FIPI

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Policy & Economic Report - Oil & Gas Market

Federation of Indian Petroleum Industry (FIPI)

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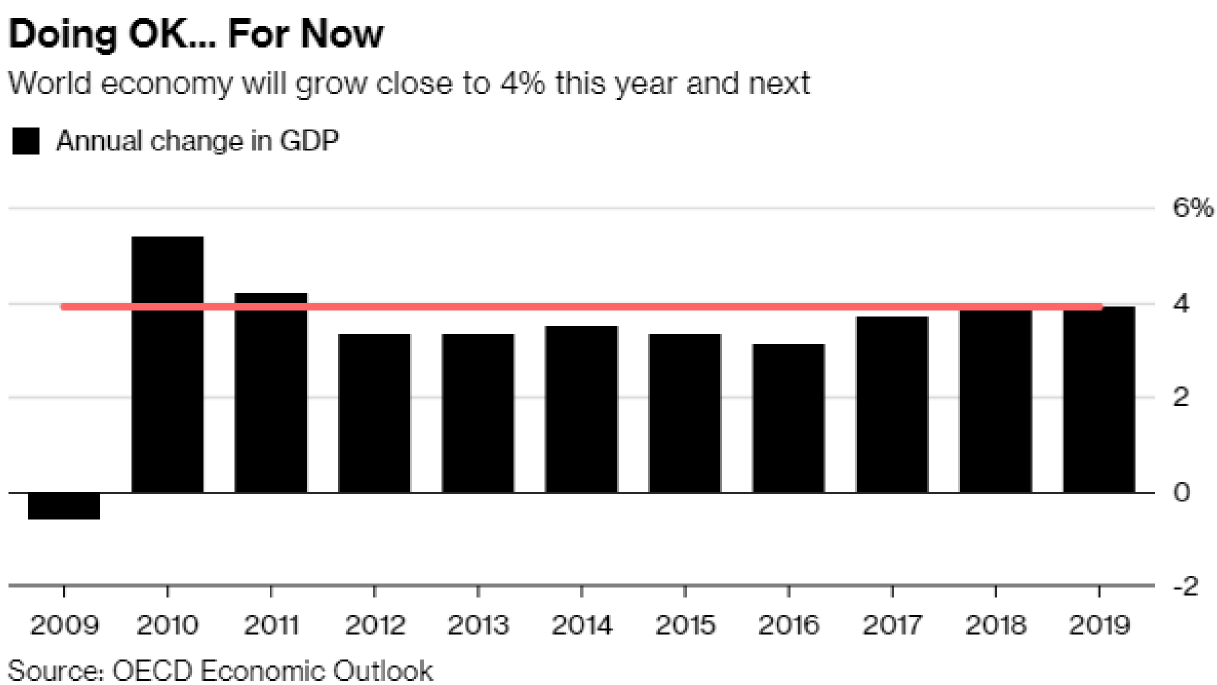
Economy in Focus

Strong global economic growth but risks are building

World trade growth accelerated over the course of 2017, and has remained firm in the first months of 2018. According to the World Trade Organization (WTO), the volume of merchandise trade expanded by 4.7 per cent in 2017, following growth of just 1.8 per cent in 2016. This acceleration was largely driven by cyclical improvements, including a notable increase in investment growth in developed economies. Investment is the most import-intensive component of domestic demand. In 2014, the import content of investment averaged more than 40 per cent in the European Union (EU) and nearly 20 per cent in the United States of America and China. This means that any shock to global investment demand has a disproportionately large impact on world trade.

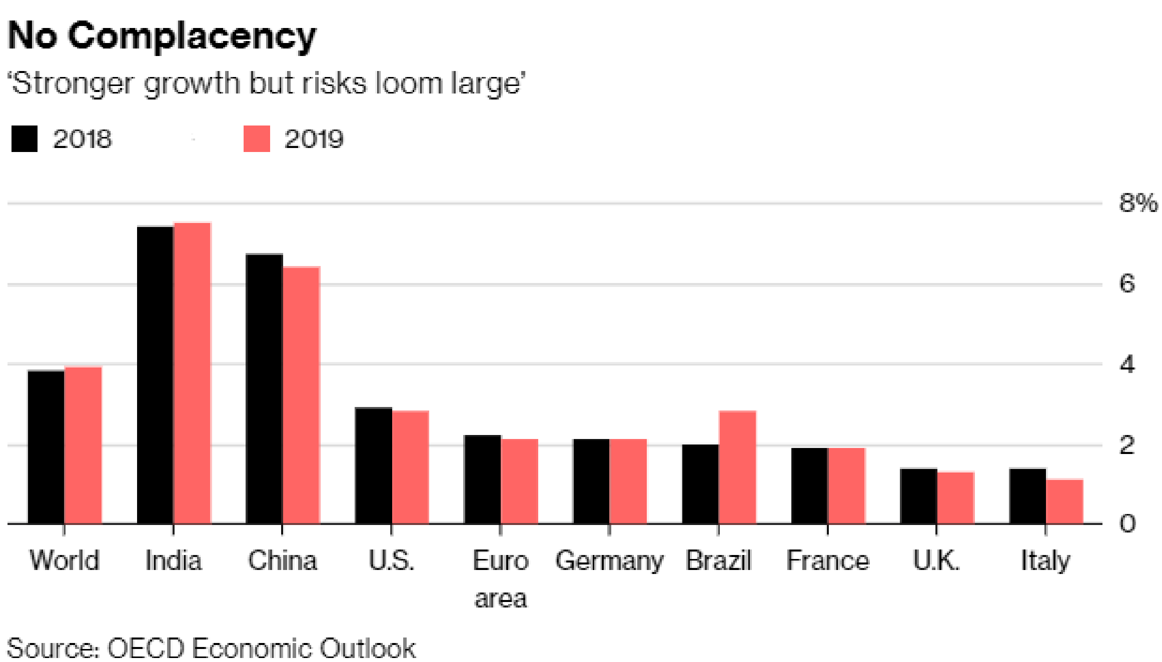
However, in parallel, there have been rising economic risks, including a rise in the probability of trade conflicts between major economies. The United States has announced the introduction of tariffs on specific imported goods, and other countries have reacted by drawing up plans for retaliatory measures. A move towards a more fragmented international trade landscape could reverse recent improvement in the global economy.



