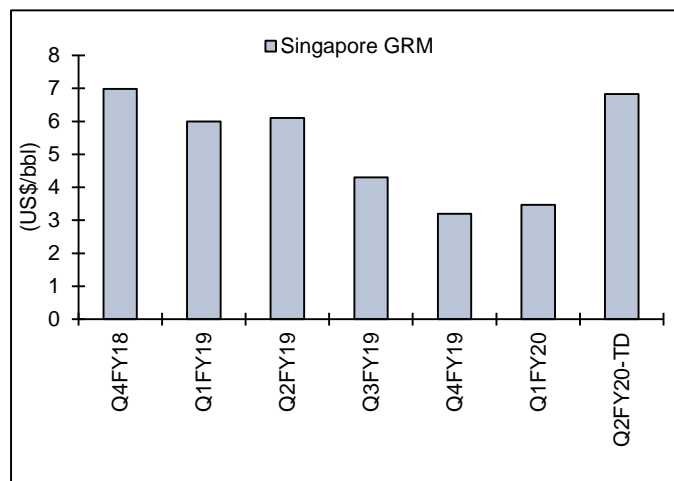
Singapore GRM, which had surged to 47-week high of US\$7.47/bbl in the W.E. 12-Jul'19, has declined by 12% over the last three weeks. GRM decline in the last three weeks is due to US\$1.2-2.6/bbl fall in naphtha, fuel oil and petrol cracks.

Petrol, naphtha and FO cracks down; diesel, LPG & jet fuel up

Over the last three weeks:

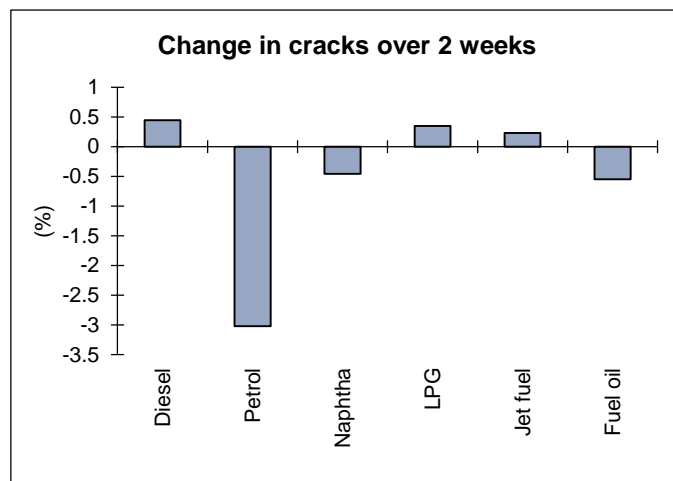
- Naphtha, fuel oil and petrol cracks are down by US\$1.2/bbl, US\$1.8/bbl and US\$2.6/bbl from minus US\$7.1/bbl, US\$2.4/bbl and US\$11.5/bbl respectively. Petrol cracks were at a 60-week high in the W.E. 19-Jul'19 at US\$11.9/bbl. Petrol, naphtha and fuel oil account for 62% of Reuters' product slate.
- Jet fuel, diesel and LPG cracks are up US\$0.4/bbl, US\$0.9/bbl and US\$1.2/bbl to US\$15.7/bbl, US\$15.3/bbl and minus US\$21.7/bbl respectively. Jet fuel, diesel and LPG account for 38% of Reuters' product slate..

Chart 7: Singapore GRM at 6-quarter high of US\$6.83/bbl in Q2FY20-TD



Source: Reuters, I-Sec research

Chart 8: Singapore GRM down 12% in three weeks due to fall in petrol cracks by US\$3.0/bbl



Source: Reuters, I-Sec research

OMCs' Q2FY20-TD GRM up 21%-23% over the last three weeks

Our OMCs' Q2FY20-TD GRM estimate has gone up by 21%-23% over the last three weeks to US\$6.5-7.3/bbl from US\$5.3-6.0/bbl as of W.E. 12-Jul'19. Q2FY20-TD Singapore GRM has also gone up by 1.5% to US\$6.83/bbl vs US\$6.73 as of W.E. 12-Jul'19. The main reasons for OMCs' Q2FY20-TD GRM rising much more sharply than Reuters' Singapore GRM are:

- All product cracks except petrol and naphtha in Q2FY20-TD up to W.E. 2-Aug'19 are higher than those up to W.E. 12-Jul'19.
- Refinery transfer price (RTP), which OMCs got for diesel and petrol in 16-31 Jul'19, is US\$2.1-4.5/bbl (3%-6%) higher than international prices during that period due to 15-day lag in RTP vs international prices. Petrol and diesel RTP during 1-2 Aug'19 is US\$5.6-6.1/bbl (8%) higher than international prices. In a falling price environment, RTP is higher than international prices and vice versa.

OMCs' GRM rebounds smartly in Q2FY20-TD

OMCs' GRMs estimated at US\$3.54-4.01/bbl in Q1FY20

Q1FY20 GRM is estimated at:

- US\$4.01/bbl for BPCL (including inventory loss of US\$0.41/bbl)
- US\$3.84/bbl for HPCL (including inventory loss of US\$0.42/bbl)
- US\$3.54/bbl for IOC (including inventory loss of US\$0.34/bbl)

Table 2: Estimate Q1FY20 GRM of OMCs at US\$3.8-4.0/bbl and Q2FY20-TD at US\$6.5-7.3/bbl

(US\$/bbl)	Q1FY20E	Q2FY20-TD
HPCL	3.84	7.30
BPCL	4.01	6.93
IOC (including inventory gain of US\$1.1/bbl)	4.69	6.50

Source: Reuters, I-Sec research

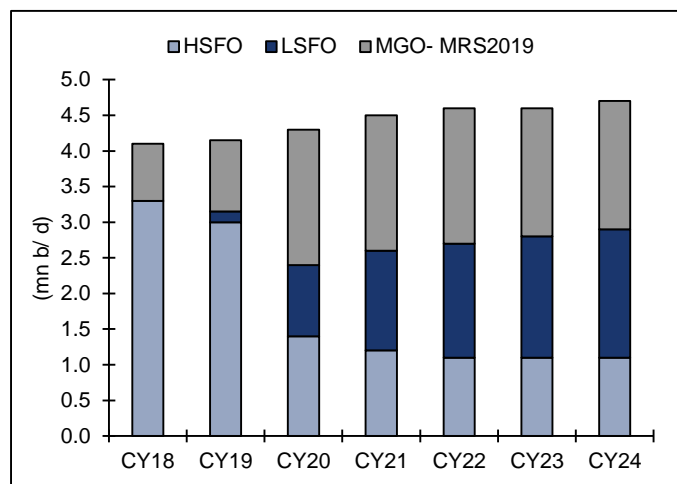
OMCs' GRMs at US\$6.5-7.3/bbl in Q2FY20-TD

In Q2FY20-TD till W.E. 2-Aug'19, GRM is estimated to have rebounded to:

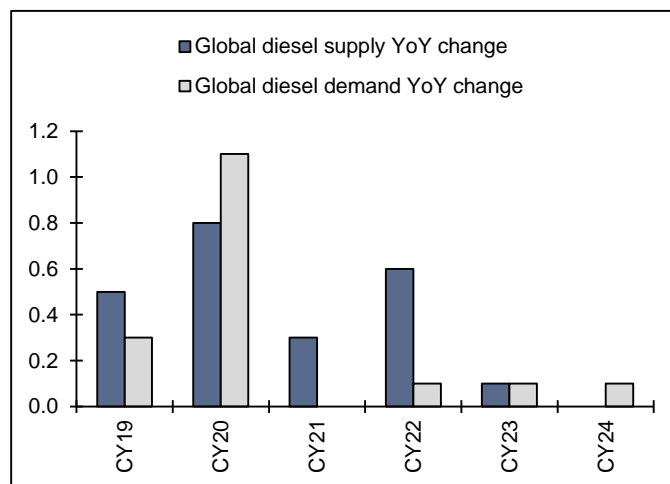
- US\$6.93/bbl for BPCL
- US\$7.30/bbl for HPCL
- US\$6.5/bbl for IOC

IMO and India Euro VI shutdowns may support GRM in H2CY19**Gains from Philadelphia refinery closure may wear off by early-Sep'19**

As discussed, permanent closure of 335k b/d Philadelphia refinery from 21-Jun'19 led to a cut in diesel and petrol supply by 100-160k b/d during peak gasoline demand US driving season. The closure has triggered sharp recovery in GRM. The gains to GRM from this shutdown are likely to wane when peak gasoline demand US driving season ends in early-Sep'19.

Chart 9: IEA estimates IMO to boost diesel demand by 0.2-0.9m b/d in CY19-CY20

Source: IEA, I-Sec research

Chart 10: IEA estimates diesel demand boosted by IMO to exceed supply in CY20

Source: IEA, I-Sec research

IMO to boost diesel demand by 0.3-0.9m b/d in Q3-Q4CY19 and CY20

IMO requires ships to switch to marine fuel with sulphur content of 0.5% from 3.5% earlier. IMO-mandated change in sulphur content is expected to boost diesel demand, cracks and GRM. Impact may become visible from H2CY19 as the largest ships and those operating on longest routes are expected to switch to 0.5% sulphur marine fuel from Jul'19 and majority of the global fleet by Oct'19. IEA estimates that IMO would boost global diesel demand by:

- 0.32m b/d in Q3CY19
- 0.83m b/d in Q4CY19
- 0.9m b/d in CY20.

Non-compliant fuel carriage ban from Mar'20

All ships would have to switch to compliant fuel latest by 10-Dec'19. From Mar'20, there would also be non-compliant fuel carriage ban, which implies ships cannot even carry such fuel.

IMO to boost marine gasoil demand by 0.2-0.9m b/d in CY19-CY20

IEA estimates:

- High sulphur fuel oil (HSFO) consumption by ships would decline by 0.3mb/d from 3.3mb/d in CY18 to 3m b/d in CY19 and by a further 1.6m b/d to 1.4m b/d in CY20 assuming 84% compliance.
- Low sulphur fuel oil (LSFO) consumption would rise from zero in CY18 to 0.15m b/d in CY19 and by another 0.85m b/d YoY to 1m b/d in CY20. Supply would be the constraint with not enough LSFO produced to replace HSFO.
- Demand for MGO would rise by 0.2m b/d YoY to 1.0m b/d in CY19 and by a further 0.9m b/d YoY to 1.9m b/d in CY20.

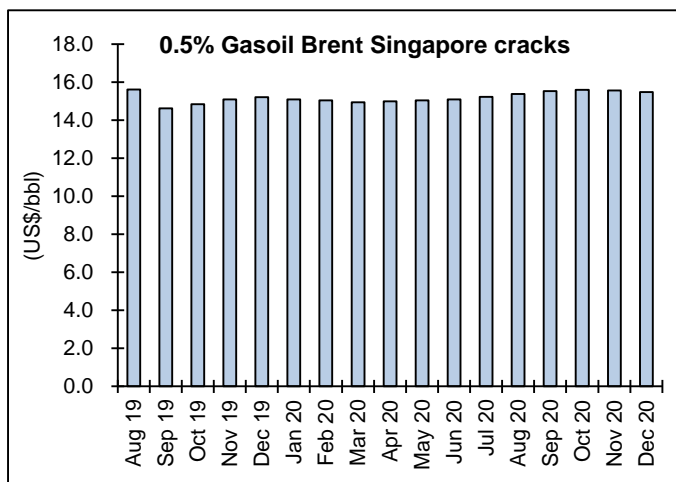
Diesel cracks forward curve not reflecting IMO gains; FO reflects hit

Diesel cracks have recovered to a 3-quarter high of US\$14.9/bbl in Q2FY20-TD and was at US\$15.3/bbl last week. However, the forward curve for diesel does not as yet reflect gains expected due to IMO, which IEA estimates would boost diesel demand by 0.83-0.9m b/d in Q4CY19 and CY20. Fuel oil cracks are currently strong, but forward curve does reflect the steep fall expected due to IMO.

Valero expects significant rise in diesel demand due to IMO

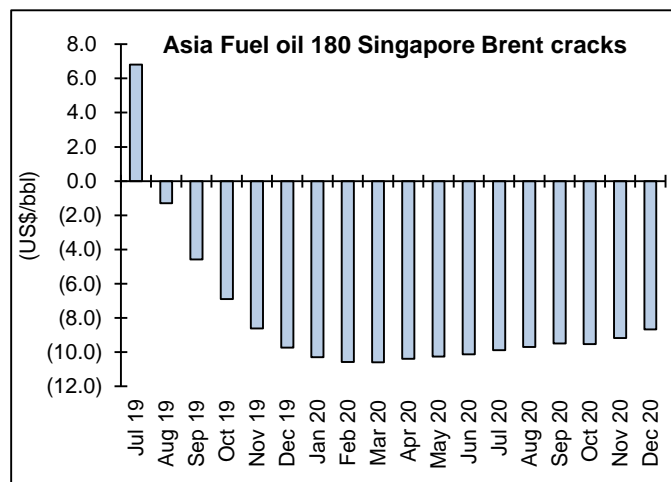
US refiner Valero, in its Q2CY19 earnings call, said that “a fairly significant steep change in diesel demand” is expected due to change in IMO marine fuel specs though it is not yet reflected in the forward curve.

Chart 11: Diesel cracks now at 3-quarter high, but forward curve not showing any rise



Source: Bloomberg, I-Sec research

Chart 12: Fuel oil cracks forward curve showing a sharp decline as expected due to IMO



Source: Bloomberg, I-Sec research

Extent of GRM gains from IMO to depend on compliance

IEA in its base case estimates compliance with IMO-mandated sulphur content in marine fuel at 84%. This is based on the assumption that the US, Europe, Singapore, China, Korea and Japan comply with the IMO regulation. In the base case, it estimates

global diesel demand to exceed supply by 0.1m b/d in CY20. We estimate it would imply 7% fall in OECD diesel inventory in CY20, which would modestly boost diesel cracks. IEA believes 100% compliance is very unlikely but, if achieved, diesel demand would exceed supply by 0.8m b/d. This would imply 58% fall in OECD diesel inventory in CY20, which would lead to a surge in diesel cracks. Thus, the extent of compliance with IMO norms would significantly determine the extent of boost to diesel cracks and GRM.

