



Indian Petrochemical Industry



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Country Paper from India

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Section 1

The Indian Economy



The Indian Economy: Review and Outlook

The Indian Economy Review of 2018-19

India remained ahead of China to retain the tag of world's fastest growing large economy withstanding several ups and downs, spike in oil prices and global trade war like situation during 2018. The Indian economy's roller-coaster ride during 2018 was best captured by the GDP growth.

The GDP growth has shown improvement to 7.2% in the nine months ended December 2018 compared with 6.8% growth in the corresponding period of last year. The GDP growth emanating from agriculture sector has eased to 3.8%, while services sector growth eased to 7.3%. However, the industrial sector growth has accelerated to 7.9% in nine months ended December 2018.

Two major policy events namely, the Union Budget for FY20 and the February meeting of the Monetary Policy Committee, have both introduced stimulatory initiatives to strengthen India's growth momentum. In the budget, the fiscal momentum has been introduced through a number of channels. First, a budgetary support to the small and marginal farmers in the form of direct transfers has been introduced, the annual commitment for which is \$1.07 billion in FY20. A kick-start to the extent of \$2.85 billion is also being introduced in FY19 itself.

The FY20 forecast has been raised by 0.1% point from the projected outlook in October 2018. India's Central Statistics Office expects gross domestic product to grow 7.2% in FY19, up from 6.7% last year, while the Reserve Bank of India has pegged it at 7.0% revised it from 7.4%

In its latest report, World Bank has said, In India, the growth has accelerated, driven by an upswing in consumption and investment growth has firmed as the effects of temporary factors have waned. Domestic demand has strengthened as the benefits of structural reforms such as the Goods and Services Tax (GST) harmonization and bank recapitalization take effect.

India's growth outlook is still robust. India is still the fastest growing major economy as per the World Bank Global Economic Prospects report 2019.

According to the report, India's GDP is forecast to grow by 7.3% in FY 2018/19 and 7.5% thereafter, in line with June forecasts. Private consumption is projected to remain robust and investment growth is expected to continue as the benefits of recent policy reforms begin to materialize and credit bounds. The GDP data showed that private consumption continued to propel economic growth while the earlier estimates of a revival in investment demand seemed unlikely with an almost flat growth in 2018-19 at 10%.

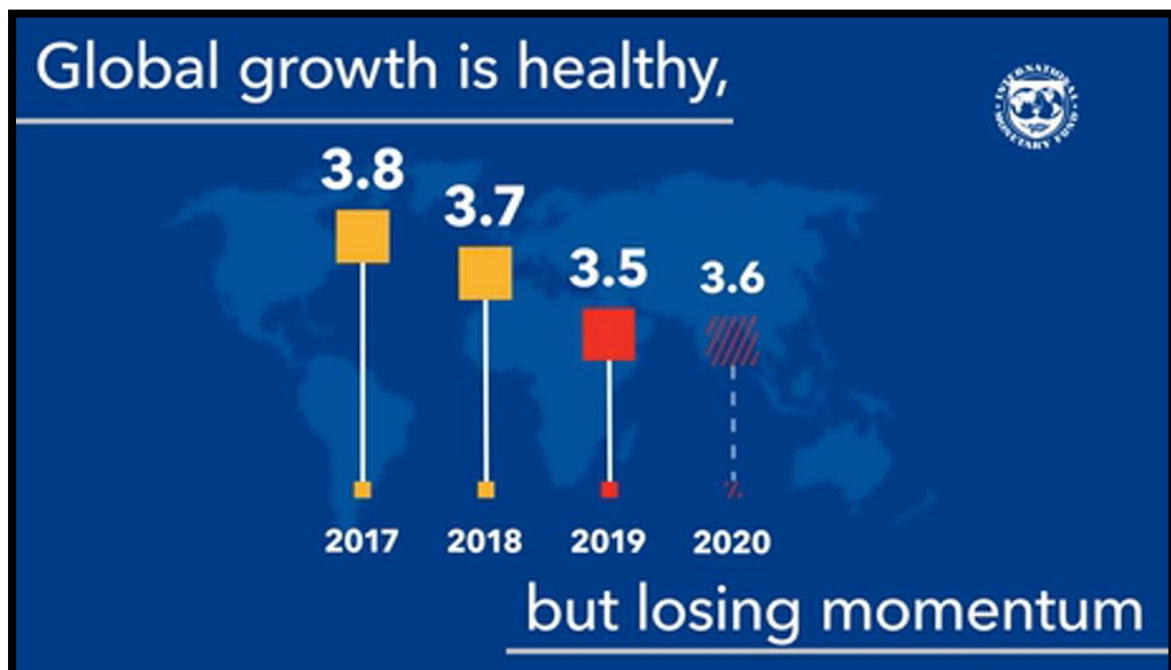


In the first advance estimates released in January, investment demand as represented by gross fixed capital formation was estimated at 12.2%.

However, according to the latest data released by RBI, non-food bank credit rose by 13.1% in January 2019 as compared to 9.5% in January 2018. Similarly, credit to industry rose by 5.1% in January 2019 as compared with an increase of 1.1% in January 2018.

On the other hand, the IMF cut the global growth forecast from last October's estimate. The global economy is projected to grow 3.5% in 2019 and 3.6% in 2020, 0.2% and 0.1% points below last October's projections.

Figure 1: Global growth in healthy

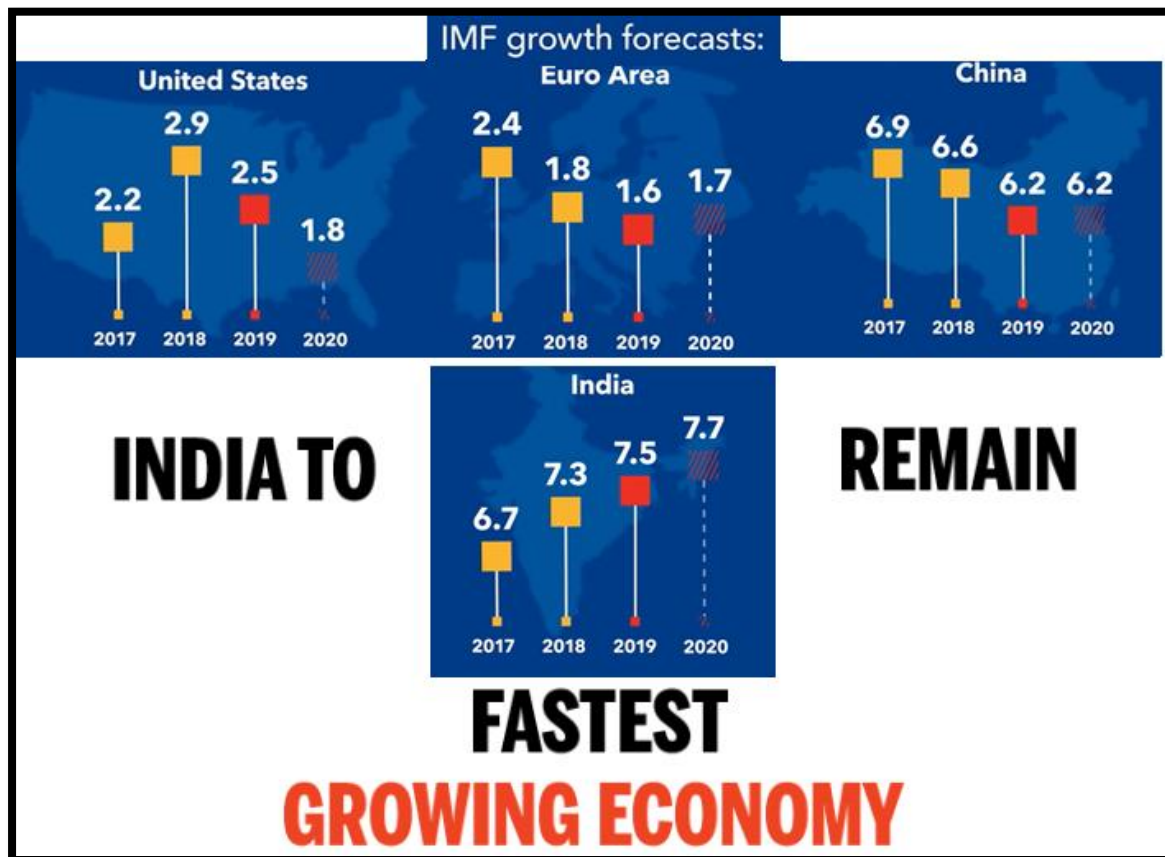


The International Monetary Fund (IMF) has said that India is one of the fastest growing large economies in the world. It even mentioned that the country has carried out various key reforms in the last five years, but still more needs to be done.

As per IMF, important reforms have been implemented and we feel more reforms are needed to sustain this high growth, including harnessing the demographic dividend opportunity, which India has.



Figure 2: India - Fastest-Growing Economy



Clearly, what makes India resilient to global flurries, to a great extent, is its rock-solid domestic demand, accounting for about 60% of the GDP. This figure is 37% for China, and this has led the Chinese economy’s restructuring and rebalancing to rely less on exports and investment and more on consumption demand.

The broad macroeconomic indicators, based on latest data, are as follows:

Retail inflation has stayed below the Reserve Bank of India’s (RBI) medium-term target of 4% for the seventh straight month and has opened up the possibility of more rate cuts

Experts believe, the WPI inflation number has started to move upwards and will continue to do so in the coming months. The hardening of crude oil prices as well as reversal in prices of some food items will exert upward pressure.

For the next financial year 2019-20, fiscal deficit target is pegged at 3.4% of GDP as the full fiscal impact of the income support scheme for farmers will be felt in 2019-20. Excluding the impact of income support for farmers, the fiscal deficit would have been less than 3.3% of GDP for 2018-19 and less than 3.1% for the year 2019-20.



Foreign direct investment (FDI) into India contracted by 7% to USD 33.49 billion during April-December in the current fiscal

Exports appear on course to finally cross the 2013-14 level during the current financial year despite the sluggishness seen in recent months. Exports inched up by 2.5% to \$26.7 billion in February as several key sectors, such as engineering goods, chemicals, rice and cotton yarn and fabrics reported tepid growth, while oil product exports fell by 7.7%. In the April-February period, the trade deficit widened to \$165.5 billion from \$148.6 billion in the year ago period.

The rupee weathered last year's emerging market turbulence vis-a`-vis other BRIC currencies like South Africa rand and Brazil's real. The rupee is getting stronger in spite of a strong dollar as we are seeing FII inflows. The Indian rupee in second week of March strengthened the most among all major currencies in Asia, hitting an eight-and-a-half month high of 68.53 a dollar on increased portfolio flow. Market forces bring the exchange rate to its Goldilocks level and the regulator only intervenes to smoothen the journey. Going by this, the rupee seems to have found its Goldilocks level.

India's current account deficit (CAD) at \$ 19.1 billion (2.9% of GDP) in Q2 of 2018-19 increased from \$6.9 billion (1.1% of GDP) in Q2 of 2017-18 and \$15.9 billion (2.4% of GDP) in the preceding quarter. According to the central bank, the widening of the CAD on a year on year basis was primarily due to a higher trade deficit of \$50 billion, compared with \$32.5 billion a year ago.

Foreign investors have poured in a net amount of \$5.45 billion in the domestic capital markets in March so far, mainly on account of improved global liquidity. In February, foreign portfolio investors (FPIs) had put in a net amount of \$1.59 billion in the capital markets -- both debt and equity. Analysts attributed the increase in infusion to a shift in stance on monetary policy outlook by various central banks globally.

As a result of very good rainfall during monsoon 2018 and various policy initiatives taken by the Government, the country has witnessed record foodgrain production in the current year. Total food grain production in India is estimated at 281.37 million tonnes during 2018-19 as compared to 277.49 million tonnes in the previous fiscal. According to second advance estimates released by the Department of agriculture, the rise is comparatively 15.63 million tonnes than the previous five years' (2013-14 to 2017-18) average production of food grain. Most major crop-producing states witnessed normal monsoon rainfall, hence the production of most crops is higher. Forecast of a normal monsoon in 2019 raises prospects of higher farm and economic growth in the \$2.7 trillion Indian economy. An El Nino event, which has a negative influence on the Indian monsoon, may never form in the next few months, India Meteorological Department (IMD).



Proactive policy reforms along with several campaigns and initiatives, such as Make in India, Digital India, Skill India, Start-up India and Swachh Bharat Abhiyan (Clean India Mission), are likely to transform the extent and the quality of rural and urban infrastructure. These steps are expected to bring forth a number of investment opportunities.

Prime Minister Modi's 'Make in India' initiatives and push towards manufacturing remains in place, where by road building targets of 40 km per day and attracting foreign companies to establish factories, India will continue to boost oil demand.

The government has set a target of constructing 10,000 km of highways in the next financial year, 25% more than that in the current fiscal. The government has approved an over \$ 1.57 billion-project to construct all-weather roads and improve connectivity for security reasons.

In the 2019 Budget, Infrastructure was given a major push by increasing spending in airports, railways etc. Budget 2019 witnessed, announcement of the Pradhan Mantri Gram Sadak Yojana (PMGSY) being allocated \$2.71 billion for 2019-20 as against the \$2.214 billion spent in 2018-19.

The promotion of inland waterways as modes of freight transport got a shot in the arm, with the start of freight container movement between Varanasi and Kolkata. The government is also continuing its Sagarmala initiative to boost coastal connectivity as an alternative to road and rail infrastructure creation. The programme envisages a string of operational ports that could help boost logistics.

The projects identified under Sagarmala Programme are expected to mobilize more than \$ 100 billion of infrastructure investment, double the share of domestic waterways (inland& coastal) in the modal mix, generate logistic cost savings of \$5.714 billion per annum, boost merchandize exports by USD 110 Billion and enable creation of 100 billion new jobs, including 40 Lac direct jobs, in the next 10 years. With the commissioning of the Pakyong Airport in Sikkim, India now has 100 operational airports. The number of smaller airports is also tied in with the government's UDAN Scheme. India's domestic airline passenger traffic has doubled over the past five years. There was a significant boost to rural development by the sanctioning of \$2.714 billion for this fiscal. As per the Government, construction of rural roads tripled in 5 years, and if the momentum is maintained, then the increased connectivity will definitely help the real estate sector.

The interim budget listed out last four years' achievements and investments in the infrastructure sector. With mention of flagship schemes like Pradhan Mantri Gram Sadak Yojna (PMGSY), UDAN (Ude Desh ka Aam Nagrik) amongst others, the government reiterated its continued thrust and commitment to these programs.



Interim Finance Minister Mr. Piyush Goyal was quoted saying, "Infrastructure is the backbone of any nation's development and quality of life. Whether it is highways or railways or airways or even digi-ways, we have gone beyond incremental growth to attain transformative achievements."

To quote the minister, "The first dimension of this vision will be to build physical as well as social infrastructure for a \$10 trillion economy". Safe drinking water to all Indians, micro-irrigation techniques for efficient use of water in agriculture, road connectivity, rail network, electric vehicles, renewable energy, affordable housing, most of the sectors found mention in the budget speech

The major takeaways from the budgetary allocation 2019-20 for the Infrastructure Sector are as follows:-

A total of \$ 65.14 billion was allocated to the Infrastructure Sector wherein the railways saw a 21% increase and the Aviation Sector witnessed 54% cut as compared to the previous year budgetary allocation.

A big sum of \$22.66 billion was allocated as the capital expenditure for the railways, up from \$19.83 billion in 2018-19 whereas the expenditure on the 'Rashtriya Rail Sanraksha Kosh' (Railways safety fund) remained the same i.e., \$ 2.87 billion.

The roadways were allocated a slightly increased sum of \$11.87 billion even though the Government had pledged to bring connectivity to every 'unconnected' village. An upgraded allocation of \$2.714 billion was made on rural roads under the 'Pradhan Mantri Gram Sadak Yojana' (PMGSY) from a sum of \$ 2.214 billion in 2018-19.

The Government had a narrative of creating a blue economy and bringing back the inland waterways. In pursuance of the same, \$ 0.271 billion have been allocated to the shipping industry. Furthermore, \$ 78 million has been allocated for port and coastline development under the flagship programme named 'Sagarmala', as against \$ 54 million in 2018-19.

The Aviation Sector was allocated \$ 640 million. The Aviation Sector is witnessing dynamic changes with the revised FDI norms and new private players in the market, the Government seems to be playing it safe in this sector since the Aviation Sector has too much in its hands to handle as of now like reviving the national carrier Air India and fulfillment of its promise of maximum regional connectivity.

The budget seems positive around economic development, farmers' issues, and tax sops for the middle class as well as small businesses. Thrust on electric vehicles and renewables is in the right direction, however, specific steps are expected to fast-track the adoption of clean energy.



Arunachal Pradesh came on the air map recently and Meghalaya, Tripura and Mizoram have come on India's rail map for the first time. Allocation for the North Eastern Areas is being proposed to be increased by 21% to \$ 8.30 billion in 2019-20 BE over 2018-19 BE.

Indian Railways has been allocated \$ 9.22 billion, as compared to \$ 7.58 billion last year, a 22% jump. The Railways' overall capital expenditure programme is of \$ 22.66 billion.

The government will allocate 600 billion rupees (\$8.4bn) a year for farmer income. The government also said it would spend 190 billion rupees (\$2.6bn) for the construction of rural roads.

The new announcements come as India enters an intense political season with what are expected to be keenly fought general elections. With the government ready to run the extra mile on key reforms including land acquisition and infrastructure, the economy is poised for growth in the coming months.

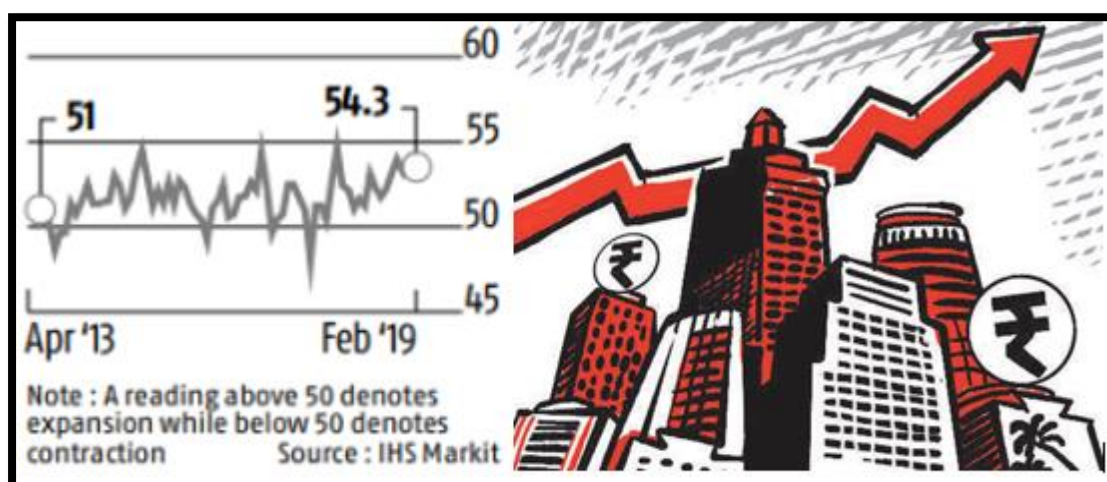
Snapshot of Key Indicators

India's manufacturing sector performance further strengthened in February and touched a 14-month high driven by acceleration in sales, output and employment. The Nikkei India Manufacturing Purchasing Managers' Index rose to 54.3 in February, from 53.9 in January, amid a robust improvement in business conditions.

This is the 19th consecutive month that the manufacturing PMI remained above the 50-point mark. In PMI parlance, a print above 50 means expansion, while a score below that denotes contraction.

According to the survey, the February data reflected strongest improvement in business conditions since December 2017, sharpest rise in factory orders for 28 months and underpins faster increases in production and employment.

Figure 3: PMI Manufacturing



It was noted that the upturn in employment was one of the best seen for six-and-a-half years, as goods producers sought to expand output capacities to meet strengthening demand from both domestic and external sources.

On the inflation front, rates of both input cost and output charge inflation remained subdued by historical standards, despite picking up from January. According to experts, the signs of easing inflationary pressures indicate that the Reserve Bank of India is likely to adopt an accommodative monetary policy stance.

The next meeting of RBI's Monetary Policy Committee is scheduled on April 2-4, 2019

For FY19, IHS Markit has revised higher its GDP growth forecast, from 7.0% to 7.1%, amid the announcement of fiscal stimulus for the new interim budget and the policy rate cut announced in February.

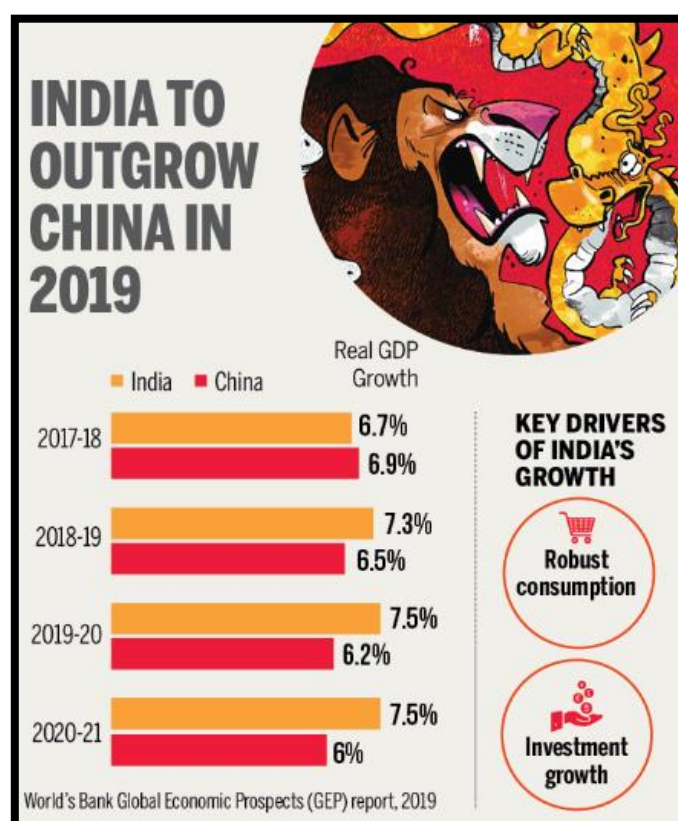
India is set to grow at a faster pace over the next three years even as storm clouds gather over the global economy, the World Bank said, while warning about softened international trade and investment with trade tensions remaining elevated.

India's economic growth is forecast to accelerate to 7.5% in each of the next three financial years (fiscal 2020-22), from 7.3% in the current year, riding an upswing in consumption and a pickup in investments, as the effects of demonetization and goods and services tax rollout wane, as per the World Bank. This is unchanged from the June 2018 forecast. The global economy is forecast to slow down to 2.9% in 2019 from 3% in 2018 and further to 2.8% in 2020 because of a weakening US economy and moderation in the euro area.

China is projected to slow down to 6% by 2021 from 6.5% in 2018.



Figure 4: India to Outgrow China in 2019



It warned of escalation in simmering trade disputes and said more frequent weather events raised the possibility of large swings in food prices.

India's growth has accelerated because of strengthening domestic consumption, as the benefits of structural reforms such as GST harmonization and bank recapitalization take effect.

Official statistics released by the government showed the Indian economy is likely to grow 7.2% in FY19, almost in line with 7.3% estimated by the World Bank and up from 6.7% last year.

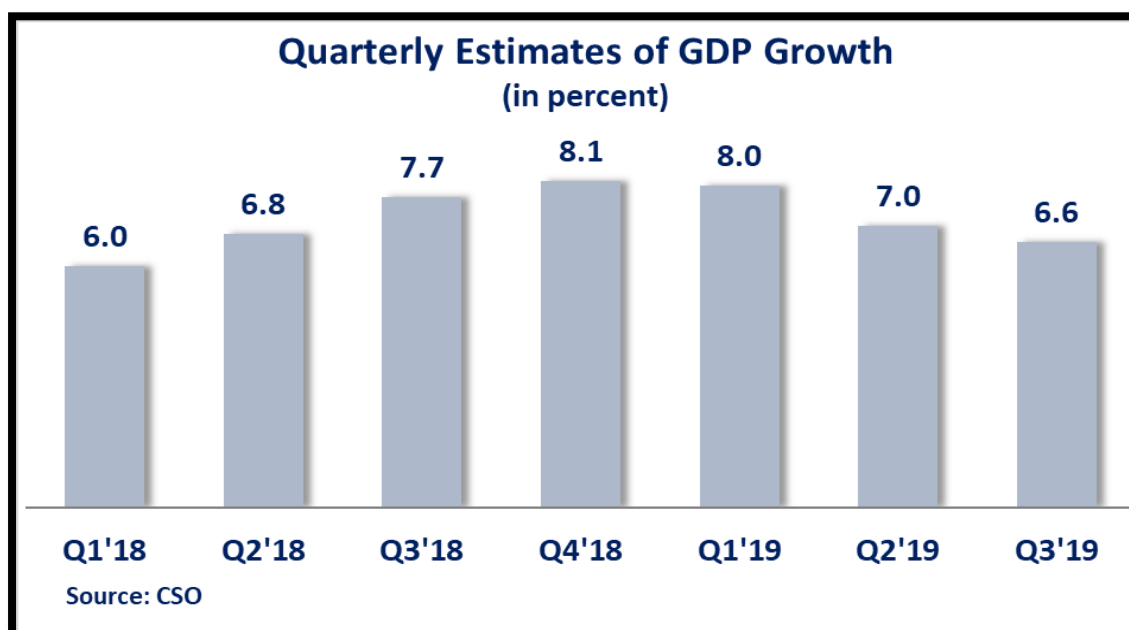
Going ahead, private consumption is projected to remain robust and investment growth is expected to continue as the benefits of recent policy reforms begin to materialize and credit rebounds. Strong domestic demand is likely to widen the current account deficit to 2.6% of GDP next year, while inflation is forecast at the midpoint of the Reserve Bank of India's target range of 2-6%.

Growth in gross domestic product (GDP) slowed to a six-quarter low of 6.6% in the third quarter (Q3) of 2018-19 (FY19) due to subdued expansion in agriculture, manufacturing, and government expenditure, the data released by



the Central Statistics Office (CSO) shows. Investment activity, however, continued to grow at a healthy pace.