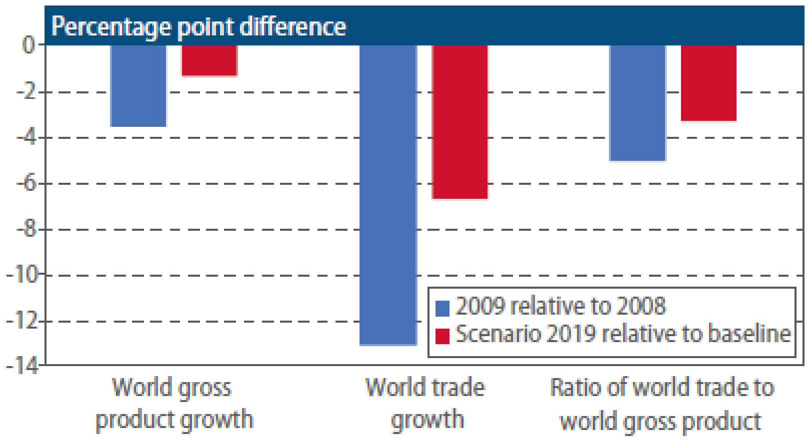
Escalation of trade policy disputes poses risk to recovery in global trade

Leading indicators point to steady trade growth in the first half of 2018, although export orders suggest some easing in the rate of growth in the second quarter of the year. In some parts of the world, recent and ongoing negotiations to lower tariff and non-tariff barriers between trading partners could support an expansion of regional trade networks. However, there are significant downside risks to the prospects for global trade, arising from a build-up of trade tensions among the world's largest economies.

A range of tariff and non-tariff barriers have been put forward by major economies, notably between the United States and China. In the first quarter of 2018, the United States imposed new tariffs on a range of its imports, including steel, aluminium, washing machines, and solar panel cells. Subsequently, the United States announced plans to impose a 25 per cent tariff on imports of more than 1,000 products from China, worth approximately $50 billion. China responded by identifying an equivalent value of imports to tax from the United States. This, in turn, instigated proposals by the United States to broaden the tariff base further, to cover imports totaling up to $150 billion. Both parties have raised disputes in this regard at the WTO, and the situation remains in flux.



Impact of illustrative scenario of an escalation of trade barriers, compared to key variables in 2009



Source: UN/DESA scenario based simulation

Political turmoil in Italy impacting global markets

Italy's politics are in ferment, after a decision by the country's president, Sergio Mattarella, effectively blocked a populist coalition between the anti-establishment Five Star movement and the anti-immigrant League. This has led to a significant impact on the global debt and equity markets.

Italy's 10-year bond yields, a measure of the country's sovereign borrowing costs, breached 3 per cent recently, the highest in four years. At the start of the month they were just 1.8 per cent. That means many traders have been marking down the price of Italian debt and selling it because they think the chance they might not be repaid (for instance if Italy crashes out of the eurozone) has risen.

Asian share markets all plunged into the red on Wednesday. Tokyo was down 1.5%, Hong Kong lost 1.5% and Shanghai was 1.7% lower. Sydney gave up 0.6% and the Kospi in Seoul was down 2.1%.

As Italy is the third largest eurozone economy and has a sovereign debt pile of Euro 2.3 trillion, which is the largest in eurozone, any default in the borrowings will have significant financial repercussions in Europe and even globally.

In the worst-case scenario, Italy could abandon the euro resulting in a full-blown financial crisis leading in to a deep recession.

Blockchain Reshaping Global Economic Structure: Chinese President Xi Jinping

The global economic structure is being reshaped with artificial intelligence, internet of things and blockchain. Inspite of a ban in September 2017, the government and local conglomerates like Alibaba and Tencent have continued to focus on developing the blockchain and decentralized platforms that have the potential to improve the economy and the global financial structure. In fact, the government has decided to spend $1.6 billion on funding blockchain startups. ZhongAn, an insurance giant in China founded by Alibaba and Tencent founders Jack Ma and Pony Ma Huateng has recently partnered with more than 100 hospitals to utilise the blockchain in processing healthcare records, financial information, and payments.

Fighting climate change literally good for the economy!

A study led by researchers at Stanford University and published in the journal "Nature", states that strict limits on global warming can bolster the world economy by averting tens of trillions of dollars in damage this century from heat waves, droughts and floods.

Global economy loses $160 trillion to gender inequality issues

No fewer than 141 countries are losing $160 trillion in wealth because of differences in lifetime earnings between women and men, the World Bank Group report on gender inequality has shown.

