



Chemicals & Petrochemicals
Manufacturers' Association, India



INDIAN PETROCHEMICAL INDUSTRY

COUNTRY PAPER FROM INDIA-2021



INDIAN PETROCHEMICAL INDUSTRY



COUNTRY PAPER FROM INDIA-2021



Chemicals & Petrochemicals
Manufacturers' Association, India

**Chemicals & Petrochemicals
Manufacturers' Association, India**
708, 7th Floor, Kailash Building,
26, Kasturba Gandhi Marg, New Delhi-110001, INDIA
Phone: +91-11- 43598337, Fax: +91-11-43598337
Email: cpmai@airtelmail.in, Website: www.cpmaindia.com

Contents

SECTION 1	01
THE INDIAN ECONOMY: REVIEW AND OUTLOOK	02
THE INDIAN ECONOMY REVIEW OF 2020-21	02
SNAPSHOT OF KEY INDICATORS	07
I. GDP GROWTH	07
II. IIP – INDEX OF INDUSTRIAL PRODUCTION	12
III. CORE INDUSTRIES PERFORMANCE	15
IV. CURRENT ACCOUNT DEFICIT AND BALANCE OF PAYMENTS	17
V. FDI	18
VI. FOREX RESERVES	19
VII. FII FLOW AND STOCK MARKET	20
VIII. INDIA'S TRADE	26
IX. INFLATION	29
X. RUPEE	30
XI. OUTLOOK FOR 2021-22: INDIA	32
SECTION 2	39
XII. FACTORS INFLUENCING FUTURE TRAJECTORY OF PETROCHEMICALS MANUFACTURING AND CONSUMPTION GROWTH	40
XIII. OUTLOOK FOR 2021-22	44
XIV. GLOBAL PETROCHEMICAL INDUSTRY REVIEW OF 2020-21 & OUTLOOK FOR 2021-22	45
XV. INDIAN PETROCHEMICAL INDUSTRY REVIEW 20-21 & OUTLOOK 21-22: PRODUCT WISE	49
XVI. FEEDSTOCK	49
A. NAPHTHA	49
B. NATURAL GAS	50
C. COAL BED METHANE	58
D. METHANOL	61
XVII. BUILDING BLOCKS	64
A. ETHYLENE & PROPYLENE	64
B. BUTADIENE	72
C. STYRENE	73
D. EDC AND VCM	74
E. AROMATICS – PARAXYLENE	76

XVIII.	INTERMEDIATES	80
	A. FIBRE INTERMEDIATES	80
XIX.	POLYMERS, FIBRES AND ELASTOMERS	86
XX.	POLYOLEFINS	89
XXI.	VINYL'S: PVC	90
XXII.	STYRENICS	91
	A. POLYSTYRENE	91
	B. ACRYLONITRILE-BUTADIENE-STYRENE (ABS)	93
	C. STYRENE-ACRYLONITRILE (SAN)	94
XXIII.	PET (POLYETHYLENE TEREPHTHALATE)	95
XXIV.	SYNTHETIC FIBRES	97
XXV.	SYNTHETIC RUBBER	100
XXVI.	SURFACTANTS	112
XXVII.	CARBON BLACK FEEDSTOCK & CARBON BLACK	114
XXVIII.	OTHER KEY PETROCHEMICALS	118
XXIX.	OUTLOOK FOR THE OVERALL INDIAN PETROCHEMICAL INDUSTRY	121
	SECTION 3	125
	STATISTICAL APPENDIX	125
	FEEDSTOCK	126
	BUILDING BLOCKS (KT)	127
	INTERMEDIATES (KT)	128
	FIBRE INTERMEDIATES (KT)	128
	POLYMERS, FIBRES AND ELASTOMERS (KT)	128
	VINYLS (KT)	130
	STYRENICS (KT)	130
	PET (KT)	131
	SYNTHETIC FIBRES (KT)	131
	SYNTHETIC RUBBER (KT)	132
	OTHER KEY PETROCHEMICALS (KT)	133
	SURFACTANTS (KT)	134
	CARBON BLACK & CBFS (KT)	134

TABLES

TABLE 1: USE BASED CLASSIFICATION OF (IIP)	14
TABLE 2: INDIA'S GDP GROWTH PROJECTION – 2021-22 AND 2022-23	33
TABLE 3: NAPHTHA DEMAND SUPPLY	49
TABLE 4: NATURAL GAS DEMAND SUPPLY	53
TABLE 5: COAL BED METHANE DEMAND SUPPLY	60
TABLE 6: METHANOL DEMAND SUPPLY	61
TABLE 7: ETHYLENE & PROPYLENE NET AVAILABILITY	64
TABLE 8: BUTADIENE DEMAND SUPPLY	73
TABLE 9: STYRENE DEMAND SUPPLY	74
TABLE 10: EDC & VCM IMPORT INTO INDIA	75
TABLE 11: PARAXYLENE DEMAND SUPPLY	78
TABLE 12: FIBRE INTERMEDIATE DEMAND SUPPLY	82
TABLE 13: POLYMER DEMAND SUPPLY	87
TABLE 14: POLYOLEFIN DEMAND IN INDIA ACTUAL & PROJECTED	89
TABLE 15: PVC DEMAND SUPPLY	91
TABLE 16: POLYSTYRENE DEMAND SUPPLY	92
TABLE 17: ABS DEMAND SUPPLY	94
TABLE 18: SAN DEMAND SUPPLY	95
TABLE 19: PET DEMAND SUPPLY	96
TABLE 20: DEMAND SUPPLY BALANCE OF SYNTHETIC FIBRE	98
TABLE 21: DEMAND SUPPLY BALANCE OF PBR, SBR, NBR, EPDM & BUTYL RUBBER	109
TABLE 22: DEMAND & SUPPLY OF LAB & EO	113
TABLE 23: DEMAND SUPPLY BALANCE OF CBFS & CARBON BLACK	117
TABLE 24: DEMAND SUPPLY BALANCE OF BENZENE, TOLUENE, MXS & OX	118