Figure 5: Quarterly GDP Growth (in percent)



The CSO lowered estimate of economic growth for Q1 and Q2 of FY19 to 8% and 7%, respectively, from 8.2% and 7.1%, respectively. As a result, the forecast for the full-year growth has been revised downwards to the lowest in the Narendra Modi-led government at 7% in FY19. Because of high growth in Q1, manufacturing is projected to show higher growth this year compared to the previous year.

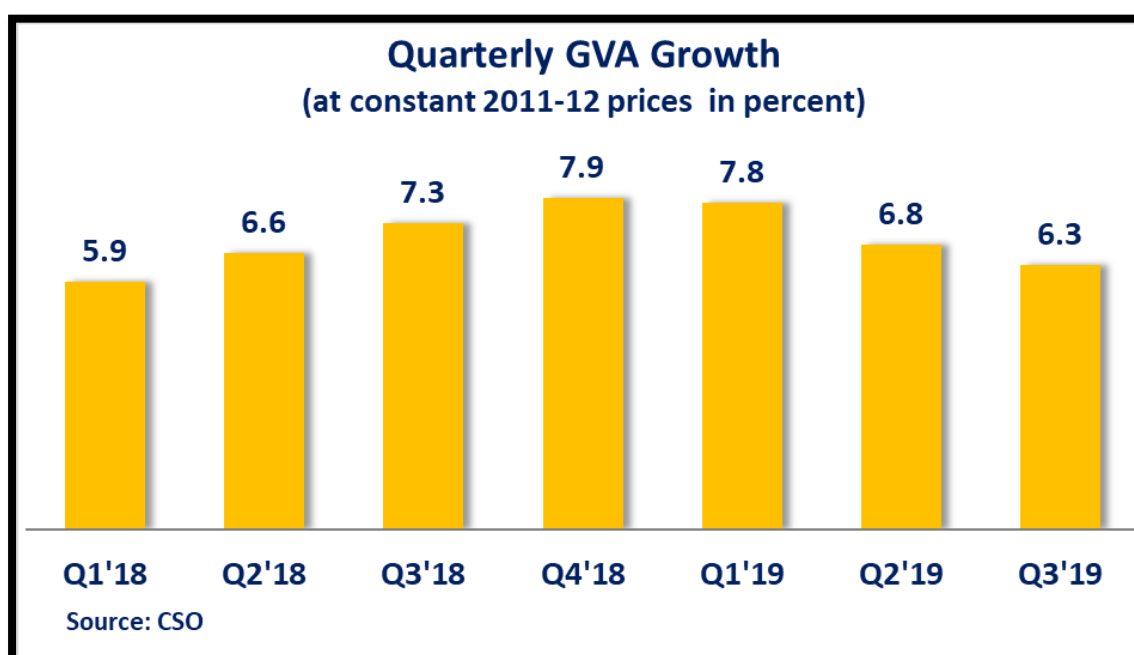
Quarterly Gross Value Added (GVA) growth also eased to 6.3% in Q3 of 2018-19 from 6.8% in Q2 of 2018-19 and 7.3% in Q3FY of 2017-18. The GDP growth moderation has been mainly driven by slowdown in the GDP growth emanating from the agriculture sector to 2.7% from 4.2% growth in the previous quarter, while services sector growth has shown slight moderation to 7.2% from 7.4%.

However, the industrial sector growth has improved to 7.1% in Q3 of 2018-19 from 6.7% growth in Q2 of 2018-19. Within the industrial sector, the mining sector growth rebounded to 1.3% from 2.1% decline in the previous quarter.

The growth for construction sector accelerated to 9.6% in Q3 of FY2018-19. However, the manufacturing sector growth moderated marginally to 6.7% and utilities sector to 8.2% in the quarter ended September 2018.



Figure 6: Quarterly GVA Growth (in percent)



The services sector growth eased to 7.2% led by slower growth in public services at 7.6%, while trade, hotel, transport and communication has posted higher growth of 6.9% in Q3 of FY2019. The financial, real estate and professional services have also recorded improved growth of 7.3% in Q3 of FY2019.

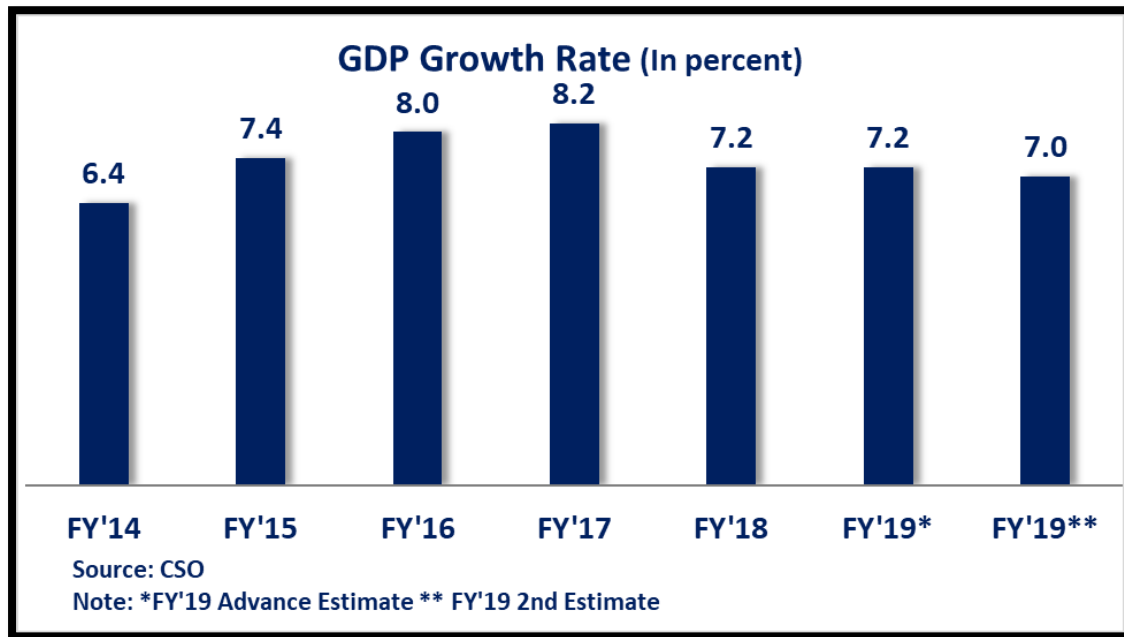
The GDP growth has shown improvement to 7.2% in the nine months ended December 2018 compared with 6.8% growth in the corresponding period of last year. The GDP growth emanating from agriculture sector has eased to 3.8%, while services sector growth eased to 7.3%. However, the industrial sector growth has accelerated to 7.9% in nine months ended December 2018.

Second advance estimate of 2018-19

The GDP growth estimate for 2018-19 is revised downward to 7.0% from 7.2% growth estimated at first advances estimate level released in January 2019. The GDP growth for agriculture sector is expected to ease to 2.7% and services sector to 7.4% in 2018-19, while industrial sector growth estimate to accelerate to 7.7% in 2018-19.

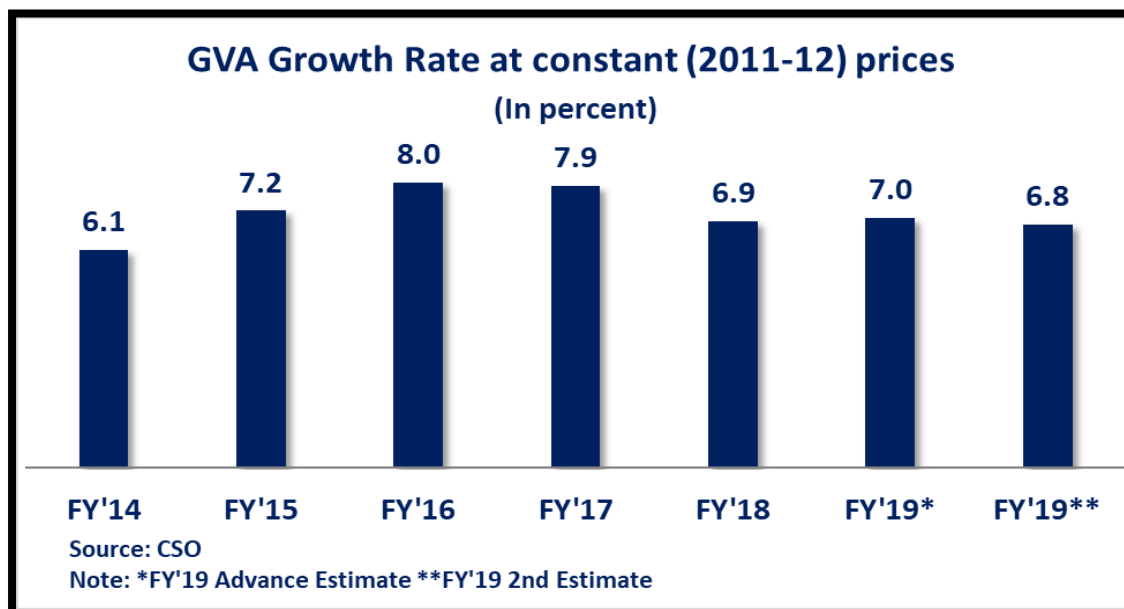


Figure 7: India's GDP Growth (year-on-year in percent)



The sectors which are likely to register growth rate of over 7.0% are construction, public administration, defence and other services, manufacturing, electricity, gas, water supply and other utility services and financial, real estate and professional services.

Figure 8: India's GVA Growth (year-on-year in percent)



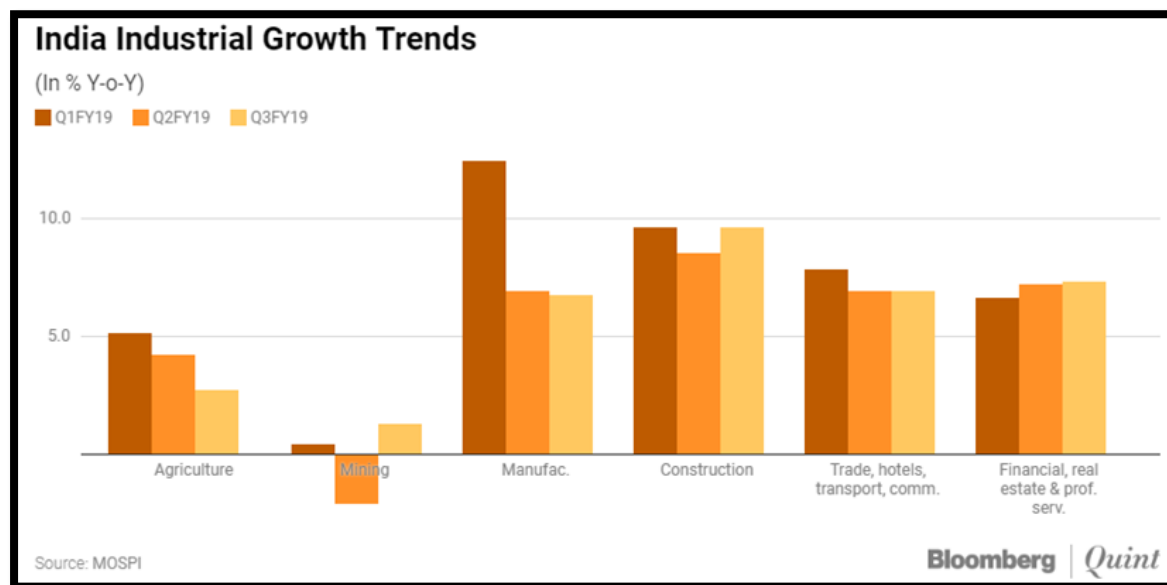


The growth in the agriculture, forestry and fishing, mining and quarrying and trade, hotels, transport, communication and services related to broadcasting is estimated to be 2.7%, 1.2% and 6.8% respectively.

Economists expect the RBI’s monetary policy committee to further cut the repo rate to boost growth. The lower growth in GDP could prompt the RBI to lower interest rates as economic growth has been cited as a concern. This would, however, be contingent on the inflation reading for the coming months. Sector-wise break up shows that growth of gross value added (GVA) by agriculture, forestry and fishing slowed to 2.7% in Q3, down from 4.2% in Q2.

At current prices, the sector grew by a mere 2% in Q3, down from 3.4% in Q2. This reflected farmers' distress. Agriculture has seen a decline in growth rates in Q3 which can be attributed to the unfavorable weather condition/uneven rainfall. Manufacturing activity slowed down considerably over the course of the year with GVA estimated to have grown by 6.7% in Q3, down from 12.4% in Q1. It had grown by 6.9% in Q2. However, for the full year, manufacturing is expected to grow at 8.1% in FY19, up from 5.9% in FY18, aided by higher growth in Q1.

Figure 9: Quarterly Growth in Sectors till Q3 FY19



Over the course of the year, growth in the industrial sector has slowed down, coming in at 6.1% Q3 FY19 from 10.1% in Q1 FY19. Of its sub-sectors, mining activity showed expansion of 1.3% from 0.4% in Q1 FY19. Manufacturing activity has slowed down to 6.7% in Q3 FY19 from 12.4% in Q1 FY19. Nevertheless, for the full year, industrial sector is expected to grow by 7.0% in FY19 compared to 6.1% in FY18, aided by the high first quarter growth. Services GDP registered growth at 7.5% in Q3 FY19 compared to 7.6% in Q3 FY18.



The construction sector continued to show signs of an upswing, growing at 9.6% in Q3, up from 8.5% in Q2. The CSO pegged the sector's full-year growth at 8.9%, up from 5.6% the year before, on the back of infrastructure spending push by the government.

On the services side, GVA by public administration, defence and other services, which are largely government spending, grew by 7.6% in Q3, down from 8.7% in Q2. Growth for the full-year is pegged at 8.5% in FY19, down from 11.9% in FY18.

Segments such as trade, hotels, transport, communication and services and financial, real estate, and professional services grew at almost the pace same as the last quarter. Though for the full year, financial, real estate and professional services are expected to grow at 7.3%, up from 6.2% in FY18. Trade, hotels, transport, communication and services slowed down to 6.8%, down from 7.8% in FY18.

During the fiscal year ending 31st March, while agriculture growth is projected to sharply slow down to 2.7% from 5% a year ago, manufacturing is estimated to accelerate to 8.1% from 5.9% a year ago. The labor-intensive construction sector is estimated to pick up pace to grow at 8.9% from 5.6% in the previous year. However, the largest employer in the services sector— trade, hotels and transportation— is set to decelerate to 6.8% from 7.8% a year ago.

On the expenditure side, private final consumption expenditure, denoting demand in the economy, grew at 8.4% in Q3, down from 9.8% in Q2. However, investment activity continued to remain robust with gross fixed capital formation growing at 10.6% in Q3, marginally higher than 10.2% in Q2. For the full year, CSO expects investments to grow at 10%, up from 9.3% the year before. To achieve this, fixed investment will have to grow at 7.7% in Q4. This will not be easy with government capital expenditure contracting from September 2018 to January 2019.

The size of the Indian economy estimated through nominal GDP was revised upward to ₹190.54 trillion (\$2.7 trillion) against ₹188.41 trillion (\$2.65 trillion). This will help the government achieve the fiscal deficit target of 3.3% of GDP for 2018-19 as originally estimated in last year's budget against the revised estimate of 3.4%.

While the slowdown in the second half (October-March) of this financial year was expected, CSO now estimates it to be sharper than it earlier estimated. However, most international agencies project India's growth to bounce back in the next fiscal year. The International Monetary Fund last month projected India's growth at 7.5% in 2019-20 amid slower global expansion. Risks to global growth tilt to the downside, with IMF cutting 2019 growth projection by 20 basis points (bps) to 3.5%.



India still remains the fastest growing economy as China's economy cooled in the December quarter to a 28-year low of 6.4%.

Meanwhile, the per capita income in real terms (at 2011-12 prices) during 2018-19 is likely to grow to ₹ 92,718 as compared to ₹ 87,623 for 2017-18. The growth rate in per capita income is estimated at 5.8% during 2018-19, as against 5.7% in the previous year.

The Gross Fixed Capital Formation (GFCF), an indicator of investment, at current prices is estimated at \$ 7.8 trn in 2018-19 as against \$ 6.9 trn in 2017-18. At constant prices (2011-12), the GFCF is estimated at \$ 6.42 trn in 2018-19 as against \$ 5.91 Trn in 2017-18.

In terms of GDP, the rates of GFCF at current and constant prices during 2018-19 are estimated at 28.9% and 32.3%, as against 28.6% and 31.4% in 2017-18. The GFCF is expected to register a growth of 12.4% at current prices and 10% at constant prices during 2018-19.

i. IIP – Index of Industrial Production

Industrial activity slowed in January 2019 growing by just 1.7% due in large part to a deceleration in the manufacturing, electricity, and capital goods sectors. The Index of Industrial Production (IIP) saw growth slip below the 2% for the second time in three months in January, with the previous occurrence being the 0.32% growth seen in November 2018. Growth in the IIP was at 2.6 in December.

Within the IIP, the mining and quarrying sector was one of the only major sectors that saw growth accelerating, from a contraction of 0.39% in December to a growth of 3.9% in January.

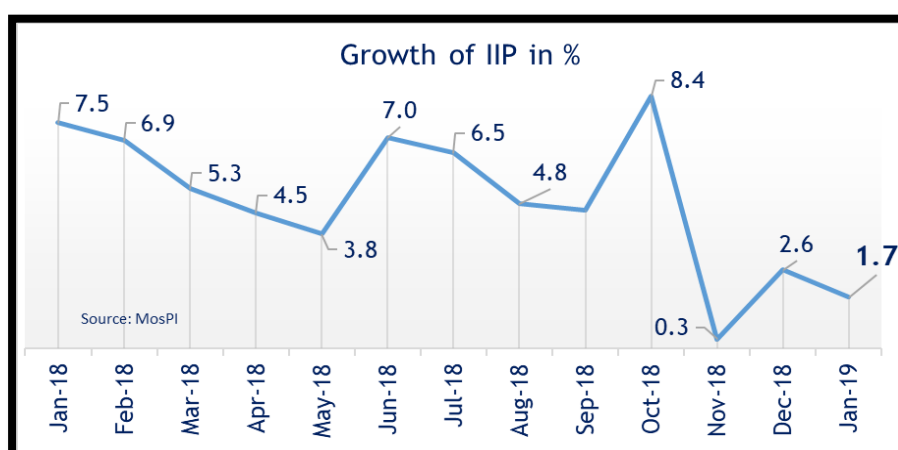
The manufacturing sector saw growth slowing to 1.3% in January from 2.65% in December. The electricity sector saw growth slowing to 0.8% from 4.45% over the same period. The capital goods sector contracted 3.2% in January, down from a growth of 5.9% in the previous month.

The construction sector witnessed the strongest growth of all the major sectors, of 7.9%, but this was still significantly slower than the 10% seen in December.

The consumer sector also saw growth slowing, with growth in the consumer durables sector slowing to 1.8% and in the consumer non-durables sector to 3.8% in January, from 2.93% and 5.35%, respectively, in the previous month.



Figure 10: Index of Industrial Production (IIP)



As per economists, by March, government spending usually expands, but this time the signs of that are not very prominent because they are trying to cut down on capital expenditure to meet the revised fiscal deficit target. It is believed that, an expansion in government spending would have meant a recovery in IIP growth in coming months.

Table 1: Use based Classification of (IIP)

	Primary Goods		Capital Goods		Intermediate Goods		Infrastructure/ Construction Goods		Consumer Durables		Consumer Non-Durables	
Weight	34.04		8.22		17.22		12.33		12.83		15.32	
	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19
Jan-19	5.9	1.4	12.4	-3.2	5.4	-3	7.5	7.9	7.6	1.8	10.7	3.8
Apr-Jan 2019	3.8	3.8	3.6	5.9	2.1	0.1	4.5	8.4	-0.3	7.0	10.5	4.1

Manufacturing, which constitutes 77.63% of IIP, grew 1.3% in January while electricity generation was up marginally at 0.8%. Mining output rose 3.9%. Consumer durables output, an indicator of urban demand, increased 1.8%, much slower than 7.6% in January last year. There was growth in 11 of the 23 industry groups in the manufacturing sector. Factory output was in line with the performance of the eight core infrastructure industries whose growth slowed to a 19-month low of 1.8% in January.

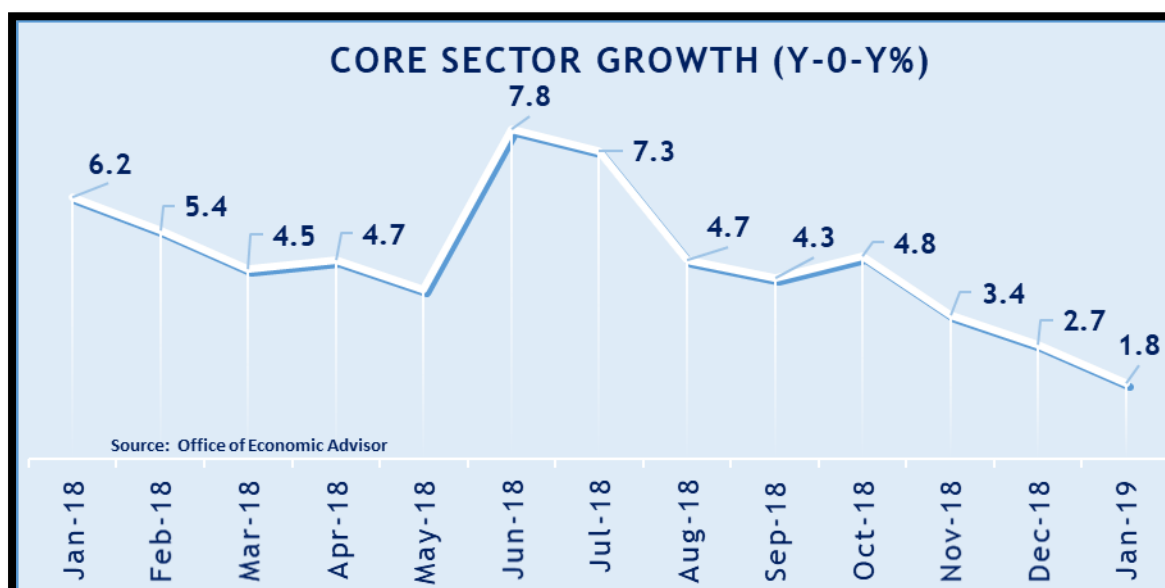
ii. Core Industries Performance

The eight core industries comprising 40.27% weight in IIP which grew at a slower rate of 1.8% has declined for 4th consecutive month. The core sector growth has come at a 19-months low. In Jan'19, it grew by 1.8%, significantly lower than 6.2% growth seen in the corresponding period previous year. However, on the cumulative basis, the overall growth in eight core industries stood at 4.5%, higher than 4.1% growth in the comparable period a year ago.



The low core sector growth during Jan'19 can be ascribed to a high base effect amidst a contraction in crude oil, refinery and electricity production. Electricity generation stood at multi-year low. The sustained growth in cement and steel production coupled with a notable growth in fertilizer production has limited the fall in the core sector growth.

Figure 11: Core Industries Growth Rate (in percent)



Industry-wise Growth in January '19

- Coal Production grew by 1.7% in Jan'19, 0.6% higher than the growth in the previous month. However, this is lower than 3.8% growth witnessed in the corresponding period previous year.
- The contraction in crude oil production is sustained for 14 months in a row. Crude oil production contracted by -4.3% in Jan'19 as against -2.1% contraction in Jan'18.
- Natural gas production rose by 6.2%, which is the highest level since Oct'17. This is higher than the contraction of -1.2% seen in Jan'18 and growth of 4.2% in Dec'18. Natural gas production has continued to grow for 3 consecutive months.
- Refinery products, which has the highest weightage of 28% in the core index continued to contract for the 2nd consecutive month. The contraction of -2.6% in Jan'19 is over the -4.8% contraction seen in Dec'18.
- Fertilizer production has seen a reversal in trend and has grown at a double digit growth of 10.5% in Jan'19, which is at 34-months high. This growth is against the contraction of -1.6% in Jan'18.
- Steel production continues to witness sustained growth having grown at 8.2% in Jan'19 over the 12.9% growth in Dec'18. The growth in the steel segment was driven by increased demand from construction, auto and infrastructure segments.



- Cement production, on the back of increased construction activities has seen a growth of 11% in Jan'19 over the 11.6% growth in Dec'18. Barring Nov'18, cement production has seen double-digit growth for the previous 15 months.
- Electricity generation has contracted by -0.4% in Jan'19 which is at a multi-year low. Electricity generation was higher at 7.6% in the corresponding period previous year and has seen a decline in the previous 3 months.

Table 2: Core Industries Growth Rate (in percent)

Growth in Eight Core Industries									
Sector	Coal	Crude Oil	Natural Gas	Refinery Prdts	Fertilizers	Steel	Cement	Electricity	Overall Index
Weight	10.33	8.98	6.88	28.04	2.63	17.92	5.37	19.85	100
Jan-18	3.8	-3.2	-1.2	11	-1.6	1.7	19.6	7.6	6.2
Dec-18	1.1	-4.3	4.2	-4.8	-2.4	12.9	11.6	4.4	2.7
Jan-19	1.7	-4.3	6.2	-2.6	10.5	8.2	11	-0.4	1.8

Source: Office of Economic Advisor

Cumulative core sector performance

During Apr-Jan'19, the eight core industries production grew by 4.5% higher than the 4.1% growth in the corresponding period in the previous year. The high growth can be ascribed to increase in cumulative production in coal (7.1%), cement (13.6%) and electricity (5.7%) and steel (5%). The growth was however curtailed due to decline in production in crude oil (-3.8%) and fertilizers (-0.3%).