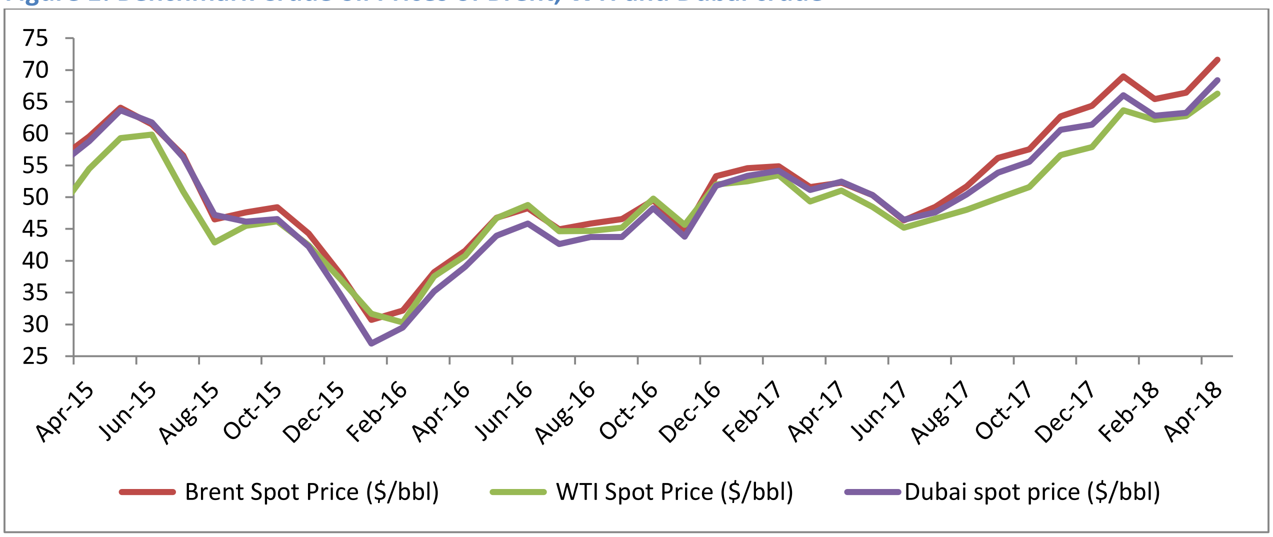
The loss amounts to an average of $23,620 for each person in the 141 countries.

Oil & Gas Market

Crude oil price

Crude oil prices showed an increasing trend in the month of April 2018. Global benchmark crudes such as Brent, WTI and Dubai increased in the range of 5.6% - 8.1% over the last month due to geopolitical risks in Middle East, curb on production by OPEC, worries over output in Venezuela and rising demand in Asia.

Figure 1: Benchmark Crude oil Prices of Brent, WTI and Dubai crude



Source: EIA, World Bank,

- Brent crude price averaged $71.6 per bbl in April 2018, and was up 7.8% and 36.9% on a month on month (MoM) and year on year (YoY) basis, respectively.
- WTI crude price averaged $66.3 per bbl in April 2018, and was up 5.6% and 29.8% on a month on month (MoM) and year on year (YoY) basis, respectively.
- Dubai crude price averaged $68.4 per bbl in April 2018, and was up 8.1% and 30.4% on a month on month (MoM) and year on year (YoY) basis, respectively.

Table 1: Crude oil price in April, 2018

Crude oil	Price ($/bbl) in April 2018	MoM (%) change	YoY (%) change
Brent	71.6	7.8%	36.9%
WTI	66.3	5.6%	29.8%
Dubai	68.4	8.1%	30.4%

Source: EIA, World Bank,

Crude oil price continues to soar in May 2018

Global crude oil prices touched $ 80 per barrel in May 2018, and are at their highest point since 2014, thus proving wrong forecasts made by various agencies for oil price to remain around $ 60 per barrel level in 2018. There are various ongoing factors that have contributed to increase in oil prices:

- **Shortage of supplies from Venezuela:** Worsening economic situations in oil-rich South American countries, and ageing, conventional oilfields have together resulted in Venezuela cutting its oil production significantly. This in turn, has worsened the already-tight supply situation from OPEC (Organization of Petroleum Exporting Countries) and political instability in the South American nation surrounding its national elections is just adding fuel to a rapidly-growing fire.

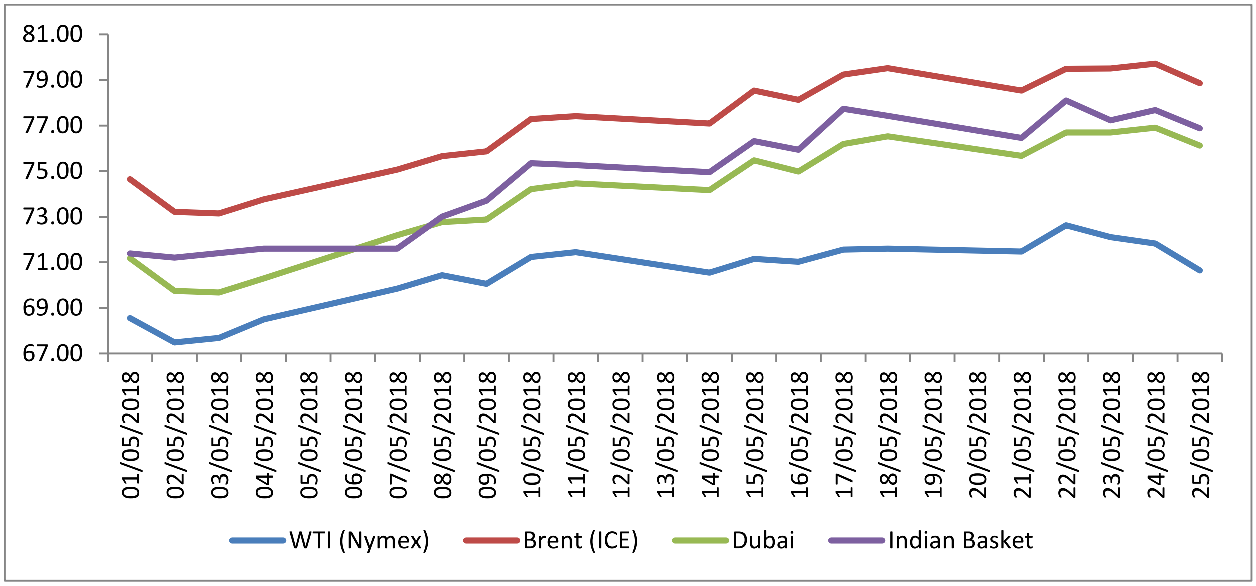
- **US exit from Iran nuclear deal:** The United States' decision to exit the Iran nuclear deal unilaterally and the sanctions that are expected to be imposed on Iran as a result, are some of the major factors behind the recent rally in crude prices. Iran currently exports around 2.5 million barrels of oil a day, which is roughly 4 percent of world's total supply, and the newly-imposed restrictions, could bring this figure down by as much as 1 million barrels a day.