Table 3: Decline in OECD diesel inventory estimated at 7%-58% in CY20 depending on whether compliance with IMO is 86% or 100%

<i>(m b/d)</i>	IMO Compliance enforced	
	Not strictly (86%)	Strictly (100%)
OECD middle distillate inventory Dec'18	533	533
Less jet fuel inventory (20%)	107	107
Diesel inventory in Dec'18	426	426
Rise in diesel inventory in CY19	73	73
Diesel inventory in Dec'19	499	499
Fall in diesel inventory in CY20	-36	-292
Diesel inventory in Dec'20	463	207
Fall in diesel inventory in CY20	-7%	-58%

Source: IEA, I-Sec research

Indian refineries shutdown for Euro VI may also support GRM

All Indian refineries would be shut down one by one for 15-45 days during Jul'19-Mar'20, as they prepare to comply with Euro VI auto fuels from Apr'20. IOC has indicated its throughput may decline by 5% YoY due to Euro-VI compliance in FY20. Lower Indian crude throughput may also support GRM in Q2-Q4FY20.

GRM may remain strong in H2, but supply surge may hit in CY20

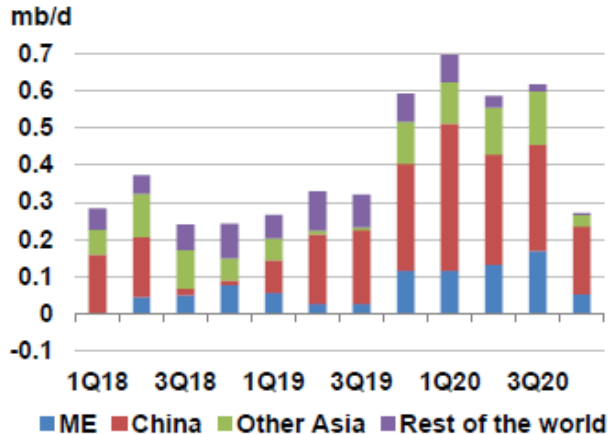
Refining capacity addition to exceed demand growth in CY19-CY20

IEA estimates refining capacity addition at 3.5m b/d to exceed refined products demand growth of 1.6m b/d in CY19E-CY20E. IEA estimates:

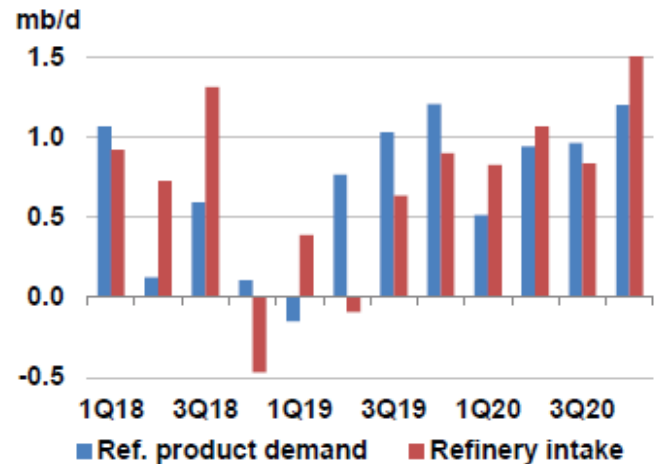
- Refining capacity addition of 2.4m b/d vs demand growth of 0.7m b/d in CY19
- Refining capacity addition of 1.1m b/d vs demand growth of 0.9m b/d in CY20

Throughput from capacity addition to be high in Q4CY19-Q3CY20

IEA estimates that of the 3.5m b/d refining capacity addition in CY19-CY20, peak addition of 1.4m b/d would be in Q4CY19. Assuming rolling averages of capacity addition over four quarters, IEA estimates rise in throughput from capacity additions of just 0.25-0.35m b/d in Q1-Q3CY19. It estimates incremental crude throughput from capacity additions to be high at 0.55-0.7m b/d in Q4CY19-Q3CY20.

Chart 13: Throughput from capacity additions to surge in Q4CY19-Q3CY20

Source: IEA, I-Sec research

Chart 14: Demand growth to exceed supply in H2CY19, but supply excess expected in CY20

Source: IEA, I-Sec research

GRM may remain strong in H2CY19 as demand growth exceeds supply

IEA estimates refined products demand growth to exceed refined products supply growth in Q3-Q4CY19. It estimates refined products demand growth at 1.0-1.2m b/d and refinery throughput increase at 0.6-0.9m b/d implying supply deficit of 0.4m b/d and 0.3m b/d in Q3 and Q4CY19 respectively. This would augur well for GRM outlook. IEA expects refined products demand growth to exceed throughput from refining capacity additions in Q3-Q4CY19 due to:

- IMO boosting diesel demand by 0.32-0.83m b/d in Q3-Q4CY19
- Low throughput from refining capacity additions in Q3CY19 as big chunk of refining capacity addition of 1.4m b/d is expected only in Q4CY19

H2CY19 demand growth may disappoint; H1 demand growth was weak

Refined products demand growth in Q3-Q4CY19 may be lower than IEA's estimate of 1.0-1.2m b/d given the lacklustre demand trend in H1CY19; refined products demand was down 0.15m b/d in Q1CY19 while it was up by 0.75m b/d in Q2. IEA estimates Chinese oil demand growth to recover to 0.51m b/d in H2CY19 vs growth of just 0.18-0.32m b/d in Q1-Q2CY19. IEA estimates IMO to drive strong diesel growth in H2CY19, but may not be factoring-in weakness/decline in onland demand growth in H1CY19 continuing in H2CY19. In Jan-May'19, Chinese diesel consumption was down 11.5% YoY while IEA estimates that US petrol and diesel consumption was also down YoY in H1CY19. Indian diesel consumption growth has decelerated from 3.5% YoY in Q1CY19 to 2.1% YoY in Q2CY19.

Supply growth to exceed demand growth in three quarters of CY20

IEA estimates refined products supply growth to exceed demand rise in three of the four quarters of CY20. IEA estimates refined products supply rise at:

- 0.85m b/d to exceed demand rise of 0.5m b/d in Q1CY20
- 1.05m b/d to exceed demand rise of 0.9m b/d in Q2CY20
- 1.5m b/d to exceed demand rise of 1.2m b/d in Q4CY20
- 0.85m b/d to lag demand growth of 0.95m b/d in Q3CY20

Large capacity addition may pull utilisation down and hit GRM in CY20

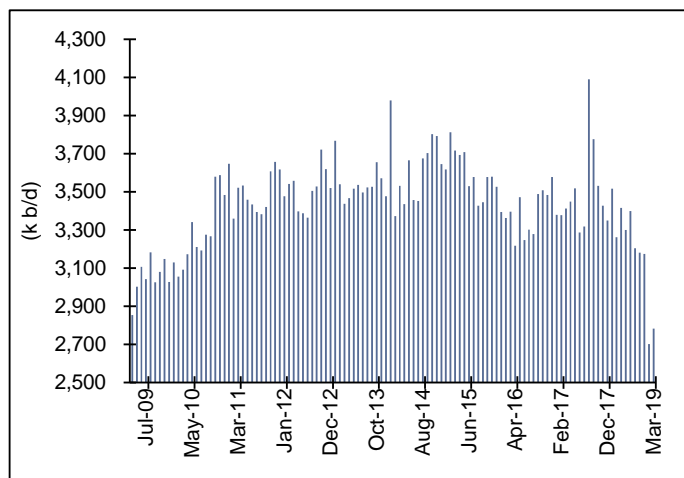
As discussed, IEA estimates global net refining capacity addition of 3.5m b/d to be more than 2x of global refined products demand growth of 1.6m b/d in CY19-CY20. As a large chunk of the 2.4m b/d refining capacity addition in CY19 would be in Q4 at 1.4m b/d, the impact of supply from this addition would be far more significant in CY20 than in CY19. Much weaker refined products demand growth than potential incremental supply from capacity addition would mean global refining capacity utilisation will decline in CY20, thereby hurting CY20 GRM outlook. Refined products supply rise of 0.5m b/d is likely to lag demand rise of 0.7m b/d in CY19, but supply rise of 1.1m b/d is likely to exceed demand rise of 0.9m b/d in CY20.

Diesel cracks at 3-quarter high in Q2 –TD; weak in last 2 quarters

Diesel cracks at 3-quarter high in Q2-TD; 7-8quarter low last 2 weeks

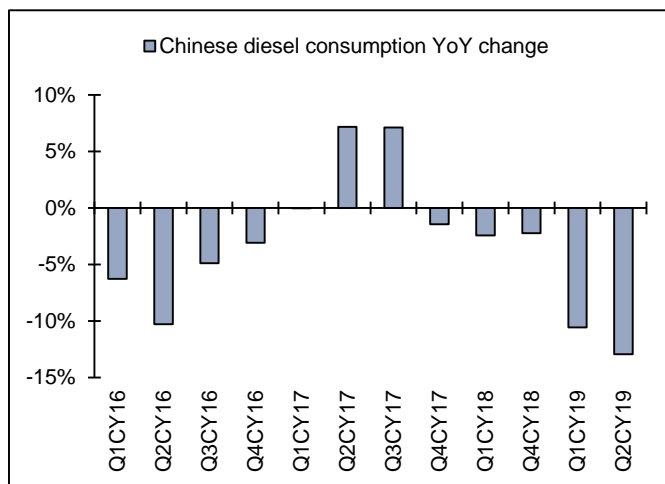
Diesel cracks were at a seven-quarter low of US\$12.7/bbl in Q4FY19 and eight-quarter low of US\$12.4/bbl in Q1FY20. Diesel cracks have recovered and are up to three quarter high of US\$14.9/bbl in Q2FY20-TD.

Chart 15: Chinese diesel consumption in Mar'19 lowest since Apr'09



Source: Bloomberg, I-Sec research

Chart 16: Chinese diesel consumption down 10.6% YoY in Q1CY19 and 12.9% YoY in Q2CY19



Source: Bloomberg, I-Sec research

Diesel cracks hit by fall in China and US in last two quarters

Diesel cracks in Q4FY19 (Q1CY19) appear to have been hit by steep fall in Chinese consumption. Chinese diesel consumption is down 10.6% YoY in Q1CY19 as per Bloomberg. Diesel cracks appear to have been hit by fall in US consumption by 4.8% YoY in Q2CY19 till May'19 and China consumption by 13% YoY in Q2CY19.

Mar'19 Chinese diesel consumption lowest in almost 10 years

As per Bloomberg data Chinese diesel consumption in Mar'19 at 2.7m b/d is down 17% YoY. Diesel consumption was up by 80k b/d MoM in Apr'19 but is still 19.3% lower than Apr'17 levels; data for Apr'18 is not available. Mar'19 Chinese diesel consumption is the lowest in almost 10 years; it was last lower in Apr'09.

IEA estimates China diesel demand fall by 420k b/d YoY in Q1CY19

IEA in May'19 OMR estimates Chinese diesel consumption declined sharply (0.8m b/d as per chart) YoY in Mar'19 on a high base and by 420k b/d YoY in Q1YCY19. As per Bloomberg data, Chinese diesel consumption is down 357k b/d in Jan-Mar'19.

China diesel demand down 4.6%-6.8% YoY in CY18

Chinese diesel consumption data on Bloomberg is available only for Jan-Mar'18 and Sep-Dec'18. Chinese diesel consumption was down 4.6% YoY if average consumption for the seven months in CY18 for which data is available is compared with average consumption in CY17. Consumption is down 6.8% in CY18 if consumption for months for which data is available is compared only with consumption in the corresponding months in CY17.

US distillate demand down 0.4% YoY in CY19-TD hit by fall in Q2-TD

As per EIA's monthly data, which is more reliable than the weekly data, US distillate consumption growth was strong at 5.1% YoY in CY18. As per EIA's monthly data US distillate consumption is down 0.4% YoY in CY19-TD (up to May'19). US distillate consumption was up 2.5% YoY in Q1CY19 but is down 4.8% YoY in Q2CY19-TD (till May'19). US distillate consumption was up 9.3% YoY in Feb'19 but down 0.3%-5.4% YoY in Jan'19 and Mar-May'19.

Table 4 Diesel consumption in China, US and India down 6.3% YoY in Q2CY19-TD, hit by 4.8%-12.9% fall in US & China demand, but India demand up 2.1% YoY

<i>(m b/d)</i>	YoY			YoY		
	Q2CY19-TD	Q2CY18	Change	Q1CY19	Q1CY18	Change
US	4.01	4.21	-4.8%	4.28	4.18	2.5%
India	1.85	1.82	2.1%	1.77	1.71	3.5%
China	2.84	3.27	-12.9%	3.02	3.38	-10.6%
Total	8.71	9.29	-6.3%	9.07	9.26	-2.1%

Source: PPAC, Bloomberg, EIA, I-Sec research

US distillate demand up 2% YoY in Jun'19 as per weekly data

As per the weekly EIA data, Q1CY19 distillate consumption is up 2.8% YoY vs 2.5% YoY rise as per the more reliable EIA monthly data. As per the

- More reliable monthly data US distillate consumption is down 5.4% YoY in May'19 v/s down 0.8% YoY as per the less reliable weekly data
- Weekly EIA data, US distillate consumption is up 2% YoY in Jun'19.

China, US and India diesel demand down 2%-6% YoY in Q1-Q2CY19

Diesel consumption in China, US and India is:

- Down 2.1% YoY in Q1CY19 hit by 10.6% YoY fall in Chinese diesel consumption in Q1CY19. However, US and India diesel consumption is up 2.5% and 3.5% YoY respectively in Q1CY19.
- Down 6.3% YoY in Q2CY19-TD hit by 12.9% YoY fall in China and 4.8% YoY fall in US diesel/distillate demand in Apr-May'19. Indian diesel consumption is up 2.1% YoY in Apr-Jun'19.

US demand rise made up for China fall in CY18 but US demand down in CY19-TD

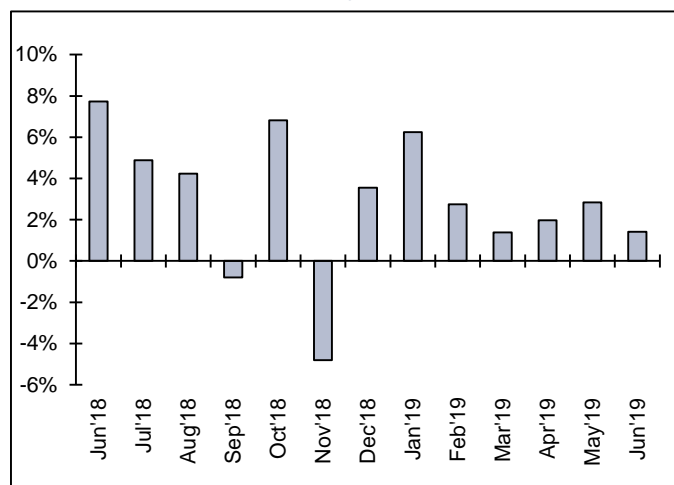
Chinese consumption declined even in CY18 as per Bloomberg data but strong US demand growth more than made up for Chinese demand decline. Strong US

consumption growth and export fall ensured strong diesel cracks in CY18. In CY19-TD US demand has declined 0.4% YoY while China consumption decline is steeper at 11.5% YoY.