FIGURES

FIGURE 1: INDIA'S GDP GROWTH (YEAR-ON-YEAR IN PERCENT)	07
FIGURE 2: QUARTERLY GDP GROWTH (IN PERCENT)	08
FIGURE 3: QUARTERLY GVA GROWTH (IN PERCENT)	10
FIGURE 4: INDEX OF INDUSTRIAL PRODUCTION (IIP)	12
FIGURE 5: CORE INDUSTRIES GROWTH RATE (IN PERCENT)	16
FIGURE 6: CORE INDUSTRIES SECTORAL GROWTH RATE (IN PERCENT)	15
FIGURE 7: FDI INFLOWS	18
FIGURE 8: FOREX RESERVES	19
FIGURE 9: INDIA SAW HIGHEST FIIS INFLOWS IN 2020 AMONGST EMERGING MARKETS	20
FIGURE 10: CUMULATIVE MONTHLY FPI FLOWS INTO INDIA FY 21	21
FIGURE 11: MONTHLY FPI NET INVESTMENTS	23
FIGURE 12: STOCK MARKET PERFORMANCE	23
FIGURE 13: INDIA'S RANK IN MARKET CAPITALIZATION	24
FIGURE 14: INDIA TOPS ONE-YEAR RETURN AMONG MAJOR MARKETS	25
FIGURE 15: INDIA'S EXPORTS AND IMPORTS	27
FIGURE 16: TRADE BALANCE	28
FIGURE 17: CPI AND WPI INFLATION (IN PERCENT)	30
FIGURE 18: RUPEE MOVEMENT IN LAST ONE YEAR	31
FIGURE 19: INDIAN AUTO INDUSTRY GROWTH	101
FIGURE 20: INDIAN AUTO INDUSTRY DOMESTIC SALES	102
FIGURE 21: INDIAN AUTO INDUSTRY DOMESTIC SALES COMPARISON	102
FIGURE 22: AGGREGATE PETROCHEMICAL DEMAND (ALL KEY SEGMENTS – MMT)	121
FIGURE 23: PROPOSED INVESTMENTS IN PETROCHEMICAL PROJECTS IN INDIA	122
FIGURE 24: FUEL DEMAND DESTRUCTION LEADING TO RISE OF O2C	123

Message from Kamal P. Nanavaty

President, CPMA, India



The annual India report is published every year by CPMA as well by each APIC nation for circulation among all the delegates from across the globe during APIC meet.

It is indeed my privilege to launch the India report 2021 which is released during the APIC, Asia Petrochemicals Industry Conference.

The year 2020-21 was an unprecedented year for the global petrochemical industry. Due to outbreak of COVID, the virus infection was unknown for the entire world and medical fraternity was struggling to understand the ways of spread of virus and ways to contain same. Across the globe, countries announced complete lockdowns and ban on domestic and international travels. This impacted the economic activities adversely in the beginning of 20-21.

This report has become the reference book for petrochemical industry representing all its segments covering review and outlook of Petchem industry together with detailed statistics on demand, production, import, export etc. Hope that you will find it useful and enriching.

India has a vast potential for petrochemical industry to grow, the Indian Government's guiding principle for most segments of the economy are to be "Self Reliant- Atmanirbhar". New investment of nearly US\$ 100 Bn is lined up and is at various stages of planning. India is working hard to reduce its trade deficit.

CPMA enjoys the status of being VOICE of Petrochemical Industry in the country with a credible contact point for the Government on all matters relating to growth of the petrochemical industry. In order to facilitate policy regime which ensures sustainable growth, CPMA has been striving to lead advocacy initiatives. To safeguard the interest of the industry and for its sustainable growth, CPMA has now become the apex forum of the industry at Government level as well as at National Trade level by affiliation with trade bodies like FICCI, CII and other related associations etc.