- **Politics in Middle East:** Over the past few months, tensions between Saudi Arabia and Iran over conflicts with Iraq, Yemen, Libya and Syria have rapidly escalated. Although there haven't been any military confrontations as yet, the intensifying conflict and political interventions have turned the heat up in the entire Middle-Eastern region, which is yet another reason for the recent uptick in prices.

- **Drop in US crude oil inventories:** An EIA report has indicated another 1.1 million barrel drop in U.S. crude oil inventories. This has now moved crude oil inventories down into the lower half of the range for this time of year. In addition to the drop in crude oil inventories, the EIA also reported that gasoline and diesel inventories each dropped by at least 3.0 million barrels in April, bringing the total drop in commercial inventories to 10.6 million barrels for the week. That's an unusually large (and bullish) draw on inventories.

- **OPEC's efforts to tighten markets:** OPEC's efforts to tighten markets are being led by top exporter Saudi Arabia, where state-controlled oil firm Saudi Aramco is pushing for higher prices ahead of a partial listing planned for later this year or 2019. However, OPEC is deliberating over easing output to check the global increase in crude prices.

Figure 2: Crude oil price in May 2018

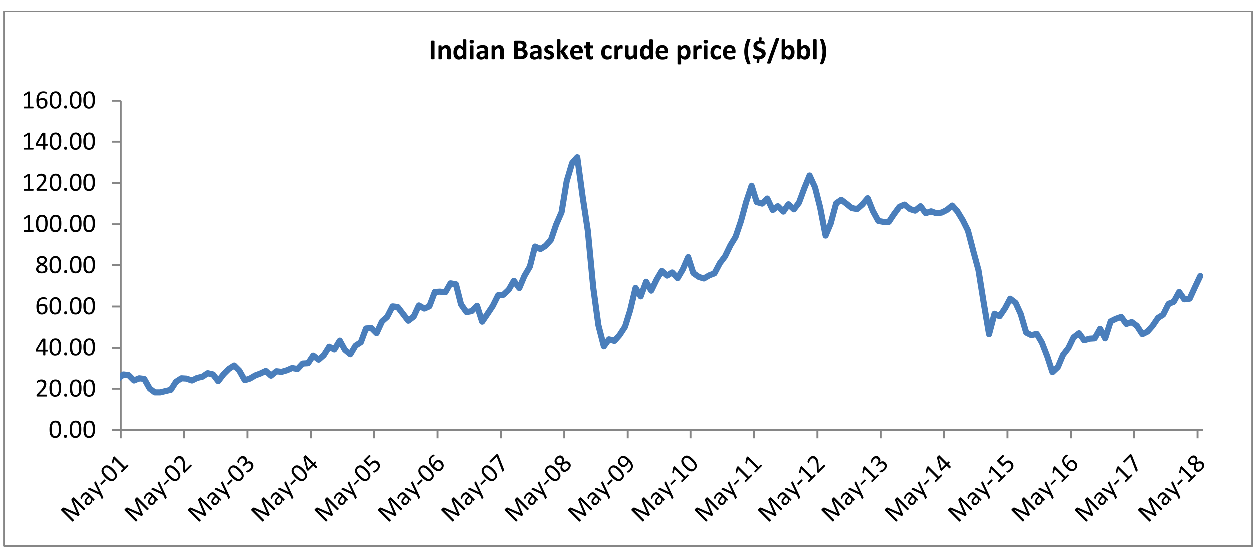


Source: EIA, PPAC

Indian Basket Crude oil price

- The Indian basket of Crude Oil represents a derived basket comprising of Sour grade (Oman & Dubai average) and Sweet grade (Brent Dated) of Crude oil processed in Indian refineries in the ratio of 72.38:27.62 during 2016-17.

Figure 3: Indian crude oil basket price in $ per bbl



Source: Petroleum Planning & Analysis Cell

- Indian crude basket price $ 75.95 per barrel on May 28, and was up 8.6% and 32.0% on a month on month (MoM) and year on year (YoY) basis, respectively.

Oil demand & supply

- According to OPEC, World oil demand is expected to grow by 1.70% in 2018* to 98.85 mbpd from 97.20 mbpd in 2017. India's demand for oil in 2017 was 4.47 mbpd and is projected to increase to 4.67 mbpd in 2018.

Table 2: World Oil demand in mbpd

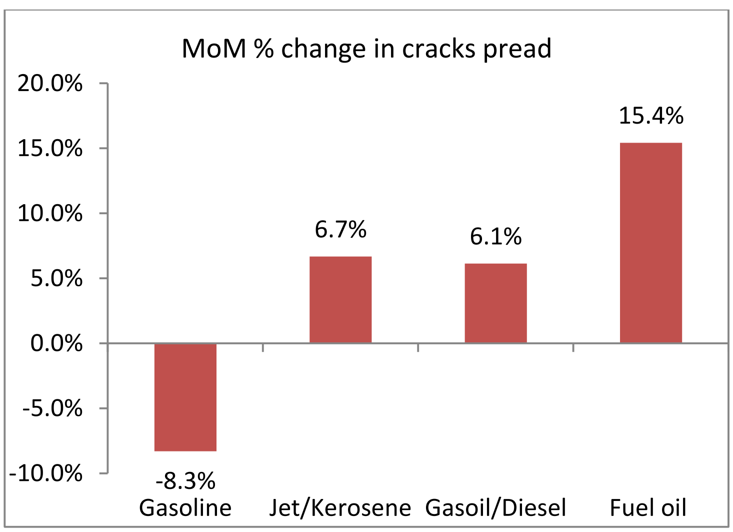
	2017	1Q18	2Q18	3Q18	4Q18	2018	Growth	%
Total OECD	**47.41**	**47.54**	**47.35**	**47.96**	**48.31**	**47.79**	**0.38**	**0.80**
Dev. Countries	**32.04**	**32.34**	**32.72**	**33.15**	**32.82**	**32.76**	**0.72**	**2.24**
~ of which India	*4.47*	*4.75*	*4.66*	*4.32*	*4.97*	*4.67*	*0.21*	*4.66*
Other regions	**17.74**	**17.68**	**18.01**	**18.33**	**19.15**	**18.30**	**0.56**	**3.13**
~ of which China	12.32	12.28	12.82	12.71	13.12	12.74	0.42	3.37
Total world	**97.20**	**97.55**	**98.08**	**99.44**	**100.28**	**98.85**	**1.65**	**1.70**