Indian diesel consumption growth slowed down in Mar-Jun'19

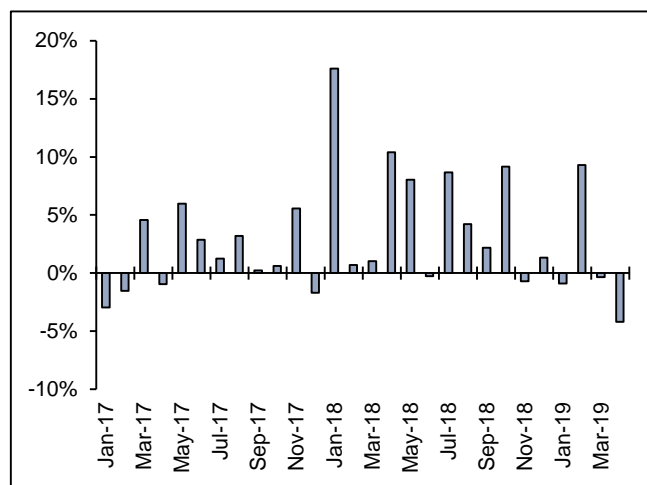
India diesel consumption growth, which was up 4.2% YoY in CY18, 6.3% YoY in Jan'19 and 3.1% YoY in Feb'19, slowed down to 1.4%-2.8% YoY in Mar-May'19 and further slowed down to 1.4% YoY in Jun'19. Commercial and passenger vehicle sales are down in India, which does not augur well for diesel consumption, until there is a turnaround.

Chart 17: Indian diesel consumption growth weak at 2.0%-2.8% YoY Apr-May'19; 1.4% YoY in Jun'19



Source: Bloomberg, I-Sec research

Chart 18: US distillate consumption up 9% YoY in Feb'19, but down 0.3%-4.2% YoY in Mar-Apr'19



Source: Bloomberg, I-Sec research

US, China and India demand up in CY18 but down in CY19-TD

Aggregate US, China and India diesel consumption was up 1.2% YoY in CY18 but down 3.9% YoY in CY19-TD. **Chinese diesel consumption was down 4.6% YoY in CY18 and 11.7% YoY in CY19-TD (up to Jun'19) but US consumption was up 5.1% YoY in CY18 but down 0.4% YoY in CY19-TD (up to May'19).**

Table 5: US, China and India diesel consumption up 1.2% YoY in CY18 but that in CY19-TD down 3.9% YoY; both US and China demand down in CY19-TD

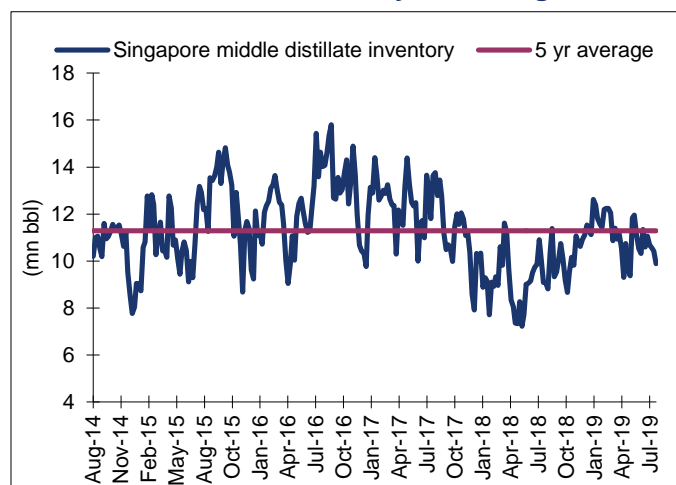
(mb /d)	Diesel consumption in:			
	India	US	China	Total
CY15	1.49	4.00	3.61	9.10
CY16	1.58	3.88	3.39	8.84
CY17	1.63	3.93	3.51	9.07
CY18	1.70	4.13	3.35	9.18
CY19-TD	1.81	4.17	2.93	8.91
YoY change				
CY15	5.3%	-0.9%	0.0%	0.4%
CY16	5.6%	-3.0%	-6.1%	-2.8%
CY17	3.3%	1.4%	3.6%	2.6%
CY18	4.2%	5.1%	-4.6%	1.2%
CY19-TD	2.8%	-0.4%	-11.7%	-3.9%

Source: Bloomberg, PPAC, EIA, I-Sec research

US distillate inventory up 1.5m bbls WoW; 1.6% below 5-year average

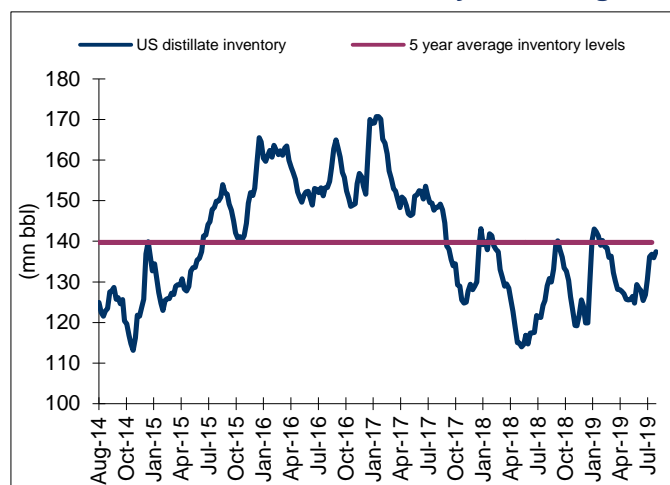
US distillate inventory was up by 1.5m bbls (1.1%) WoW in the W.E. 2-Aug'19 and by 12.1mn bbls (9.6%) in the last six weeks. However, US distillate inventory has declined in 19 of the past 29 weeks and is now 1.6% below 5-year average levels.

Chart 19: Singapore middle distillate inventory at 9.9mn bbls is 12.4% below 5-year average



Source: Bloomberg, I-Sec research

Chart 20: US distillate inventory up 1.5m bbls WoW last week but 1.6% below 5-year average



Source: EIA, I-Sec research

Singapore middle distillate inventory 12.4% below 5-year average

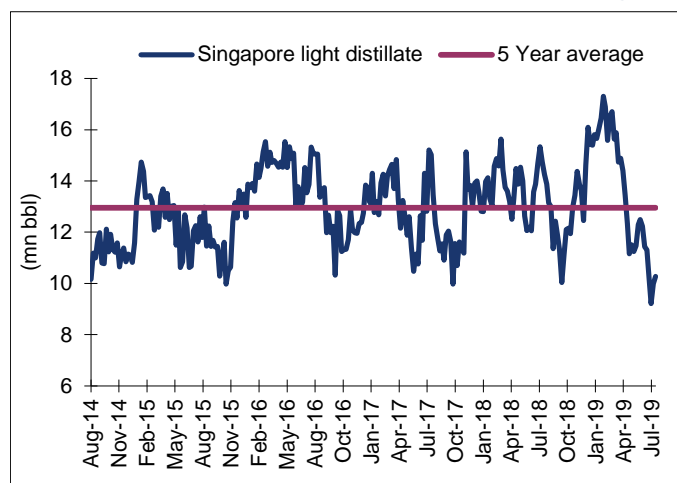
Singapore middle distillate inventory was down 0.5mn bbls WoW to 9.9mn bbls last week and is now 12.4% below 5-year average.

Petrol cracks at 4-quarter high in Q2FY20-TD**Petrol cracks up 2x QoQ in Q1FY20 and 30% QoQ in Q2FY20-TD**

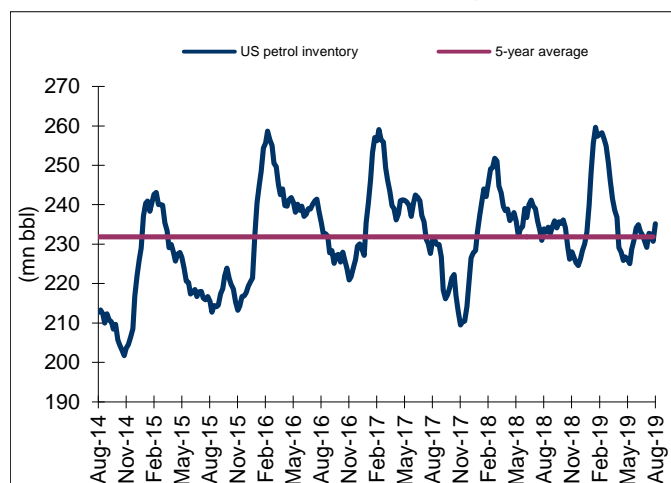
Petrol cracks, which were at 37-quarter low of US\$3.7/bbl in Q4FY19, were up 2.0x QoQ at US\$7.6/bbl in Q1FY20. The recovery in petrol cracks in Q1FY20 was driven by supply response as refiners globally cut utilisation rates, which led to fall in US and Singapore petrol inventories. Closure of US east coast refinery during peak US driving season has boosted petrol cracks in Q2FY20-TD, which are up 30% QoQ.

US petrol inventory up 4.4m bbls WoW; 1.4% above 5-year average

In the last five years, US petrol inventories were at their lowest level at 201.8mn bbls in Oct'14. From those levels, petrol inventories surged over 51 months by 29% to an all-time high of 259.6mn bbls in the W.E. 18-Jan'19. From these peak levels, US petrol inventories are down 24.4m bbls (9.4%). US petrol inventory was up 4.4m bbls (1.9%) WoW last week but down in six of the last eight weeks. **US gasoline inventory is 1.4% (3.3mn bbls) above 5-year average levels.**

Chart 21: Singapore light distillate inventory up 0.3m bbls WoW but 20.6% below 5-year average

Source: Bloomberg, I-Sec research

Chart 22: US petrol inventory up 4.4mn bbls last week and 1.4% above 5-year average level

Source: EIA, I-Sec research

Singapore inventory down 41% in 24 weeks; 21% below 5-year average

Singapore light distillate inventory was up by 0.3m bbls in the W.E 9-Aug'19 but down by 7.0m bbls (41%) over the last 24 weeks. Light distillate inventory is 2.7mn bbls or 20.6% below the 5-year average level of 12.95mn bbls.

Table 6: US petrol consumption was down 0.5% YoY in Q1CY19 but up 0.1% YoY in Q2CY19-TD; US consumption was also down 0.3%-0.8% YoY in Q2-Q3CY18

(m b/d)	Q2CY19-TD	Q2CY18	YoY Change	Q1CY19	Q1CY18	YoY Change
US	9.38	9.37	0.1%	8.96	9.00	-0.5%
India	0.74	0.67	10.0%	0.68	0.63	9.4%
China	2.94	2.85	3.2%	3.05	2.92	4.5%
Total	13.05	12.89	1.3%	12.69	12.54	1.2%

Source: PPAC, Bloomberg, EIA, I-Sec research

China petrol demand up 3.1% YoY in Jun'19 and 4.7% in CY19-TD

Chinese petrol consumption was up 4.5% YoY in Q1CY19. While petrol consumption was weak at 0.6% YoY in Jan'19, consumption growth strengthened to 10.3% YoY in Feb'19, and 2.2% YoY in Mar'19. Consumption growth was 1.4% YoY in Apr'19, 8.8% YoY in May'19, 3.1% YoY in Jun'19 and 3.8% YoY in CY19-TD (up to Jun'19).

Table 7: US petrol consumption was down 0.1%-0.2% YoY in CY18 and CY19-TD; petrol consumption growth of 3.8%-9.7% YoY for China & India in CY19-TD

(mb/d)	Petrol consumption in:			
	India	US	China	Total
CY15	0.49	9.18	2.67	12.34
CY16	0.55	9.32	2.76	12.63
CY17	0.59	9.32	2.83	12.75
CY18	0.65	9.32	3.02	13.0
CY19-TD	0.71	9.13	2.99	12.83
YoY change				
CY15	14.7%	2.9%	11.1%	5.0%
CY16	12.9%	1.5%	3.4%	2.4%
CY17	7.3%	0.1%	2.6%	0.9%
CY18	8.9%	-0.1%	6.6%	1.8%
CY19-TD	9.7%	-0.2%	3.8%	1.2%

Source: EIA, Bloomberg, PPAC, I-Sec research

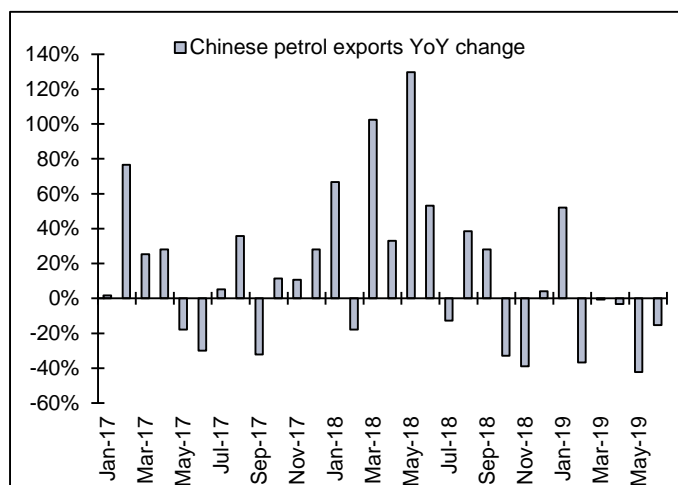
US petrol demand down 0.2% YoY in CY19-TD and 1.6% YoY in May'19

US petrol consumption, which was up 0.1% YoY in Q4CY18, was down 0.2% YoY in CY19 up to May'19. While US petrol consumption was down 2.9% YoY in Mar'19 and 1.6% YoY in Jun'19, it was up 0.01%-1.7% YoY in Jan-Feb'19 and up 1.8% YoY in Apr'19 as per EIA's monthly data.