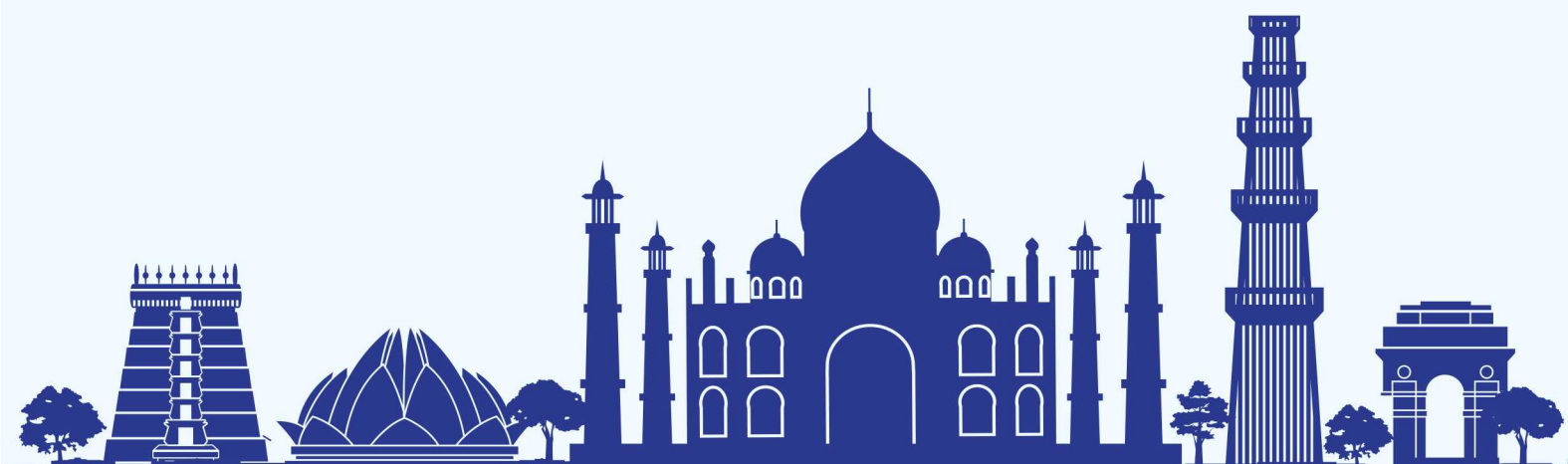
The Indian economy saw a contraction of 8% in 2020-21 whereas polymer consumption managed to show a flat consumption.

Indian Petrochemical industry has shown resilience in tough times and comes forward with good rate of consumption even during worst economic crises. We see a very bright prospects for future consumption and growth of petrochemical products and march towards self-sufficiency.

My best wishes to you and your families for the year 2021.

Thank you.

Kamal P. Nanavaty
President, CPMA, India



SECTION 1

THE INDIAN ECONOMY

The Indian Economy: Review and Outlook

The Indian Economy Review of 2020-21

Preamble

The year 2020-21 was an unprecedented year for the global petrochemical industry. Covid virus infections started in Dec 2019 from Wuhan in China and by March 2020 almost the entire world had reported COVID cases in their countries. The virus infection was unknown for the entire world. Most countries were not aware of the spread of virus and ways to contain the spread. This resulted in announcing complete lockdowns and ban on domestic and international travels across the globe.

Amid lockdowns, life was required to continue, so at the cost of spreading the infections, most countries had to allow movement of essential commodities which included Food and medicines. This lockdown had massive impact on industrial activities across the globe and GDP of almost all countries showed massive drop.

As the understanding about COVID improved and efforts started to develop vaccines, limited unlocking started and economic activities started limping back to normalcy.

By the end of 2020-21, sufficient data was gathered about containing the covid spread, treating the covid infections and developing the vaccine. The mankind was less scared and had learned to live with the virus and controlled unlocking led to return to near normalcy and demand of petrochemicals returned to near pre-covid levels by end of 2020-21.

India started manufacturing of two COVID vaccine. One was fully developed in India i.e., Covaxin and another manufactured in India and developed by Oxford Astra Zeneca of UK.

India started vaccinations from 16th Jan 2021 for Health care workers and front-line workers and from 1st Mar 21 for people above 60 years old.

Indian Economy

After growing at very high rates for several years, India's economy had begun to slow down to 4% growth before the pandemic. Between 2016 and 2019, growth decelerated from 8.3% to 4%. In March 2020, the government imposed one of the world's most stringent lockdowns to contain the spread of the virus, which brought the economy to a halt, as public movement was restricted, factories were shut and trains were stopped.

The three-month lockdown sent the economy into its worst ever contraction of -24% in the June 2020 quarter, followed by a -7.3% shrinkage from July to September, pushing the economy into a rare recession.

Since then, the economy has shown a gradual economic recovery. GDP grew 1.6% in Q4'21, compared with the same period a year earlier.

The composite Purchasing Managers' Index (PMI), an integrated measure of activity in the manufacturing and services sector continues to see improvement, rising to its highest levels in the post-pandemic phase at 57.30. A reading above 50 in the index indicated month-on-month expansion in business activity.

The impact on services such as travel, tourism and hospitality had multiplier effects, as these sectors have strong backward links with other sectors of the economy. However, agricultural growth and rural demand have been quite robust until now and are expected to give further boost to the economy due to the timely onset of the monsoon season.

Though the government now has limited fiscal space to bring out a massive bailout program, production-linked incentive programs could bring some relief to manufacturers planning to make investments in fast-recovering sectors

Last year, India announced a \$266 billion package to support the economy during a strict nationwide lockdown to contain the first coronavirus wave. But this was largely liquidity support given to banks to boost company credit.

While car sales bounced back after the first wave last year it was not on a scale seen elsewhere and the recovery was brief.

As per RBI, despite seasonally adjusted month-on-month momentum in industrial production being positive for the fourth consecutive month, anecdotal evidence points to feedback loops from the demand contraction seeping through into curtailments of output in the months ahead unless infections ebb.

It also pointed out that e-way bills - an indicator of domestic trade - have recorded a double-digit contraction at 17.5% month on month in April and said this could be pointing to a moderation in GST collections in coming months.

Macro-economic indicators:

First of all, India's macroeconomic indicators such as balance of payment, foreign exchange reserves and to an extent private debt have not deteriorated to the extent seen in other major economies in the aftermath of the pandemic.