Source: OPEC monthly report, April 2018

*Note: *2018 = Forecast*

Global petroleum product prices

The Asian gasoline market witnessed losses, with gasoline cracks in Singapore falling to the lowest level seen since August 2016. This poor performance was attributed to an oversupplied gasoline market in Asia, with firm volumes coming from China.

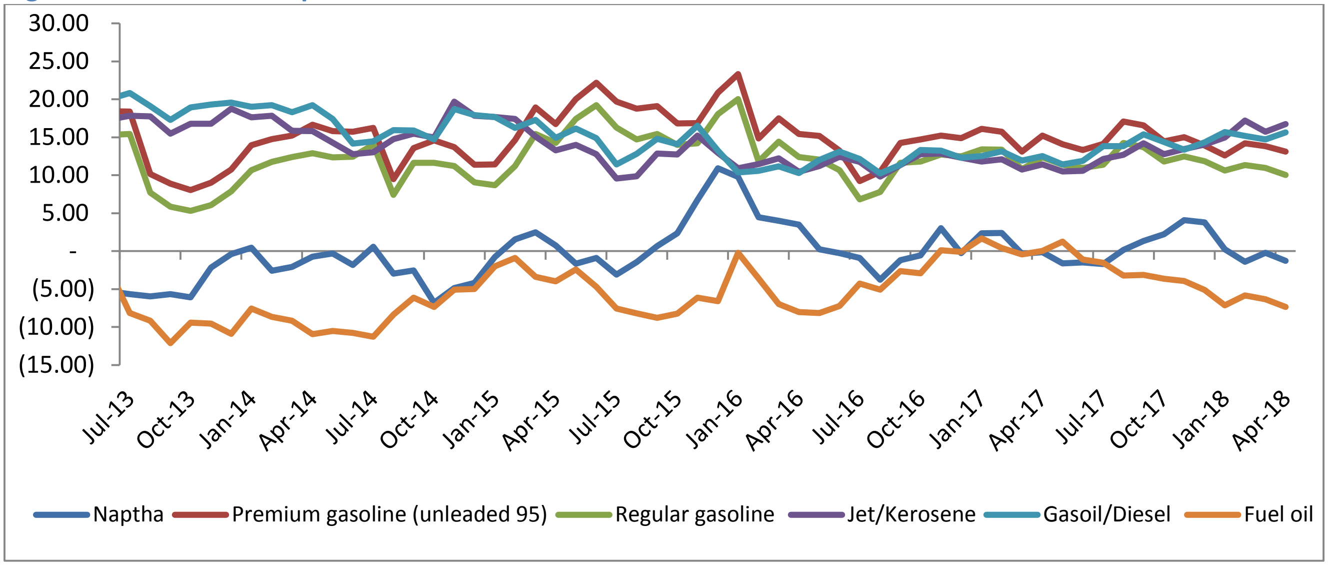


The Singapore light distillate naphtha market weakened, pressured by the return of supplies following maintenance. The jet/kerosene market in Asia recovered some ground on the back of arbitrage opportunities to the USWC, inching closer to the record high level registered in February.

The Singapore fuel oil crack spread against Oman fell, pressured by higher crude prices and higher refinery output as refineries restored operations after turnarounds.

Asian gasoil crack spreads strengthened slightly, supported by strong regional demand amid reduced refinery output due to a heavy maintenance season.

Figure 4: Product crack spreads vs. Dubai crude



Source: OPEC, World Bank, FIPI

Table 3: Singapore FOB, refined product prices ($/bbl)

Products	Price ($/b) in April 2018	MoM (%) change	YoY (%) change
Naptha	67.14	6.4%	28.4%
Premium gasoline (unleaded 95)	81.50	5.7%	20.5%
Regular gasoline (unleaded 92)	78.45	5.7%	21.0%
Jet/Kerosene	85.16	7.8%	33.3%
Gasoil/Diesel (50 ppm)	84.04	7.7%	29.3%
Fuel oil (180 cst 2.0% S)	61.07	7.3%	16.4%
Fuel oil (380 cst 3.5% S)	56.56	0.9%	19.5%

Source: OPEC

Petroleum products consumption in India

- With the push by government on promotion of LPG, its Consumption has steadily increased in India. In April, LPG consumption increased 12.9% and YoY basis, respectively.
- Consumption of gasoline increased significantly (9.5% YoY) driven by higher demand from transport segment.
- Demand for diesel also witnessed robust growth of 2.7% YoY in the month of April.