Chinese CY19-TD petrol export down 9% YoY

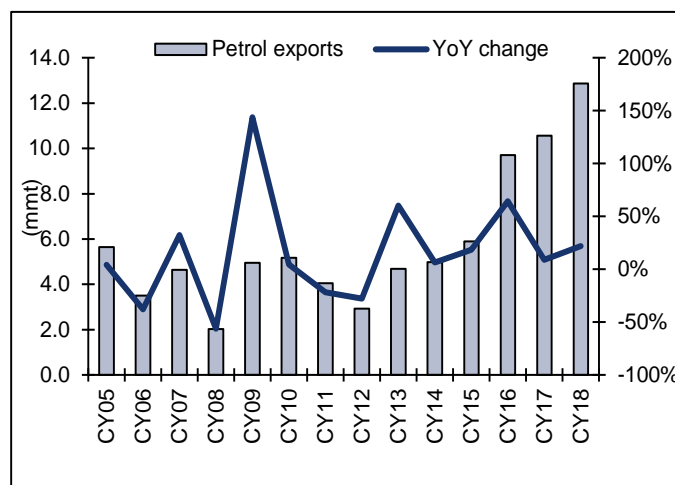
Chinese petrol exports are down 9% YoY in CT19-TD (up to Jun'19). Chinese petrol exports were up 52% YoY in Jan'19 but are down 1%-42% YoY in Feb-Jun'19. Chinese petrol exports were up 5% YoY in Q1CY19 but down 22% YoY in Q2CY19.

Chart 23: Chinese petrol exports up 3-22% YoY in CY19-TD & CY18, down 1-42% YoY in Feb-Jun'19



Source: Bloomberg, I-Sec research

Chart 24: Chinese petrol exports up 22% YoY in CY18; the sixth consecutive year of rise

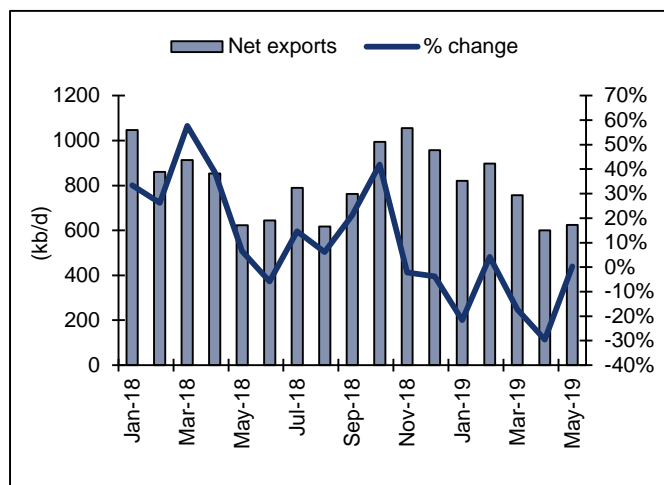


Source: Bloomberg, I-Sec research

US petrol net exports down 14% YoY in CY19-TD

US petrol net exports were up 18% YoY in CY18. As per monthly data, US gasoline exports are down 14% YoY in CY19-TD till May'19, 17%-30% YoY in Jan'19 and Mar-Apr'19 but up 0.2%-4% YoY in May'19 and Feb'19. As per EIA's weekly data, US petrol net exports is down 20% YoY in May'19, but up 12% YoY in Jun'19.

Chart 25: US net petrol exports up 18% YoY in CY18, but down 14% in CY19-TD (up to May'19)



Source: Bloomberg, I-Sec research

Table 8: US net petrol exports up 18% YoY in CY18, down 14% YoY in CY19-TD (till May'19)

	US gasoline		
	Exports	Imports	Net exports
CY18	888	45	843
CY17	749	32	717
YoY change	19%	39%	18%
CY19-TD	817	77	740
CY18-TD	896	37	859
YoY change	-9%	108%	-14%

Source: Bloomberg, I-Sec research

Risk of supply surplus from Q1CY20 caps oil price

Oil down 1-3% WoW on US-China trade war escalation & strong USD

WTI and Brent prices were down 1%-3% WoW last week, despite 11.1m bbls fall in US crude inventory, due to:

- Escalation of trade war between US and China
- Weakening of Chinese currency and strengthening of US dollar
- Concerns on global demand growth and likely global oversupply in three of the four quarters of CY20

US oil and NGL output up 0.43m b/d in CY19-TD (up to May'19)

US oil and NGL output up 2.2m b/d YoY in CY19-TD (up to May'19)

US oil and NGL output:

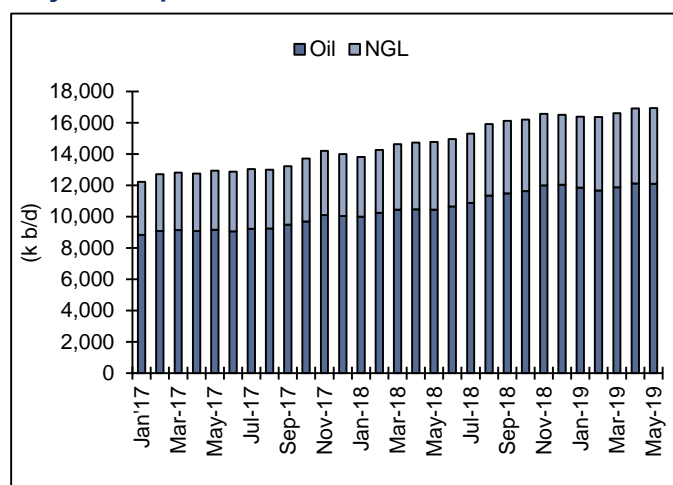
- At 16.95m b/d in May'19, was up 2.17m b/d YoY. While US oil output was up 1.65m b/d YoY, NGL output was up 0.52m b/d YoY in May'19.
- At 16.65m b/d in CY19-TD (up to May'19), was up 2.2m b/d. While US oil output is up 1.6m b/d YoY, NGL output is up 0.6m b/d YoY in CY19-TD (up to May'19).

Table 9: US oil and NGL output in CY19-TD (up to May'19) at 16.65m b/d is up 2.2m b/d YoY

(m b/d)	US production		
	Oil	NGLs	Total
CY19-TD (till May'19)	11.93	4.72	16.65
CY18-TD (till May'18)	10.33	4.12	14.45
YoY change	1.60	0.60	2.20
CY19E	12.03	4.79	16.82
CY18	11.09	4.40	15.49
YoY change	0.94	0.39	1.33

Source: IEA, EIA, I-Sec research

Chart 26: US oil and NGL output at 16.95m b/d in May'19 is up 25k b/d MoM and 2.2m b/d YoY



Source: EIA, I-Sec research

US oil & NGL output up 430k b/d in CY19-TD (up to May'19)

As per the more reliable EIA monthly data up to May'19:

- US oil output is up 71k b/d in CY19-TD but down 26k b/d MoM in May'19.
- US oil and NGL output is up by 430k b/d and is up 25k b/d MoM in May'19.

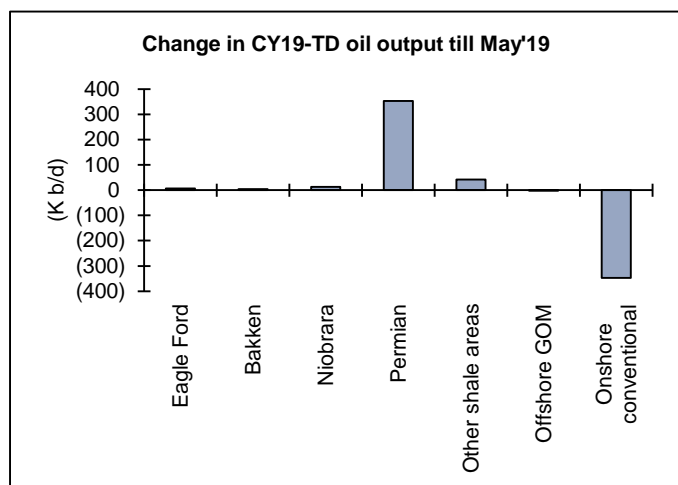
US output has to rise by 1.2m b/d by Dec'19 to be as per IEA estimates

IEA estimates US oil and NGL production to be up 1.73m b/d YoY to 17.22m b/d in CY19. US oil and NGL production would have to rise by 1.19m b/d to 18.14m b/d in Dec'19 from 16.95m b/d in May'19 to be in line with IEA estimate. US oil and NGL output is up 430k b/d in May'19 from Dec'18 levels. Thus, US oil and NGL output growth would have to accelerate in the rest of CY19 for CY19 production growth to be in line with IEA estimates.

US output likely to rise sharply in H2 on start of Permian pipelines

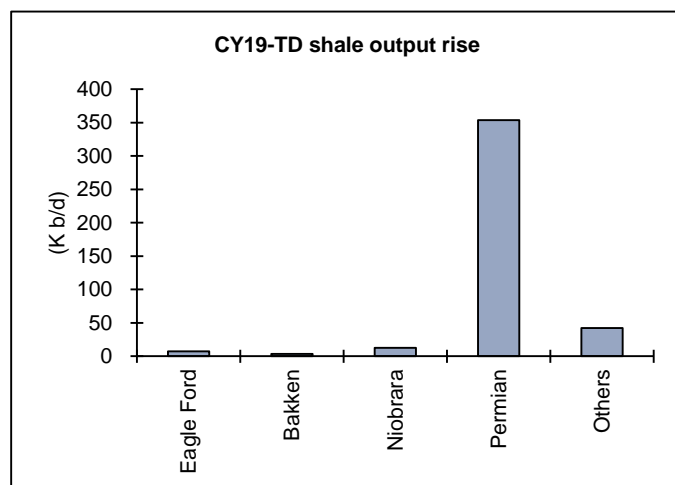
Permian output growth has slowed down due to inadequate pipeline capacity to evacuate production. Permian output, which was up 1.14m b/d in CY18, is up by just 306k b/d in Jan-Jul'19. It appears US output may rise sharply only in H2CY19 when pipeline commissioning boosts Permian output. Permian output is up 168k b/d in CY19-TD (up to May'19) despite pipeline constraints. Oil output in other shale areas is up 13k b/d in the same period. We believe that US oil producers remain focussed on the Permian basin despite pipeline constraints. It appears they prefer to wait for a few months for pipeline bottlenecks in the Permian to be resolved rather than incur large capex in other shale basins to boost output in the interim.

Chart 27: US tight oil output up 420k b/d but conventional output down 347k b/d in CY19-TD



Source: EIA, Bloomberg, I-Sec research

Chart 28: US tight oil production up 420k b/d in CY19-TD driven by 354k b/d rise in Permian



Source: EIA, Bloomberg, I-Sec research

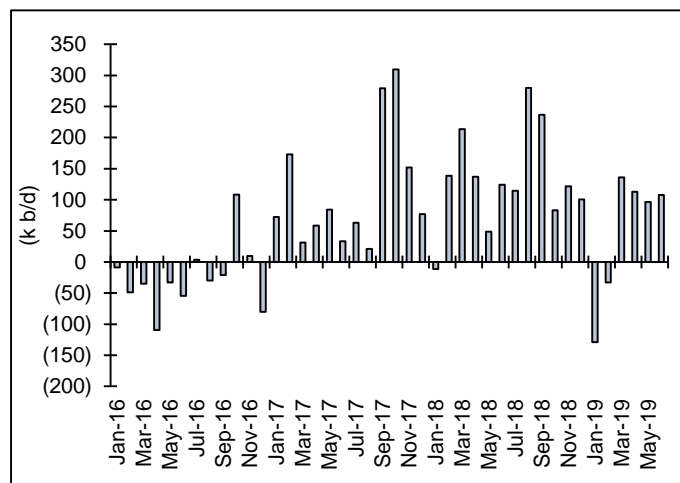
US CY19-TD output rise up to May'19 driven by Permian

In CY19-TD (up to May'19), US output is up 71k b/d from Dec'18 levels. In CY19-TD (up to May'19):

- US tight oil production is up 420k b/d
- Permian oil production is up 354k b/d
- Gulf of Mexico (GoM) is down just 2k b/d

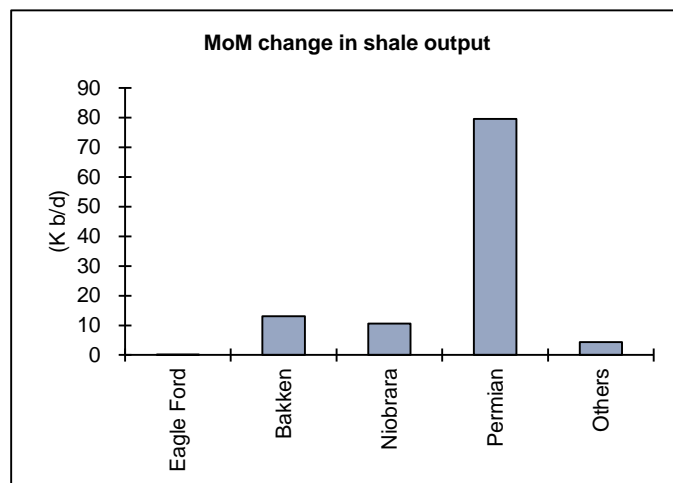
Thus, it appears that conventional onshore oil production is down by 347k b/d in CY19-TD

Chart 29: US shale production up 420k b/d in May'19 from levels in Dec'18 driven by Permian



Source: EIA, Bloomberg, I-Sec research

Chart 30: Permian drove MoM US shale oil output rise accounting for 74% of shale rise



Source: EIA, Bloomberg, I-Sec research

H1CY19 supply surplus due to demand growth; H2 rebound?

H2CY19 demand growth 0.56m b/d; strong at 1.8mb/d in H2CY19E

Demand growth in Q1CY19 at 0.31m b/d is estimated to be the weakest in 29 quarter while that in Q2CY19 is estimated at 0.8m b/d. Thus, H1CY19 global oil demand growth is estimated at just 0.56m b/d. IEA estimates much stronger global oil demand growth of 1.6m b/d in Q3CY19 and 1.95m b/d in Q4CY19.

IEA estimates IMO and China demand rebound to drive H2 growth

IEA estimates H2CY19 demand growth to be driven by:

- IMO boosting global diesel demand growth by 0.32m b/d in Q3 and 0.83m b/d in Q4CY19E
- China's oil demand growth, which IEA estimates at 245k b/d in H1CY19 (180k b/d in Q3CY19 and 310k b/d in Q4CY19), to be much stronger at 510k b/d in H2CY19.