Table 3: Core Industries Growth Rate (in percent)

Cumulative growth in Eight Core Industries (Apr'18-Jan'19)									
Sector	Coal	Crude Oil	Natural Gas	Refinery Prdts	Fertilizers	Steel	Cement	Electricity	Overall Index
Weight	10.33	8.98	6.88	28.04	2.63	17.92	5.37	19.85	100
FY18	1.8	-0.7	3.5	4.7	-0.7	5.7	4.0	5.3	4.1
FY19	7.1	-3.8	0.5	3.4	-0.3	5.0	13.6	5.7	4.5

Source: Office of Economic Advisor

iii. Balance of Payments

Developments in India's Balance of Payments during the Second Quarter (July-September) of 2018-19. Key Features of India's BoP in Q2 of 2018-19:- India's current account deficit (CAD) at US\$ 19.1 billion (2.9% of GDP) in Q2 of 2018-19 increased from US\$ 6.9 billion (1.1 per cent of GDP) in Q2 of 2017-18 and US\$ 15.9 billion (2.4% of GDP) in the preceding quarter. The widening of the CAD on a year-on-year (y-o-y) basis was primarily on account of a higher trade deficit at US\$ 50.0 billion as compared with US\$ 32.5 billion a year ago. Net services receipts increased by 10.2% on a y-o-y basis mainly on the back of a rise in net earnings from software and financial services. Private transfer receipts, mainly representing remittances by Indians employed overseas, amounted to US\$ 20.9 billion, increasing by 19.8% from their level a year ago. In the financial account, net foreign direct investment at US\$ 7.9 billion in Q2 of 2018-19 moderated from US\$ 12.4 billion in Q2 of 2017-18. Portfolio investment recorded net outflow of US\$ 1.6 billion in Q2 of 2018-19 – as compared with an inflow of US\$ 2.1 billion in Q2 last year – on account of net sales in both the debt and equity markets. Net receipts on account of non-resident deposits increased to US\$ 3.3 billion in Q2 of 2018-19 from US\$ 0.7 billion a year ago.

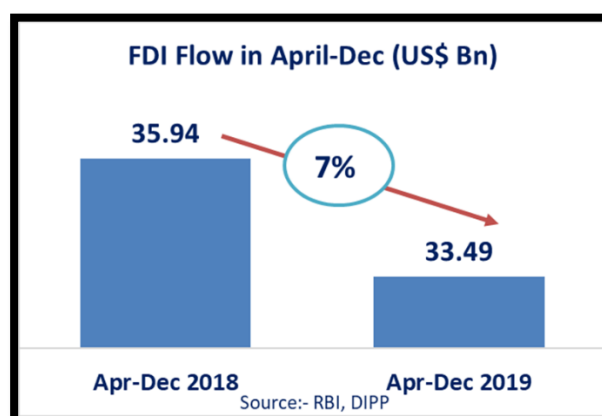


In Q2 of 2018-19, there was a depletion of US\$ 1.9 billion of the foreign exchange reserves (on BoP basis) as against an accretion of US\$ 9.5 billion in Q2 of 2017-18.

iv. FDI

Foreign direct investment (FDI) into India contracted by 7% to USD 33.49 billion during April-December in the current fiscal, according to commerce and industry ministry data. Foreign fund inflows during April-December 2017-18 stood at USD 35.94 billion. The key sectors that received the maximum foreign investment during the nine months of the fiscal include services (USD 5.91 billion), computer software and hardware (USD 4.75 billion), telecommunications (USD 2.29 billion), trading (USD 2.33 billion), chemicals (USD 6.05 billion), and the automobile industry (USD 1.81 billion).

Figure 12: FDI Inflows



Singapore was the largest source of FDI during April-December 2018-19 with USD 12.97 billion inflow, followed by Mauritius (USD 6 billion), the Netherlands (USD 2.95 billion), Japan (USD 2.21 billion), US (USD 2.34 billion), and the UK (USD 1.05 billion).

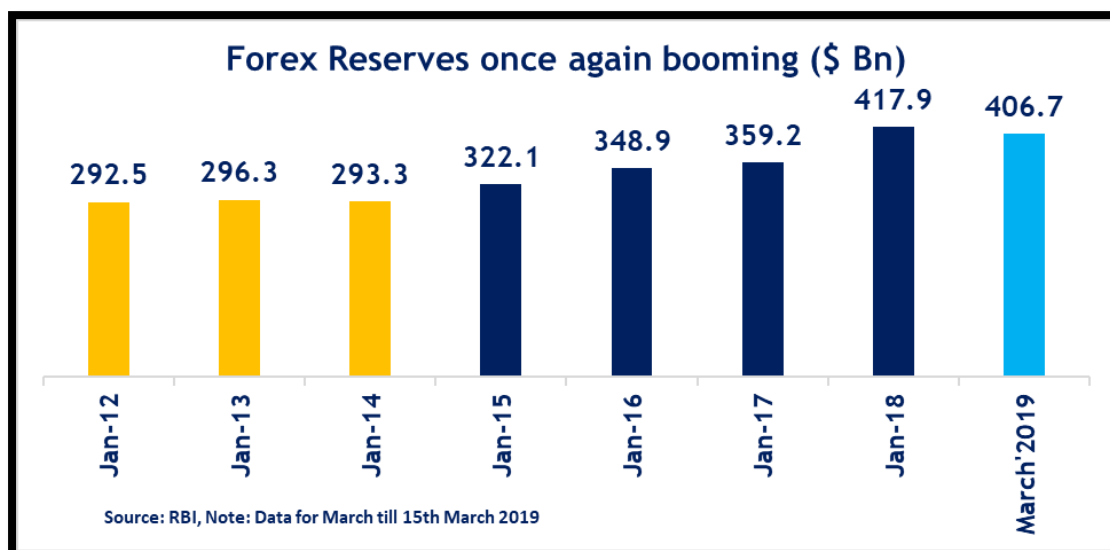
v. Forex reserves

India's foreign exchange reserves continued to surge for the third week in a row, adding \$1.029 billion at \$406.667 billion in the week to March 22nd, according to the Reserve Bank data. Forex reserves had increased by \$3.6 billion to \$405.6 billion in the second week of March, 2019, driven by an increase in foreign currency assets. In the third week of March 2019, foreign currency assets -- a major component of the overall reserves -- increased by \$1.031 billion to \$378.805 billion, as per RBI. Expressed in the greenbacks, foreign currency assets include the effect of appreciation/depreciation of non-US units like the euro, pound and the yen held in the reserves. The reserves had touched a life-time high of \$426.028 billion in the week to April 13, 2018. Since then, the reserve kitty has been sliding as the rupee came under pressure. But since March this year it has been increasing on the back of rising



foreign investors' play in domestic equities. Gold reserves were unchanged at \$23.408 billion in the third week of March 2019, according to data from the central bank. The special drawing rights with the International Monetary Fund dipped by \$0.7 million to \$1.460 billion. The country's reserve position with the Fund, too, came down marginally by \$1.5 million to \$2.993 billion, as per the apex bank.

Figure 13: Forex Reserves



vi. FII Flow and Stock Market

Foreign inflows into Indian equities and debt markets have surged, with \$3.65 billion pouring in this month as of March 15. That compares with inflows of \$1.58 billion in February and \$788 million outflows in January, according to exchange data.

Apart from the equities, Foreign Institutional Investors (FIIs) have pumped in more than \$800 million in debt, aiding the rupee to gain over 2% against the US dollar over upbeat investor sentiments. The healthy inflow of foreign funds during March 2019 comes second just to the inflow of \$3.78 billion seen in March 2017.

The Reserve Bank of India's (RBI's) proposal to swap \$5 billion with banks is also viewed positively by the market. The policy stimulus from the RBI is sustaining strong foreign investor inflows into the Indian equity markets, as per Nomura. Scope for the policy stimulus is provided in parts by the lower inflation environment, with inflation unlikely to become an issue into H2, 2019, it added.

Institutional investment from abroad is especially significant as it is not only fruitful for currency but also for the equities. Experts have said that foreign investors have turned bullish on the Indian markets owing to the expectation that a stable government will be in place after the general election.



Riding on the same, the equities have logged strong gains, inching close to fresh highs. Among other reasons giving a boost to the investor sentiments are the crude oil prices which have been stable, hence inflation is expected to remain benign.

While this fiscal saw indices rising higher, net foreign portfolio investments in equities look anything but promising. With just one month left for FY2018 to close, there is merit in looking at the foreign portfolio investors' (FPIs) 'net' equity investment activity on the stock exchanges.

Overseas investors have bought USD 2.4 billion in equities this month, taking net foreign purchases to USD 4.7 billion, the highest in Asia. Global funds have raised holdings of rupee-denominated bonds by USD 833 million this month.

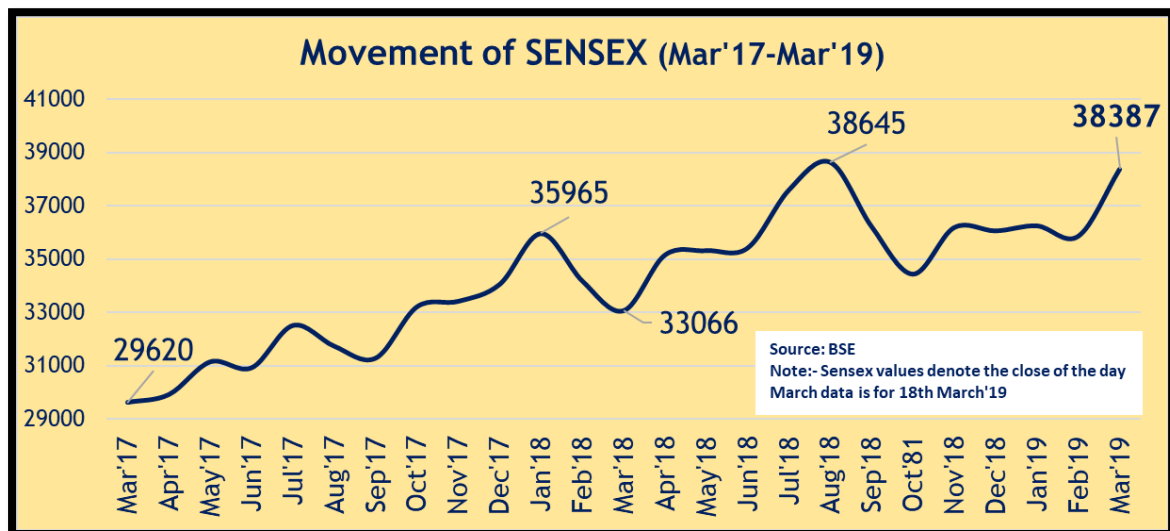
The signaling at the Federal Reserve of the US meeting in 2nd week of March 2019 that no more interest rate hikes should be expected during 2019 has ramifications across the globe given the scale of the US economy and the importance of Federal Reserve policy to global investments.

Biggest takeaway from the signals provided by the Federal Reserve is that the trends such as the availability of large amounts of capital for investment and the move from institutional investors towards more direct investments are here to stay. As developed economy based investors look towards emerging markets to generate investment returns, India by the sheer size of its market, is a destination for the return-seeking capital.

BSE Sensex in 2nd week of March 2019 was barely 600 points (or 1.6%) away from its all-time high of 38,989 hit last August. The combined market value of the five index stocks hitting all-time high levels (in 2019 so far) has climbed 6.19% since August 2018, even as the rest 25 saw a 7% erosion in their combined market value. Morgan Stanley said the Indian equity market could start pricing in a stronger election outcome in the coming weeks, which may help Nifty break its four-month range on the upside. Indian shares closed higher for a sixth straight session, led by energy and financial stocks, as expectations that the incumbent government would return to power after the general election starting next month boosted investor confidence.



Figure 14: Stock Market Performance



A stronger rupee, which rose to a more than seven-month high, and strength in broader Asian markets also buoyed the shares. On March 18th 2019, the benchmark BSE Sensex closed up 0.19% at 38,095.07, its longest winning streak since December, while the broader NSE Nifty advanced 0.31% to 11,426.20.

Going by the rally, the market seems to be assuming two things — de-escalation of geopolitical tensions and political stability post elections. The Election Commission in March 2019 announced that Lok Sabha elections will be held in seven phases from April 11 to May 19 with counting on May 23. Nearly 9 million voters will be eligible to vote in 543 Lok Sabha constituencies across the country.

Political sentiment seems to have improved a little bit. Interest in the market also seems to have risen, especially in midcaps

The market's confidence that the next government will be led by the BJP (political party currently in power) has increased following the recent border skirmishes. This was indicated by the nifty breaching the psychological mark of 11,000 on 18th March 2019 and ending above the level for the fourth session in a row. Money managers also said that macro headwinds that were a significant source of concern for markets earlier are not such a big worry now as crude oil prices have stabilized and the interest rate scenario is benign.

Analysts believe, if there is a stable government post elections, the rally can continue. Mid-caps are still looking attractive relative to large-caps. Investors are expected to build equity allocations in the next two to two-and-a-half months. The market rally may continue for a bit. Around 11,400-11,500 levels, the (Nifty) index would trade at 18 times, which is one standard deviation above average multiples. The market could stabilize at that level as per analysts.



In long term India is likely to see a steady growth on the back of improvement in rural economy, rising government expenditure, revival of private capex and higher disposable income in the hands of consumers.

With strong demographic dividend that India is seeing, we expect the economic growth and demand conditions in the country to remain strong for a long period. This is likely to augur well for investment in equities.

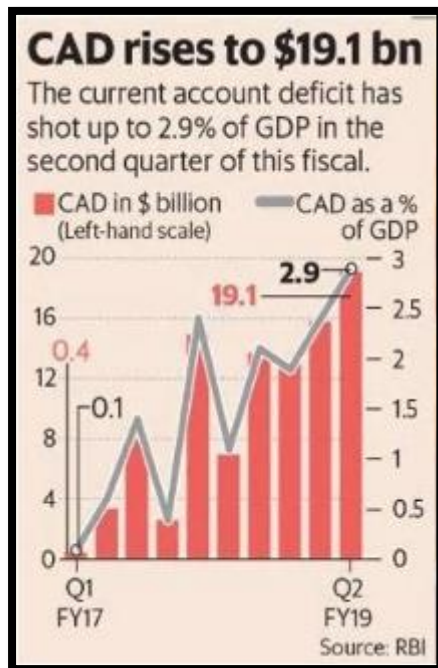
vii. Current Account Deficit

India's current account deficit (CAD) widened to 2.9% of the GDP in the second quarter of the fiscal, against 1.1% in the year-ago period, mainly due to a large trade deficit, as per the RBI. The CAD, or the difference between outflow and inflow of foreign exchange in the country's current account, was \$19.1 billion during the quarter ended September 30, 2018. It increased from \$6.9 billion, or 1.1% of GDP, in the second quarter of 2017-18. The CAD stood at \$15.9 billion (2.4% of GDP) in the April-June quarter. India's current account deficit (CAD) at \$ 19.1 billion (2.9% of GDP) in Q2 of 2018-19 increased from \$6.9 billion (1.1% of GDP) in Q2 of 2017-18 and \$15.9 billion (2.4% of GDP) in the preceding quarter, as per the RBI. The CAD increased to 2.7% of GDP in the



first half of 2018-19, from 1.8% in the corresponding period of 2017-18, on the back of widening of the trade deficit.

Figure 15: Q2'19 CAD at 2.9% of GDP



According to the central bank, the widening of the CAD on a year on year basis was primarily due to a higher trade deficit of \$50 billion, compared with \$32.5 billion a year ago. RBI's preliminary data on India's balance of payments (BoP) for July-September 2018-19 further revealed that net services receipts increased by 10.2% on a year on year basis, mainly on the back of a rise in net earnings from software and financial services.

Private transfer receipts, mainly representing remittances by Indians employed overseas, amounted to \$20.9 billion during the quarter, a 19.8% increase from a year ago. In the financial account, net foreign direct investment at \$7.9 billion in the second quarter of 2018-19 moderated from

\$12.4 billion in the same period last fiscal. As per RBI, portfolio investment recorded a net outflow of \$1.6 billion, compared with an inflow of \$2.1 billion in the second quarter last year, on account of net sales in both debt and equity markets. Further, net receipts on account of non-resident deposits increased to \$3.3 billion in the second quarter of 2018-19, from \$0.7 billion a year ago. In July-September of the current fiscal, there was a depletion of \$1.9 billion of foreign exchange reserves (on BoP basis), against an accretion of \$9.5 billion in the year-ago period.

Will CAD continue its upward trend?

Most analysts believe that CAD will fall in the third quarter (October-December) as crude oil prices have started softening. With oil prices falling by over 30% since October, India's external outlook is expected to improve. However, a decision last week by the OPEC and some non-Opec producers, including Russia, to cut oil production by 1.2 million barrels per day has supported prices in March 1st week 2019. That said, with an impending global slowdown and higher oil production in the US, the upside to oil price rise seems to have been capped.

Where is India's CAD expected to end up this fiscal?

Once seen near 3% of GDP, most analysts have pared down their CAD forecasts for 2018-19. While ratings agency Icra Ltd now estimates CAD at



2.6% of GDP, Bank of Baroda has projected the figure at 2.5%. The International Monetary Fund said that India's CAD was expected to widen to 2.6% of GDP in 2018-19. However, at current levels it is much narrower than the near 5% of GDP seen during the taper tantrum in 2013.

Exports in 2018-19 set to finally scale 2013-14 level

Exports appear on course to finally cross the 2013-14 level during the current financial year despite the sluggishness seen in recent months. Exports inched up by 2.5% to \$26.7 billion in February as several key sectors, such as engineering goods, chemicals, rice and cotton yarn and fabrics reported tepid growth, while oil product exports fell by 7.7%.

In the April-February period, the trade deficit widened to \$165.5 billion from \$148.6 billion in the year ago period. The major commodity groups of export showing positive growth in February were organic and inorganic chemicals (4.1%), drugs and pharmaceuticals (16.1%), and ready-made textiles (7.1%), as per the ministry.

In rupee terms, exports growth was 13.3% in February, with currency depreciation contributing to the rise. Imports denominated in rupee were up 9.8% in the month.

18 out of 30 sectors showed a decline in exports in December. Non-oil and non-gold imports fell 3.7% in the month, indicating weakness in domestic demand. Exports in the April-February period were up 8.8% to \$298.5 billion. Imports totaled \$464 billion over this period, a rise of 9.8%.

And, with gold, electronics and crude imports shrinking in February, the overall import bill fell by over 5.4% to \$36.3 billion, narrowing the trade deficit to \$9.6 billion, compared to \$12.3 billion in February last year. In fact, during February, 12 of the 30 closely watched segments showed a decline in the value of shipments.

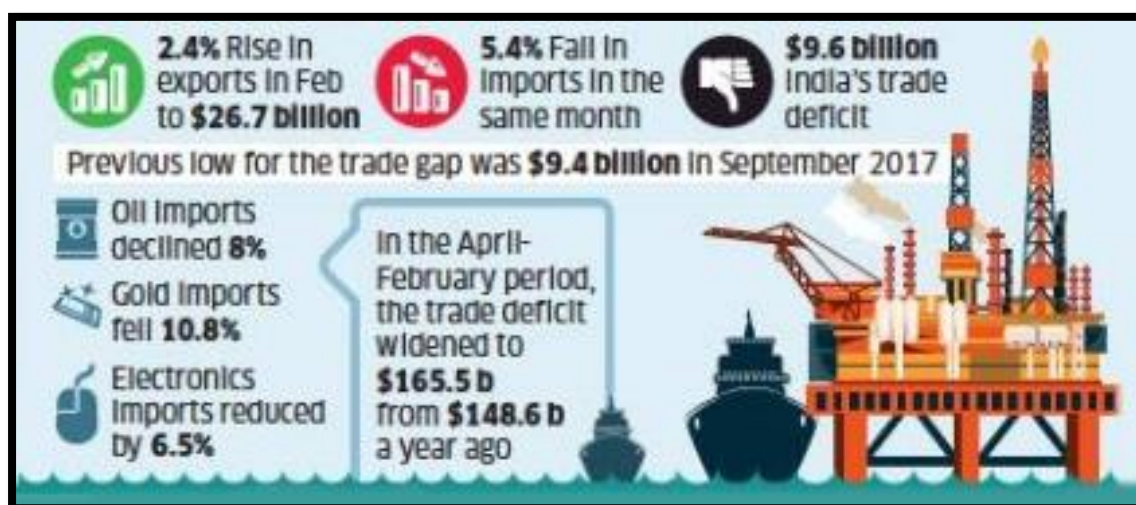
The trade deficit was \$14.7 billion in January and \$12.3 billion in February of the previous year. In February, import of oil, gold and electronic items declined by 8%, 10.8% and 6.5%, respectively. During April-February, India's exports are estimated to be 8.8% higher at \$298.5 billion, while imports are up a shade under 10% at \$464 billion. Policymakers and trade experts are keeping close tabs on the export numbers, as the government has so far fallen short of scaling the level of exports that it had inherited.

Government officials blame it on the global export slowdown as well as growing protectionism across the world, especially in the US, which had been an advocate of free trade. With March expected to see a year-end rush of shipments, the government expects to close the year with exports of around \$330 billion, helping it scale the record \$314 billion reached during UPA's last year in office. India trade gap narrowed to USD 9.6 billion in February of 2019



from USD 12.3 billion a year earlier and below market expectations of USD 14.3 billion. It is the lowest trade deficit since September of 2017.

Figure 16: Trade Deficit at \$16.3 billion



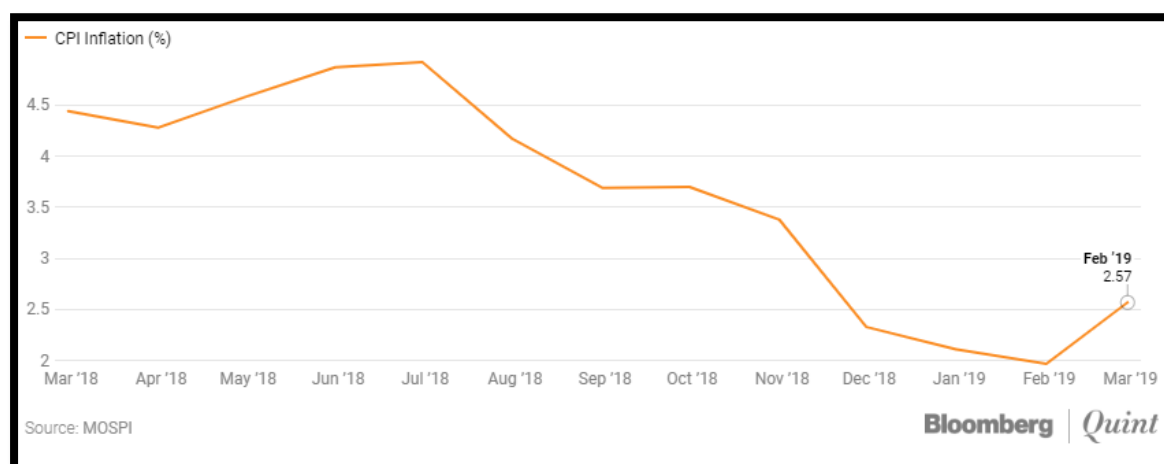
Exports increased 2.4% year-on-year to USD 26.7 billion, mainly due to engineering goods (1.7%) and drugs and pharmaceuticals (16.1%). In contrast, imports declined 5.4% to USD 36.3 billion, mainly due to oil (-8.1%), electronic goods (-6.5%) and gold (-10.8%). From April to February, the country's trade gap increased to USD 165.52 billion from USD 148.55 billion a year earlier. Balance of Trade in India averaged -2553.58 USD Million from 1957 until 2019, reaching an all-time high of 258.90 USD Million in March of 1977 and a record low of -20210.90 USD Million in October of 2012. Exports rose 2.4% from a year ago to \$26.7 billion, while a 5.4% contraction in imports led to a decline in the trade deficit to \$9.6 billion. The previous low for the trade gap was \$9.4 billion in September 2017.

viii. Inflation

Retail inflation jumped to a four-month high of 2.57% in February due to costlier food articles, according to official data released Tuesday. The Consumer Price Index-based inflation for January was revised down to a 19-month low of 1.97% from an earlier estimate of 2.05%.



Figure 17: Retail Inflation



The retail inflation number for February 2019 is the highest since October 2018 when it stood at 3.38%, the data released by the Central Statistics Office under the Ministry of Statistics and Programme Implementation (MoSPI) showed.

Food inflation was lower at (-) 0.66% in February against 3.26% in the same month last year. The retail inflation in February 2018 was at 4.44%. On a monthly basis, the consumer food price index moved up by 0.15% in February against January 2019.

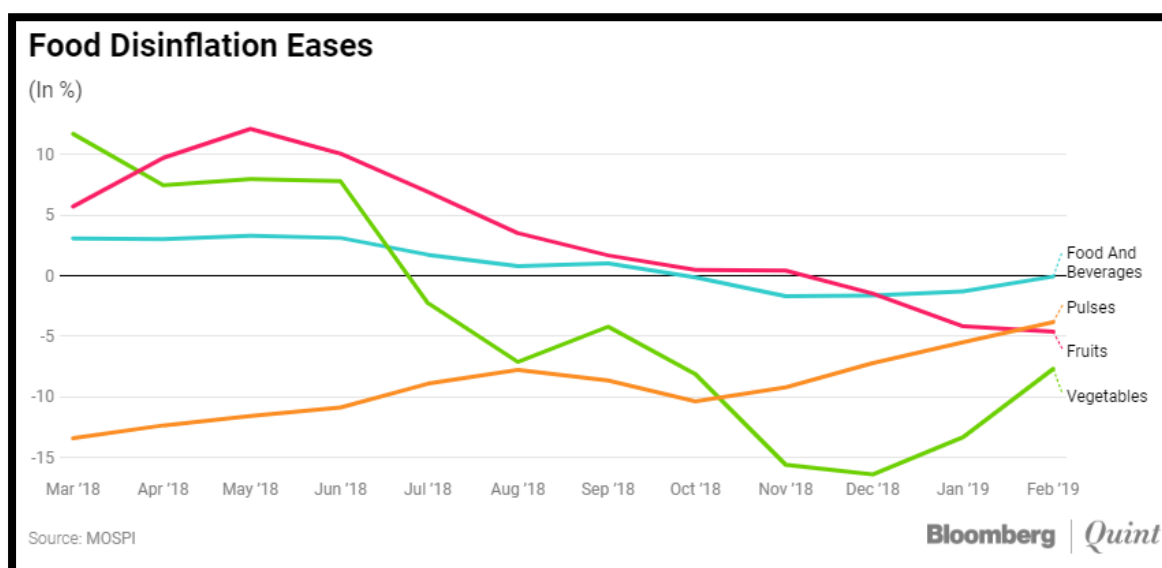
Protein-rich items such as meat & fish and eggs witnessed a quick rise in prices at 5.92% and 0.86% respectively in February. Prices of cereal and products went up at 1.32%. Prices of fruits (-4.62%) and vegetables (-7.69%) continued to decline in February. In January, the prices declined 4.18% and 13.32% respectively.