India's foreign exchange reserves of close to \$600 billion coupled with a largely stable currency have provided strong cushion to foreign investors known to be averse to wild swings in the currency of the investing country.

The Reserve Bank of India deserves credit for managing the external macro factors astutely while at the same time ensuring that the government's record borrowings did not create panic in the bond market.

Secondly, India's earnings growth cycle is finally emerging out of the doldrums of the past seven-to-eight years. Some foreign brokerages say the pace of earnings upgrades in India is likely to be one of the swiftest in all of Asia.

With post-pandemic growth in China already fading as a function of it emerging faster than the world out of the pandemic, India's close to 10% GDP growth and over 35% expected profit growth makes it a top pick for foreign investors.

Thirdly, the surge in foreign inflows into India has come at a time when equity risk premia for the country has been falling sharply. The risk premium of Indian equities has fallen from as high as 3.51% in March 2020 to 1.82% as of March 2021.

An equity risk premium is the excess return investors demand over the risk-free rate to invest in a risky asset. The decline in India's equity risk premium is indicative of the reducing risk attached to the country and rising surety of returns for investors.

These factors among others such as the extremely accommodative monetary policy conditions in advanced economies, India's large weightage in most emerging market portfolios and the government's largely reform-oriented policy agenda have helped drive foreign inflows into Indian equities.

Sensex touched new high above 53K in June 2021 amid positive global cues and the progress of the Covid-19 vaccination drive.

The Purchasing Managers' Index (PMI) for the manufacturing sector improved marginally in April. However, the improvement was driven by the faster pace of new exports orders rather than new domestic factory orders. This in line with the export data for April, which remained robust, reflecting increased external demand.

After a gap of four years, the contribution of the Centre's indirect taxes in gross domestic product (GDP) has exceeded that of direct taxes, underscoring the regressive taxation system in the country. The share of direct tax in GDP fell to a 15-year low in 2020-21 (FY21) at 4.79%, while that of indirect taxes grew to a four-year high of 5.48%.

The increase in indirect taxes was primarily due to a 63% year-on-year (YoY) jump in excise duty collections to Rs 3.89 trillion and a 23% YoY increase in Customs duty to Rs 1.35 trillion.

Gross tax revenue grew 0.73% in FY21, exceeding the revised Budget target by Rs 1.24 trillion. In the previous year, gross tax revenue posted a 3.39% decline. Centre's tax-to-GDP ratio improved to 10.25% after touching a decadal low of 9.88% in FY20 - the pre-Covid year. Lower tax-to-GDP ratio constrains the government's capital spending as it puts pressure on the fiscal deficit.

The recovery in investments on the expenditure side was in line with that in construction on the supply side. Real Gross Fixed Capital Formation grew 10.6% in Q4.

Manufacturing GVA, too, rebounded strongly, growing the fastest in 11 quarters in Q4, at 6.9% over the previous year. Agriculture grew in the range of 3-4.5% in all the four quarters, showing resilience.

Real Government Final Consumption Expenditure grew 28.3% in Q4, backed by massive spending by the Centre in the March quarter, that included clearing of subsidy arrears. Unlike consumer spending, real investments grew at 10.6%. This took the investment rate, which is the rate of GFCF to GDP, above the 30% barrier after almost six years, to reach 31.2% of GDP.

A normal monsoon rainfall in current year is likely to lift crop production and support the nascent economic recovery amid a resurgence of new infections that has prompted lockdown-like curbs in many cities.

Going forward, demand in rural areas and recovery in the industrial activity is likely to be key drivers for corporate earnings in the near to medium term

India's foodgrains production in the 2020-21 crop year expected to touch a new all-time record high of around 303 million tonnes (MT), which is over 2% higher than the previous year's output.

The recovery in Q4 was nevertheless impressive in the sense that nominal GDP grew at 8.7%, which was faster than the growth witnessed in Q2 and Q3 of 2019-20, showing the gravity of economic slowdown that began before Covid-19.

What stands out is the sharp recovery in construction activity. Real GVA in construction grew by a staggering 14.5% in Q4, after growing 6.5% in Q3. This mass-employment sector had shown the highest contraction in GVA in the first quarter of FY21, when a national lockdown was in place.

India saw its highest-ever inflow of foreign direct investment (FDI) of \$81.72 billion during the financial year 2020-21. It is a 10% rise on a year-on-year basis.

India's exports have been growing steadily every month and rose 69.35% in May. It may be noted that the trade deficit dropped to an eight-month low of USD 6.28 billion.

Strong fundamentals, an upbeat policy environment, and stronger- than-expected economic recovery resulted in net inflows of foreign portfolio investment (FPI) worth ₹2.74 trillion into India in FY21.

Significantly, there is positive momentum on the ground on the vaccination front which has improved to 3.2 million doses daily in the week to June 13 from 2.5 million as of end-May. The impact of the pandemic has not been symmetrical across society or businesses. For industries like retail, travel, hospitality and live entertainment, the pandemic has been a threat to their survival. While other industries, like healthcare, life sciences or technology, have seen their growth turbo-charged during the pandemic.