Cut in lofty H2 demand growth appears imminent given H1 weakness

H2CY19 global oil demand growth estimate of 1.8m b/d appears lofty. A cut in these demand estimates appears imminent as:

- Global oil demand growth in Q1CY19 at just 0.31m b/d, was the weakest growth since Q4CY11 (in 29 quarters)
- IEA estimates global petroleum product demand in Q1CY19 was down 676k b/d QoQ due to seasonal factors and up just 273k b/d YoY; petrol demand was down 740k b/d QoQ and 24k b/d YoY while diesel demand was down 968k b/d QoQ and 84k b/d YoY
- US EIA has also cut CY19 global oil demand growth estimate by 160k b/d to 1.22m b/d while OPEC has cut its corresponding estimate by 70k b/d to 1.14m b/d.
- As per IEA, China's apparent oil consumption in Mar'19 was down 270k b/d YoY and is the first fall since May'18.
- China diesel consumption is down 11.5% YoY in CY19-TD up to May'19.
- Global manufacturing output fell in Q2CY19 for the first time since late-CY12.

- IEA estimates US gasoline and diesel consumption to be down YoY in H1CY19.
- Indian petroleum product consumption declined by 1.5%-1.7% YoY in May-Jun'19 and by 0.2% YoY in Q2CY19. It last grew in Apr'19 by 2.6% YoY.
- China, India and US petroleum product consumption in CY19-TD at 408k b/d is sharply lower than IEA's CY19 consumption growth estimate of 890k b/d.

Table 10: US, India & China CY19-TD demand rise at 408k b/d vs IEA's CY19 estimate of 890k b/d

k b/d	CY19-TD	CY19E
Demand growth in:		
China	245	420
US	92	250
India	71	220
Total	408	890

Source: IEA, PPAC, EIA, I-Sec research

Table 11: OPEC, IEA & EIA cut CY19E global oil demand by 70-160k b/d to 1.14-1.22m b/d

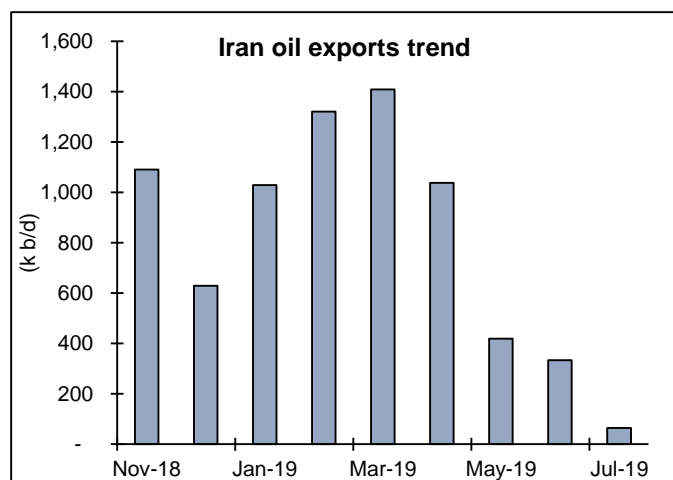
m b/d	Report dated		Change
	Jun'19	May'19	
CY19 consumption growth as per			
IEA	1.2	1.3	(0.10)
EIA	1.22	1.38	(0.16)
OPEC	1.14	1.21	(0.07)

Source: IEA, EIA, OPEC, I-Sec research

Iran or Venezuela export/output fall may reduce supply

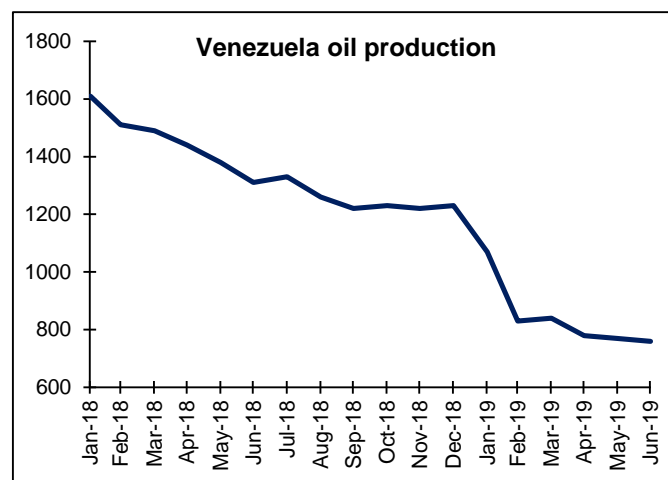
Any further decline in Iran's oil exports or Venezuela production is likely to mean a bigger supply deficit in Q3CY19 than estimated and lower supply surplus in Q1CY20. Press reports suggest Venezuela's crude and product exports rebounded by 26% MoM to 1.1m b/d from 874.5k b/d in May'19. Exports to China at 656k b/d in Jun'19 are almost 3x the 233k b/d in Feb'19 and 59% of Venezuela's Jun'19 exports.

Chart 31: Iran oil exports fell to 65k b/d in Jul'19 from 1038k b/d in Apr'19 due to US sanctions



Source: Bloomberg, I-Sec research

Chart 32: Venezuela oil output down from 2.0-1.2m b/d in Sep'17-Jan'19 to 0.76m b/d in Jul'19



Source: EIA, I-Sec research

Supply deficit likely in Q3CY19 on OPEC+ output cut extension

OPEC and Russia agree to extend oil output cuts until Mar'20

OPEC and its non-OPEC allies led by Russia agreed to extend 1.2m b/d output cut deal for nine months from Jul'19 to Mar'20. Extension of output cuts is likely to mean supply deficit of 0.7m b/d in Q3CY19 unless demand is sharply lower than IEA's estimate of 1.6m b/d.

Q3-Q4CY19 supply deficit 0.7-0.1m b/d; supply surplus in Q1-Q2CY19

IEA estimates supply surplus of 0.5m b/d in Q2CY19. IEA estimates call on OPEC oil at 30.6m b/d in Q3 and 30.0m b/d in Q4CY19. OPEC's Jun'19 output stood at 29.91m b/d. Thus, assuming Iran oil exports and output of other members of OPEC remains at

same level as in Jun'19, we estimate based on IEA demand and non-OPEC output estimates:

- Supply deficit of 0.7m b/d in Q3CY19E
- Supply deficit of just 0.09m b/d in Q4CY19E

Supply deficit, thus, appears likely in Q3CY19 with OPEC and Russia agreeing to extend oil output cut deal for nine months.

Table 12: Supply deficit of 0.7m b/d estimated in Q3CY19E and demand-supply more or less balanced in Q4CY19 if OPEC output remains at Jun'19 level

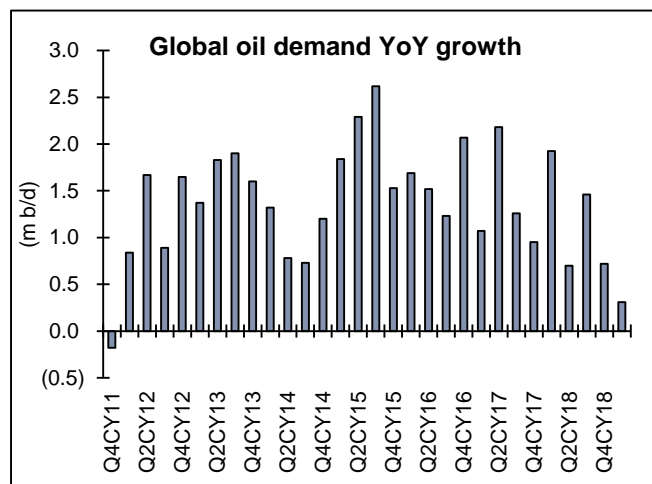
	2019E	2019E			2019A
		Q4	Q3	Q2	Q1
OPEC (including NGLs)	35.7	35.5	35.5	35.6	36.2
Non-OPEC (including NGL)	64.9	65.8	65.3	64.5	63.9
Global oil production (including NGLs)	100.6	101.3	100.8	100.1	100.1
Global oil demand	100.3	101.3	101.4	99.6	98.8
Global supply surplus/(deficit)	0.3	-0.1	-0.7	0.5	1.3
OPEC NGLs	5.6	5.6	5.6	5.6	5.6
OPEC oil output at Jun'19 level in rest of CY19	30.1	29.9	29.9	30.0	30.6

Source: IEA, I-Sec research

US oil inventory fall in Q3CY19-TD appears to corroborate likely deficit

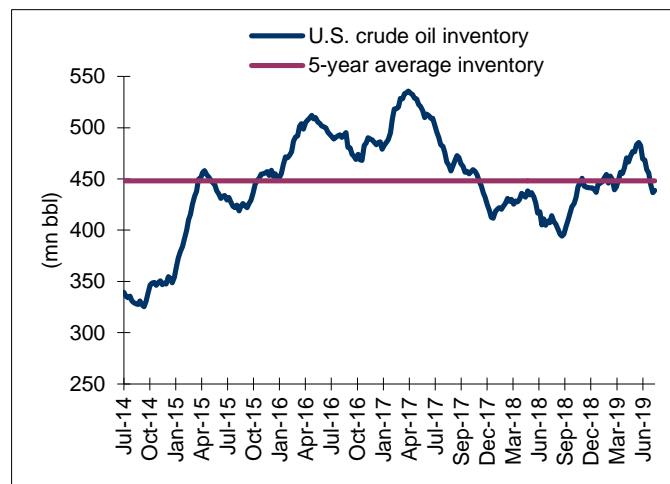
US crude oil inventory was up 2.4m bbls last week but is down by 29.6m bbls in Q3CY19-TD. This appears to corroborate expectation of likely global oil supply deficit in Q3CY19.

Chart 33: Q1CY19 global oil demand growth lowest in 29 quarters



Source: IEA, I-Sec research

Chart 34: US crude inventory up 2.4m bbls WoW last week but down 29.6m bbls in Q3CY19-TD



Source: EIA, I-Sec research

Supply surplus in Q1 & CY20 if OPEC+ do not cut output further

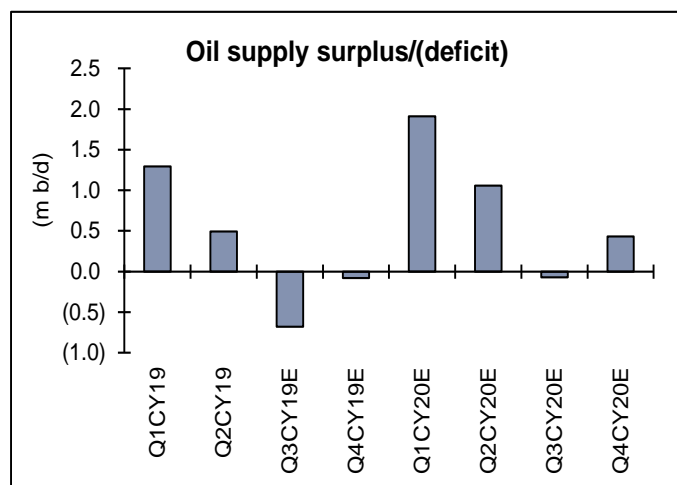
Call on OPEC oil output at 28m b/d in Q1CY20

IEA as per Jul'19 OMR estimates call on OPEC oil at:

- 28m b/d in Q1CY20E
- 28.9m b/d in Q2CY20E
- 30.0m b/d in Q3CY20E

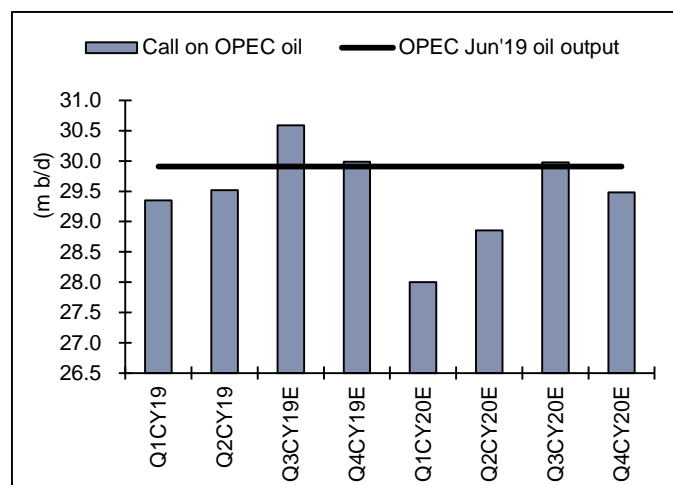
- 29.5m b/d in Q4CY20E

Chart 35: Global supply deficit 0.7m b/d in Q3CY19 but 1.1-1.9m b/d surplus in Q1-Q2CY120E



Source: IEA, I-Sec research

Chart 36: Call on OPEC oil at 28-29.5m b/d in 3 of 4 quarters of CY20 lower than Jun'19 output of 29.9m b/d



Source: IEA, I-Sec research

Supply surplus of 1.1-0.4m b/d in Q2-Q4CY20E and 0.8m b/d in CY20E

Based on IEA's demand, non-OPEC output, OPEC's NGL output estimates and assuming OPEC oil output remains at the Jun'19 level of 29.91m b/d, we estimate:

- Supply surplus of 1.9m b/d in Q1CY20E.
- Supply surplus of 1.1m b/d in Q2CY20E.
- Supply deficit of 0.1m b/d in Q3CY20E.

Table 13: Supply surplus at 1.9m b/d in Q1, 1.1m b/d in Q2, 0.4m b/d in Q4, 0.8m b/d in CY20E & deficit 0.1m b/d in Q3 if OPEC output stays at Jun'19 level

	2020E	2020E			
		Q4	Q3	Q2	Q1
OPEC (including NGLs)	35.5	35.5	35.5	35.5	35.5
Non-OPEC (including NGL)	67.0	67.6	67.3	66.8	66.2
Global oil production (including NGLs)	102.5	103.1	102.8	102.3	101.7
Global oil demand	101.7	102.7	102.9	101.2	99.8
Global supply surplus/(deficit)	0.8	0.4	-0.1	1.1	1.9
OPEC NGLs	5.6	5.6	5.6	5.6	5.6
OPEC oil output at Jun'19 level in rest of CY19	29.9	29.9	29.9	29.9	29.9

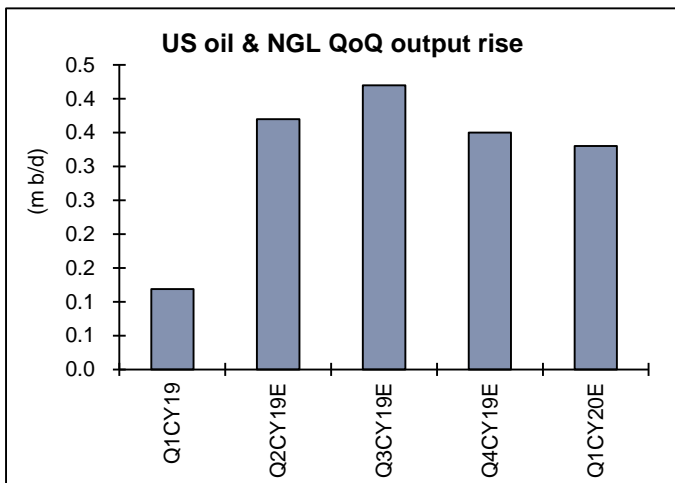
Source: IEA, I-Sec research

- Supply surplus of 0.4m b/d in Q4CY20E.
- Supply surplus of 0.8m b/d in CY20E.