In the fuel and light category, the rate of price rise slowed to 1.24% from 2.20% in January. With the headline inflation reading at 2.57% and industrial production surprising on the downside at 1.7%, there clearly is a case and space for one more rate cut of 25 bps by RBI in April to support growth, RBL Bank.

Retail inflation has stayed below the Reserve Bank of India's (RBI) medium-term target of 4% for the seventh straight month and has opened up the possibility of more rate cuts as industrial growth remains tepid. With inflation remaining below RBI's target, inflationary expectations declining and growth profile weakening, RBI may frontload its monetary easing in the beginning of FY20. The RBI in the month of February 2019 lowered the benchmark repo rate by 25 basis points, its first rate cut in 17 months.



Figure 18: Food inflation lower in Feb'19



Core inflation numbers, however, remain sticky at above 5% and prices for most services are rising at above 6%, reflecting pickup in demand conditions and pricing power, particularly in urban economy. The upward movement was driven primarily by a sequential rise seen in various food groups, except in vegetables. Core inflation moved down slightly as expected, reflecting easing of input costs, pricing powers and growing slack in the economy. The earlier spikes seen in rural health and education seem to have stabilized for the moment.

NON-FOOD WORRIES

Non-food items and services pushed overall consumer inflation upward despite a decline in food inflation to 0.66% in February from 2.24% in January.

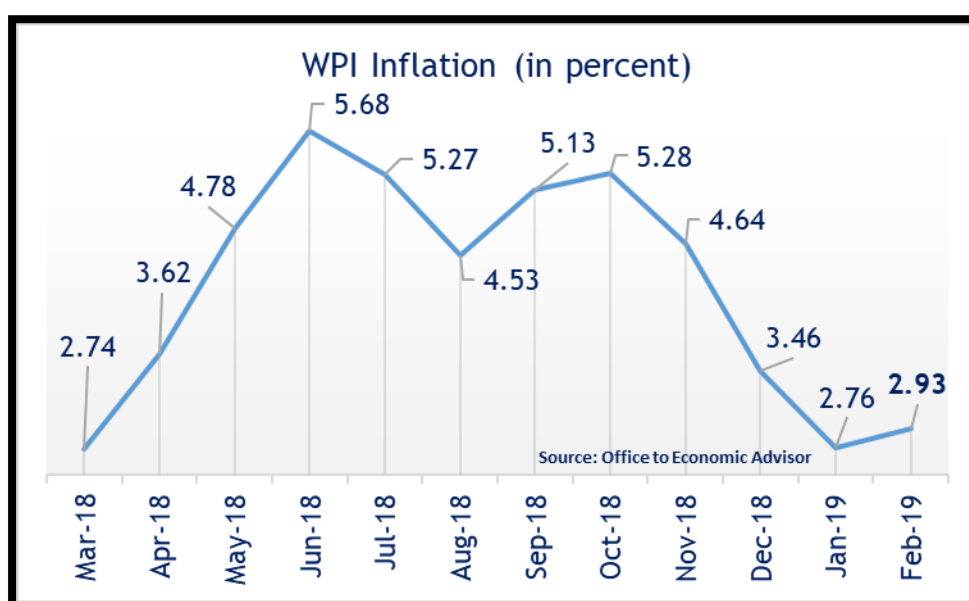
The Central Statistics Office revised the headline inflation for January to 1.97% from 2.05% earlier.

In the food category, inflation eased in vegetables, sugar and fruits, highlighting the stress in agriculture. Inflation in key services such as health and education was 8.82% and 8.13%, respectively, which drove consumer inflation upward.

As per CARE ratings, there is even chance of a rate cut in the next policy review meeting as gross domestic product growth and IIP growth have been low, which will make the MPC consider giving further impetus to growth.



Figure 19: Rate of Inflation (in percent)



Wholesale price index (WPI)-based inflation for February was higher at 2.93%, against 2.74% recorded in the same month of last year. It was also higher than 2.76% inflation recorded in January this year. Build-up inflation rate (April-February) in the financial year so far was 2.75% compared to a buildup rate of 2.56% in the corresponding period of the previous year.

Inflation of primary articles, which include potato, onion, fruits and milk, increased to 4.84%, higher than 3.54% in January. 'Fuel and power' segment increased to 2.23% against 1.85% in January. Experts believe, the WPI inflation number has started to move upwards and will continue to do so in the coming months. The hardening of crude oil prices as well as reversal in prices of some food items will exert upward pressure.

Though fuel and manufacturing inflation continues to be moderate, the main thrust for February WPI came from higher food inflation which jumped to 4.3% compared to 2.3% in January. At a more disaggregated level inflation in some of the select cereal items such as wheat, jowar, bajra, maize, barley is now in double digit. Pulses, which as a category was witnessing deflation till November 2018, is now witnessing double digit inflation. Also vegetables as a category witnessed 6.8% inflation in February 2019 despite a high base.

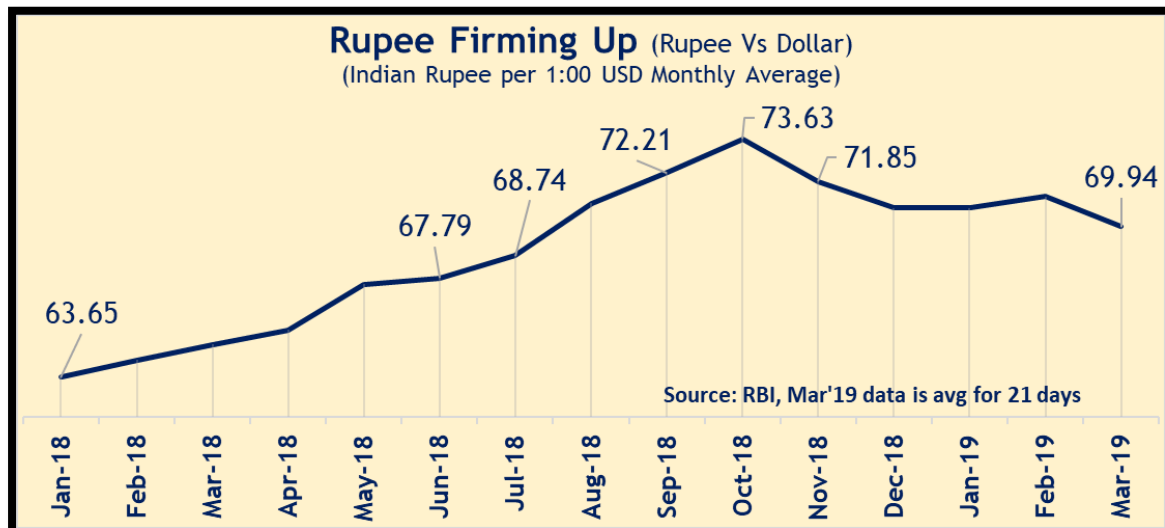
ix. Rupee

The rupee weathered last year's emerging market turbulence vis-a-vis other BRIC currencies like South Africa rand and Brazil's real. The rupee is getting stronger in spite of a strong dollar as we are seeing FII inflows. The co-relation between the rupee and the dollar index is low. The link between the rupee and oil increases whenever we see a significant movement in crude. Crude oil is



going nowhere, trading in a narrow range. So, the rupee is focusing on inflows in equity and the general trend of Indian stocks. In 2018, Brazil, Russia and Turkey struggled as raw materials prices and commodities languished. Unlike these countries, we are not reliant on commodity exports. In fact, lower oil prices were helpful to India, reducing the need for fuel subsidies as it freed up money for other budget priorities. In the month prior to India's last general elections in 2014, the rupee appreciated by 20% against the dollar. The reason was anticipation of BJP's landslide victory.

Figure 20: Rupee Movement in last one year



China and Brazil are running high debt and if China runs into trouble then it would mean crash in commodity prices, which is a boon for India, as we are a big net importer of raw materials. The Indian rupee in second week of March strengthened the most among all major currencies in Asia, hitting an eight-and-a-half month high of 68.53 a dollar on increased portfolio flow.

Rupee gained 0.823% against the dollar in intra-day trade on 18th March 2019, the steepest gain in the region, while Korean won gained 0.442%. Year-to-date, the rupee has gained 1.8%, whereas some others in the region, such as Thai baht, have gained just over 2%. Experts believe, Rupee is appreciating because of strong portfolio inflow in March. Globally, stock markets are rallying too, and there is a feeling that PM Shri Modi is going to form the government again after the Pulwama incident. That indicates political stability as per, Mecklai Financial.

Investors are bullish on the Indian rupee for the first time in nearly a year, a Reuters poll showed last week of Feb 2019, as a recent surge in popularity of the country's ruling party is expected to bode well for its alliance in the upcoming national elections.

The RBI plans to swap rupees for dollars for a total of \$5 billion with domestic banks which is likely to help achieve its twin objectives of pushing interest rates down while also preventing a sharp appreciation in the rupee.



Outlook for 2019-20: India

Fiscal 2019 was a year of recovery from demonetization and the initial disruption caused by the Goods and Service Tax implementation. The economy has so far fired mainly on the public investment cylinder, and is estimated to grow at 7.2%. Private consumption has disappointed. Exports, however, have performed well, presenting a buoy to the manufacturing sector.

Overall investments rebounded in fiscal 2019 with fixed investments growing 12.2%, up from 7.6% in fiscal 2018. Moreover, the investment ratio (investment/GDP) is estimated to have surged to 32.9% after wallowing at 30-31% in the past 4-5 years. The pick-up might have brought with it a healthy change in the investment spending mix, though official data on this will only be available in early 2020. Spending (by the Centre and the states) on construction of rural roads, highways, and affordable housing drove public investments, but private investment looked up only in select sectors such as auto, cement and steel, where capacity utilization increased.

In fiscal 2019, exports performed well, growing 12.1%, led by a low base, easing of constraints posed by GST implementation and lingering tailwind of global trade revival in 2017. The spur was also reflected in the sharp pick-up in manufacturing GDP growth to 8.3% compared with 5.7% in fiscal 2018. But gains on the external front were offset with imports rising faster than exports.

In all likelihood, fiscal 2019 would be the second consecutive year of sub-4% consumer price index (CPI)-based inflation. Current account deficit (CAD) is expected to reduce to 2.4% of GDP in fiscal 2020 from 2.6% of GDP in fiscal 2019. Import growth is expected to slow down, driven by lower oil prices relative to fiscal 2019.

Interestingly trade war seems to have boosted India's exports to China. In fiscal 2019 so far (April-November), India's exports to China has grown 41% on-year, compared with 11.8% growth to US and 8% to the Euro-area. Exports have, especially, increased in cotton and petroleum, on which China has been intending to impose tariffs on US. If this trend continues, it can help India reduce its massive trade deficit with China. On the upside, a dovish monetary policy in the US would ease the pressure on rupee and interest rate, as foreign capital that exited emerging market economies on the back of steady US rate hikes in US and rising US treasury yields returns.

Moreover, expansion in government spending at the central and state level should support economic activity and infrastructure creation. The bank recapitalization process and resolution of insolvency proceedings should help to ease the twin balance sheet constraints on fresh investment. Elevated bond yields may shift incremental demand for credit to the banking system from the bond market. Improvement in private consumption, increase in capacity utilization and private capex cycle revival will be driving higher growth. As the



impact of GST rollout fades, the industrial sector, especially manufacturing, will see a rebound in activity. An uptick is expected on the services front as well on factors like a favourable base effect, recovery in most of the lead indicators like deposit and credit for banks, cargo handled at major ports, passengers carried by domestic airlines and foreign tourist arrivals.

Rising foodgrain production in 2019-20 assuming a normal monsoon is likely to boost exports from India. Rising farm output, coupled with higher minimum support prices announced by government are likely to improve farm incomes and rural consumption.

The government on its part has shown confidence in its existing approach and schemes and increased allocations in a number of programs. The next step would clearly be the effective implementation of these schemes, which can potentially help the economy from a structural perspective. Schemes to alleviate skill shortages are likely to also lead to a healthier job market that is in tune with the changing times while increased rural spend is likely to bring about changes at the supply side of the economy.

Present budget allocation in the Infrastructure Sector, it becomes very evident that the present Government is looking at making major changes in the Infrastructure Sector and development of the economy. It was also the first time that the use of electric vehicles was mentioned in a budget aiming at renewable energy boosted transportation by 2030, which is the need of the hour.

The International Monetary Fund (IMF) has said that India is one of the fastest growing large economies in the world. It even mentioned that the country has carried out various key reforms in the last five years. IMF has put its growth projection for India to 7.3% for 2018 and 7.5% in 2019 and 7.7% for 2020, predicting strong growth despite new challenges and maintains that India still remains a bright spot in the global landscape.

The World Bank in the recent update said India's growth accelerated to an estimated 7.3% in FY2018/19 (April to March) as economic activity continued recover with strong domestic demand. While investment continued to strengthen amid the GST harmonization and a rebound of credit growth, consumption remained the major contributor to growth. World Bank estimates Indian economy to grow at 7.5% going ahead in 2019-20 and 2020-21.

India is the rising star on the list of most attractive investment markets, according to PwC's annual "Global CEO Survey" released at the World Economic Forum in Davos.

India's economy is poised to pick up in 2019, benefiting from lower oil prices and a slower pace of monetary tightening than previously expected, as inflation pressures ease, the IMF said in its update of the flagship World Economic Outlook released in Davos.



Table 4: India's GDP Growth Projection – 2018–19, 2019 and 2020

Agencies	2018-19	2019	2020
CSO	7.2%		
ADB*	7.2%	7.2%	7.3%
Fitch Ratings	7.2%	7.0%	7.1%
RBI	7.0%	7.2%	
Moody's*	7.0%	7.3%	7.3%
IMF*	7.3%	7.5%	7.7%
World Bank*	7.3%	7.5%	7.5%
OECD*	7.0%	7.2%	7.3%
UN*	7.4%	7.6%	7.4%

*figures represent calendar year 2019 and 2020

While other International agencies also continue to remain positive on India and still believe in the fact that growth would accelerate in FY 2019-20 pegged at and around 7.5% as economic activity is likely to bounce back on the back of strong fundamentals still in place, implementation of reforms, easing monetary policy and credit conditions and infrastructure spending.

The growth is predicted majorly on the basis of the expansion of the agricultural and manufacturing sector. The expansion in activities in 'agriculture, forestry and fishing' is likely to increase to 3.8% in the current fiscal as against 3.4% in the preceding year. The growth of the manufacturing sector is expected to accelerate to 8.3% this fiscal, up from 5.7% in 2017-18.

More importantly, it is believed in the long run India may benefit immensely from the increased digitalization of the economy and expansion of the formal banking sector. India is likely to gain momentum in the year to come as the results of earlier measures are visible.

However, going forward, export growth faces risks of weakening global trade growth owing to escalating trade wars. But it could also benefit from bilateral trade wars, especially between United States and China. In the recent past, India's exports to China have actually risen for those products on which China has imposed tariffs on US.

In fiscal 2020, CRISIL expects GDP to grow 7.3% on following assumptions:

- Normal rains
- Oil prices lower than 2018
- A stable political outcome

With the government likely to stick to a fiscal consolidation path, the pick-up in growth is expected to be only gradual. A change in the growth mix is on cards, with private sector likely to take over the baton from the government.



Section 2

Indian Petrochemical Industry



Petrochemical Industry in India

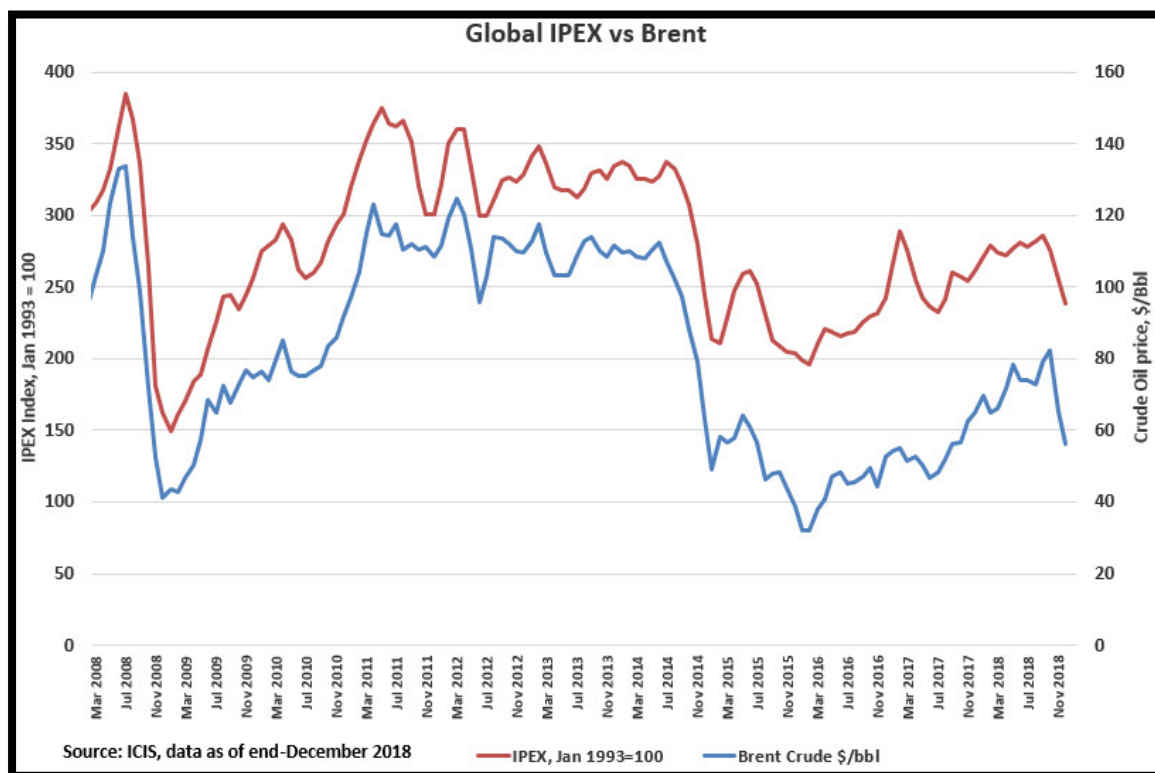
Petrochemicals play a vital role in the functioning of virtually all key sectors of economy which includes agriculture, infrastructure, healthcare, textiles and consumer durables. Polymers provide critical inputs which enable other sector to grow. Petrochemical products cover the entire spectrum of daily use items ranging from clothing, housing, construction, furniture, automobiles, household items, toys, agriculture, horticulture, irrigation, and packaging to medical appliances.

Per capita consumption of polymer has reached saturation level in US. India has the advantage of high population and expected to maintain high economic growth. This should propel India’s polymer consumption to new levels in coming year.

Petrochemical Industry Review of 2018-19 & Outlook for 2019-20

After a positive start to 2018, the global petrochemicals industry ended the year with trade and political tensions casting a shadow over prices and profitability in the business.

Figure 21: Global IPEX Vs Brent Basket



The IPEX (ICIS petrochemicals index based on a basket of 12 major commodity chemicals) fell steadily through most of Q4 2018 mirroring the correction in crude oil prices. The deepening US-China trade war and the slowing of the Chinese economy also had an impact.



Overall, 2018 average prices were higher than 2017 for many products but producers struggled to catch up with feedstock costs increases. The impact of the narrowing differential between rising feedstock costs on the one hand and rising product prices on the other was visible in margins.

In the US, feedstock ethane prices soared as new crackers came on-stream. In May, ethane averaged 26 cents/gal. In early September, the ethane price was 55 cents/gal). On a spot basis, third quarter ethylene margins were down 89%. On a contract basis the decline was 43%.

Spot ethylene margins based on naphtha feedstock in northeast Asia were down 20% year on year in the third quarter. In Southeast Asia the decline was 26%. Contract, naphtha feed, ethylene margins in northwest Europe were down 18% while spot margins were down 19%.

With the trade war between the US and China yet to be resolved, the industry has started 2019 on a weak footing. Concerns abound over demand growth prospects, especially in China, at a time when additional volumes from new plants that started up in 2018 and the ones in the pipeline for 2019 will have to find a home.

Growth is slowing in most of the world's key economies. At best, these economies are reverting to trend. More worrisome is the rising risk that growth will drift below trend. IHS Markit projects global growth to slow from 3.2% in 2018 to 2.9% in 2019 and 2.8% in 2020 and 2021. As growth slows, vulnerability to shocks will increase, leading to rising recession risks in the next few years.

IHS Markit expect Brent price to rise to around \$70/barrel in the second and third quarters of 2019. This is driven by Saudi Arabia's output cuts, falling Venezuelan production, further restrictions on Iranian exports, and strong crude oil demand growth as refiners prepare to meet the International Maritime Organization's 2020 cap on the sulfur content of fuel oil.

However, price gains are expected to dissipate as US production accelerates in the second half of 2019 and into 2020. The price of Brent is projected to average \$69/barrel in 2019 and \$65/barrel in 2020.

The global basic chemicals industry has been experiencing an extended up-cycle, characterized by record levels and steady demand growth, and above-reinvestment level profitability during the past four years. In early 2019, the strong growth and elevated profitability appears to be threatened by developing economic headwinds at the same time a wave of new capacity prepares to start-up. In addition to the threat of slowing economic growth, in 2018 the issue of plastics waste was thrust into the global spotlight.

It is now threatening long-term demand growth for the chemical industry. Consumers and governments are responding to the visibility and enormity of



the plastics waste problem by often supporting bans and de-selection initiatives that impact potential growth in the future. Chemical industry has started 2019 on a cautious note.

Crude-to-chemicals, increased focus of oil companies on chemical portfolio and concern around plastics waste are some of the major emerging trends which will influence chemical industry. India chemical industry continue to grow at healthy growth rates with increased focus on domestic capacity addition.

Review of 2019 and Outlook

Styrene butadiene rubber (SBR) prices in Asia are facing upward pressure from rising costs of feedstock's butadiene (BD) and styrene monomer (SM). On 28 February, non-oil grade 1502 SBR prices were assessed at \$1,750/tonne CFR (cost & freight) SE (southeast) Asia, up by \$50/tonne from the previous week, ICIS data showed. BD prices have jumped by 20% over roughly two months to \$1,420/tonne CFR northeast (NE) Asia on 23 February, while SM has gained 12% over the same period to \$1,435/tonne CFR NE Asia, according to ICIS data.

Meanwhile, demand for SBR had waned in February because of the Lunar New Year holiday, which is celebrated in most parts of northeast and southeast Asia. Demand is expected to improve in March, when downstream tyre makers typically tap the spot market to replenish their inventories. But the tyre makers are resisting higher SBR prices, citing cheaper natural rubber (NR), an alternative raw material. NR and SBR are rival feedstock's for the production of tyres for the automotive industry and their prices tend to impact each other. Tyre makers in Asia have more flexibility in feedstock substitution in their product formulations.

Butadiene (BD) supply in Asia in the first quarter of 2019 is expected to ease as BD plants in China are expected to resume production following their turnarounds in the fourth quarter of 2018. Deep-sea supply from Europe and the Middle East is also expected to increase, with cargoes from these regions heading to Asia ahead of the Lunar New Year holidays in early February. Demand for butadiene (BD) is mixed in the first quarter of 2019. Spot interest is expected to pick up for January shipments on re-stocking ahead of the Lunar New Year holidays in early February. However, it is unclear whether demand will remain firm after the Lunar New Year holidays, given concerns over the ongoing trade war between the US and China, the world's two largest economies.

Asia's purified terephthalic acid (PTA) supply is likely to remain largely balanced to tight in 2019 as a result of limited capacity expansion, while demand is expected to continue growing. China will remain the key demand growth driver for Asia, followed by India. The expected demand growth for China is at around 6-7%, tracking the country's expected GDP growth, representing a slowdown from the double-digit growths posted in the past two years.



Uncertainties in the global macroeconomic environment, generated by the ongoing US-China trade war, could cap PTA demand growth. China's PTA consumption increased by 2.4m-2.8mtonnes in 2018 to around 40m tonnes. Within Asia, supply of PTA is expected to be tighter in 2019 amid increasing demand, as majority of new capacities will only come on-stream toward the end of the year. Majority of upcoming PTA expansions are in China, with the bulk of effective capacities coming on line in 2020.

PTA margins should remain relatively healthy for the year, spurred by balanced to tight PTA supply demand, on the backdrop of ample feedstock availability. In 2018, the PX and PTA spread for US-dollar denominated cargoes stood at around an average of \$158/tonne, while the spread for China yuan (CNY) cargoes stood at an average of \$134/tonne.

With the expectation of a healthy market fundamentals this year, the PX and PTA spread for both US-dollar denominated cargoes and CNY cargoes are expected to be within the range of \$140-160/tonne, much higher than the break-even level of around \$85/tonne.

PTA inventories in key China begin the year at a low, with the China PTA futures warehouse receipted cargoes at the lowest level compared to the last two years. Majority of market players are keeping their inventories low, wary of incurring losses amid the global macroeconomic uncertainties. China's polyester average operating rates in 2018 stood at around 82%, compared to 79.4% in the previous year, according to ICIS data.

Going into 2019, Chinese polyester average operating rates are expected to be maintained within the 80-85% range. PTA operating rates in Asia are likely to be very margin sensitive, especially in the key China market.

Historically, producers tend to shut their plants when margins are negative for a sustained period of at least two to three months. In 2018, the average operating rates of PTA facilities in the key China market stood at around 78%, up from an average of 65.8% in the previous year. Yuan-denominated PTA cargoes are likely to continue to closely track price movement in the futures market, which is sensitive to global macroeconomic trends, as well as fiscal and monetary policies in China.

Asia Outlook - ICIS

The year 2019 promises many significant changes in Asia's petrochemical markets amid booming production capacity and integration of petrochemical plants and refineries across China, and the global impact inflicted by the US-China trade war. This will be the year that opens the floodgates for massive new petrochemical capacities being brought on stream by private Chinese companies. They aim to integrate all the way upwards from their purified Terephthalic acid and polyester plants to greenfield refineries.