Table 4: Petroleum products consumption in India, April 2018

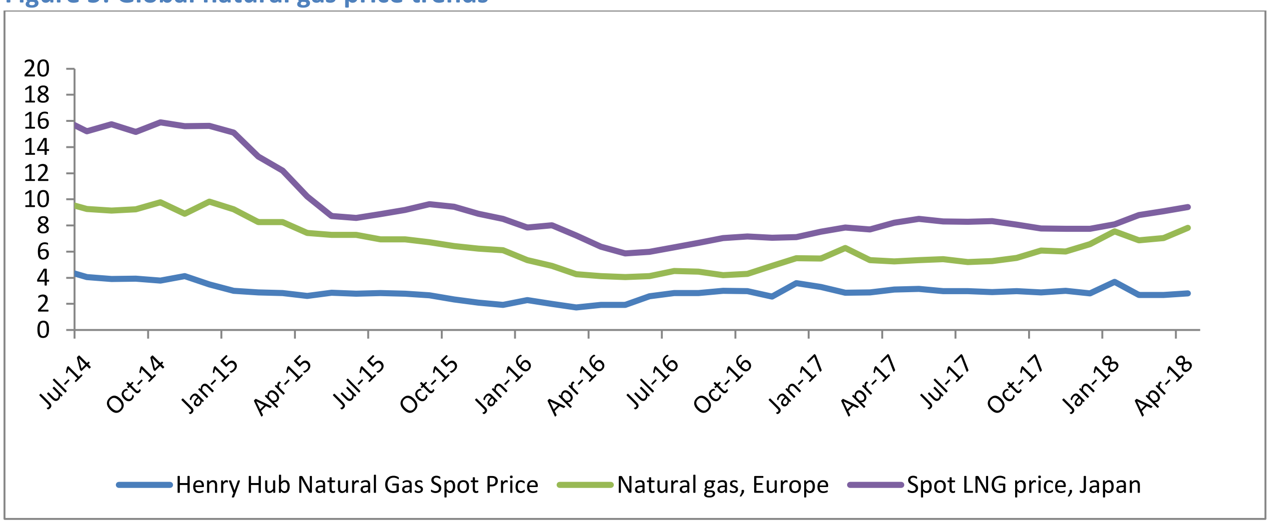
Petroleum products	Consumption in '000 MT April 2018	MoM (%) change	YoY (%) change
LPG	1,872	-8.9%	12.9%
Naphtha	1,062	-5.7%	6.2%
MS	2,284	-5.0%	9.5%
ATF	692	1.0%	13.5%
HSD	7,156	-2.6%	2.7%
LDO	56	9.6%	44.2%
Lubricants & Greases	284	-20.5%	-0.1%
FO & LSHS	552	-6.6%	-8.6%
Bitumen	667	-12.5%	16.4%
Petroleum coke	2,178	-6.4%	-0.7%
Others	559	-10.8%	-0.7%
TOTAL	17,668	-5.1%	4.5%

Source: PPAC

Natural Gas Price

Natural gas prices in US remained low due to higher US production. LNG prices saw an upswing due to higher natural gas demand.

Figure 5: Global natural gas price trends



Source: EIA, World Bank

Table 5: Gas price

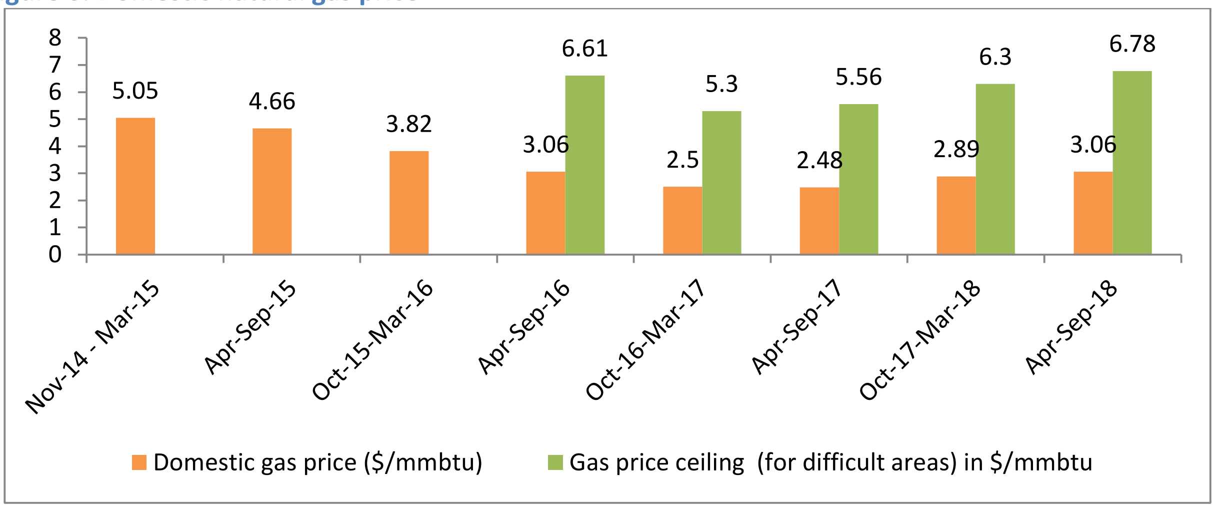
Natural Gas	Price ($/MMBTU) in April 2018	MoM (%) change	YoY (%) change
India, Domestic gas price	3.06	5.9%	23.4%
India, Gas price ceiling – difficult areas	6.78	7.6%	21.9%
Henry Hub	2.80	4.1%	-9.7%
Natural Gas, Europe	7.81	11.1%	49.0%
Liquefied Natural Gas, Japan	9.40	3.3%	14.6%

Source: EIA, World Bank, PPAC,

Domestic natural gas price which takes into account international benchmarks including Henry Hub, Alberta hub, Russia and UK National Balancing Point, has increased around 16% as compared to a year before, thus capturing the international gas price trends.

A notification was issued by MoP&NG on 21st March 2016, for marketing including pricing freedom for gas to be produced from discoveries in deep water, ultra-deep water, and high pressure high temperature areas. For the Apr-Sep-18 period, the price of gas from such areas was notified at $6.78 per MMBTU.