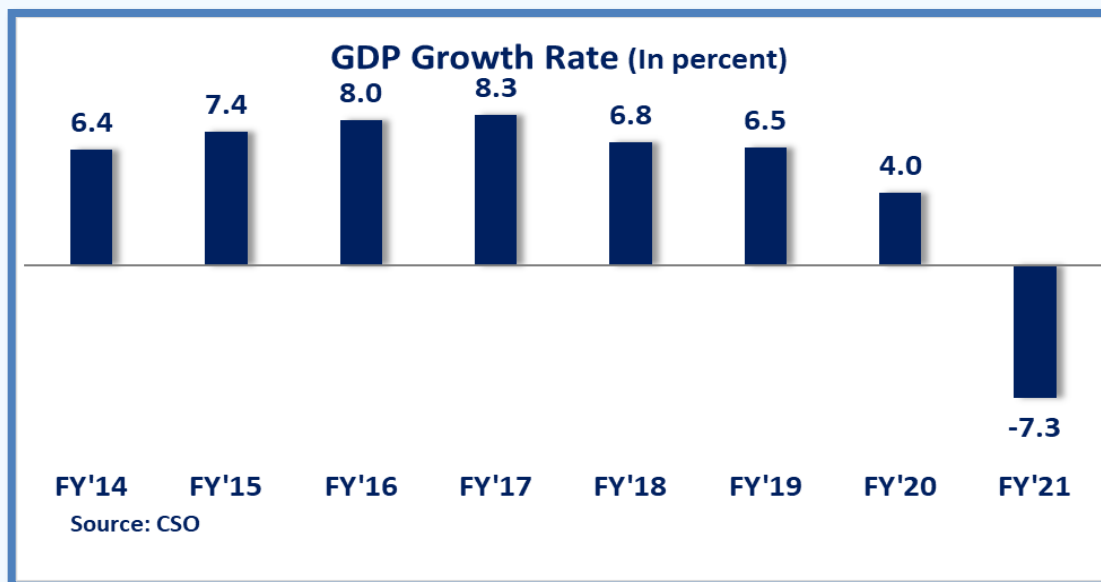
A combination of monetary, fiscal and financial market measures is needed to help the businesses and people cope with the crisis. India's recovery to its trend growth is going to be very slow, however a quick recovery in investments would not only boost demand, including through consumption.

Snapshot of Key Indicators

I. GDP Growth

India's economy had contracted during the first half of FY21, before returning to positive territory in October-December quarter with a growth of 0.4%. The economy reported growth in the December quarter after two quarters of contraction. GDP had seen revival, albeit marginally, as economic activities resumed after a long and arduous lockdown and overall sentiment improved with the rollout of vaccination drive.

Figure 1: India's GDP Growth (year-on-year in percent)

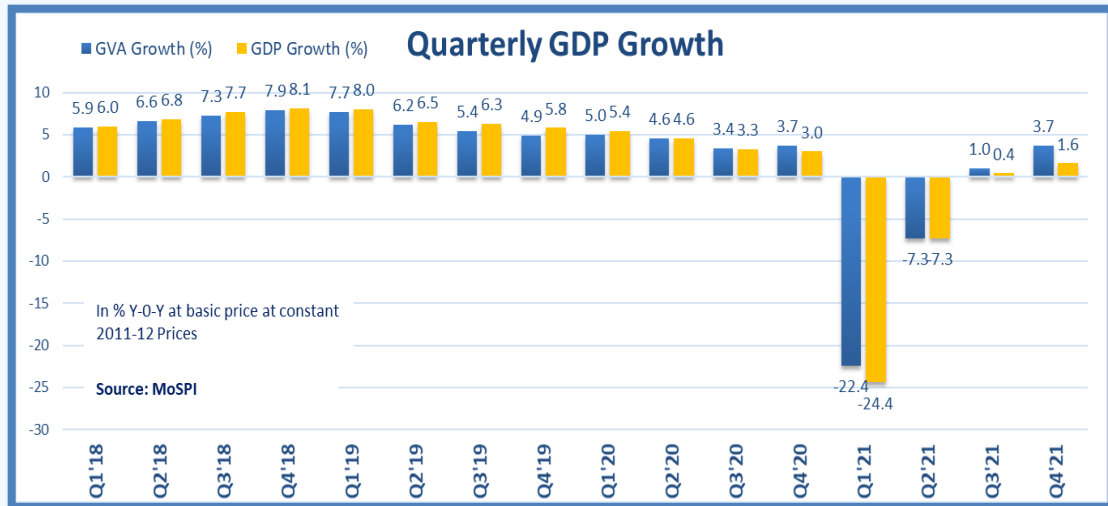


In the April-June quarter of FY21, the economy shrunk by 24.4%, which improved to -7.3% contraction in July-September.

Estimates including growth rates of Q1, Q2 and Q3 of 2020-21 released earlier have been revised in accordance with the revision policy of National Accounts. The Q3 GDP growth has been revised from 0.5% to 0.4% earlier, while Q2 GDP de-growth stands at -7.4% compared to -7.3% earlier.

India's gross domestic product (GDP) expanded 1.6% in the March quarter of FY21, but contracted 7.3% in the full financial year. As per the government, the improvement in the quarter was due to calibrated and steady opening of the economy.

Figure 2: Quarterly GDP Growth (in percent)



This is the second quarter in a row in which the GDP has shown growth after being ravaged by the novel coronavirus pandemic since March, 2020. In the October to December quarter, Indian economy had grown at 0.4%, pulling out of a steep pandemic-induced recession in earlier six months.

GDP at Constant (2011-12) Prices in Q4 of 2020-21 is estimated at ₹38.96 lakh crore, as against ₹38.33 lakh crore in Q4 of 2019-20, showing a growth of 1.6%, the government data stated.