Asia's naphtha market is envisaged to draw support from healthy regional demand for petrochemical production, which might outpace supply despite expectations of ample western arbitrage cargo flows. Asia butadiene (BD) prices may rise in January ahead of the Lunar New Year holidays on re-stocking although the price uptrend may fizzle out unless US-China trade war tensions ease or there is positive news during this period.

Asia's styrene butadiene rubber (SBR) prices are likely to be stable or soft in the first quarter of 2019 if tensions in the US-China trade war failed to ease. Movements in Asia's styrene market for the first quarter of 2019 are likely to hinge on the viability of deep-sea arbitrage flows from exporters in the West and buying appetite from several downstream sectors. Asia spot prices of 1,4-butanediol (BDO) and its downstream polybutylene terephthalate (PBT) are expected to continue their downward trend in the first quarter of 2019, and the prospects for recovery are seen weak for the rest of the year.

Southeast Asia polyethylene (PE) market is likely to face some downward pressure in 2019 on oversupply as demand could not catch up with the large capacity additions. Polypropylene (PP) spot prices in Southeast Asia may continue to be suppressed moving into the first quarter of 2019 as the market continues to grapple with fresh supplies and tepid downstream demand amid global trade tensions.

Asia's acrylonitrile (ACN) price trend may take a cue from feedstock propylene in 2019 as ACN plants are expected to run in full throttle given a lower rate of turnarounds next year, and Chinese and South Korean supply is expected to increase as such.

Asia toluene is poised for increased spot trading liquidity and cargo availability, be it free-on-board (FOB) Korea basis or cost-and-freight (CFR) China, though demand in the downstream benzene market is seen slightly weaker in the first quarter. Asia's polyethylene terephthalate (PET) market is expecting to be balanced in supply and demand next year, and margins are likely to be within range following a tumultuous 2018. The Indian polyolefin market is likely to remain afflicted by tight fiscal liquidity that presently persists in the country, and a recovery, if any, is poised to be seen only in the second half of the year.

Asia's Caprolactam prices are expected to see more weakness in 2019, pressured by rising supply amid high runs and upcoming plant expansions in China. Asia ethylene is expected to be more ample in 2019, on the back of fewer cracker turn arounds in Japan, regional capacity expansions and possible downstream output cuts.

Asia's polystyrene (PS) prices shall take strong cues from volatility in upstream feedstock styrene monomer (SM), as margins are a main driving force for liquidity in the regional markets. Sustained demand in India for polyvinylchloride (PVC) and increased safety concerns in China are likely to lend support to firmer prices in the first quarter of 2019.



Downward pressure on caustic soda prices in Asia is likely to remain in the first quarter of 2019 due to ample supply from northeast Asia. Import demand for acrylonitrile-butadiene-styrene (ABS) and styrene-acrylonitrile (SAN) resins in the key China market is expected to remain tepid in 2019, despite the temporary truce achieved in the US-China trade war in early December.

Supply of Paraxylene (PX) in Asia should gradually lengthen as a result of PX capacity expansion growth, driven by two large production units coming on stream in the key China market this year.

As for India, most sources agreed- Demand will be strong, and will primarily come from the automobile and construction sectors. India's demand has been growing in excess of 9%/year for several years, while exports have declined more than 40%/ year over the same period, turning it from a net exporting country to a self-sufficient one. In fact, Indian economy has turned the cornerstone and it's once again on the growth path. Globally India is being looked at as the bright spot in the global economy. Consumer sentiments are high and growth expectations are reasonable well, which augers well with the petrochemical industry whose growth has a direct relation with the economic growth.

For the Indian petrochemical industry in 2017-18- the key application industries like packaging, construction, and automobiles actually helped pull up the demand and declining prices resulted in higher offtake by downstream converters for virtually all polymers.

Government of India's initiatives like Digital India, Swachh Bharat, Start-up India and Skill development program etc. have started and will eventually have a widespread multiplier effect. One can expect them to fuel petrochemical demand in India in the years to come.

Success of 'Make in India' programme will be a game changer and a big boost to manufacturing in the country. Increased focus on agriculture and irrigation will boost the demand for plastics along with GOI's thrust on infrastructure followed by a good monsoon forecast in 2019 by IMD.

A few of the many such initiatives that are likely to result in new opportunity for industries and positively push the demand for petrochemicals are: Rapid expansion of Metro Rail Projects across the country and electrification of existing & addition of new railway lines. From a humble beginning of just 8 km in 2002, 425 km of metro lines are operational as of now in 10 different cities across the country. In the next few years, the network length is expected to cross 700 km.

The interim budget listed out last four years' achievements and investments in the infrastructure sector. With mention of flagship schemes like Pradhan Mantri Gram Sadak Yojna (PMGSY), UDAN (Ude Desh ka Aam Nagrik) amongst



others, the government reiterated its continued thrust and commitment to these programs.

Safe drinking water to all Indians, micro-irrigation techniques for efficient use of water in agriculture, road connectivity, rail network, electric vehicles, renewable energy, affordable housing, most of the sectors found mention in the interim budget speech. The major takeaways from the budgetary allocation 2019-20 for the Infrastructure Sector are as follows:-

A total of \$ 65.14 billion was allocated to the Infrastructure Sector wherein the railways saw a 21% increase and the Aviation Sector witnessed 54% cut as compared to the previous year budgetary allocation. A big sum of \$ 22.66 billion was allocated as the capital expenditure for the railways, up from \$ 19.83 billion in 2018-19 whereas the expenditure on the 'Rashtriya Rail Sanraksha Kosh' (Railways safety fund) remained the same i.e., \$ 2.85 billion. The roadways were allocated a slightly increased sum of \$ 11.85 billion even though the Government had pledged to bring connectivity to every 'unconnected' village. An upgraded allocation of \$ 2.71 billion was made on rural roads under the 'Pradhan Mantri Gram Sadak Yojana' (PMGSY) from a sum of \$ 2.214 billion in 2018-19.

The Government had a narrative of creating a blue economy and bringing back the inland waterways. The opportunities are huge, and the petrochemical industry stands to benefit in a big way. These proposals and the focus to support the start-ups will also go a long way in encouraging domestic manufacturing and demand.

A number of Indian state-owned energy companies are making major investments to boost their petrochemical activities and are expected to become significant players in the sector. Capacity expansions by several other manufacturers are moving ahead and gradually filling the gap between domestic demand and supply.

Overall, the outlook for the petrochemical industry in India is somewhat more positive than it has been recently, as growth in GDP and industrial output is expected to be higher in 2018-19 than in the previous year, and key end-use industries like automotive, packaging, and consumer durables reflect this outlook.

Feedstock

A. Naphtha

Naphtha is a major raw material for production of Ethylene, Propylene and Aromatics. The current demand in country is lower than the production from refineries and as a result, India is exporter of nearly 7-9 MMTPA. Naphtha consumption is expected improve by around 9% due to increase in demand from downstream products like Ethylene, Propylene demand.



Table 5: Naphtha Demand Supply

Naphtha (MT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Production	19993	19949	--	--
Imports	2212	2281	--	--
Exports	8951	7495	--	--
Apparent Demand	12889	13987	--	--
Demand Growth%	-2.7%	8.5%	--	--

B. Natural Gas

Natural gas production from India's conventional fields has been declined from past few years which is also supported by lack of new gas discoveries. Unconventional fields (like CBM) are also not contributing significantly, hence country is dependent on incremental gas imports with increase in consumption.

The state-run company GAIL (India) Ltd has committed an investment of USD 2 billion to expand its natural gas pipeline network to 18,000 km, up from 11,000 km at present. GAIL envisaged pipeline network is expected to be completed by December 2020. India has set a target of natural gas contributing 15% to the energy mix from the current level of 6.5%. India imports half of its gas which costs more than double the domestic rate. The central government is promoting gas based economy which needs a massive network of pipelines for transportation of natural gas to various corners of the country

Table 6: Natural Gas Demand Supply

Natural Gas (MMSCM)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Production	32649	32064	--	--
Imports	26328	27623	--	--
Exports	--	--	--	--
Apparent Demand	52260	53838	--	--
Demand Growth%	5.2%	3.0%	--	--

The Centre will initially spend \$ 10 billion to spread gas pipelines across the country, and is working out plans to expand gas network to Myanmar through Bangladesh. Under this programme, pipelines are proposed to be constructed between Dhamra to Bangladesh and Siliguri to Bangladesh to export LNG gas according to the requirement of the neighboring nation

Turning to Odisha, Pradhan said the state needs a huge infrastructure to store, refine and transport the natural gas to the doorstep of the industry from Paradip, Dhamra and Gopalpur. Centre is contemplating to promote port based industries in Odisha and also in other coastal states having natural ports.



The eastern part of India, including Odisha, needs a high double digit growth rate to be on a par with Western region. In Odisha, around \$ 640 million would be pumped in to construct 1700 kms of pipeline network in first phase.

A strategic oil reserve project will also be launched in Chandikhol after acquiring land there. South Eastern Region Pipelines (SERPL) is presently operating cross-country pipelines network of crude oil and refined products as well as LPG of 1570 kms length with 19.35 MMTPA capacity Under this region, India Oil is having the biggest and largest crude oil handling facility at Paradip, which is feeding four most important refineries - Paradip, Haladia, Barauni and Bongaigaon.

As future expansion plans under SERPL, laying works of 1212 km Paradip-Hyderabad pipeline with capacity of 4.5 MMTPA is in progress. Moreover, preconstruction works for 360 km long Paradip-Dhamra-Haladia LNG pipeline and 345 km long Paradip-Somanathpur-Haladia pipeline are also under progress

In Feb 2019, IOC won city gas distribution licences for nine cities, most of them in Bihar and Jharkhand, on its own and one in a joint venture with Adani Gas. HPCL, a subsidiary of state-owned Oil and Natural Gas Corp (ONGC), won licences to retail CNG to automobiles and piped natural gas to households in nine cities in Uttar Pradesh and West Bengal.

A little known consortium of LNG Marketing Pte Ltd and Atlantic Gulf & Pacific Company of Manila Inc. won rights for nine cities in Andhra Pradesh, Karnataka, and Kerala. Gujarat Gas Ltd won rights for six cities while state gas utility GAIL India's unit GAIL Gas Ltd won rights for four. Indraprastha Gas Ltd and Torrent Gas won rights for three cities each while Adani Gas and Bharat Gas Resources Ltd, a subsidiary of state-owned Bharat Petroleum Corp Ltd (BPCL), bagged two cities each.

This is the second auction in a row that IOC has dominated. In the previous 9th bid round, IOC had won licences for eight cities on its own and another nine in a joint venture with Adani Gas. Adani Gas had in the 9th round won licences for 13 cities on its own while Bharat Gas Resources Ltd bagged 11 areas. Gujarat-based Torrest Gas Pvt. Ltd got nine cities.

Prior to this, city gas distribution (CGD) licences had been given for 178 GAs covering 280 districts (263 complete and 17 part) spread over 26 states and UTs. These cover about 50% of India's population (as per 2011 census) and 35% of its geographical area.

As per the commitment made by the various entities in the 50 GAs approved for issuance of Lols in 10th CGD Bidding Round, 2.02 crore domestic PNG (piped natural gas) connections and 3,578 CNG (compressed natural gas)



stations for transport sector would be installed largely during a period of 8 years up to March 31, 2029, in addition to 58,177 inch-km of steel pipeline.

Further, the entities would be authorized to supply natural gas to industrial and commercial units in their respective GAs as per the limits provided in the CGD Authorization Regulations

IOC will have over 20,000-km of natural gas and liquid fuel pipes by fiscal 2021. Currently, the oil and gas major has 13,000-km of the 15,000-km operational pipelines, making it the largest player in the country. The government has set a target of doubling the 15,000-km gas pipeline to 30,000-km by then. In terms of natural gas distribution, where IOC is the second largest player, the company will be investing in gas infra to meet future needs of the nation by building terminals and pipelines and pursuing city gas distribution.

IOC is developing three natural gas pipelines -- Mallavaram-Bhopal-Bhilwara-Vijaipur, Mehsana-Bhatinda & Bhatinda-Jammu, adding it is also partnering in the development of a 1,500-km natural gas pipeline grid to connect Guwahati to other major cities of all north-eastern states.

The company is also working on laying a 1,385 km natural gas pipeline originating from the Ennore terminal to Nagapattinam in Tamil Nadu via Puducherry. Also, branch pipelines will be laid in Madurai, Tuticorin, and Bengaluru to meet the demand from multiple LNG consumers in the region. Indian Oil Corporation (IOC) commissioned its liquefied natural gas (LNG) import terminal at Ennore in Tamil Nadu in March 2019. This is the first LNG terminal that IOC has built on its own. The 5 million-tonne-per-annum (MTPA) liquefied natural gas (LNG) import and regasification terminal, built by IOC at a cost of \$ 735 million after completion of dredging of the channel that will bring cryogenic ships carrying natural gas in its liquid form to the port. IOC has already secured captive customers for 2 MTPA of capacity. The Ennore terminal will also help fast-track IOC's city gas distribution plan, as gas from the terminal will be supplied to consumers around Chennai and Madurai. PM Narendra Modi laid foundation stone of India's longest LPG pipeline in February 2019. State-owned Indian Oil Corp (IOC) is laying an LPG pipeline from Gujarat coast to Gorakhpur in eastern Uttar Pradesh to cater to growing demand for cooking gas in the country. IOC plans to import LPG at Kandla in Gujarat and move it through the 1,987-kilometre pipeline to Gorakhpur via Ahmedabad (in Gujarat), Ujjain, Bhopal (in Madhya Pradesh), Kanpur, Allahabad, Varanasi and Lucknow (in Uttar Pradesh).

The pipeline possibly is the longest LPG (liquefied petroleum gas) pipeline in the world, and the pipeline would be laid at a cost of \$ 1.28 billion. The pipeline will carry 3.75 million tonne per annum of LPG. LPG will be fed into the pipeline at Kandla port as well as IOC's Koyali refinery in Gujarat. This will be the biggest LPG pipeline in the country. GAIL currently operates a 1,415-km line from Jamnagar in Gujarat to Loni near here. The line carries 2.5 million tonne of LPG



annually. GAIL also has a 623-km Vizag-Secunderabad pipeline. IOC also has a 274-km pipeline from Panipat in Haryana to Jalandhar.

Further, due to the Government of India's emphasis to make LPG – a clean and environmentally friendly fuel, available to every domestic household in the country, LPG demand is expected to increase at a much steeper rate in the coming year. It expected the deficit between what its refineries produce and the demand to reach about 10 million tonne per annum by 2031-32. LPG demand has grown 10.5% this fiscal (2019-20) with just about half of the 8.4 million tonne consumed being locally produced. India is poised to lift its domestic natural gas price to the highest in at least two years, boosting earnings of producers like Oil and Natural Gas Corp. Ltd (ONGC), according to a survey of analysts and industry participants. India plans to double its LNG import and regasification capacity to 56.5 MTPA by 2025 to meet the energy needs of a fast-growing economy. Natural gas prices were last hiked on October 1, 2018, by 10% to \$3.36 per mBtu from \$3.06 per mBtu. If the prices are hiked again, it will be the fourth straight increase. Experts, believe the prices of domestic natural gas for the April-September 2019 period will increase from the current \$3.36 per mBtu to around \$3.97 per mBtu, an 18% increase.

C. Coal Bed Methane

India has the fifth largest proven coal reserves in the world and thus holds significant prospects for exploration and exploitation of CBM. The prognosticated CBM resources in the country are about 92 TCF (2600 BCM) in 12 states of India. Data published by petroleum planning and analysis cell (PPAC) shows that in 2016-2017 domestic production of CBM contributed to 1.78% of India's total natural gas production of over 31,000 MMSCM. In a bid to incentivize production, the Cabinet Committee on Economic Affairs (CCEA) had in February 2018 approved a new policy allowing marketing and pricing freedom for CBM gas.

Reliance Industries (RIL) started commercial production from its CBM block at Sohagpur in Madhya Pradesh in March 2017. Reliance Industries Ltd.'s (RIL) production of coal-bed methane (CBM) at the Sohagpur West CBM Block in Madhya Pradesh State has fallen short of its targets owing to operational issues and poor pipeline connectivity. Sohagpur's output slipped to 940,000 mcm per day in July-September from 1 mcm per day in April-June. While RIL sells the CBM production to its petrochemical facilities in Gujarat and Maharashtra. RIL has arranged for state-owned GAIL (India) to pipe the CBM to fertilizer-maker IFFCO in exchange for deliveries of imported LNG to its petrochemical facilities. Fluctuations in IFFCO's demand, however, have limited RIL's production volumes.

Essar Oil has sold its entire production of coal-seam gas or CBM from a West Bengal block to state-owned GAIL India Ltd. GAIL will buy 2.3 million standard cubic metres per day of coal-bed methane (CBM) that Essar Oil and Gas



Exploration and Production (EOGEPL) will produce from its Raniganj block in West Bengal for USD 7.1 per million British thermal unit. The Raniganj East block is India’s most prolific CBM block, which has achieved gas production of more than 1 mmscmd (million standard cubic metres per day), which will be gradually scaled up a saleable volume to 2.3 mmscmd.

Coal India is in talks with Gail India and IOC for joint ventures to develop coal bed methane fields and sell the produce. Coal India has already lined up investments to the tune of \$ 428 million for its methane projects. The joint ventures are also likely to enable Coal India inject coal bed methane into the proposed Urja Ganga gas pipeline that aims to meet energy requirements of 40 districts and 2,600 villages covering Uttar Pradesh, Bihar, Jharkhand, Odisha and West Bengal. In June 2018, the Cabinet Committee on Economic Affairs had waived the requirement for procuring separate licences from the ministry of petroleum and natural gas for taking up coal bed methane projects on its lease hold areas.

Following the development, the world’s largest coal producer lined up two coal bed methane projects at an estimated investment of \$ 428 million. The first project will be undertaken by Coal India subsidiary, Bharat Coking Coal, at Jharia coalfields in Jharkhand. This block is estimated to hold methane reserves of 25 billion cubic meters and is expected to start production two years after the project is initiated.

The second project at Raniganj in West Bengal is to be undertaken by Eastern Coalfields. The block holds around 3 billion cubic meter of coal bed methane that can be viably extracted and sold. EOGEPL has invested around \$ 0.571 billion in the Raniganj block, which will produce 1.7 million standard cubic metres per of gas from coal seams (CBM) in the next two years and ramp up to 2.5 mmscmd in the next three to four years.

Table 7: Coal Bed Methane Demand Supply

Coal Bed Methane (MMSCM)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Production	735	712	--	--
Imports	--	--	--	--
Exports	--	--	--	--
Apparent Demand	--	--	--	--
Demand Growth%	--	--	--	--

Essar Oil & Gas Exploration and Production (EOGEPL) has received environment clearance for exploring shale gas reserves in its Raniganj block in West Bengal, in March 2019. This follows the government's decision to allow operators freedom to explore both conventional oil and natural gas as well as



non-conventional sources like coal-bed methane (CBM) and shale reserves within an exploration acreage.

Previously, companies could explore only oil and natural gas or CBM depending on their licence for the block. The official said the expert appraisal committee (EAC) in January 29 2019 meeting allowed Essar to drill 20 wells to explore shale gas in its Raniganj CBM block.

It has been awarded an exploration lease for shale gas, CBM and hydrocarbons in the Raniganj block. EOGPL has got approval to drill 20 shale wells at a cost of Rs 10 crore. To start with, it will drill five wells in the block to test the shale potential.

D. Methanol

Methanol consumption and production over last couple of years in India were stable, however consumption has been increased by 4% vs 1% projected. Increase in Methanol consumption majorly due to initiatives taken by government to substitute petroleum products with methanol to reduce GHG effect and crude oil import bill. Methanol consumption in India is projected to grow at a CAGR of approx. 3 to 4 %. India's domestic production also expected to increase with increase in consumption, however 90% of methanol requirement is met through imports primarily from Iran and Saudi Arabia.

Table 8: Methanol Demand Supply

Methanol (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	631	631	631	631
Production	200	200	213	250
Imports	1839	1921	1992	2042
Exports	0	0	0	0
Apparent Demand	2039	2121	2205	2292
Demand Growth%	4.3%	4.0%	3.9%	3.9%

Building Blocks

A. Ethylene & Propylene

Ethylene Capacity further increased from 6253 KT in 2016-17 to 7377 KT in 2017-18 with RIL Jamnagar, Hazira, Gandhar and Nagothane plants adding up capacity. Ethylene consumption in the country is expected to rise from 5940 KT in 2017-18 to 6390 KT in 2018-19. It is further expected to rise to 6720 KT in 2019-20 and touch 6824 KT in 2020-21. Exports of Ethylene are expected to see a spike from 29 KT in 2016-17 to 125 KT in 2020-21. While production is also expected to increase from 6023 KT in 2017-18 to 6872 KT in 2020-21. Propylene is set to rise to 5746KT by 2020-21 from 4847 KT in 2017-18, with capacity rising from 6034 KT in 2017-18 to 6524 KT by 2020-21 and production



rising from 4844 KT in 2017-18 to 5711 KT in 2020-21. Propylene capacity as mentioned in the table above is expected to touch 5176 KT in 2018-19 with capacity additions at BPCL, Kochi in 2019-20.

Table 9: Ethylene & Propylene net availability

Ethylene (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	7377	7377	7377	7377
Production	6023	6516	6832	6872
Imports	53	26	13	76
Exports	136	152	125	125
Net Availability	5940	6390	6720	6824
Propylene (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	6034	6364	6524	6524
Production	4844	5163	5659	5711
Imports	7	13	49	35
Exports	4	0	0	0
Net Availability	4847	5176	5707	5746

The world's largest refinery was being planned in Ratnagiri district of Maharashtra, however as per news reports, has been now planned where the population have no objection to it. The Ratnagiri Refinery & Petrochemicals Ltd (RRPCL), which is running the project, says the 1.2 million barrel-per-day (bpd) refinery, and an integrated petrochemical site with a capacity of 18 million tonnes per year, will help create direct and indirect employment for up to 150,000 people, with jobs that pay better than agriculture or fishing.

The proposed 60 million tonne per annum mega refinery with an investment of USD 42 billion will have IOC holding 50% in the JV company formed in June while the rest of the equity will be equally held by the other two state-run refiners HPCL and BPCL.

The BPCL Kochi Refineries is expecting around 16% increase in its turnover in another three years with the completion of its second petrochemical project. Its \$1.59 billion second petrochemical complex to manufacture polyols is expected to go on stream by 2022. An import substitute, the products find wide use in the production of automotive seats, mattresses, shoe soles, refrigeration etc.

BPCL Kochi Refinery is in discussion with various global companies to finalize the technology for six different products. There is a huge demand for polyols and it is growing by over 10% per annum providing good scope for MSMEs to set up units for polyols-based products in the complex

The company's first petrochemical project being constructed at a cost of \$ 0.785 billion is all set to begin operation by the middle of the year. It will produce acrylic acid, acrylates and oxo alcohol that are used in the manufacture of paints, super absorbent polymers, detergents, adhesives, sealants, solvents



etc. The technology has been sourced from global companies like Mitsubishi, Air Liquide Global and Johnson Matthey Davy.

Both complexes have been made possible after the integrated refinery expansion project (IREP), recently dedicated to the nation by the Prime Minister Narendra Modi that will raise the capacity of the refinery to 15.5 million tonnes from 9.5 million tonnes. The propylene produced after the expansion is the main feedstock of the petrochemicals.

The refinery now has the capacity to produce 500,000 tonnes of propylene and 100,000 tonnes of ethylene. The entire quantity of propylene will be used for the two petrochemical complexes. The two projects will result in \$ 1.857 billion forex savings per annum for the country

BPCL Kochi Refinery is slated to complete its fuel upgradation project to comply with BS-VI norms by February next year. The project cost is around \$ 0.471 billion. The country is expected to move to BS-VI automotive fuel by April 2020.

Reliance Industries Ltd has received green signal of the key expert appraisal committee in the Ministry of Environment, Forest and Climate change to expand the capacity of its export-oriented refinery in the special economic zone (SEZ) at Jamnagar by 5.8 million tonnes.

Reliance Industries Ltd. (RIL) is planning to increase its refinery capacity by 50% to over 100 million tonnes per annum (mtpa). The company has decided to increase its capacity to meet the increasing demand of refined products in India. The proposed expansion involves a brownfield project for two of its existing refineries in Jamnagar, and a new greenfield project at a cost of \$10 billion. Reliance built its first refinery at Jamnagar with an installed capacity of 6,60,000 barrels per day (bpd), or 33 mtpa, in 1999. This refinery sells most of its petroleum products in the local market. When the SEZ plant was added in 2008, the Jamnagar complex became the world's largest oil processing hub. Most of the products from the SEZ plant are sold overseas.

Haldia Petrochemicals Ltd (HPL) will invest over USD 4 billion in setting up a mega petrochemical complex in Odisha. The Odisha government in March 2019 approved the Rs 28,700 crore (USD 4.05 billion) investment proposal of the joint venture Haldia Petrochemicals Ltd (HPL). The proposal envisages setting up an integrated refinery with aromatics complex for production of Paraxylene and Purified Terephthalic Acid (PTA) near Subarnarekha Port in Balasore district. The production capacity of the Paraxylene plant will be 1.6 million tonnes per annum (mtpa) and for PTA it will be 2.5 mtpa in the first phase. The first phase of the project is expected to be operationalized within five years of the allotment of land.

The West Bengal-based company had proposed investment of \$ 10 billion at the Make in Odisha Conclave global investors' meet held in November last year. The land requirement for the project is 2,000 acres which will be recommended



for allotment post assessment by the Industrial Promotion and Investment Corporation of Odisha Limited (IPICOL). The land for the project has been identified in the vicinity of the upcoming Subarnarekha Port.

In addition to Haldia Petrochemicals, the HLCA also approved the proposal of state-run Indian Oil Corp to set up a polyester products manufacturing unit of 300 kilo tonnes per annum (KTPA) capacity at an investment of \$ 280 million in the textiles park coming up at Bhadrak district. The project will create employment opportunities for many people and is expected to be implemented within four years of land allotment. Considering the large population base and high GDP growth rate of Odisha and the country overall, the demand for these products is likely to be huge. It is worth considering that entire eastern India and nearby countries like Bangladesh are dependent on sourcing polyester fibres from the western part of India to meet the clothing demand of the region.