Figure 6: Domestic natural gas price

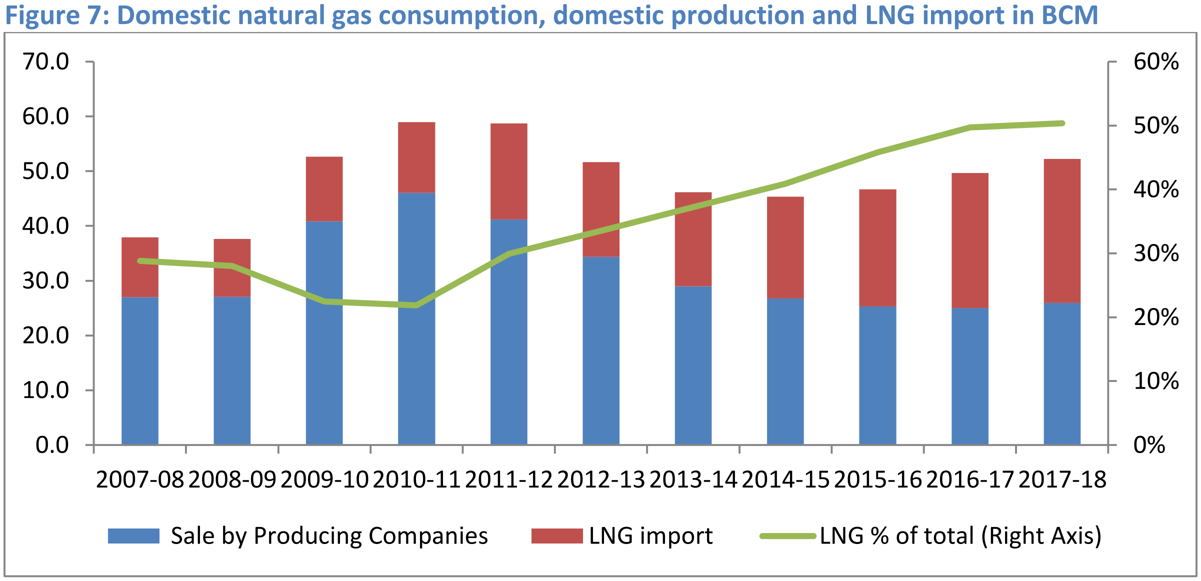


Source: PPAC

Natural gas production, consumption and import in India

- Natural gas constitutes for 6.5% of total energy primary mix of India
- Natural gas consumption in India has grown at a very slow pace in the past 3 – 4 years, with share of LNG imports increasing in the overall consumption mix

Figure 7: Domestic natural gas consumption, domestic production and LNG import in BCM



Source: PPAC

Key policy announcements in energy sector during the month

- **India's OALP maiden Bid Round concluded; 110 bids received for 55 exploration blocks**

The OALP Bid Round – I was successfully concluded on May 2, 2018. This was the first ever auction of blocks under the Open Acreage Licensing Programme ('OALP') in India. Path breaking Hydrocarbon Exploration and Licensing Policy ('HELP'), which was approved by the Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, in March 2016, has been the centre-piece of upstream Oil and Gas sector reform process in the country. OALP under the aegis of Hydrocarbon Exploration and Licensing Policy (HELP) is meant to steer India as a global E&P investment destination.

Investors had submitted Expression of Interest (EoI) for fifty-five blocks spread across the country for carrying out Exploration and Production activities. Sh. Dharmendra Pradhan, Union Cabinet Minister in charge of Ministry of Petroleum and Natural Gas inaugurated the National Data Depository and opened OALP process in June 2017. 55 EoI's received were put on bid in the month of January 2018. These 55 blocks spread across 10 sedimentary basins of India were on offer, spread across Onland, Shallow Water (offshore), and Deep-water areas, cover around 60,000 sqkms. The blocks are spread all across the Indian sedimentary areas, namely, Assam-Arakan (19), Mumbai Offshore (2), Cambay (11), Rajasthan (9), KG (5), Cauvery (3), Kutch (2), Saurashtra (2), Himalayan Foreland (1) and Ganga (1) basins.

In spite of challenging global market environment, where E & P investments are in consolidation mode, Directorate General of Hydrocarbons (DGH) received 110 e-Bids for the 55 blocks on offer. Out of the total 110 e-bids received, 92 e-bids were received for inland blocks and 18 e-bids were received for offshore blocks. As many as 9 companies (Individually or as member of the bidding consortium) have participated in the bid round.

The technical bid documents (online and hard copies) were opened on 02 May 2018 at DGH's Noida office in the presence of the bidders. The evaluation of the bids would be undertaken in a time bound manner and decision on award would be taken by Empowered Committee of Secretaries and Group of Ministers, after the commercial bids are opened.

- ## IXth City Gas Distribution bidding round launched by PNGRB

Natural Gas is the fuel for the future and the need is to increase share of Gas in India's primary energy basket from current 6.5% to 15%. Till 2014, India had City Gas networks in 47 Geographical Areas across 73 districts. Through the 9thBidding round, PNGRB plans to roll out City Gas networks in another 86 GAs (Geographical Areas) covering 174 districts. After this round, India shall have CGD coverage in nearly 50% of the total 640 districts in the country and about 50% (61 Crore) of the population of the country.

Speaking at the ninth CGD Bid Round, Shri Dharmendra Pradhan Minister of Petroleum and Natural Gas & Skill Development & Entrepreneurship said that this is the largest ever round which covers 20 states and 2 UTs of the country. Bid process has been rationalized and investor-friendly parameters evolved to attract serious bidders, encourage competition and unreasonable parameters like amount of Bank Guarantee determining the winner have been removed.

The Minister underlined that reforms in Natural Gas sector in India are important and PNGRB is performing an important role in refining the gas usage model and even becoming a facilitator from a regulator. A Mini Gas Grid in North East connecting all state capitals being developed by a JV of 5 companies will cover 1,500 kms is also being developed. He said partnership with State Governments is needed and they should co-operate and support the CGD entities and the Ministry in making states pollution free.