The GDP for the financial year 2020-21 is now estimated to attain a level of ₹135.13 lakh crore, as against the First Revised Estimate of GDP for the year 2019-20 of ₹145.69 lakh crore, released on 29th January 2021, the data by Ministry of Statistics & Programme Implementation (MoSPI) stated.

During the March quarter, the gross value added (GVA), which is a more accurate way of assessing the actual growth in the economy, grew 3.7% as against 1% in the December quarter.

The measures taken by the Government to contain the spread of the Covid-19 pandemic have had an impact on economic activities as well as on data collection mechanisms.

As per the Chief Economic Adviser, the momentum of GDP growth has been affected by the second wave but overall economic impact of second COVID-19 wave not likely to be very large. Foodgrains production is expected to be at record levels in this year and coming year given the normal monsoon that has been predicted by the IMD. This is reflected both in cereals (rice and wheat) and pulses. The demand in rural India has been resilient.

A fiscal push on capital spending and some green shoots in private spending seem to have played an important role in the faster than expected recovery in the quarter ending March 2021.

The Q4FY21 GDP growth of 1.6% reflects the full impact of unlocking of the economy post COVID-19 shock (of first wave). While the second wave of infections has been much more severe, the absence of a stringent nationwide lockdown has been a positive.

The impact during the second wave has been more pronounced on consumer sentiment and mobility rather than economic activity. The rebound in consumer spending would hence be more gradual than wave 1 with vaccination being the key driver.

While pent-up demand for everything from mobile phones to cars revived consumption in Asia's third-largest economy after it reopened last year from one of the strictest lockdowns that lasted more than two months, India's status now as the global virus hotspot could hurt those prospects.

India had slipped into a technical recession during July-September when GDP fell for two successive quarters. In the July-September quarter, India's GDP contracted 7.5% year-on-year. The economy shrank 23.9% year-on-year in the April-June quarter in the wake of coronavirus outbreak and nationwide lockdown to prevent the virus. The government has revised the GDP growth for June and September quarters to -24.4% and 7.3% respectively against earlier estimates of -23.9% and -7.5%.

Meanwhile, India's fiscal deficit for 2020-21 ballooned to a record last year, as the government borrowed more to spend its way out of the pandemic-induced slump. The fiscal gap for the year ended March 31 touched 9.3% of GDP. That's the widest on record, and is narrower than the government's revised 9.5% goal set in February.

The better estimated numbers have been driven by an exceptional performance by the construction sector which grew by 14% in Q4. Utilities which include gas, electricity, water supply performed better with 9.1% growth. On the other hand, services comprising hotels, trade, transport contracted by 2.3%.

The economy has shown signs of improvement compared to the previous quarters, but the current Covid-19 situation in the country has forced the forecasters to trim their GDP projections for both Q4 and Q1 of FY22.

An analysis of the Gross Value Added (GVA) data by sectors for the quarter ending March shows that construction (14.5%) and manufacturing (6.9%) saw the biggest sequential improvement in growth.

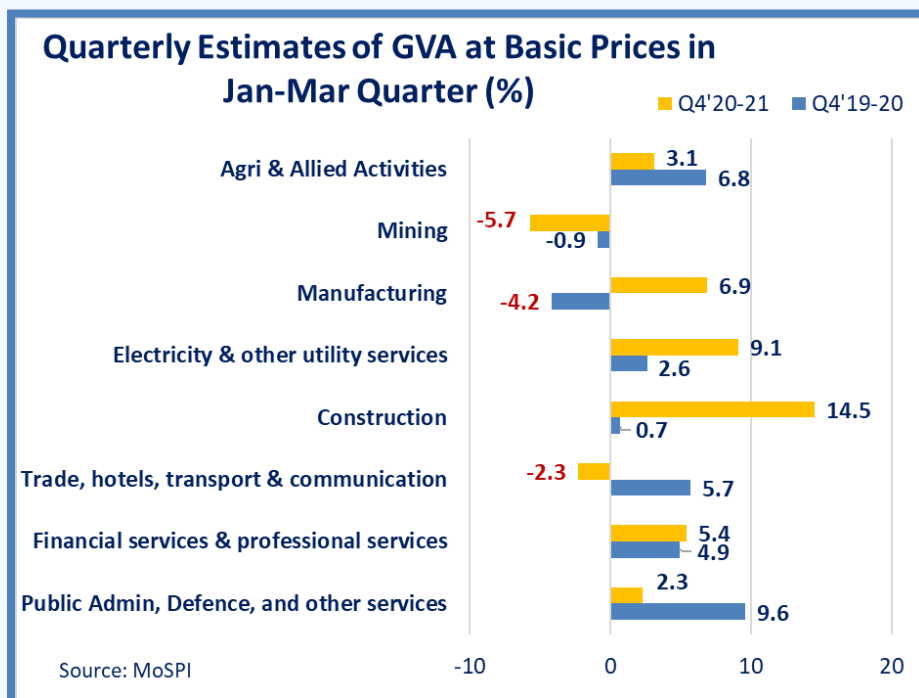
The labour-intensive service sectors of trade, hotels, transport, communication and broadcasting services remained in contraction zone (2.3%) despite a significant improvement in mobility levels in the quarter.

Agriculture grew at 3.1%, a moderation compared to the 4.5% growth seen in the quarter ending December 2020.

Private final consumption expenditure came out of the contraction zone for the first time in 2020-21 in the quarter ending March 2021 with a growth of 2.7%.