Supply deficit in Q3-Q4CY19 lower if demand lower than IEA estimate

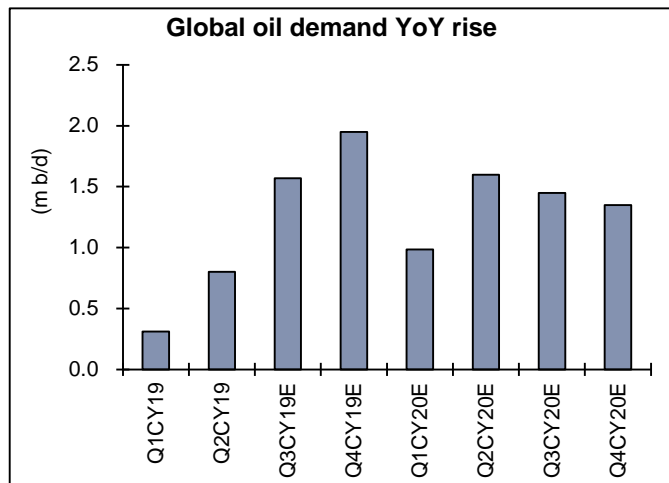
Global oil deficit may be lower than estimated in Q3-Q4CY19 or there may be no deficit if global oil demand is significantly lower than 1.6-1.95m b/d estimated in Q3-Q4CY19.

Chart 37: US oil & NGL output estimated to rise by 0.33-0.42m b/d QoQ in Q2CY19 to Q1CY20



Source: IEA, I-Sec research

Chart 38: IEA estimates global demand growth at 0.3-1.95m b/d YoY in Q1CY19 to Q1CY20



Source: IEA, I-Sec research

IEA estimates Q1CY20 & Q3-Q4CY19 demand growth at 1.0-1.95m b/d

IEA estimates global oil demand growth at:

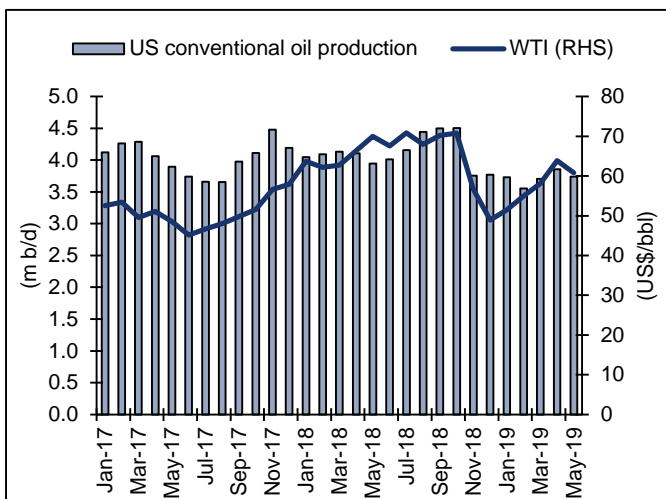
- 0.31m b/d in Q1CY19
- 0.8m b/d in Q2CY19
- 1.6m b/d in Q3CY19.
- 1.95m b/d in Q4CY19
- 1.0m b/d in Q1CY20

US oil output up 558k b/d in CY19-TD as per weekly data

As per EIA’s weekly data, US oil output was up by:

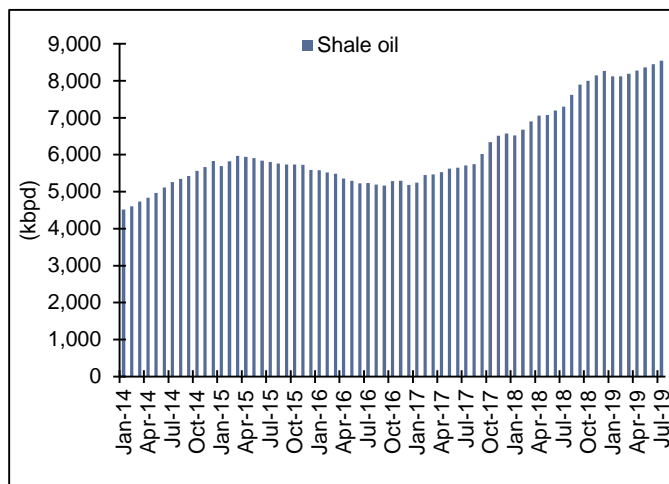
- 1.92m b/d in end-CY18 from levels in end-CY17.
- 558k b/d in the CY19-TD till W.E 2-Aug’19 as per EIA’s weekly data
- 71k b/d in CY19-TD (up to May’19) as per the more reliable monthly data of EIA

Chart 39: US conventional crude oil output down 0.76m b/d in May’19 from Oct’18 levels



Source: EIA, Bloomberg, I-Sec research

Chart 40: EIA estimates US Shale production increased by 95k b/d MoM at 8.55m b/d in Jul’19

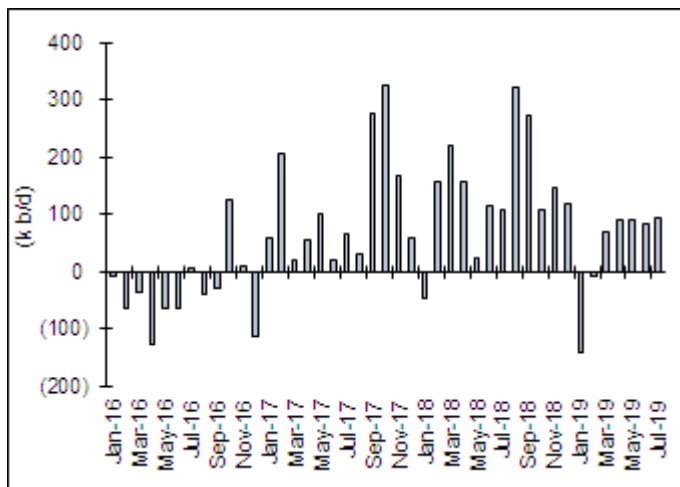


Source: EIA, Bloomberg, I-Sec research

US oil production up 3.7m b/d (43%) from lows in Sept'16

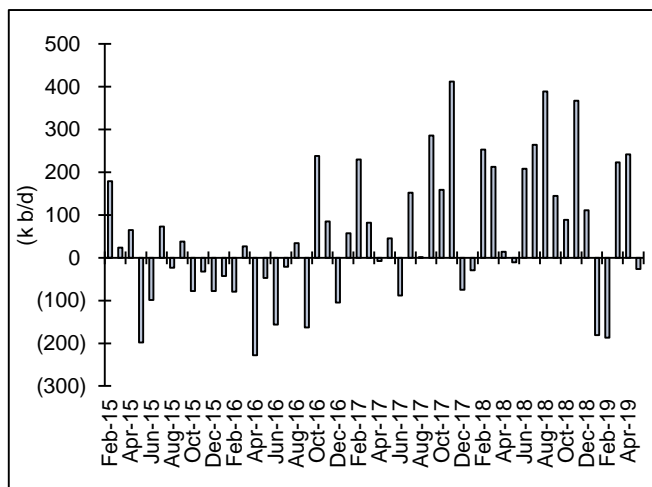
Total US oil production had peaked at 9.63m b/d in Apr'15 and bottomed at 8.55m b/d in Sept'16. US oil production at 12.2m b/d in the W.E.26-Jul'19 is up 3.7m b/d (43%) from 8.55m b/d in Sept'16.

Chart 41: EIA estimates US Shale oil production to have risen by 95k b/d in Jul'19



Source: EIA, I-Sec research

Chart 42: US total oil production up 3.6m b/d in May'19 from lows in Sep'16

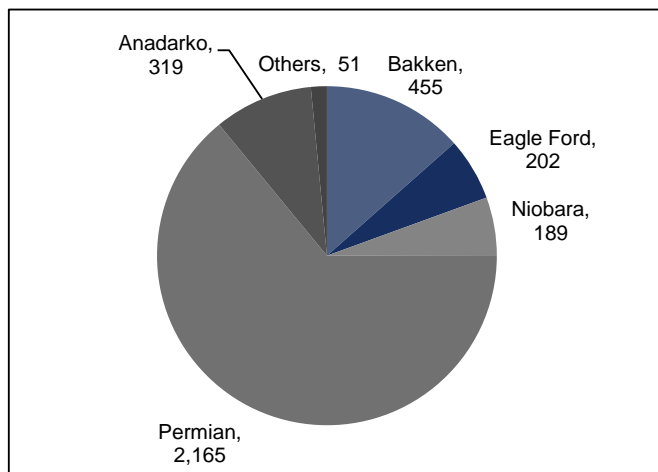


Source: EIA, Bloomberg, I-Sec research

EIA estimates Shale output up 95k b/d MoM to 8.55m b/d in Jul'19

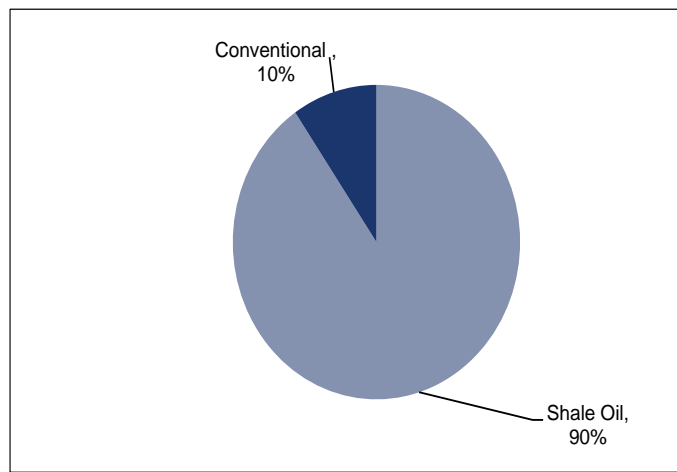
US Shale oil production is estimated to rise 95k b/d MoM to 8.55m b/d in Jul'19 from 8.45m b/d in Jun'19. Shale production last peaked at 5.97m b/d in Mar'15 but declined by 0.81m b/d thereafter due to low oil prices and bottomed out at 5.16m b/d in Sep'16. Rebound in oil prices from the lows of Feb'16 led to rising oil rig count, drilled and completed Shale oil wells in Mar-May'16 and rebound in US Shale oil production from Nov'16.

Chart 43: EIA estimates Shale output up 3.3m b/d from Sep'16 lows; 65% of growth from Permian



Source: EIA, I-Sec research

Chart 44: Shale oil has accounted for most of US crude oil production growth from Sep'16 lows



Source: EIA, Bloomberg, I-Sec research

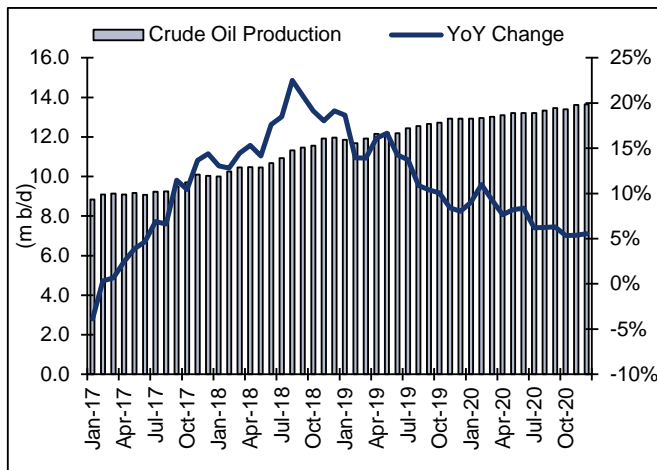
Shale output up 3.3m b/d (65%) up to May'19 from Sep'16 lows

EIA estimates US Shale oil output at 7.6m b/d in May'19. Shale production is estimated to have risen 3.3m b/d (76%) from 4.31m b/d in Sep'16.

Permian accounted for 65% of Shale output rise from Sep'16 lows

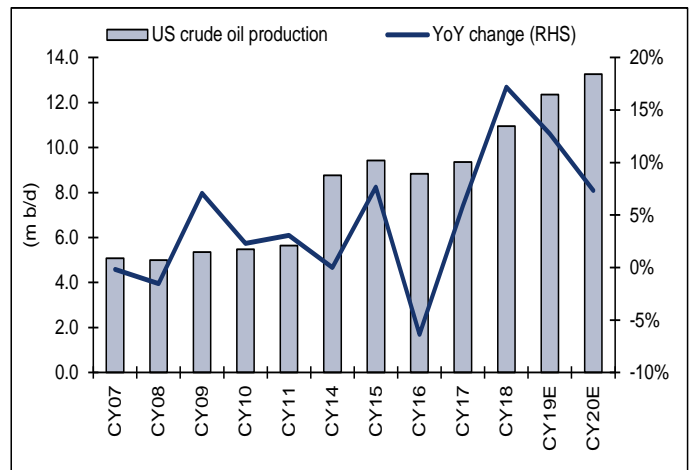
Permian basin has accounted for 65% (2.14m b/d) of US Shale production rise of 3.27m b/d from Sep'16 to Jul'19. Permian basin output has contributed 84% of the shale output rise in CY19-TD (up to May'19); Permian output has increased by 354k b/d while total shale output has increased by 420k b/d. Permian output at 3.53m b/d accounts for 47% of US shale production of 7.58m b/d in Jul'19.

Chart 45: EIA estimates US oil output to continue to rise, but growth to slow down



Source: EIA, I-Sec research

Chart 46: EIA estimates US output rise by 1.6m b/d in CY18, 1.40m b/d in CY19 and 0.91m b/d in CY20



Source: EIA, I-Sec research

US CY19 output estimate raised by 0.04m b/d

In the Jul'19 STEO, EIA estimates US crude oil production at:

- 12.35m b/d in CY19 v/s earlier estimate of 12.32m b/d implying an upgrade of 0.04m b/d.
- 13.26m b/d in CY20 which remains unchanged from the earlier estimate.