Therefore, it is envisaged that setting up PTA unit will trigger investment in these products and will catalyze the growth of further downstream processing units along the value chain, driving economic growth of the region. Since the total polyester chain starting from spinning to garments is a labor-intensive process, it is estimated that direct and indirect employment generation potential of the project is about one lakh people.

Indian company, Essar Oil Limited had been rebranded as Nayara Energy Limited in 2018, operates a 20 million tonnes a year oil refinery at Vadinar. It is one of the world's most modern and complex refineries with a complexity of 11.8, which is amongst the highest globally. Nayara Energy has become the fastest growing retail business chain in India with the largest private sector fuel retail network. The company has over 4,500 operational outlets spread across 28 states and 4 Union Territories.

Nayara Energy Limited- an integrated downstream oil company, partially owned by Russia's energy giant Rosneft (49.13%), plans to launch petrochemical production at an oil refinery in India's Vadinar in 2022. The first stage of the development of the company's oil refinery in Vadinar involves organizing the production of petrochemical products and entry to the Indian petrochemical market. This decision has already been approved by the board of directors of Nayara Energy.

The first phase of implementation of the development program of the Vadinar oil refinery includes the construction of new facilities that will allow producing up to 450,000 tonnes of polypropylene per year. The project is scheduled to be completed in 2022.

The planned investment is for a 450,000 tonnes a year Propylene Recovery Unit (PRU), a similar capacity Polypropylene plant and a 200,000 tonnes MTBE (methyl tertiary-butyl ether) plant.



A preliminary total investment at the first phase will amount to \$850 million, the company said. Financing is planned to be provided at the expense of the Indian company's own funds, as well as with the involvement of bank financing. At present, an economic evaluation of the program is being carried out and a final decision on implementing the project will be made in 2019, according to Rosneft.

The new development program will allow in the medium term to improve the financial performance of Nayara Energy and optimize the existing production processes. Besides the petrochemical unit, investments would also go into adding capacity at the refinery to produce Euro-VI grade petrol and diesel. As part of the pacts signed, Nayara Energy will initiate smart agriculture and water conservation programme in 11,000 hectares in Dwarka, Gujarat.

HPCL-Mittal Energy Ltd. (HMEL), has selected Lyondell Basell's fifth generation Spheripol polypropylene process technology for a 500,000 metric tons per year (m.t./yr) plant in Bathinda, India.

The 15 million tonne IOC refinery at Paradip is already producing diesel, petrol, kerosene etc. The unit is being set up at an estimated cost \$450 million. The 680-KTA Polypropylene Plant at Paradip Refinery will increase Indian Oil's petrochemicals capacity to 3.15 MMTPA, with many other projects to follow. It will also considerably reduce import of polypropylene grades, thereby saving foreign exchange for the exchequer

The plant would make use of Spheripol Technology from Basell, Italy, and will be capable of producing different grades of polypropylene. However, it will commence with the production of homo grade initially. The major facilities envisaged under the project are coker LPG treater unit, warehouse for polypropylene storage and other associated facilities such as flare and cooling tower.

The PP Plant will act as the mother unit in nurturing downstream plastics processing industry in the region. PP-based downstream industries include Injection Moulding Products, BOPP Film, TQPP Film, Raffia, Fibre & Filament and Thermoforming.

The oil marketing company has also got the approval of its board to set up a second unit- the mono ethylene glycol plant at a cost of Rs 38 billion. Ethylene Glycol is extensively used in the manufacture of items like polyester fibre, bottle & film grade chips, solvents, coolant, textiles, packaging, PET film, sheet and molded containers for food packaging, which have a sustained industrial demand.

The project is seen as a key driver for the growing textiles industry in the region and will cater to the rising demand for polyester fibre. With a textiles park proposed at Bhadrak, there will be huge opportunity for supplying raw material to downstream textile units, the officials said.



An estimated \$ 0.285 billion is likely to be invested in downstream units, generating large scale employment.

Two projects –the purified Terephthalic acid (PTA) plant and petcoke gasification based synthetic ethanol plant would together cost IOCL \$ 4 bn and are due to be commissioned by September 2021.

On the crude oil refinery spread over 3,300 acres, the oil behemoth IOC has already invested \$ 5 billion. The company has pledged to invest \$ 7.4 billion more on various components of the petrochemical complex.

B. Butadiene

Butadiene prices were highly volatile in 2018 (ranging from \$1740 to \$1005) in line with fluctuations in natural rubber prices and tight supply due to cracker turnaround season in Asia. Butadiene prices have been witnessing a dip since the start of 2019 and ranging between \$1145 and \$1065 (\$/MT SEA prices). Continuing weak natural rubber market sentiment and lower tire operating rates in lieu of weak automobile demand from China weighed down on butadiene prices and synthetic rubber prices. The ongoing US-China trade war had dampened market sentiment for Synthetic rubber (SBR & PBR) & ABS segment weighing down on demand.

Butadiene prices are likely to remain stable to soft volatile in 2019 as supply will ease with new capacity additions in NEA & SEA coming on-stream in 2019 with no downstream capacity. The startup of light feed crackers in 2018 & 2019 in the US, will create additional supply of BD, hence reducing current deficit and dependency on European imports. India to remain net exporter of refined butadiene with relatively less derivative production, although export volume is expected to decrease with increased domestic consumption. Butadiene production remains limited in India and is not expected to change in the foreseeable future. Butadiene demand is set to improve in India as growth in the automotive sector is likely support robust domestic consumption of synthetic rubber, especially styrene-butadiene rubber (SBR) and polybutadiene rubber (PBR). Experts believe, downstream consumption of synthetic rubber might get impacted a little while implementation of BSVI norms for the automobile sector (April 2020 deadline)

Table 10: Butadiene Demand Supply

Butadiene (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	550	597	597	597
Production	420	439	484	506
Imports	2	0	0	0
Exports	104	74	99	111
Apparent Demand	298	318	340	373
Demand Growth%	-1.4%	6.7%	6.9%	9.8%



There was an exportable surplus of 104 KT in 2017-18, which is expected to strengthen further and touch 111 KT by 2020-21. There are no imports expected going forward in next three years.

C. Styrene

The Indian Styrenics Market stood at 762 KT in 2016-17. The demand of Styrene has been continuously increasing in Indian plastics market from past few years. The end segment with high styrene consumption was automobiles, packaging, building and constructions, consumer products, medical devices and others.

The market saw major investments in enhancing the production capacity of styrene, petrochemical, and downstream plastic processing industries, which helps to drive the strong growth of styrene in the region.

The favorable government policies & rapid expansion in projects such as Smart Cities has increased consumption of styrene used in the plastic products. The major demand for styrene is from the automotive application in which it is used as an alternative material to metals and steel to reduce the weight of the vehicle which in turn increases the efficiency. Further, it is expected that market will see a favorable styrene demand growth because of roll out of Goods and Service Tax (GST) in the Indian market.

However, the product innovation, strong technology, and product awareness among the end-users are the key challenges for Styrenics in the Indian plastics market. The strong dependency on imports due to the limited domestic production, global market prices, and currency fluctuations are the major constraints for the Indian Styrene Market. India's total imports for Styrene grew by 9.3% in 2016-17 and are projected to increase by ~5% and expected to reach 805 KT in 2017-18 and further to 845 KT in 2018-19.

Table 11: Styrene Demand Supply

Styrene (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Imports	790	840	885	935
Exports	0	0	0	0
Apparent Demand	790	885	885	935
Demand Growth%	8.2%	12.0%	0.0%	5.6%



D. EDC and VCM

Almost the entire production of EDC and VCM in India are consumed captively by the polymer manufacturers for production of PVC and hence, PVC manufacturers who do not have facilities for captive production of EDC and VCM have to rely entirely on imports to meet their demand for PVC building blocks viz. EDC and VCM.

Table 12: EDC & VCM Import into India

EDC (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	205	237	237	237
Production	188	229	237	237
Imports	521	512	530	530
Exports				
Apparent Demand	709	741	767	767
Growth (%)	0.4%	4.5%	3.5%	0.0%
VCM (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	996	996	996	996
Production	928	948	1008	974
Imports	478	482	551	553
Exports				
Apparent Demand	1406	1430	1559	1527
Growth (%)	-0.4%	1.7%	9.0%	-2.1%

EDC demand witnessed a flat growth of 0.4% in 2017-18 however it is expected to grow at 4.5% in 2018-19 and witness a pickup for demand to touch 767 KT by 2020. While VCM too witnessed a dip in 2017-18 and expected to witness a flat growth of 2% in 2018-19. It is forecasted to grow 9% in 2019-20 before once again witnessing a de-growth of 2.1% in 2020-21. In case of EDC imports, there is dip expected going forward in 2018-19 to 587 KT from 600 KT in 2016-17. Imports in case of VCM is expected to remain around same level as in 2016-17 i.e. 485 KT in coming next two years also.

E. Aromatics – Paraxylene

The demand for Paraxylene is driven by the growing apparel and textile industry across the regions. The use of PET is rising in the textile industry due to its recyclability, which reduces the amount of energy consumed while producing fibers. Surging demand for the packaged food and beverages from the working population owing to convenience and longer shelf life is uplifting the market growth. Paraxylene consumption is growing in cosmetics and personal care industry with increasing focus on the consumer on their personal appearance. Moreover, growing demand for polymers from the major end user industries is propelling the market growth



Reliance Industries Limited will make its first term Paraxylene export to China from the second phase of its new 2.2 million mt/year plant at Jamnagar in late April, as per APIC-online with reference to industry sources. Of the 35,000 mt of PX due to load from Sikka in Gujarat on the MT Bunga Angelica, 15,000 mt will be discharged at Dalian in China under term contracts, sources said. The rest will form part of Reliance's regular shipments to the region.

The volume en route to China is output from the second phase of Reliance's aromatics plant, which had been ramping up since early April and was operating at a fairly high rate now. The first phase of the plant was commissioned last December. Reliance plant at Jamnagar has a nameplate production capacity of 2.2 million mt/year of PX. It more than doubles RIL's PX production capacity to 4.3 million mt/year, making it the world's second-largest PX producer with 9% of global PX capacity and 11% share of global production.

Table 13: Paraxylene Demand Supply

(KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	5643	5786	5926	5926
Production	5028	5377	5491	5473
Imports	889	762	676	676
Exports	1968	2262	2207	2223
Apparent Demand	3959	4200	4254	4646
Demand Growth%	4.8%	6.1%	1.3%	9.2%

PX import's stood at 889 KT in 2017-18 and it is expected to further fall to 762 KT in 2018-19. It is expected to reduce to 676 KT in 2019-20 and remain at same level in 2020-21. Meanwhile exports witnessed a staggering increase of 135%, from 839 KT in 2016-17 to 1968 KT in 2017-18. The same is expected to increase further to 2262 in 2018-19 and touch 2223 KT by 2020-21.

Capacity addition from RIL took up the existing capacity to 5643 KT in 2017-18 and further to 5786 KT in 2018-19. For next two fiscals it is expected to touch 5926 KT and remain at the same level. In 2017-18, PX registered a modest growth of 5% and consumption is expected to grow at around 6% in 2018-19 and touch 4646 KT by 2020-21 with RIL capacity expected to touch 4646 KT in 2020-21.

Intermediates

Fibre Intermediates

In FY 18-19, PTA demand increased by ~3% Y-0-Y to 6MMTA. PTA prices remained firm at \$850+MT (CFR CMP) for FY 18-19, peaking at \$1050/MT by Sep'18. Strong downstream demand in H1 FY 18-19, rising crude oil prices combined with Aromatics Prices & some unplanned shutdowns created a positive buying sentiment leading to firming of PTA prices.



Later in H2 FY 18-19, oil & downstream corrected sharply. Inability of Polyester producers to pass the impact of high RM (PTA & MEG) to their customers in Oct'18 & price melt down lead to shrinking of demand & increase in pipeline inventory. High inventory coupled with liquidity crunch in the market place limited options for market revival. Industry ramped up with prices bottoming out in Dec'18.

PTA startup of JBF's 1.2MMTA capacity has been delayed due to ongoing financial crisis with JBF group. The project completion & its startup timing is highly uncertain as of now.

In 2017-18, the combined production of fibre intermediates viz. ACN, Caprolactam, PTA and MEG reached 7212 KT, which is expected to touch 7997 in 2018-19 and 8125 in 2019-20 and further up to touch 8709 KT by 2020-21.

PTA and MEG constituted 29% and 59% of the total 1803 KT fibre intermediates imported in 2017-18. The same is expected to change with PTA share going up to 37% and 47% for MEG in 2018-19. Further in 2020-21 the same is expected to change to 32% and 51% for PTA and MEG.

Exports of fibre intermediates from India in 2017-18 was 214 KT and is expected to dip to 207 jump to 300 KT in 2020-21 with the addition of new PTA capacity of 600 KT from JBF. ACN production was stopped by RIL and demand is being met by imports on the back of pesticide industry doing well.

PTA import volumes into India (which is another big and growing polyester market in Asia) are also expected to decline as the new plant by Reliance Industries now runs at full capacity and touch 188 KT by 2018-19.

Table 14: Fibre Intermediate Demand Supply

ACN	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	0	0	0	0
Production	0	0	0	0
Imports	157	165	177	185
Exports	0	0	0	0
Demand	157	165	177	185
Demand Growth (%)	12.1%	5.1%	7.3%	4.5%
Caprolactam				
Capacity	70	70	70	70
Production	86	89	90	90
Imports	58	65	65	65
Exports	0	0	0	0
Demand	144	154	155	155
Demand Growth (%)	4.3%	6.9%	0.6%	0.0%



PTA				
Capacity	6330	6475	6510	7110
Production	5604	5836	6043	6489
Imports	522	510	550	450
Exports	214	207	140	300
Demand	5912	6139	6453	6639
Demand Growth (%)	7.9%	3.8%	5.1%	2.9%
MEG				
Capacity	1715	2215	2215	2215
Production	1522	2072	2082	2130
Imports	1066	652	660	720
Exports	139	233	177	148
Demand	2399	2503	2565	2702
Demand Growth (%)	11.7%	4.3%	2.5%	5.3%

IOC has planned two projects at Paradip for the petrochemical complex- 1,200,000 tonnes per annum purified Terephthalic acid (PTA) plant and petcoke gasification based synthetic ethanol plant. Both these projects would together cost IOCL \$ 4.38 billion and are due to be commissioned by September 2021.

With the availability of mono ethylene glycol (MEG) and PTA from these units, downstream industries like polyester chips, fibres, PET (polyethylene terephthalate) grade chips, PET film grade chips and polyester industrial yarn can be developed. IOCL has pumped in USD 5.5 billion on the crude oil refinery. Indian Oil signed another MoU with MCPI Ltd. for setting up a Textiles Park in Odisha. With the coming up of an MEG (Mono Ethylene Glycol) Unit at Paradip refinery and availability of PTA (Purified Terephthalic Acid) at Haldia in West Bengal, the polyester downstream industry can flourish very well in eastern region. A synergy of cotton fibre with polyester fibre to promote and popularize synthetic textiles and the manufacturing units of the textiles park can be linked to Bangladesh and Myanmar. This will create huge employment opportunity for the State.

Majority of the Caprolactam produced in the country are utilized during the production of nylon 6 fibres and nylon 6 resins, to cater textile and engineering plastic product manufacturers, respectively. Growing textile industry coupled with favourable government initiatives are expected to steer the demand for Caprolactam in the country. India is having the fastest growing economy, due to which production and demand of fibers, hence polyamides is increasing and almost all the Caprolactam produced in India is used for manufacture Nylon-6.

At present, GSFC is the largest (56% share) and one of the only two manufacturers of the chemical in India with 70,000 tonnes per annum production (full capacity), of which around 17,000 tonnes is used internally for production of nylon and the rest is sold. In March 2018, GSFC successfully started operations of its Caprolactam Quality Improvement Project which



enhances the quality of Caprolactam extract made at the company's Caprolactam-I Plant. This improvement enables GSFC to produce international grade Caprolactam. With this project the company expects its bottom-line to improve by around Rs. 15 crore, annually.

In 2017-18 demand for Caprolactam grew at a modest growth of 4.3% and the same is expected to grow at a healthy growth of 7% in 2018-19, however almost flat growth in the next two fiscals.

Polymers, Fibres and Elastomers

The Indian domestic polymer industry (like global industry) is dominated by Polyolefins (PE & PP), representing about 72% of all commodity resins consumed in 2017-18. After clocking a growth of 6.8% in 2016-17 the polymer growth in India grew at 8.3% in 2017-18. Domestic demand is expected to outpace domestic production in coming years too. Demand growth on an average is expected to be around 7%+ in next three years to come.

Polymer import dependency remained high at 32% in 2017-18 and is expected to come down in next three years to ~26% by 2020-21. In 2017-18 net trade deficit of total polymers stood at 3226 KT which was lower than previous year which stood at 3371 KT. Trade deficit is expected to dip to 2078 KT in 2019-20 and spike again in 2020-21 to touch 2746 KT.

Table 15: Polymer Demand Supply

Polymers (KT)	2017-18 E	2018-19 E	2019-20 E	2020-21 E
Capacity	12121	13004	13733	13742
Production	10278	12006	13257	13696
Op Rate (%)	85%	92%	97%	100%
Import	4285	3959	3935	4331
Exports	1058	1727	1857	1585
Net Trade	-3226	-2232	-2078	-2746
Demand	13455	14140	15336	16447
Demand Growth %	8.3%	5.1%	8.5%	7.2%

The demand for polymers grew at 8.3% in 2017-18 and is expected to grow at ~5.1% in 2018-19 and further see a spike in growth to 8.5% and 7.2% in 2019-20 and 2020-21. India's petrochemical industry, like the overall economy, faces near-term challenges, but the long-term growth outlook for the industry remains positive. Capacity expansions by several other manufacturers are moving ahead.

Polyolefins

All PE registered a robust demand growth of 11.2% in 2017-18.



Table 16: Polyolefin Demand in India Actual & Projected

(KTA)	Actual			Projected			% change Y-0-Y				
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2016-17	2017-18	2018-19	2019-20	2020-21
LDPE+EVA	821	843	921	945	977	1012	3%	9%	3%	3%	4%
LLDPE	1542	1655	1916	2105	2256	2430	7%	16%	10%	7%	8%
HDPE	2038	2239	2452	2440	2577	2770	10%	9%	0%	6%	7%
PP	4186	4346	4756	5082	5517	5950	4%	9%	7%	9%	8%
Polyolefins	8587	9083	10044	10572	11327	12162	6%	11%	5%	7%	7%

It is expected that PE will see a modest growth of 4% next year and further witness a spike and grow at 5.9% and 7.1% in 2019-20 and 2020-21 respectively. PP registered a robust growth of 9.4% in 2017-18 and it is expected to witness a healthy growth of 7% in next fiscal. Further it is expected to grow at 8.6% and 7.8% in 2019-20 and 2020-21 respectively. Polyolefins too registered a robust demand growth of 10.6% in 2017-18 and is expected to grow at 5.3% in next fiscal. Further it is expected to grow at 7.1% in 2019-20 and 7.4% in 2020-21.

Vinyl’s: PVC

The demand for PVC increased marginally in 2017-18 from the previous year growth of 10.7% in 2016-17.

As the economy is expected to perform well with the easing of monetary policy and various PVC end use sectors performance improving after the demonetization effect and GST roll-out, PVC demand is expected to see a sustained growth in coming years. It is expected to grow at ~5% in 2018-19 and grow double digit by 2019-20 and grow around 7% by 2020-21.

In case of cPVC, capacity expansion is expected by Chemplast Sanmar in 2019-20 around 22 KT which will take the total PVC capacity to touch 1579 KT in 2019-20 from 1557 KT in 2017-18. Reliance Industries capacity stands at 750 KT capacity for 2017-18 and expected to remain at 750 KT till 2020-21. Meanwhile, PVC imports are expected to increase further from 1658 KT in 2017-18 to 1787 KT in 2018-19, and further to 2087 in 2019-20 and touch 2369 by 2020-21.



Table 17: PVC Demand Supply

PVC (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	1557	1557	1579	1579
Production	1378	1401	1528	1497
Imports	1658	1787	2087	2369
Exports				
Apparent Demand	3049	3189	3615	3866
Demand Growth%	2.0%	4.6%	13.4%	6.9%

PVC demand in India is expected to improve in 2019 in view of the peak season for pipe laying in the region. Traditionally stronger demand for pipes from the agricultural sector is expected to support prices during Q1 2019.

In 2018, the market saw seasonal demand in Q1 while prices were largely stable from May to September after which prices declined owing to poor demand in the wake of an extended monsoon season. Lower crop prices for the year also affected PVC sales as farmers were cautious with investments due to a tighter cash flow.

The US-China trade war has also impacted the market, with the US dollar-Indian rupee change rate reaching all-time lows in the year. This caused Indian buyers to be sidelined for most of the year, opting only to buy as-needed from domestic suppliers where possible to recoup margins. The low interest in imports and excess supply prompted many producers to decrease offers, resulting in an all-year low price in November 2018.

However, players believe the prices had bottomed out in mid-December, and demand is slowly improving ahead of the seasonal peak starting in January. The Indian PVC market is now poised for a recovery, as players believe activity should increase in the coming months.

Styrenics

A. Polystyrene

After witnessing a negative demand growth in 2016-17, demand for Polystyrene witnessed a positive growth of 2.7% in 2017-18 to touch 262 KT, as shown in table below. Imports are expected to remain at the same level in next two years. While demand is expected to see a growth of 5% and touch 275 KT next fiscal and grow further to touch 285 KT in 2019-20 and grow ~5.3 to touch 300 KT in 2020-21. Total Polystyrene capacity in India to remain at 490 KT till 2020-21. Major producers of polystyrene in India include Supreme Petrochem and Styrolution India.



Table 18: Polystyrene Demand Supply

Polystyrene (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	490	490	490	490
Production	295	300	315	320
Imports	29	30	25	30
Exports	55	55	55	55
Apparent Demand	262	275	285	300
Demand Growth%	2.7%	5.0%	3.6%	5.3%

B. Acrylonitrile-Butadiene-Styrene (ABS)

ABS, the third-largest styrene derivative, is the largest-volume engineering thermoplastic resin in the world. ABS is used in many consumer-related end-use applications including appliances, electronics/electrical, building and construction, and transportation. ABS demand in India stood at a healthy 9.3% in 2017-18. It is expected to grow strongly above 6% in next three years, owing to the growth in the Indian middle class expenditure in home appliances and automobiles, which will drive the core demand for ABS. The appliance sector will continue to be the largest ABS end-use market. Demand for ABS expected to continue to grow around 7% in 2018-19 and around 5% and 6% in next two fiscals.

In August 2017, INEOS Styrolution India Ltd, announced its plans to increase its compounding capacity for engineering plastics by an additional 34,000 metric tonnes per annum at its Moxi plant located in Gujarat, India. Expected for completion by June 2019, this expansion will grow the Company's compounding capacity to 100,000 metric tonnes per annum at the site.

This expansion will involve a capital expenditure of US\$20 million (Rs. 130 Cr.), which also includes the upgrading of site infrastructure. Additionally the company has sanctioned a detailed engineering study to evaluate doubling the overall production capacity for ABS in India over the next years. The planned capacity expansion intends to meet the growing demand for styrenic polymers across key growth industries in India.

With INEOS Styrolution India Ltd capacity addition in 2019-20 the total capacity of the industry would touch 240 KT which is expected to remain same for 2020-21. With crude prices rising at close to \$60-65 a barrel, there will be higher margin made on ABS. This is because, the raw material used in manufacturing ABS comes from Crude oil. The ABS capacity expansion plan of Bhansali Engineering Polymers Ltd from 80 KTPA to 100 KTPA at its Abu Road Unit was successfully implemented within the envisaged cost and time frame i.e. \$ 2.85 million and 31st March, 2018 respectively. The cost of aforesaid expansion has been financed through internal accruals of the company while it continues to maintain its status as a Zero Debt entity. The current production of ABS will



utilize raw material purchased in previous years, at a time when crude prices and hence raw material prices were lower. The margin pressure being witnessed by INEOS Styrolution Ltd. in previous years on account of low crude oil prices and weakness in ABS demand will reverse now.

Table 19: ABS Demand Supply

ABS (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	190	210	240	240
Production	140	145	155	170
Imports	84	95	95	95
Exports	0	0	0	0
Apparent Demand	224	240	250	265
Demand Growth%	9.3%	7.1%	4.2%	6.0%

Further, raw material – particularly styrene – needed for the production of ABS are also expected to rise, particularly due to plant shutdowns in global styrene market.

However, prices of Acrylonitrile have eased recently due to increase in supply. Thus, raw material price volatility continues to be a norm in the ABS market but improving demand scenario is expected to be a key determinant for ABS pricing.

C. Styrene-Acrylonitrile (SAN)

SAN has been witnessing healthy growth due to its wide ranging usage in consumer electronics, appliances and automotive sector.

Table 20: SAN Demand Supply

SAN (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	170	170	170	210
Production	110	121	133	146
Imports	6	7	7	7
Exports				
Apparent Demand	116	128	140	153
Demand Growth%	8.6%	9.6%	9.5%	9.5%

Demand for SAN surged to 8.6% in 2017-18 over next three years it is expected to grow at a staggering rate of 9.5% with demand touching 153 KT by 2020-21. It is expected there will be an increase in demand of SAN grades, with a focus on consumer and industrial applications. Imports are expected to be around 6 KT to 7 KT in next three fiscals to meet the rising domestic consumption.



Over the last few years, INEOS Styrolution India Ltd has made investments to expand its styrene acrylonitrile copolymer (SAN) and rubber plant capacity. The new Absolan line augments Styrolution’s current 60KT/annum production capacity in India taking the total annual production capacity to 100KT/annum.

PET (Polyethylene Terephthalate)

Today, 60% of polyethylene terephthalate (PET) bottle consumption comes from the beverage sector and it is believed that by 2020 liquor and milk alone will account for 20% of the consumption. The demand for PET bottle packaging of milk and milk products is growing at around 25-30% CAGR. Chinese ban on import of post-consumer PET is helping improve PSF operating rates and margins.