Government final consumption expenditure jumped by massive 28.3%. Gross Fixed Capital Formation, which measures investment, grew by 10.9%.

Figure 3: Quarterly GVA Growth (in percent)



Construction, manufacturing, financial services and agriculture showed positive Gross Value Added (GVA) growths in the fourth quarter of last fiscal year, driven largely by pent-up demand in the first three and stupendous growth in output in the fourth, as per experts.

However, the growth in the key sectors of construction and manufacturing driven largely by pent-up demand also holds ominous signs for the current quarter as the second wave of Covid-19 is seen to have affected that very part of the economy, the experts added.

Among the four, construction registered a healthy growth of 14.5% in the January to March quarter of 2020-21 as consumers scrambled to complete their purchases that had been struck due to the extended lockdown and slow growth in the first three quarters.

The sharp slowdown in Covid cases post January and easing up of all restrictions also seemed to have built on the positive sentiment.

In the case of manufacturing, growth in the fourth quarter of FY21 rose to 6.9% as against a negative growth of 4.2% in the previous quarter as factories and industries started functioning in full steam.

In the case of agriculture and allied activities, data showed that growth at constant prices in the fourth quarter was down to 3.1% as compared to 6.8% during the comparable period in the previous financial year.

This was largely due to high base effect as production of agriculture commodities was robust in the kharif season.

However, at current prices, GVA of agriculture and allied activities in Q4 of 2020-21 was estimated at 5.1% down from 14.8% in the same period last year.

Kharif foodgrains production in the 2020-21 crop year (July to June) is estimated to be at a record 148.36 million tonnes, which is 3.16% more than the previous year.

While most analysts had projected a double-digit growth in FY22, albeit on a lower base, the second wave of COVID-19 pandemic and lockdowns imposed by state governments to control the surge in cases have led to revisions in growth estimates. For the first quarter of 2021-22, median forecasts by rating agencies and major economists stand at 21.6%, which is lower than 23% predicted earlier.

As per analysts, whether growth will be in double digits or single digits, there is uncertainty. Some of the scientists are talking about the possibility of a third wave too. It would be speculative to tell exact numbers, stressing that vaccination is important for the health of the people as well as the health of the economy.

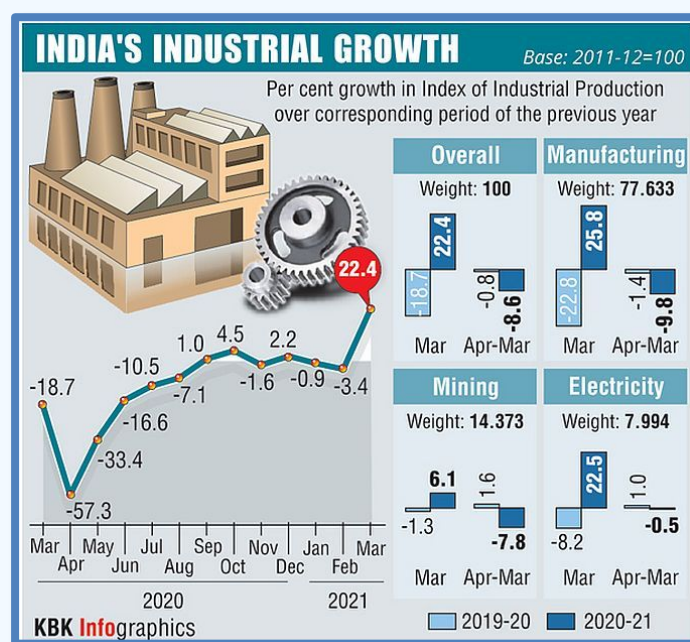
With a lower contraction in GDP as well as GVA in 2020-21, the sharp recovery projected for 2021-22 by a number of agencies like the IMF at 12.5% and the RBI at 10.5% may have to be moderated. These projections were done prior to the impact of the second COVID wave. The combination of the second wave and the revised base effect may imply a lower GDP growth for the Indian economy for 2021-22, may be in the range of 9-9.5%.

II. IIP – Index of Industrial Production

India’s factory output climbed 22.4% in March, benefiting from the base effect of the lockdown-marred month a year back as well as a turnaround in the manufacturing sector, while retail inflation slipped to a three-month low of 4.29% in April.

The high positive annual growth in the index of industrial production (IIP) in March 2021 came on back of a contraction of (-)0.9% and (-)3.4% in January and February 2021 respectively, according to the data released by the National Statistical Office (NSO).

Figure 4: Index of Industrial Production (IIP)



This turnaround was led by recovery in the mining, manufacturing and electricity sectors. Also, it benefited from the base effect as most parts of the country were under lockdown in March 2020 and the IIP gauge had recorded a massive contraction of (-)18.7%. The gross generation of electricity in FY21 almost reached the levels in FY20 despite the lockdown driven disruption, implying that higher residential power demand largely offset the drop in demand from industrial and commercial activity.

While there is a broad-based uptick in manufacturing on a year-on-year basis due to the base effect, there has been a heightened activity in the export driven sectors and particularly refined petroleum products in March 2021.

The manufacturing sector — which constitutes 77.63% of IIP — grew by 25.8% in March 2021. The mining sector output too grew 6.1% in March, while power generation increased by 22.5%. Consumer durables recorded the highest YoY expansion of 54.9% in March 2021.