EIA estimates US oil output rise by 1.40-0.91m b/d YoY in CY19-CY20

EIA estimates US oil production to rise by:

- 12.7% or 1.40m b/d YoY to 12.35m b/d in CY19 from 10.96m b/d in CY18
- 7.3% or 0.91m b/d to 13.26m b/d in CY20 from 12.35m b/d in CY19

US oil rig count down by 115 (13%) in CY19-TD

In CY19-TD rig count down by 115 – 44 in Permian & 71 in other areas

In CY19-TD (up to W.E 2-Aug'19), US oil rig count is down by 115 with that in

- Permian basin down by 44.
- Shale areas other than Permian down by 71.

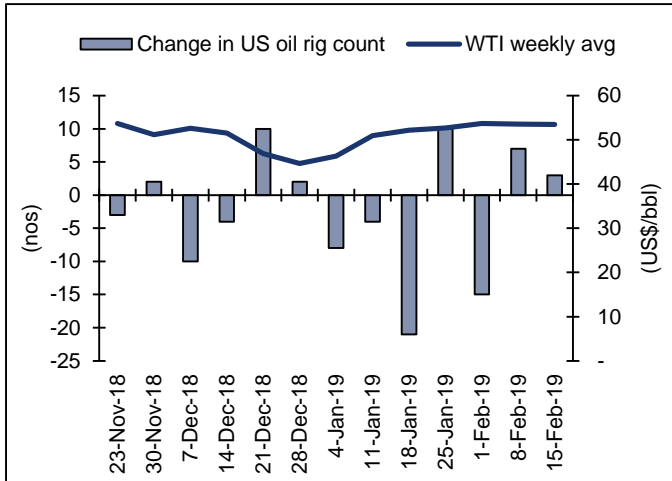
US oil rig count down after WTI slipped below US\$55/bbl

US oil rig count was up by 141 in CY18 up to the W.E. 16-Nov'18. WTI price fell below US\$55/bbl thereafter. Weekly average WTI price was below US\$55/bbl for 13 weeks from W.E. 23-Nov'18 to W.E. 15-Feb'19. During this 13-week period, US oil rig count declined by 31.

Rig count down by 53 in Mar-May'19 despite WTI at US\$56-65/bbl

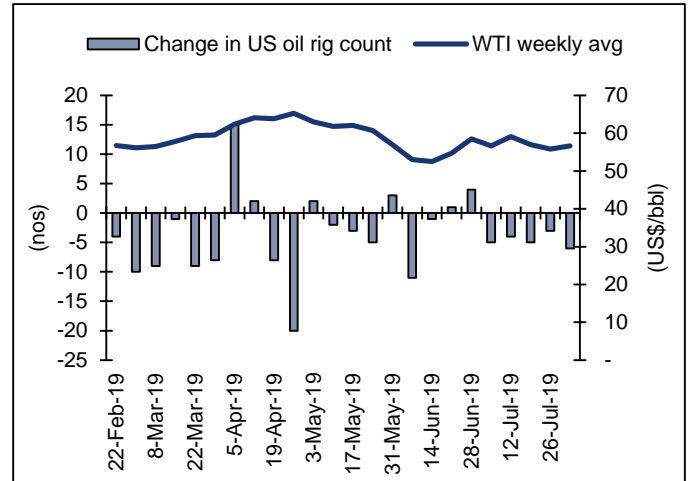
The fall in Jan-Feb'19 output may be due to low oil prices. However, US oil rig count, a lead indicator of output, was down by 53 even in Mar-May'19, when WTI averaged US\$56-65/bbl; it was down by 31 in the 13 weeks in mid-Nov'18 to mid-Feb'19 when WTI was below US\$55/bbl. US oil rig count was down 30 in Jun-Aug'19-TD; WTI slipped below US\$55/bbl in Jun'19 but is above US\$55/bbl in Jul-Aug'19-TD.

Chart 47: US oil rig count down by 31 in 13 weeks starting W.E. 23-Nov'18 when WTI weekly average was US\$44.6-53.7/bbl



Source: Bloomberg, Baker Hughes, I-Sec research

Chart 48: US oil rig count down 77 in Mar-Jul'19-TD despite WTI above US\$55/bbl in Mar-May'19; WTI slipped below US\$55/bbl in Jun'19

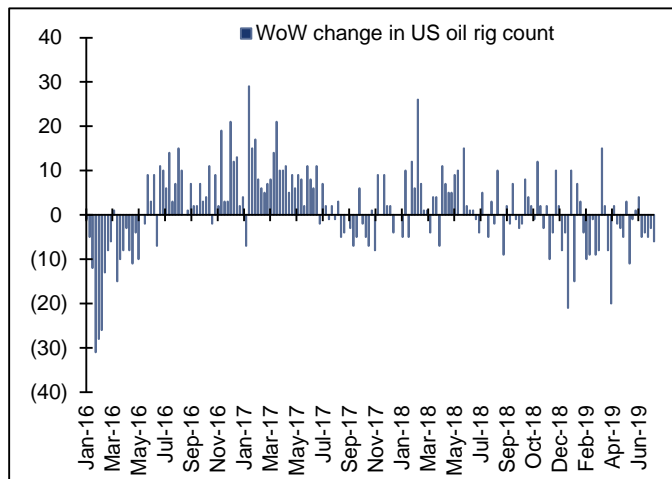


Source: Bloomberg, Baker Hughes, I-Sec research

US onshore oil rig count up 144% from low in end-May'16

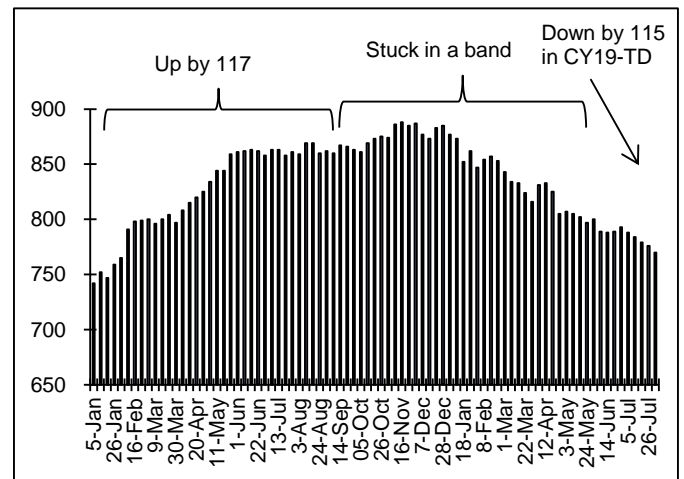
US oil rig count peaked in the W.E. 10-Oct'14 at 1,609, four months after the WTI price peaked in Jun'14. US oil rig count bottomed out at 316 in the W.E. 27-May'16, more than three months after WTI price bottomed out on 11-Feb'16 and is up 144% from those levels. US oil rig count is down by 115 in CY19-TD at 770 in the W.E. 2-Aug'19.

Chart 49: US oil rig count down by 6 WoW last week and down by 118 since W.E. 16-Nov'18



Source: Bloomberg, I-Sec research

Chart 50: US oil rig count down by 6 to 770 last week and by 115 in CY19-TD



Source: EIA, I-Sec research

Marketing margin super-normal in Q2CY20-TD

Net auto fuel marketing margin at Rs2.18/l in Q2FY20-TD

Net margin Rs1.38/l on 6-Aug'19 vs Rs1.63/l on 31-Jul'19 on price cut

Net marketing margin on auto fuels fell to Rs1.38/l on 6-Aug'19 from Rs1.63/l on 31-Jul'19 due to rise in RTP of diesel by Rs0.25/l and fall in petrol price charged to dealers by Rs0.46/l on 6-Aug'19 from levels on 31-Jul'19. Net marketing margin declined to Rs2.73/l on 15-Jul'19 on price cuts and is further down to Rs1.38/l on 6-Aug'19. Net marketing margin on 6-Aug'19 on:

- Diesel – is estimated at Rs1.90/l vs Rs2.20/l on 31-Jul'19 due to Rs0.25/l increase in RTP but a reduction of Rs0.05/l in price charged to dealers.
- Petrol – is estimated at minus Rs0.18/l vs minus Rs0.09/l on 31-Jul'19 due to Rs0.46/l cut in price charged to dealers exceeding fall in RTP of Rs0.37/l.

Table 14: Petrol and diesel net marketing margins at minus Rs0.18/l and Rs1.9/l on 6-Aug'19 from minus Rs0.09/l and Rs2.2/l on 31-Aug'19

	Diesel			Petrol		
	6-Aug-19	31-Jul-19	Change	6-Aug-19	31-Jul-19	Change
CIF price (US\$/bbl)	78.21	77.87	0.34	73.06	74.15	-1.10
INR/USD rate	68.87	68.66	0.21	68.87	68.66	0.21
Refinery transfer price (Rs/l)	34.27	34.02	0.25	31.81	32.18	-0.37
Price charged to dealer (Rs/l)	37.90	37.95	-0.05	33.38	33.83	-0.46
Gross marketing margin (Rs/l)	3.63	3.94	-0.30	1.56	1.65	-0.09
Marketing cost (Rs/l)	1.74	1.74	0.00	1.74	1.74	0.00
Net marketing margin (Rs/l)	1.90	2.20	-0.30	(0.18)	(0.09)	-0.09

Source: OMCs, PPAC, I-Sec research

Net margin at Rs2.18/l in Q2FY20-TD

Net auto fuel marketing margin is at a super-normal level of Rs2.18/l in Q2FY20-TD (up to 6-Aug'19). The net marketing margin on:

- Diesel – is at a super-normal level of Rs2.6/l
- Petrol – is at a super-normal level of Rs0.87/l

Table 15: Q2FY20-TD auto fuel net marketing margin at Rs2.18/l, up 162% YoY and 24% QoQ, and FY20-TD at Rs1.87/l, up 3% YoY

(Rs/l)	Diesel	Petrol	Blended
Net marketing margin			
Q2FY20-TD	2.60	0.87	2.18
QoQ change	9%	NM	24%
YoY change	168%	114%	162%
Q1FY20	2.40	-0.22	1.75
QoQ change	-50%	NM	-62%
YoY change	234%	NM	182%
FY20-TD	2.46	0.10	1.87
YoY change	27%	-94%	3%
FY19	1.93	1.51	1.83
FY18	1.06	1.10	1.07
YoY change	81%	37%	70%

Source: PPAC, I-Sec research

Net margin at Rs1.75/l in Q1FY20 and Rs1.90/l in FY20-TD

Net marketing margin of Rs1.75/l in Q1FY20 driven by diesel

Net auto fuel marketing margin is at a super-normal level of Rs1.75/l in Q1FY20 driven by diesel margins in spite of negative margin on petrol. The Q1FY20 net marketing margin on:

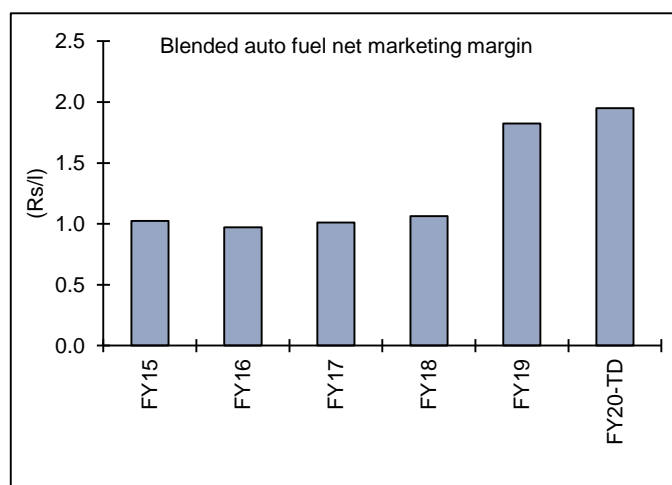
- Diesel is at a super-normal level of Rs2.40/l
- Petrol is negative at minus Rs0.22/l.

Net margin super-normal at Rs1.87/l in FY20-TD

Net auto fuel marketing margin is at super-normal level of

- Rs1.75/l in Q1FY20
- Rs2.18/l in Q2FY20-TD
- Rs1.87/l in FY20-TD.

Chart 51: Net marketing margin at Rs1.87/l in FY20-TD up 3% YoY



Source: PPAC, I-Sec research

Net margin super-normal at Rs1.83/l in FY19 but ~Rs1/l in FY15-FY18

Net auto fuel marketing margin was super-normal at Rs1.83/l in FY19 but was at normal level of

- Rs1.03/l in FY15.
- Rs0.97/l in FY16.
- Rs1.01/l in FY17.
- Rs1.06/l in FY18.

Q1FY20 integrated margin down QoQ & YoY; Q2-TD higher

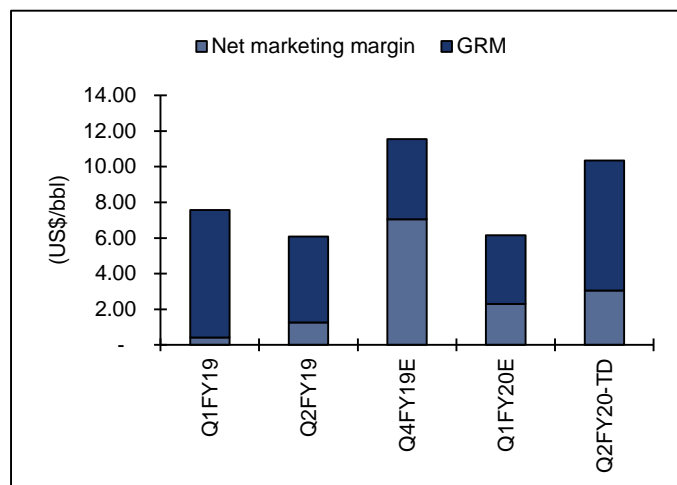
OMCs' Q1FY20 integrated margin at US\$6.0-6.4/bbl

Q1FY20 integrated GRM and net marketing margins are estimated at:

- US\$6.4/bbl for BPCL including GRM of US\$4.0/bbl and marketing margin of US\$2.4/bbl

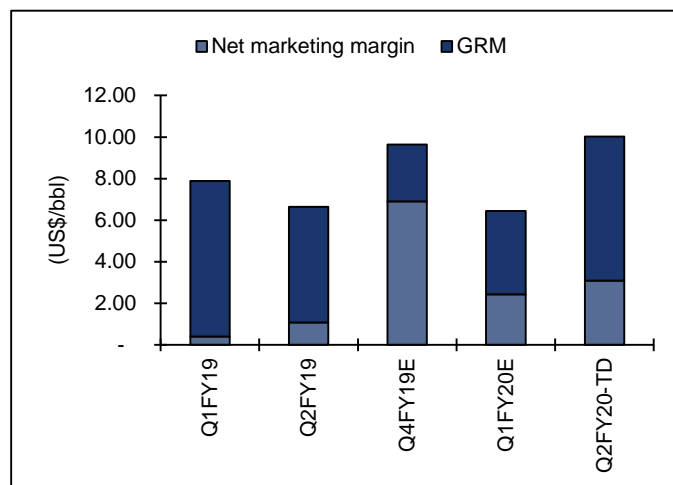
- US\$6.1/bbl for HPCL including GRM of US\$3.8/bbl and marketing margin of US\$2.3/bbl
- US\$6.0/bbl for IOC including GRM of US\$3.5/bbl and marketing margin of US\$2.4/bbl

Chart 52: HPCL's integrated margin at US\$10.4/bbl in Q2FY20-TD vs US\$7.6/bbl in Q1FY19



Source: PPAC, company data, I-Sec research

Chart 53: BPCL's integrated margin at US\$10.0/bbl in Q2FY20-TD vs US\$7.9/bbl in Q1FY19



Source: PPAC, company data, I-Sec research

OMCs' Q1FY20E integrated margin down QoQ and YoY

Q1FY20E integrated GRM and net marketing margin of OMCs at US\$6.0-6.4/bbl is down 18%-43% YoY and 33%-47% QoQ. While marketing margin is down QoQ but up YoY, OMCs' Q1FY20 GRM is estimated to be down both QoQ and YoY.