- ## 1st crude oil shipment received at Mangalore strategic reserve

India received the first cargo of UAE crude oil for filling up one of the two Strategic Petroleum Reserve (SPR) caverns built by Indian Strategic Petroleum Reserve Ltd (ISPRL) at Mangalore. Earlier, on 12th May, Shri Dharmendra Pradhan, Minister of Petroleum and Natural Gas & Skill Development & Entrepreneurship and H.E. Dr. Sultan Al Jaber, UAE Minister of State and ADNOC Group CEO from Abu Dhabi jointly initiated the filling of the crude oil carrier vessel MT Inspiration with 2 million barrels of crude oil belonging to Abu Dhabi National Oil Company (ADNOC) of UAE.

In February 2018, during the visit of Prime Minister Narendra Modi to UAE, ISPRL and ADNOC signed an Agreement under which ADNOC will store about 5.86 million barrels of crude oil in India's SPR facility at Mangalore at its own cost. The filling up began with the 2 million barrels. ADNOC will bring additional crude oil and fill up the Mangalore cavern later this year.

ADNOC's investment by way of crude oil in Indian SPR facility is the first time that a private foreign entity, is filling up an Indian SPR cavern with crude oil. Government of India under phase I of SPR programme has built crude oil storage facilities with total capacity of 5.33 million tonnes (around 39 million barrels) at three locations viz. Vishakhapatnam, Mangalore and Padur. Vishakhapatnam storage has a capacity of 1.33 million tonnes (around 9.77 million barrels) of crude oil, Mangalore has a capacity of 1.5 million tonnes (around 11 million barrels) and Padur can stock 2.5 million tonnes (18.37 million barrels).

The entire Vishakhapatnam facility and one of the two caverns at Mangalore facility have been filled with crude oil under government funding, the second cavern at Mangalore facility is now being filled by ADNOC of UAE at its own cost under the Agreement with ISPRL. The Agreement stipulates that during emergency oil shortage situation the Indian government can use the entire available crude oil stored by ADNOC in the Mangalore SPR facility for its use. Further, as an incentive for storing crude oil at its own cost, the Agreement allows ADNOC to sell part of the crude oil to Indian refineries during normal times.

- **Cabinet approved the National policy on Biofuels - 2018**

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi has approved National Policy on Biofuels – 2018. Salient Features:

I. The Policy categorizes biofuels as "Basic Biofuels" viz. First Generation (1G) bioethanol & biodiesel and "Advanced Biofuels" - Second Generation (2G) ethanol, Municipal Solid Waste (MSW) to drop-in fuels, Third Generation (3G) biofuels, bio-CNG etc. to enable extension of appropriate financial and fiscal incentives under each category.
II. The Policy expands the scope of raw material for ethanol production by allowing use of Sugarcane Juice, Sugar containing materials like Sugar Beet, Sweet Sorghum, Starch containing materials like Corn, Cassava, Damaged food grains like wheat, broken rice, Rotten Potatoes, unfit for human consumption for ethanol production.
III. Farmers are at a risk of not getting appropriate price for their produce during the surplus production phase. Taking this into account, the Policy allows use of surplus food grains for production of ethanol for blending with petrol with the approval of National Biofuel Coordination Committee.
IV. With a thrust on Advanced Biofuels, the Policy indicates a viability gap funding scheme for 2G ethanol Bio refineries of Rs.5000 crore in 6 years in addition to additional tax incentives, higher purchase price as compared to 1G biofuels.
V. The Policy encourages setting up of supply chain mechanisms for biodiesel production from non-edible oilseeds, Used Cooking Oil, short gestation crops.
VI. Roles and responsibilities of all the concerned Ministries/Departments with respect to biofuels have been captured in the Policy document to synergize efforts.

Expected benefits from the policy are:

- **Reduce Import Dependency:** One crore lit of E10 saves Rs.28 crore of forex at current rates. The ethanol supply year 2017-18 is likely to see a supply of around 150 crore litres of ethanol which will result in savings of over Rs.4000 crore of forex.

- **Cleaner Environment:** One crore lit of E-10 saves around 20,000 ton of CO2 emissions. For the ethanol supply year 2017-18, there will be lesser emissions of CO2 to the tune of 30 lakh ton. By reducing crop burning & conversion of agricultural residues/wastes to biofuels there will be further reduction in Green House Gas emissions.

- **Health benefits:** Prolonged reuse of Cooking Oil for preparing food, particularly in deep-frying is a potential health hazard and can lead to many diseases. Used Cooking Oil is a potential feedstock for biodiesel and its use for making biodiesel will prevent diversion of used cooking oil in the food industry.

- **MSW Management:** It is estimated that, annually 62 MMT of Municipal Solid Waste gets generated in India. There are technologies available which can convert waste/plastic, MSW to drop in fuels. One ton of such waste has the potential to provide around 20% of drop in fuels.

- **Infrastructural Investment in Rural Areas:** It is estimated that, one 100klpd bio refinery will require around Rs.800 crore capital investment. At present Oil Marketing Companies are in the process of setting up twelve 2G bio refineries with an investment of around Rs.10,000 crore. Further addition of 2G bio refineries across the Country will spur infrastructural investment in the rural areas.

- **Employment Generation:** One 100klpd 2G bio refinery can contribute 1200 jobs in Plant Operations, Village Level Entrepreneurs and Supply Chain Management.

- **Additional Income to Farmers:** By adopting 2G technologies, agricultural residues/waste which otherwise are burnt by the farmers can be converted to ethanol and can fetch a price for these waste if a market is developed for the same. Also, farmers are at a risk of not getting appropriate price for their produce during the surplus production phase. Thus conversion of surplus grains and agricultural biomass can help in price stabilization.

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