India is consuming presently FY18-19 -965 KT per year of PET (polyethylene terephthalate) material. Around 92% of this is used in bottles for beverages (alcoholic & non-alcoholic, health drinks, etc.), pharmaceutical and personal hygiene products. The market for consumer products is growing almost in double digit resulting in 7-8% per year growth of PET material. Most beverages are served in PET bottles.

India's polyethylene terephthalate demand is expected to remain at an average rate of ~7% over the next three years on the back of strong economic and population growth -- far outpacing the expected growth of 4%-5% in global demand. The fast pace in India's demand growth is also expected to lift the compounded annual growth rate of Asia's PET consumption to 6%-8% over the same period. India's PET demand has surged significantly in recent years, rising to 710 KT in 2014-2015 to 908 KT in 2017-2018 which is slated to grow further to 1100 KT by 2020-21. Another main driver behind India's PET demand growth is more widespread use of PET packaging in the beverage sector in India, as most non-alcoholic beverages are currently packaged in PET bottles across Asia. Further growth is also seen from an expected large increase in PET processing and its applications within Asia.

Table 21: PET Demand Supply

PET (KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	1975	1975	2025	2025
Production	1624	1624	1721	1721
Imports	120	140	150	150
Exports	836	799	841	771
Apparent Demand	908	965	1030	1100
Demand Growth%	6.3%	6.3%	6.7%	6.8%

PET demand in India is expected to see a rebound and demand would grow at 6%+ over next year’s growing demand for consumer goods and government’s various initiatives such as Make in India etc. Emerging Trends in PET in India is witnessing growth in various segments like edible oil, dairy products, MW,



bulk water, spices, fresh Juices, personal care, health care, niche drinks, cans, ANS, BCT, APET/CPET, Injection Moulded items, and in FMCG Industry: Small-Big Packs and PCR Initiatives

Synthetic Fibres

In 2017-18, the combined production of synthetic fibre (PSF, ASF, PPSF, PFY, PPFY, VFY, VFS and NFY) reached 4743 KT. The same is expected to touch 5625 KT by 2020-21. The demand growth was at 4.7% in 2017-18. It is expected that the fibre demand growth would be around 5 plus% on an average in next three years. The capacity in 2018-19 is expected to increase to 7133 KT from 6758 KT in 2018-19. Capacity is expected to touch 7621 KT by 2020-21.

Table 22: Demand Supply Balance of Synthetic Fibre

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
PSF				
Capacity	1242	1282	1444	1444
Production	980	984	1096	1156
Imports	45	23	40	40
Exports	146	168	246	252
Demand	881	829	890	944
Demand Growth (%)	-3.5%	-5.9%	7.4%	6.1%
ASF				
Capacity	167	167	167	167
Production	97	97	99	105
Imports	33	32	34	36
Exports	25	25	25	25
Demand	105	110	112	114
Demand Growth (%)	6.1%	4.8%	1.8%	1.8%
PPSF				
Capacity	13	13	13	13
Production	3	3	3	3
Imports	2	2	2	2
Exports	11	0	0	0
Demand	5	5	5	5
Demand Growth (%)	4.2%	0.0%	0.0%	0.0%
PFY				
Capacity	4659	4988	5198	5307
Production	3071	3238	3524	3717
Imports	33	30	28	24
Exports	146	145	176	177
Demand	2957	3128	3379	3568
Demand Growth (%)	6.3%	5.8%	8.1%	5.6%



PPFY				
Capacity	18	18	18	18
Production	10	11	12	13
Imports	1	1	1	1
Exports	2	2	2	2
Demand	9	10	11	12
Demand Growth (%)	-18.2%	11.1%	10.0%	9.1%
VSF				
Capacity	419	419	419	419
Production	380	390	400	410
Imports	35	30	30	32
Exports	148	154	154	154
Demand	267	266	276	288
Demand Growth (%)	10.8%	-0.4%	3.8%	4.3%
VFY				
Capacity	82	82	82	82
Production	60	60	60	60
Imports	10	12	14	16
Exports	6	6	6	6
Demand	64	66	68	70
Demand Growth (%)	3.2%	3.1%	3.0%	2.9%
NFY				
Capacity	108	108	108	108
Production	105	105	105	105
Imports	3	4	5	6
Exports	3	3	3	3
Demand	105	106	107	108
Demand Growth (%)	-1.3%	0.9%	0.9%	0.9%

Synthetic Rubber

The demand for synthetic rubbers continues to witness an upsurge as companies fail to find competent natural substitutes. In the view of changing industrial applications, styrene butadiene rubber has emerged as one of the greatest synthetic rubbers used in the automotive industry. With exceptional properties, products made of styrene butadiene rubber are finding applications across multiple industrial verticals.

SBR which accounts for 40% of the total synthetic rubber demand is consumed mostly in the tyre sector. Considering the large amount of SBR that is being consumed in the manufacture of tyres and tyre products, demand is very much



dependent on the automotive industry and tyre sectors as a whole. On a positive note, growing use of low-rolling-resistance tyres to reduce fuel consumption and decrease CO2 emissions should increase SBR demand. In 2017-18, synthetic rubber demand grew at a flat rate of 1% and is expected to maintain the same growth rate in next three fiscals.

Table 23: Demand Supply Balance of PBR, SBR, NBR & EPDM

PBR	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	124	124	124	130
Production	114	123	124	130
Imports	78	84	85	91
Exports	7	12	4	6
Demand	187	195	205	215
Demand Growth (%)	4.1%	4.3%	5.1%	4.9%
SBR	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	290	290	270	270
Production	230	230	230	230
Imports	118	118	118	118
Exports	33	30	30	28
Demand	313	316	319	321
Demand Growth (%)	1.0%	1.0%	0.8%	0.6%
NBR	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	20	20	20	30
Production	18	18	20	25
Imports	36	39	39	36
Exports	0	0	0	0
Demand	54	57	59	61
Demand Growth (%)	9.2%	4.7%	3.5%	3.4%
EPDM	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	0	0	0	0
Production	0	0		
Imports	45	48	50	53
Exports	0	0	0	0
Demand	45	48	50	53
Demand Growth (%)	2.4%	5.6%	5.3%	6.0%

Rubber prices in the world market is highly volatile and can be influenced by many factors like weather, currency exchange, supply and consumption, policy changes in the major consuming countries and speculative forces and crude oil prices. India styrene butadiene rubber (SBR) prices faced downward pressure in February 2019 on weak demand, ample supply and declining feedstock butadiene (BD) cost. On 30 January, spot prices of non-oil grade 1502 SBR were flat at \$1,350-1,450/tonne CFR(cost & freight) India, ICIS data showed.



Ample supply of deep-sea and local SBR at competitive rates have also curbed spot appetite for import material from Asia, as per market sources.

European, Russian and Iranian SBR material as well as local goods are available at cheaper rates compared with the Asia-origin product, so Indian buyers are holding back and seeking lower prices from the Asian SBR makers. Declining prices of key feedstock BD have also been weighing down on the SBR market, prompting some SBR makers to unload their stocks at lower prices before India's current fiscal year ends in March.

Some of the prominent factors that positively influence the growth of SBR market are increasing automobile production, rising demand for electric cables insulation, and increasing urbanization. Increasing urbanization along with rising per capita disposable income in developed and emerging economies are predicted to drive the growth of the market over the forecast period, 2018 to 2023.

Weak currencies against the US dollar, including the Indonesian rupiah and Indian rupee, are also likely to continue to curtail spot appetite for US dollar-denominated SBR import cargoes. An upcoming general election in India in April in 2019 will also dampen buying sentiment in the sub-continent as market players stay on the sidelines to wait for a clearer picture.

In 2018, automobile demand remained robust despite the slowdown overcast in the last three months of year. All segments reported strong double-digit growth in the calendar year ending December 31 except passenger vehicles which reported a growth of 5%. Three-wheelers sales grew fastest followed by commercial vehicles, two-wheelers, and passenger vehicles.

The overall automobile sales crossed 26.7 million units for the first time. The year to date numbers for FY 19 has shown a growth of 9.6% for the auto sector as a whole. Amidst low consumer sentiment throughout the industry, two-wheeler segment posted a double-digit growth of 12.8% in the year 2018.

Overall commercial vehicle sales showed a robust 27.28 per cent growth in domestic market in the calendar year 2018. The CV segment also crossed one million sales mark for the first time in 2018 at 10,04,900 units. M&HCV witnessed a growth of 22.97% while LCVs grew by 30.16% during the period under review.

The Indian tyre industry may log 7-9% growth over the next five year backed by favourable outlook for the domestic automotive industry, rating agency ICRA. It said based on the announcements, tyre industry was likely to see a capacity addition of \$ 2.85 billion over the next five years.

Stating that the outlook for the Indian tyre industry would remain stable, ICRA said tyre demand would grow by 7-9% over the next five years supported by favourable outlook for the domestic automotive industry. In FY2019, the



domestic tyre industry benefited from strong growth in both original equipment (OE) and replacement segments.

Amidst continued investments towards capacity additions (partly being debt funded), the liquidity position, capitalization and coverage indicators of the industry players are expected to remain comfortable largely supported by the stable earnings and healthy cash reserves available with most of the players.

The industry (including component manufacturing) is expected to grow at a compounded annual growth rate of 5.9% and reach USD 251.4-282.8 billion by 2026, thereby becoming the fastest growing industry in the country, as per the report.

The domestic tyre industry has benefited from strong growth in both original equipment (OE) and replacement segments in the ongoing fiscal. Tyre companies in India are likely to invest \$ 2.857 billion in the next five years in capacity addition to meet the growing demand, according to credit rating agency ICRA. The tyre industry in India has witnessed large capacity additions in the last decade with a cumulative spend of \$ 3.971 billion; of which 70% was spent in the last six years. With tyre demand remaining favourable, supply addition in the industry is expected to remain high going forward, as per ICRA report.

Robust sales - While there have been some headwinds such as the floods in Kerala, tightened financing, insurance-related regulatory changes impacting two-wheeler demand, rising fuel and interest costs, the year-to-date sales growth across most segments have been robust leading to healthy OE tyre demand growth.

The replacement tyre demand, too, had recovered sharply in the last one year supported by post-effect of Goods and Service tax (GST), pick-up in infrastructure activities and a healthy, consumption-driven demand. Specifically, there was a strong demand rebound in truck and bus segment (where replacement share is high at 70%). ICRA said tyre exports from India have been steadily increasing in the last one year with recovery in demand from overseas markets and rising competitiveness of Indian makers, both in terms of quality and pricing.

Imports dwindle - On the other hand, tyre imports had dwindled in the last one year following the re-imposition of anti-dumping duty (ADD) on import of new Chinese truck and bus radial (TBR) tyres for a period of five years effective from September 18, 2017 and increase in customs duty by 500 bps to 15%, effective April 1, 2018.

This has supported the domestic TBR (truck and bus radial) players as the large capacities added in recent years are now being effectively utilized, the rating agency said. Tyremakers in India have lined up an aggressive capacity



expansion plan to meet the growing demand from automobile manufacturers and replacement market after fully recovering from demonetization and the GST (goods and services tax). A total of \$ 1.9 billion is expected to be pumped in by the Tyremakers over the next 7-10 years. A substantial portion of this expansion, the first in the past five to seven years, would be used for creating Greenfield facilities.

RPG Group's CEAT Tyres plans to increase its existing output by 35-40%. The demand from replacement segment as well as the original equipment manufacturers (OEMs) has been quite strong.

Currently CEAT is producing 45000 radial truck tyres and will be taking production capacity to 120000 in early this year (2019) from their Halol plant. So, going forward, CEAT's radial truck tyre will be a larger segment. Out its six plants, CEAT's three plants-Halol, Nagpur and Ambernath are under expansion. Nagpur plant is under expansion.

They are adding another a million per month capacity for 2-W tyres there. The project will be implemented phase wise. Phase-I with a capacity of 130 tpd and Phase-II of 170 tpd, taking the overall capacity to 300 tpd

CEAT is setting up a Greenfield plant in Chennai with an estimated investment of ~\$ 285 million over next three to five years. The already acquired 160 acres of land for the project and will produce passenger car radial tyres, with an initial capacity of around 250 tonnes per day. The plant will provide an opportunity to the company to set up a state-of the art plant which will produce passenger tyres for the local and international markets.

India has set an ambitious plan of having electrification of vehicles by 2030. Though the target seems tough to achieve, tyre companies are gearing up for the big disruption. EVs will be heavier and have faster torque, which will be quite hard on tyres.

CEAT's rivals MRF and Apollo Tyres, too, have been stepping on the gas with expansion with their facilities. In its first big expansion outside Tamil Nadu, MRF, a leader in bus, truck radial and two-wheeler tyres, has earmarked an investment of \$ 642 million in Gujarat over the next decade. It will be firm's ninth unit. In January, Apollo Tyres said it was pumping in \$ 257 billion in a new factory in Chittoor, Andhra Pradesh. With a capacity to make 5.5 million tyres a year, the unit will feed domestic and export markets and will go on stream in the next two years. The investment in AP was part of Rs 642 million capex outlined for 2017-18 and 2018-19. The expansion in Chennai, is almost through, as per Apollo Tyres. The Chennai unit can now make 12,000 radials.

JK Tyre, the country's largest commercial vehicle tyre maker, is aiming to grab a larger pie of the growing personal vehicle space and has set itself a target of doubling its market share in the passenger vehicle space to 20% and 15% in



the two-wheeler tyre segment, which it has recently entered. With an eye on achieving a \$2-billion turnover by 2021, the company will be investing up to \$180 million (1,250 crore) in capacity expansion in tandem with expansion in its sales network.

JK Tyre, the company will be doubling its two-wheeler tyre manufacturing capacity and increase the capacity at its Haridwar facility for making commercial vehicle radial tyres. The tyre maker is using 100% of its truck radial tyres manufacturing capacity in its plants. In fact, they are refraining from exports; the domestic (market) has to be served first, adding. The company is outsourcing from China and supplying to the world market.

The local tyre industry benefited from the recent antidumping duties on Chinese imports. The numbers came down from an average of 1.2 lakh tyres a month in October to only 40,000 in December, giving the Indian manufacturers an additional monthly replacement demand of about 80,000 tyres, according to an analyst report. JK Tyre captured about half of this additional demand, the report said. Overall the market has been hit by various macro-economic factors right from increased fuel prices and interest rates to a squeeze in financing, which have impacted the growth rate.

In order to make further inroads in the personal vehicle tyre space, JK Tyre plans to expand the portfolio and offer a wider product range and increase its sales network by penetrating deeper into the hinterlands.

JK Tyre has set itself a target of becoming the 12th largest tyre maker globally from its position of 22nd in the next two to three years.

Michelin India is expanding its operations in India both in terms of capacity and capabilities. The company's factory in Chennai, Tamil Nadu, is the largest and most advanced globally, which has come up at an investment of over \$ 500 million and is on the verge of expanding production capacity to 30,000 tpa.

The company has also strengthened its presence in India with a research and development (R&D) centre in Gurugram and a materials testing laboratory in Manesar in recent years. Its latest X Guard range of truck radial tyres and X Multi tubeless radial range are the result of its local R&D operations.

Apart from truck and bus radial tyres, the two-wheeler tyre segment is also a key growth enabler for Michelin in India. Michelin India has an agreement with TVS Srichakra to produce Michelin-designed bias motorcycle and scooter tyres for the Indian market.

As per Automotive Tyre Manufacturers Association (ATMA), the expansion was overdue on two counts. First, the 5-6-year-old facilities had become saturated. Second, since the last couple of years, the demand from auto firms was weak and the demand in the replacement market was affected due to the GST and note ban.



A strong order book from the export and domestic markets, government's stance on anti-dumping regulations and a relatively stable natural rubber price have boded well for the tyremakers. But a soaring crude price is set to mount pressure on profitability from the current quarter itself for most companies. Crude-based raw materials such as carbon black, account for close to 45% costs for tyre firms.

Effectiveness of styrene butadiene rubber in affixing tyres to the wheel rims will continue to drive the sales in the coming years. The growing use of low rolling-resistance tyres to reduce fuel consumption and decrease CO2 emissions is expected to increase SBR consumption. It is estimated that strong tyre demand growth from the automobile manufacturers is expected in the coming years.

As shown in table, SBR demand registered a flat growth of 1.0% in 2017-18 and expected to be subdued in following three years. India is expected to jump three places to become the world's No.3 car market by 2020. This has fueled a domestic rush to produce more of the synthetic rubber that is mixed with natural rubber to make tyres. EPDM demand rebounded and witnessed an average growth of 2.4% in 2017-18 and is expected to grow at 5.6% in 2018-19 and further grow at around 5-6% in next two fiscals. Reliance is the only producer of PBR in India. PBR demand growth rate is expected to improve to ~4-5% on an average in next three years.

Surfactants

Demand for key surfactant LAB witnessed a staggering increase at 11.5% in 2016-17, however in 2017-18 it grew at a modest growth of 3% and is further expected to grow at a lower rate at 1.9% in next fiscal to touch 662 KT in 2018-19. It is further expected to grow at 3.9% and 4.7% in 2019-20 and 2020-21 respectively. LAB import is being higher in 2017-18 as compared to previous year at 206 KT and is expected to see a spike and touch 280 KT in 2020-21. Exports are also expected to remain at same level of 6 KT till next three fiscals.

Table 24: Demand & Supply of LAB & EO

LAB	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	550	550	550	550
Production	452	454	444	444
Imports	206	222	250	280
Exports	6	6	6	6
Demand	650	662	688	720
Demand Growth (%)	3.1%	1.9%	3.9%	4.7%
EO	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	271	271	271	276
Production	211	234	245	261
Imports	0	0	0	0
Exports	0	0	0	0



LAB	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Demand	211	234	245	261
Demand Growth (%)	6.1%	10.8%	4.7%	6.6%

EO capacity stood at 271 KT in 2017-18 and is expected to remain same and climb to 276 by 2020-21. Demand for EO grew at 6.1% in 2017-18 and expected to witness a staggering growth of 10.8% and is expected to be around 5 to 7% in 2-19-20 and 2010-21 respectively.

Carbon Black Feedstock & Carbon Black

Crude prices have come down from \$86 to \$64-68 therefore products like synthetic rubber, carbon black etc. are all cheaper now. The adverse effects of the increase in crude, interest rates, depreciation of INR and lack of festive demand uptick has been the maximum in the third quarter. There is some comfort that the rupee has not weakened further and crude prices have softened in Nov-Dec'18. This is a welcome change for the industry. The problems the carbon black industry has faced in the last few years—short supply, logistics problems, difficulties in increasing capacity, competition from silica, and the costs of environmental compliance—are coming to a head in 2019, according to industry experts. But demand is strong, as is the outlook for the industry this year.

Phillips Carbon Black (PCBL), a RP Sanjiv Goenka Group firm, is in talks with three state governments — Tamil Nadu, Andhra Pradesh and Telangana — to zero in on a location for setting up its proposed 1,50,000-tonne new carbon black plant with an investment of \$ 85.71 million. Additional 56,000-tonne capacity at Mundra in Gujarat had been commissioned at an investment of \$ 50 million and the 30,000-tonne capacity expansion at Palej in Gujarat would be completed by the third quarter of FY20. PCBL has already set up a research & development (R&D) centre at Palej with an investment of \$ 4.28 million. The firm plans to build an international R&D centre, for which it is looking for a suitable location in Europe. The location would be decided by July-September quarter. Recently, Birla Carbon announced that effective May 1, 2019 it will increase base prices for all carbon black products in North America by \$170/MT. All shipments made on or after this date are subject to the price increase. Adjustments for customers with supply agreements will be implemented as agreements are renewed. According to the company, this increase is made necessary by capital requirements and increased operating cost associated with meeting emission limits in the United States and the increasing cost of compliance elsewhere in North America.

Meanwhile, CBFS too registered a robust growth of 10.8% in 2017-18 and is expected to further improve to around 24% in 2019-20.



Table 25: Demand Supply Balance of CBFS & Carbon Black

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
CBFS (KT)				
Capacity	1925	2200	2530	2530
Production	1829	1935	2400	2400
Imports	1389	1475	1600	1600
Exports	240	480	240	240
Demand	1829	1935	2400	2400
Demand Growth (%)	10.8%	5.8%	24.0%	0.0%
Carbon Black (KT)				
Capacity	1040	1190	1370	1370
Production	988	1150	1300	1300
Imports	150	85	25	25
Exports	300	110	130	150
Demand	1138	1235	1325	1325
Demand Growth (%)	12.8%	8.5%	7.3%	0.0%

Other Key Petrochemicals

Overall other key petrochemicals demand in 2017-18 witnessed a growth of 3% and is expected to witness a spike in growth ~8% in next year 2018-19. Benzene demand witnessed healthy growth of 5.2% in 2017-18 and is expected to grow at a double digit rate at 15.1% in 2018-19 in line with increased production and rising exports. It is expected to maintain the robust growth of 11.5% in 2019-20 also before witnessing a dip in 2020-21.

Table 26: Demand Supply Balance of Benzene, Toluene, MXS & OX

(KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Benzene				
Capacity	1560	1710	2375	2375
Production	1135	1201	1611	1839
Imports	0	0	0	0
Exports	645	697	1096	1264
Demand	490	504	515	575
Demand Growth (%)	3.2%	2.9%	2.2%	11.7%
Toluene				
Capacity	175	175	175	175
Production	140	140	140	140
Imports	380	390	400	400
Exports	0	0	0	0
Demand	520	530	540	540
Demand Growth (%)	18.2%	1.9%	1.9%	0.0%



(KT)	2017-18 A	2018-19 E	2019-20 E	2020-21 E
MXS				
Capacity	90	90	90	90
Production	63	73	82	82
Imports	160	183	195	210
Exports	0	0	0	0
Demand	223	234	252	267
Demand Growth (%)	19.3%	4.9%	7.7%	6.0%
OX				
Capacity	420	420	420	420
Production	450	436	345	370
Imports	10	16	16	10
Exports	165	191	105	90
Demand	289	290	288	290
Demand Growth (%)	0.3%	-0.6%	0.7%	0.0%

Exports are expected to touch 1485 KT by 2018-19 with capacity additions by RIL in 2019-20 which takes up total benzene capacity to 2470 KT in 2019-20 and 2020-21 and RIL total benzene capacity to 1440 KT in the same period.

Toluene demand witnessed de-growth of 4.5% in 2017-18, however it is expected to witness a healthy demand growth of 6% in 2018-19. MXS again witnessed a double-digit growth in demand at 19.3% in 2017-18 like in the previous fiscal and is expected to register a growth in next fiscal of 5%, before once again witnessing a spike of 7.7% in 2019-20, further settling down at 6% in 2020-21.

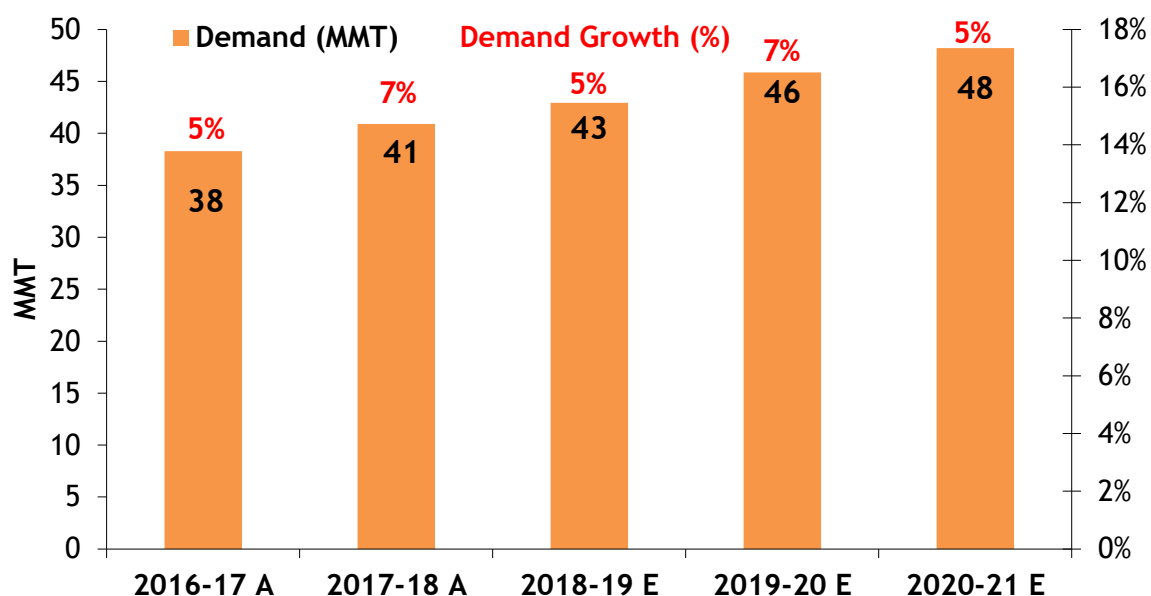
Imports in case of MXS are expected to rise to 210 KT by 2020-21 from 160 KT in 2017-18. Meanwhile, OX registered a flat demand growth of 0.3% in 2017-18 and expected to witness a flat growth in next three years. There is no new capacity addition lined up for OX.

Outlook for the Overall Indian Petrochemical Industry

India's aggregated demand for petrochemicals increased by 7% in 2017-18. Combining the demand for all the key segments in the petrochemical industry aggregate demand for the entire petrochemical sector in India is likely to increase from 41 MMT in 2017-18 to 43 MMT in 2018-19 and further to 48 MMT in 2020-21 as depicted in figure below. At the aggregate level, therefore, demand for petrochemicals in India is expected to grow at Y-0-Y of 6%+ in next three fiscals till 2020-21.



Figure 22: Aggregate Petrochemical Demand (All key segments – MMT)



Polymers are likely to register growth rate of ~5.1%, 8.5% and 7.2% in 2018-19 and 2019-20 and 2020-21 respectively. Polyolefins are expected to grow at 5.3% and 7.1% and 7.4% in 2018-19, 2019-20 and 2020-21 with the startup of new capacities. Surfactants are projected to grow at ~4% in the same period. Synthetic rubbers are expected to register demand growth of 3% in the said period. Other key petrochemicals expected to grow at ~5% and 7% in the same period.