OMCs' integrated margin in Q2FY20-TD up YoY and QoQ

Integrated GRM and net marketing margin of OMCs at US\$9.5-10.4/bbl in Q2FY20-TD is up 56%-68% QoQ and 21%-70% YoY. OMCs' marketing margin is up QoQ as well as YoY; their GRM in Q2FY20-TD is estimated to be up QoQ as well as YoY.

Q2FY20-TD integrated GRM and net marketing margins are estimated at:

- US\$10.0/bbl for BPCL including GRM of US\$6.9/bbl and marketing margin of US\$3.1/bbl
- US\$10.4/bbl for HPCL including GRM of US\$7.3/bbl and marketing margin of US\$3.1/bbl
- US\$9.5/bbl for IOC including GRM of US\$6.5/bbl and marketing margin of US\$3.0/bbl

Budget subsidy provision shortfall may be lower

Aug'19 subsidy down 38%-69% MoM and YoY at Rs10.8bn

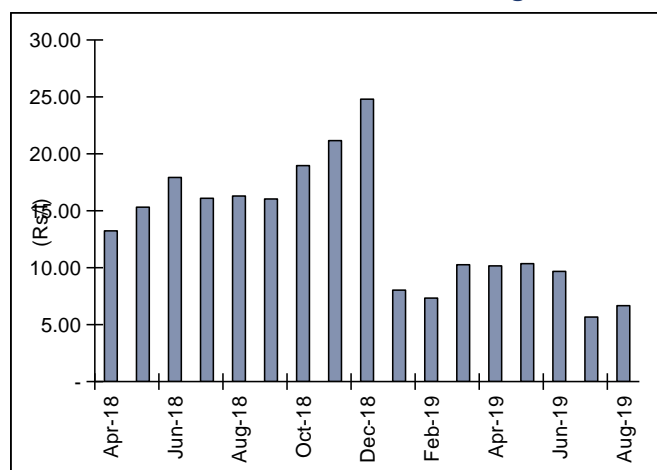
Aug'19 subsidy estimated at Rs9.8-10.8bn

We estimate LPG and kerosene subsidy in Aug'19 at Rs10.8bn to be down 38% MoM and 69% YoY. We are assuming LPG volume growth of 10% YoY and kerosene volume decline of 10% YoY in Aug'19. LPG volume declined by 1.5% YoY and kerosene volume fall was steeper at 13.2% YoY in Apr-Jun'19. Aug'19 subsidy at Rs9.8bn would be down 38% MoM and 72% YoY if Aug'19 volume growth/fall is in line with Apr-Jun'19 trend

Aug'19 subsidy down sharply on 47% MoM fall in LPG per unit subsidy

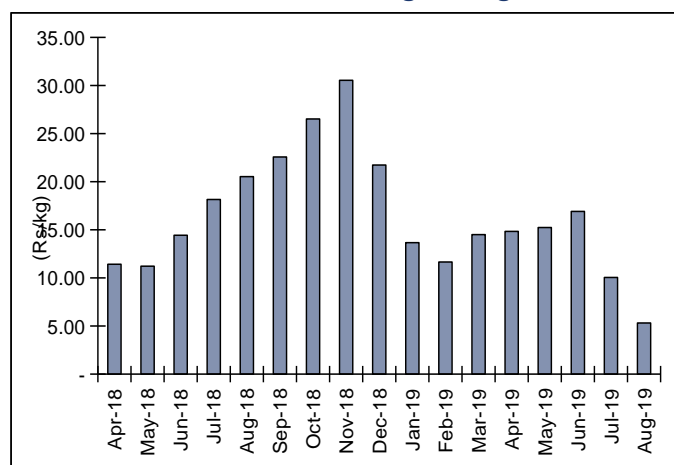
The main reason for the steep fall in subsidy is 47% MoM and 74% YoY fall in LPG subsidy to Rs5.3/kg (Rs75.5/cylinder) from Rs10.0/kg (Rs142.7/cylinder) in Jul'19 and Rs20.5/kg (Rs257.7/cylinder) in Aug'18. Kerosene per unit subsidy was up 18% MoM but down 59% YoY to Rs6.7/l from Rs5.7/l in Jul'19 and Rs16.3/l in Aug'18.

Chart 54: Kerosene subsidy at Rs6.7/l in Aug'19 is down 59% YoY from Rs 16.3/l in Aug'18



Source: PPAC, I-Sec research

Chart 55: LPG subsidy at Rs5.3/kg in Aug'19 is down 74% YoY from Rs20.5/kg in Aug'18



Source: PPAC, Bloomberg, I-Sec research

Q1FY20 subsidy estimated at Rs76.4bn; Rs65.7bn in Q4FY19

Q4FY19 subsidy at Rs65.7bn and Rs374bn in FY19

LPG and kerosene subsidy was at Rs65.7bn in Q4FY19 and Rs373.9bn in FY19. Subsidy on

- LPG was at Rs314.4bn in FY19 and Rs57.4bn in Q4Y19
- Kerosene was at Rs59.5bn in FY19 and Rs8.26bn in Q4FY19

Q4FY19 subsidy of Rs65.7bn is down 20% YoY. However, FY19 subsidy is up 46% YoY.

Table 16: Q4FY19 subsidy down 20% YoY, but FY19 up 46% YoY

	Q4FY19	Q4FY18	YoY change	FY19	FY18	YoY change
Kerosene	8.3	14.0	-41%	59.5	46.7	27%
LPG	57.4	67.8	-15%	314.4	208.8	51%
Total	65.7	81.8	-20%	373.9	255.5	46%

Source: PPAC, I-Sec research

Q1FY20E subsidy estimated to be up 8% YoY at Rs72.2bn

We estimate LPG and kerosene subsidy in Q1FY20E at Rs72.2bn to be up 8% YoY. Our estimate of subsidy is based on:

- Per unit subsidy of Rs222.4/cylinder on LPG and Rs7.6/l on kerosene
- 70% of LPG sales volumes being subsidised and 95% of kerosene volumes
- Actual LPG and kerosene volumes as reported by PPAC from Apr-Jun'19

FY19 Budget provision of Rs182bn set to be rolled over to FY20**Provision in FY19 Budget is toward CY18 subsidy**

Subsidy is accounted in the Budget on cash basis. Gol pays subsidy for Q4 (Jan-Mar) of a financial year in the next financial year. Thus, provision for FY19 is toward the CY18 subsidy.

Subsidy at Rs308bn in 9MFY19 and Rs390bn in CY18

LPG and kerosene subsidy is at Rs308.2bn in 9MFY19. LPG and kerosene subsidy is at Rs390.1bn in CY18 with subsidy at:

- Rs81.8bn in Q1CY18
- Rs308.2bn in 9MFY19

Table 17: CY18 subsidy estimated at Rs389bn

	Lower than Nov'18
LPG and kerosene subsidy in:	
9MFY19	308.2
Q1CY18	81.8
CY18E	390.1
Subsidy provided in Budget	207.7
Excess of subsidy over Budget provision	182.3

Source: PPAC, I-Sec research

Surplus of subsidy over Budget provision rolled over to FY20

As discussed, CY18 subsidy, which for the purpose of the Budget is FY19 subsidy, is at Rs390bn. Thus, subsidy has exceeded Budget provision by Rs182.3bn, which we believe has been rolled over to FY20. Our view is based on the following factors:

- Revised estimate of FY19 subsidy provision at Rs208bn is the same as Budget estimate, implying that Gol would not bear any subsidy more than Rs208bn in FY19.
- Oil PSUs have not been required to bear any subsidy.

Rs75.9-91.5bn of excess provision may be needed in FY20**Only Rs155bn of FY20 subsidy provision towards CY19 subsidy**

In the interim as well as the final FY20 budget, subsidy provision made is Rs337bn. Rs182bn would be rolled-over subsidy from FY19. Thus, balance subsidy provision of Rs155bn would be towards CY19 subsidy.

CY19 subsidy Rs231-249bn depending on volume & per unit subsidy

As discussed, Q1CY19 (Jan-Mar'19) subsidy is at Rs65.7bn and we estimate Q1FY20 subsidy at Rs72.2bn. CY19E subsidy would be:

- Rs246.5bn if LPG volume growth is 10% YoY and kerosene volume decline 10% YoY in Jul-Dec'19 and per unit subsidy in Sep-Dec'19 is at average level in Apr-Aug'19.
- Rs230.9bn if LPG volume declines 1.5% YoY (same as in Apr-Jun'19) and kerosene volume decline 13.2% YoY in Jul-Dec'19 and per unit subsidy in Sep-Dec'19 is at average level in Q3CY19 till Aug'19.

Table 18: Rs75.9-91.5bn of additional subsidy provision is estimated to be needed in FY20 budget revised estimate as subsidy provided inadequate

Rs bn	Higher volumes & subsidy	Lower volumes and subsidy
LPG and kerosene subsidy in:		
Q1CY19	65.7	65.7
Q2CY19	72.2	72.2
Jul'19	17.5	15.8
Aug'19	10.8	9.8
Oct-Dec'19	80.4	67.4
CY19E	246.5	230.9
FY19 subsidy rolled over	182.3	182.3
FY20 subsidy	428.8	413.2
Subsidy provided in budget	337.3	337.3
Excess subsidy provision needed for CY19E	91.5	75.9

Source: PPAC, I-Sec research

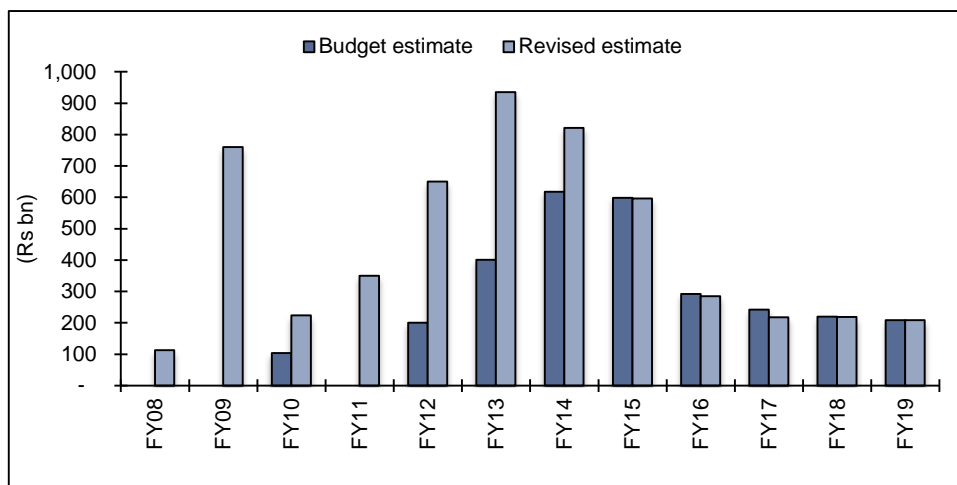
Excess provision of Rs76-91bn needed in revised estimate for FY20

As discussed, only Rs155bn of the subsidy provision of Rs337bn is towards CY19 subsidy. CY19 subsidy on the other hand is estimated at Rs230.9-246.5bn. Thus, revised estimate of subsidy provision for FY20 would have to be higher than the Budget estimate by Rs75.9-91.5bn so as to cover Rs182.3bn rolled over from FY19 and Rs230.9-246.5bn pertaining to CY19.

Excess provision of Rs113bn-759bn in revised estimate in FY08-FY14

On numerous occasions, revised estimate has been higher than Budget estimate. During FY08-FY14, revised estimate of subsidy was higher than the Budget estimate by Rs113bn-759bn. In FY15-FY18, revised estimate of subsidy was Rs1bn-24bn lower than the Budget estimate. This was mainly due to oil price in these years being lower than that estimated at the beginning of the year.

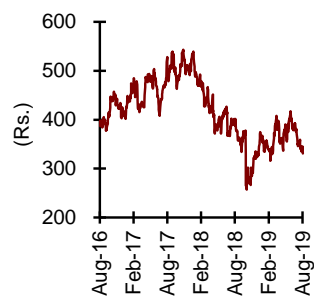
Chart 56: Revised subsidy estimate Rs113bn-759bn higher than Budget estimate in FY08-FY15



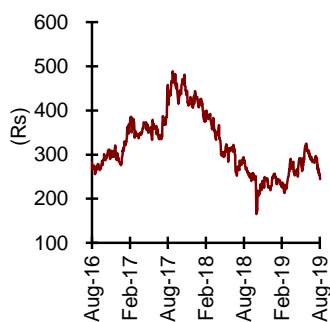
Source: Budget documents, I-Sec research

Price charts

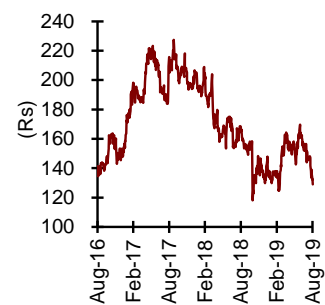
BPCL



HPCL



IOC



Source: Bloomberg

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