India’s demand from the automobiles, packaging, and agriculture and infrastructure sector is expected to grow at healthy rate with easing of government’s monetary policy.

Polymer demand drivers are in place hence plastic industry is poised for exponential growth in coming years and healthy growth rate in end-use sectors. This optimism is based on the expectation that India's GDP would grow at around 7.2% in 2018-19 and 7.5% in 2019-20.

Crude to Chemicals

Vehicle fleet electrification has gained significant momentum in recent years, supported by regulatory incentives and changing consumer perception. The eventual extent of global vehicle fleet electrification is dependent on the interaction of a large number of variables, including the direction of government policy, technological progress, raw material availability and the wider transition of energy generation towards renewable sources.

However, the emergence of Electric Vehicles has resulted in uncertainty over future of Transport Fuels. According to BP’s 2018 Energy Outlook, the share of



the average oil barrel dedicated to transportation fuel will peak at 58% in 2025 and begin to decline. Oil consumed by industry, buildings, and power will also slump. This has forced the Refinery players to relook and recast their Strategy for Future and hence the focus has shifted to “Crude to Chemicals (CTC)”

Over the next decade, oil may be the next big thing in petrochemicals. This is a change from the 2010s, when billions of dollars flowed into the US to build crackers and downstream petrochemical plants to process low-cost ethane from shale gas into ethylene and its derivatives. The driver this time is the market more than it is cheap raw material supply.

Typically, only about 10% of the output of an average refinery is chemical coproducts, and the most integrated refineries approach 20% chemicals. In a crude oil to chemicals refinery, more than 40% of the output is chemicals. And because refineries are much larger scale than chemical plants, one CTC refinery can produce the equivalent of several world scale chemical plants.

Petrochemicals, which turn oil and gas into all sorts of daily products – such as plastics, fertilizers, packaging, clothing, digital devices, medical equipment, detergents or tyres – are integral to modern societies. In addition to products critical to our daily lives, petrochemicals are also found in many parts of the modern energy system, including solar panels, wind turbine blades, batteries, thermal insulation for buildings, and electric vehicle parts. Already a major component of the global energy system, the importance of petrochemicals is growing even more with the perspective of Crude to Chemicals.

But the shift will have consequences. The larger scale of a refinery compared with a chemical plant means existing petrochemical markets could be swamped with outsize amounts of product. India economy is at the cusp of inflection point and is poised for accelerated growth. Hence provides immense growth opportunity for the downstream Chemicals. India is still a net imported for key chemicals and with the expected growth rate, the gap is going to become much wider in future.

However, the competitive feedstock has always been a challenge for India as it doesn't have advantage of Shale like US, Coal like China or Oil like Middle East. This places India in a very unique position to take early advantage of Crude to Chemicals, however the technology will play a critical role for successful implementation.

Circular Economy – An Indian Perspective

The Indian Chemical & Petrochemicals Industry, with highly diversified chemicals, is currently worth \$150 billion. Contributing to 15% of India's manufacturing GDP, the industry is critical to the country's economic development and has a potential to grow to \$226 billion by 2020. Being an inherent part of sectors such as automobile, pharmaceuticals, textiles and manufacturing, the Chemical Industry is adapting sustainable practices to meet



international quality standards as well as support related sectors to innovate and grow accordingly.

With initiatives like “Make in India”, reforming labor laws, easing the land acquisition rules and GST, India is at the brink of becoming a manufacturing hub for the world. Globalization has led supply chains for the businesses more complex; therefore, the joint initiative of ‘Together for Sustainability’ (TfS) by global chemical companies has been introduced to encourage Indian chemical manufacturers and suppliers to implement sustainability practices in their management and manufacturing systems.

The aim of this initiative is to establish benchmarks that will create a sustainable supply chain. The member companies of TfS, have assigned their resources into building up a worldwide program to audit and evaluate suppliers under pre-defined criteria regarding management, environment, health and safety, labour and human rights, and governance issues.

India being a diverse manufacturing base for the Chemical Industry, has immense potential to become a global supplier. Therefore, a sustainable supply chain for the sector has become vital. After the launch for TfS, many Indian companies, doing business globally, have shown interest to join it. Around 28 Indian suppliers have already been audited under TfS scheme.

Cleaner manufacturing process is a pre-requisite to battle ecological complexity. Indian manufacturers have started investing in R&D and implementing green methods to produce non-toxic chemicals. The textile chemical producers have likewise understood the significance of moving towards biodegradable options and have started to put resources into the advancement of bio-auxiliaries and applications of probiotics to produce alternative biochemicals. It is observed among the industry that the companies that invested in Zero Liquid Discharge before it was made compulsory. These have gained huge returns in terms of quality and cost compared to those that did not act on time.

Companies like Reliance Industries & Indian Oil corporation have increasingly strengthened their focus on sustainability in manufacturing, downstream products and traceability in supply chains. Major projects undertaken by Indian Oil to increase the share of renewable energy in its overall energy mix are grid connected wind power, grid connected and off grid solar power.

During the year 2017-18, Indian Oil invested ~\$ 7.71 million in renewable energy projects. The total electricity generation from renewable power during the year is 337 million units, which is approximately 5% of total electricity consumption. Reliance Industries has embarked on major initiatives in plastics sustainability as well.



Other companies across India have taken up various initiatives such as retail outlet solarization, implementing rain water harvesting systems, conducting CSR workshops, LED implementation, while measuring and reporting carbon and water footprint has become standard practice in the industry.

Reporting standards such as the Carbon Disclosure Project (CDP), Global Reporting Initiative (GRI) and the United Nations Global Compact (UNGC) have come to be commonplace in the chemicals and petrochemicals industry in India. Furthermore, reporting in line with the Taskforce on Climate Related Financial Disclosure (TCFD) is also gaining traction in India, especially in the chemicals sector.

The growth of plastics demand is met by an increased use of non-renewable fossil resources; plastics-based products continue to be designed for single-use, while oceans have become full of plastics and increasingly free of life; landfills continue to grow, spoiling land areas. A circular economy approach can enable,

- Wider acceptance of reuse as a major part of consumption behavior, with plastics upcycled and production based on recycled raw materials instead of virgin fossil fuels.
- A shift to the use of sustainable alternatives such as bio-based plastics.
- Oceans and land areas to become naturally clean environments free of plastic waste.

An analysis by McKinsey suggests that the volume of plastics going to recycling could increase fivefold by 2030, to 220 million metric tons per year, if current flows to landfill and incineration are redirected and recycling capture improves. The waste-management industry that collects plastics waste and does preliminary processing has its own set of challenges—notably a lack of scale even now—and these will need to be addressed if it is going to be able to handle these massive new flows.

In developed economies, the industry tends to have high costs due to small scale and lack of efficient collection and sorting processes, with so far limited application of automation. In India, plastics waste is typically processed through informal systems—individual workers picking through waste dumps, with hand sorting at collection points and landfill sites—and this represents a processing structure that cannot easily be scaled up.

Currently, ~14 Million Tons of plastic is consumed in India. Unfortunately, due to unchecked littering of a few items, plastics as a whole are maligned. The benefits of plastics need to be acknowledged, and we must be wary of throwing the baby out with the bath water. By encouraging proper collection, segregation and education a smooth transition, as a society, towards a circular economy could be achieved.



In India, an estimated ~ 4 Million tons of plastic waste is plainly, monetary value lost to the streets, every year. This is the quantity which is responsible for the plastic waste visible in India and cannot be easily recovered and is hence not recycled. This waste finds its way on to streets and highways, due to the uncontrolled littering and limited waste collection infrastructure. This waste eventually ends up in the drains and clogs the drainage system, and doubly so during the monsoons.

PET however, fetches great value and hence, is recycled. India has one of the highest PET recycling rates in the world at ~ 83%. PET collection and recycling has proven to be a very lucrative business model and is therefore seeing a nationwide expansion in recycling capacity.

The plastic waste recycling sector in India is highly fragmented, unorganized and informal. The uncollected, plastic waste such as confectionery wrappers, food wrappers, shopping bags, etc. get retrieved with mixed waste and end up on the streets and unscientific landfills, i.e. dumping grounds. The goal is therefore to help the informal sector to transition to an organized system where all plastic litter is retrieved.

Some tangible ideas and activities generated to drive progress towards a circular economy in the Indian chemicals industry

- Material flow analysis for priority components and material streams. This would allow to prioritize actions, and act as a starting point for identifying action for business.
- Online platform to help identify materials and products that are in local waste streams, including the potential for material/product reuse, recycling, and recovery. Materials management is key to driving circularity, connecting value chains and developing circular solutions. Stakeholders to undertake this work will be national governments, industry jointly with the academia.
- Managing plastic waste is a priority for enabling circularity in the polymers sector in India. There is a need to identify the factors to improve waste management in India, and that could be done by bringing together governments and industry leaders, while industry associations could be utilized to facilitate discussions and build relationships and partnerships.
- Awareness building and curriculum development for various student levels is an opportunity to enhance knowledge on circularity and policies could help connect academics, policy makers, and industry.
- Innovative collaborations by stimulating market supply and demand forces of circular products and materials. To do so, engagement needs to include the financial sector, as it can serve as a facilitator. Another opportunity is to pursue Public-Private Partnerships (PPPs) to create basic drivers and incentives, identify circularity champions and develop infrastructure for circularity.



Initiatives by Reliance Industries Ltd on Sustainable Solutions for Plastics

In order to create an enabling eco-system for widespread adoption of circularity and make India a global leader in plastic recycling. Reliance Industries Limited is taking the onus to create a core business to participate in Circular Economy and set an example for others to follow.

RIL is identifying adjacencies associated with the Circular Economy and creating an Ecosystem where RIL will act as a catalyst in overall development of the Circular Economy.

a. PET Recycling

- RIL currently is recycling ~ 2 Billion waste water bottles annually which would otherwise be mismanaged and leak into ecologically sensitive zones i.e. mangroves and national parks.
- With an overall PET recycling capacity of ~ 100 TPD, RIL’s supply chain includes procurement of used PET bottles, flaking, and manufacturing of fiber to be used for yarns and in turn, fabric.
- In retrieving ~ 2 billion bottles every year, RIL engages a vast network of informal waste collectors from across the country resulting in ~550 (Contract and Full time) jobs being created.
- A completely traceable supply chain ensures that RIL’s PET recycling business is indeed a closed loop solution.



b. Versova Beach Clean-up - Reliance Industries Limited actions to tackle marine debris

- Reliance Industries Limited (RIL) have been involved with Afroz Shah’s team in the Versova beach cleanup for six months till date.

- The Sustainable solutions team of RIL did extensive research for locating the right machine for an efficient beach cleanup. This research resulted in identifying the BobCat as an ideal machine (it cleans both dry and wet sand, as most of the plastic is embedded ~ 2 feet under the sand and manual cleaning is cumbersome).
- The landing of the Bobcat at Versova beach was historic as it was the first time that a machine with this level of precision and efficiency was being used on an Indian beach.
- The sponsorship of the BobCat machine by RIL has resulted in an expedited retrieval of plastic waste off the beaches and from the oceans. This has also resulted in a more efficient and systematic cleanup recovering ~ 1.5 Million Kgs of plastic waste in 180 days – that much less plastic in the oceans.
- By deploying BobCat, RIL ensured that Afroz's work on Versova was expedited. This meant that this model could be scaled up faster as Afroz could move on to address other flash points of pollution.



c. Plastics Waste to road

- One of the safest and time-tested solution for plastic waste is use in Road Construction.
- This technology can replace 10% of bitumen with post-consumer non-recyclable plastic waste which is as per the IRC Codes. Apart from providing enhance d tech props such as improved durability of the road, there is a significant reduction in the number of potholes.
- This addresses the problem of frequent repairs of roads that costs approximately \$ 4.28 billion per annum.



- Another factor is that there is a cost saving due to the replacement of bitumen with plastic waste. The government of India has also issued a mandate for the implementation of plastic waste into road construction.
- In RIL's first pilot for waste plastics to road, 750 kg of non-recyclable, post-consumer plastic waste was used in the construction of a 175-meter stretch of road inside Reliance Corporate Park.
- A second pilot on a 40 km road at RIL's Nagothane plant using plastics waste has already begun. This will consume 50 tons of single use non-recyclable plastics, comprising of almost 70% MLF's.
- This supports RIL's vision of creating an enabling eco-system for widespread adoption of circularity and make India a global leader in circular platforms.



Section 3

Statistical Appendix



Feedstock

Naphtha (MT)				
	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Production	19993	19949	--	--
Imports	2212	2281	--	--
Exports	8951	7495	--	--
Apparent Demand	12889	13987	--	--
Demand Growth%	-2.7%	8.5%	--	--
Natural Gas (MMSCM)				
	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Production	32649	32064	--	--
Imports	26328	27623	--	--
Exports	--	--	--	--
Apparent Demand	52260	53838	--	--
Demand Growth%	5.2%	3.0%	--	--
Coal Bed Methane (MMSCM)				
	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Production	735	712	--	--
Imports	--	--	--	--
Exports	--	--	--	--
Apparent Demand	--	--	--	--
Demand Growth%	--	--	--	--
Methanol (KT)				
	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	631	631	631	631
Production	200	200	213	250
Imports	1839	1921	1992	2042
Exports	0	0	0	0
Apparent Demand	2039	2121	2205	2292
Demand Growth%	4.3%	4.0%	3.9%	3.9%

Building Blocks (KT)

Ethylene				
	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	7377	7377	7377	7377
Production	6023	6516	6832	6872
Imports	53	26	13	76
Exports	136	152	125	125
Net Availability	5940	6390	6720	6824
Propylene				
	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	6034	6364	6524	6524
Production	4844	5163	5659	5711



Imports	7	13	49	35
Exports	4	0	0	0
Net Availability	4847	5176	5707	5746
Butadiene				
Capacity	550	597	597	597
Production	420	439	484	506
Imports	2	0	0	0
Exports	104	74	99	111
Apparent Demand	298	318	340	373
Demand Growth%	-1.4%	6.7%	6.9%	9.8%
Styrene				
Imports	790	840	885	935
Exports	0	0	0	0
Net Trade	790	885	885	935
Demand Growth%	8.2%	12.0%	0.0%	5.6%
	2017-18 A	2018-19 E	2019-20 E	2020-21 E
EDC				
Capacity	205	237	237	237
Production	188	229	237	237
Imports	521	512	530	530
Exports				
Apparent Demand	709	741	767	767
Demand Growth%	0.4%	4.5%	3.5%	0.0%
VCM				
Capacity	996	996	996	996
Production	928	948	1008	974
Imports	478	482	551	553
Exports				
Apparent Demand	1406	1430	1559	1527
Demand Growth%	-0.4%	1.7%	9.0%	-2.1%
Aromatics	2017-18 A	2018-19 E	2019-20 E	2020-21 E
PX				
Capacity	5643	5786	5926	5926
Production	5028	5377	5491	5473
Imports	889	762	676	676
Exports	1968	2262	2207	2223
Apparent Demand	3959	4200	4254	4646
Demand Growth%	4.8%	6.1%	1.3%	9.2%



Intermediates (KT)
Fibre Intermediates (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
ACN				
Capacity	0	0	0	0
Production	0	0	0	0
Imports	157	165	177	185
Exports	0	0	0	0
Apparent Demand	157	165	177	185
Demand Growth%	12.1%	5.1%	7.3%	4.5%
Caprolactam				
Capacity	70	70	70	70
Production	86	89	90	90
Imports	58	65	65	65
Exports	0	0	0	0
Apparent Demand	144	154	155	155
Demand Growth%	4.3%	6.9%	0.6%	0.0%
PTA				
Capacity	6330	6475	6510	7110
Production	5604	5836	6043	6489
Imports	522	510	550	450
Exports	214	207	140	300
Apparent Demand	5912	6139	6453	6639
Demand Growth%	7.9%	3.8%	5.1%	2.9%
MEG				
Capacity	1715	2215	2215	2215
Production	1522	2072	2082	2130
Imports	1066	652	660	720
Exports	139	233	177	148
Apparent Demand	2399	2503	2565	2702
Demand Growth%	11.7%	4.3%	2.5%	5.3%

Polymers, Fibres and Elastomers (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
LDPE				
Capacity	405	605	605	605
Production	334	614	636	648
Imports	500	284	230	200
Exports	76	142	84	36
Apparent Demand	738	755	782	812
Demand Growth%	5.7%	2.3%	3.6%	3.8%



EVA				
Capacity	0	0	0	0
Production	0	0	0	0
Imports	183	190	195	200
Exports	0	0		
Apparent Demand	183	190	195	200
Demand Growth%	26.2%	3.8%	2.6%	2.6%
LLDPE				
Capacity	1875	2155	2155	2155
Production	1565	2144	2330	2385
Imports	596	452	456	480
Exports	216	517	530	435
Apparent Demand	1916	2105	2256	2430
Demand Growth%	15.8%	9.9%	7.2%	7.7%
HDPE				
HDPE Capacity	2415	2765	2765	2765
LLDPE Capacity	1875	2155	2155	2155
Total Capacity	4290	4920	4920	4920
Production	2008	2389	2526	2626
Imports	607	533	540	600
Exports	183	410	490	456
Apparent Demand	2452	2440	2577	2770
Demand Growth%	9.5%	-0.5%	5.6%	7.5%
All PE				
Capacity	4695	5525	5525	5525
Production	3907	5147	5492	5659
Imports	1703	1269	1226	1280
Exports	475	1069	1104	927
Apparent Demand	5106	5300	5615	6012
Demand Growth%	11.2%	3.8%	5.9%	7.1%
PP	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	5247	5300	6000	6000
Production	4598	5053	5812	6100
Imports	709	680	400	450
Exports	525	600	695	600
Apparent Demand	4756	5082	5517	5950
Demand Growth%	9.4%	6.9%	8.6%	7.8%
Polyolefins				
Capacity	9942	10825	11525	11525
Production	8505	10200	11304	11759
Imports	2595	2139	1821	1930
Exports	1000	1669	1799	1527



Apparent Demand	10044	10572	11327	12162
Demand Growth%	10.6%	5.3%	7.1%	7.4%
PVC				
Capacity	1557	1557	1579	1579
Production	1378	1401	1528	1497
Imports	1658	1787	2087	2369
Exports				
Apparent Demand	3049	3189	3615	3866
Demand Growth%	2.0%	4.6%	13.4%	6.9%
PS				
Capacity	490	490	490	490
Production	295	300	315	320
Imports	29	30	25	30
Exports	55	55	55	55
Apparent Demand	262	275	285	300
Demand Growth%	2.7%	5.0%	3.6%	5.3%
EPS				
Capacity	132	132	139	148
Production	100	105	110	120
Imports	3	3	2	2
Exports	3	3	3	3
Apparent Demand	100	104	109	119
Demand Growth%	0.0%	4.0%	4.8%	9.2%
Polymers	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	12121	13004	13733	13742
Production	10278	12006	13257	13696
OR (%)	85%	92%	97%	100%
Imports	4285	3959	3935	4331
Exports	1058	1727	1857	1585
Net Trade	-3226	-2232	-2078	-2746
Apparent Demand	13455	14140	15336	16447
Demand Growth%	8.3%	5.1%	8.5%	7.2%

Vinyls (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
PVC				
Capacity	1557	1557	1579	1579
Production	1378	1401	1528	1497
Imports	1658	1787	2087	2369
Exports				
Apparent Demand	3049	3189	3615	3866



Demand Growth%	2.0%	4.6%	13.4%	6.9%
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Styrenics (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
PS				
Capacity	490	490	490	490
Production	295	300	315	320
Imports	29	30	25	30
Exports	55	55	55	55
Apparent Demand	262	275	285	300
Demand Growth%	2.7%	5.0%	3.6%	5.3%
ABS	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	190	210	240	240
Production	140	145	155	170
Imports	84	95	95	95
Exports	0	0	0	0
Apparent Demand	224	240	250	265
Demand Growth%	9.3%	7.1%	4.2%	6.0%
SAN	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	170	170	170	210
Production	110	121	133	146
Imports	6	7	7	7
Exports				
Apparent Demand	116	128	140	153
Demand Growth%	8.6%	9.6%	9.5%	9.5%

PET (KT)

PET	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Capacity	1975	1975	2025	2025
Production	1624	1624	1721	1721
Imports	120	140	150	150
Exports	836	799	841	771
Demand	908	965	1030	1100
Demand Growth (%)	6.3%	6.3%	6.7%	6.8%



Synthetic Fibres (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
PSF				
Capacity	1242	1282	1444	1444
Production	980	984	1096	1156
Imports	45	23	40	40
Exports	146	168	246	252
Demand	881	829	890	944
Demand Growth (%)	-3.5%	-5.9%	7.4%	6.1%
ASF				
Capacity	167	167	167	167
Production	97	97	99	105
Imports	33	32	34	36
Exports	25	25	25	25
Demand	105	110	112	114
Demand Growth (%)	6.1%	4.8%	1.8%	1.8%
PPSF				
Capacity	13	13	13	13
Production	3	3	3	3
Imports	2	2	2	2
Exports	11	0	0	0
Demand	5	5	5	5
Demand Growth (%)	4.2%	0.0%	0.0%	0.0%
PFY				
Capacity	4659	4988	5198	5307
Production	3071	3238	3524	3717
Imports	33	30	28	24
Exports	146	145	176	177
Demand	2957	3128	3379	3568
Demand Growth (%)	6.3%	5.8%	8.1%	5.6%
PPFY				
Capacity	18	18	18	18
Production	10	11	12	13
Imports	1	1	1	1
Exports	2	2	2	2
Demand	9	10	11	12
Demand Growth (%)	-18.2%	11.1%	10.0%	9.1%
VSF				
Capacity	419	419	419	419
Production	380	390	400	410



	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Imports	35	30	30	32
Exports	148	154	154	154
Demand	267	266	276	288
Demand Growth (%)	10.8%	-0.4%	3.8%	4.3%
VFY				
Capacity	82	82	82	82
Production	60	60	60	60
Imports	10	12	14	16
Exports	6	6	6	6
Demand	64	66	68	70
Demand Growth (%)	3.2%	3.1%	3.0%	2.9%
NFY				
Capacity	108	108	108	108
Production	105	105	105	105
Imports	3	4	5	6
Exports	3	3	3	3
Demand	105	106	107	108
Demand Growth (%)	-1.3%	0.9%	0.9%	0.9%

Synthetic Rubber (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
PBR				
Capacity	124	124	124	130
Production	114	123	124	130
Imports	78	84	85	91
Exports	7	12	4	6
Apparent Demand	187	195	205	215
Demand Growth%	4.1%	4.3%	5.1%	4.9%
SBR				
Capacity	290	290	270	270
Production	230	230	230	230
Imports	118	118	118	118
Exports	33	30	30	28
Apparent Demand	313	316	319	321
Demand Growth%	1.0%	1.0%	0.8%	0.6%
NBR				
Capacity	20	20	20	30
Production	18	18	20	25
Imports	36	39	39	36
Exports	0	0	0	0
Apparent Demand	54	57	59	61
Demand Growth%	9.2%	4.7%	3.5%	3.4%



EPDM				
Capacity	0	0	0	0
Production	0	0		
Imports	45	48	50	53
Exports	0	0	0	0
Apparent Demand	45	48	50	53
Demand Growth%	2.4%	5.6%	5.3%	6.0%



Other Key Petrochemicals (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
Benzene				
Capacity	2415	2415	2470	2470
Production	1667	2095	2142	2142
Imports	0	0	0	0
Exports	1137	1485	1462	1452
Apparent Demand	530	610	680	690
Demand Growth%	5.2%	15.1%	11.5%	1.5%
Toluene				
Capacity	175	175	175	175
Production	140	140	140	140
Imports	400	400	400	400
Exports	0	0	0	0
Apparent Demand	506	536	536	536
Demand Growth%	-4.5%	5.9%	0.0%	0.0%
MXS				
Capacity	90	90	90	90
Production	63	73	82	82
Imports	160	183	195	210
Exports	0	0	0	0
Apparent Demand	223	234	252	267
Demand Growth%	19.3%	4.9%	7.7%	6.0%
OX				
Capacity	420	420	420	420
Production	436	345	370	402
Imports	16	16	10	10
Exports	191	105	90	122
Apparent Demand	290	288	290	290
Demand Growth%	0.3%	-0.6%	0.7%	0.0%



Surfactants (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
LAB				
Capacity	550	550	550	550
Production	452	454	444	444
Imports	206	222	250	280
Exports	6	6	6	6
Apparent Demand	650	662	688	720
Demand Growth%	3.1%	1.9%	3.9%	4.7%
EO				
Capacity	271	271	271	276
Production	211	234	245	261
Imports				
Exports				
Apparent Demand	211	234	245	261
Demand Growth%	6.1%	10.8%	4.7%	6.6%

Carbon Black & CBFS (KT)

	2017-18 A	2018-19 E	2019-20 E	2020-21 E
CBFS				
Capacity	1925	2200	2530	2530
Production	1829	1935	2400	2400
Imports	1389	1475	1600	1600
Exports	240	480	240	240
Demand	1829	1935	2400	2400
Demand Growth (%)	10.8%	5.8%	24.0%	0.0%
Carbon Black				
Capacity	1040	1190	1370	1370
Production	988	1150	1300	1300
Imports	150	85	25	25
Exports	300	110	130	150
Demand	1138	1235	1325	1325
Demand Growth (%)	12.8%	8.5%	7.3%	0.0%



Chemicals & Petrochemicals
Manufacturers' Association

Chemicals & Petrochemicals Manufacturers' Association

CPMA is the apex forum representing the Indian Petrochemical Industry, Established in 1993, and the Association offers its members a podium to collectively present their ideas, voice their concerns and offer suggestions on relevant issues. It provides a linkage between the industry, the Government and society. It interacts with policy makers and industry associations to develop and maintain harmonious and conducive business conditions.

The Association, registered under the Indian Societies Act, is widely recognized as one of the national apex bodies of the Indian Petrochemical Industry by all Ministries and Departments of Government of India, apex Chambers of Commerce and Industry and other related Associations in India and abroad. CPMA is affiliated to the Confederation of Indian Industry (CII). The Association is also a Steering Committee Member of the Asia Petrochemical Industry Conference (APIC) and had successfully hosted the annual APIC 2010 conference on May 13-14, 2010 in Mumbai.

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