However, this is attributable to the low base, with a sequential growth of just 3.0% over the level in February 2021, trailing the 5.9-15.9% month-on-month (MoM) expansion recorded by the other categories.

Industrial production had plunged 18.7% in March last year following the COVID-19 outbreak and remained in the negative zone till August 2020.

With the resumption of economic activities, factory output posted a rise of 1% in September. The IIP had grown by 4.5% in October. In November 2020, the factory output fell 1.6%, and it again entered the positive territory by growing 2.2% in December 2020. The output of capital goods, which is a barometer of investment, grew by 41.9% in March 2021, as against a contraction of 38.3% a year ago.

Consumer durables manufacturing increased by 54.9% in the month under review, compared to a 36.8% decline in March 2020. Consumer non-durable goods production grew 27.5% in March this year, compared to a contraction of 22.3% in the year-ago period. During 2020-21, the IIP contracted 8.6% as against 0.8% contraction in 2019-20.

The IIP rose to 5.2% in Q4 FY2021 (+1.7% in Q3 FY2021), driven by manufacturing (+5.8%) and electricity (+9.2%). In addition, all the use-based categories also recorded a YoY growth in Q4 FY2021.

Table 1: Use based Classification of (IIP)

Trend in IIP Growth										
	Sectoral				Use-Based Classification					
	IIP	Mining	Manufacturing	Electricity	Primary	Capital	Intermediate	Infrastructure/ Construction	Durables	Non-Durables
Weight	100%	14.4%	77.6%	8.0%	34%	8.2%	17.2%	12.3%	12.8%	15.3%
Month										
Feb-19	0.2%	2.2%	-0.3%	1.3%	1.3%	-9.3%	-5.0%	1.9%	0.9%	5.0%
Mar-19	2.7%	0.8%	3.1%	2.2%	2.6%	-9.1%	12.4%	5.1%	-3.2%	1.4%
Feb-20	4.6%	9.7%	3.1%	11.5%	8.3%	-9.5%	19.4%	-0.1%	-5.8%	1.5%
Mar-20	-16.7%	0.0%	-20.6%	-6.8%	-3.1%	-35.6%	-18.5%	-23.8%	-33.1%	-16.2%
Feb-21	-3.4%	-4.4%	3.7%	0.1%	4.7%	-3.8%	-5.0%	-4.0%	6.6%	-4.5%
Mar-21	22.4%	6.1%	25.8%	22.5%	7.7%	41.9%	21.2%	31.2%	54.9%	27.5%
FY2019	3.8%	2.9%	3.9%	5.2%	3.5%	2.7%	0.9%	7.3%	5.5%	4.0%
FY2020	-0.7%	1.7%	-1.3%	1.1%	0.8%	-13.7%	8.8%	-4.0%	-8.4%	0.5%
FY2021	-8.6%	-7.8%	-9.8%	-0.5%	-7.0%	-19.2%	-9.7%	-9.1%	-15.2%	-2.3%

Source: National Statistical Office (NSO); CEIC; ICRA research

Notably, all the 23 sub-sectors of manufacturing recorded an improvement in performance in March 2021 relative to February 2021.

Out of these, 14 sub-sectors (with a weight of 49.8% in the IIP) reverted to a YoY growth in March 2021 from a YoY contraction in February 2021; this sub-set includes food products (to +18.8% in March 2021 from -1.4% in February 2021), beverages (to +22.2% from -12.8%), textiles (to +16.5% from -4.7%), wearing apparel (to +25.2% from -14.2%), wood and wood products (to +45.4% from -5.3%), pharma, medicinal chemical and botanical products (to +35.2% from -5.9%), machinery and equipment N.E.C. (to +41.3% from -1.4%), etc.

Moreover, the pace of YoY expansion in six of the 23 sub-sectors (with a weight of 14.6% in the IIP) increased in March 2021 relative to the previous month; this sub-set includes rubber and plastics products (to +46.7% from +2.3%), computer, electronic and optical products (to +74.7% from +21.1%), electrical equipment (to +50.3% from +3.1%), motor vehicles, trailers and semi-trailers (to +77.7% from +5.6%), other transport equipment (to +31.4% from +3.5%) and other manufacturing (to +48.7% from +3.0%).

Further, three subsectors (with a weight of 13.3% in the IIP) displayed a narrower YoY contraction in March 2021, relative to February 2021, including coke and refined petroleum products (to -1.6% from -9.5%), tobacco products (to -4.6% from -7.8%), and printing and reproduction of recorded media (to -3.1% from -28.4%).

Following five consecutive months of contraction, the output of mining posted a YoY expansion of 6.1% in March 2021 (-1.3% in March 2020) from the revised YoY decline of 4.4% in February 2021 (+9.6% in February 2020). This is in line with the improvement in the performance witnessed in the output of natural gas (to +12.3% from -1.0%) and crude oil (to -3.1% from -3.2%) in March 2021 relative to February 2021. In contrast to the output of coal (to -21.9% from -4.4%) witnessed a deterioration in the above period.

III. Core Industries Performance

The growth of India's eight key infrastructure segments reached a 32-month high of 6.8% in March compared to a year earlier, mainly due to a low base. The core sector output had contracted 37.9% in April last year, with the imposition of a nationwide lockdown. While the pace of contraction declined in the subsequent months, positive growth was seen only in December and January. In February, it contracted 3.8% after mild growth in the previous months.

The cumulative growth during April-March (2020-21) was 7%.

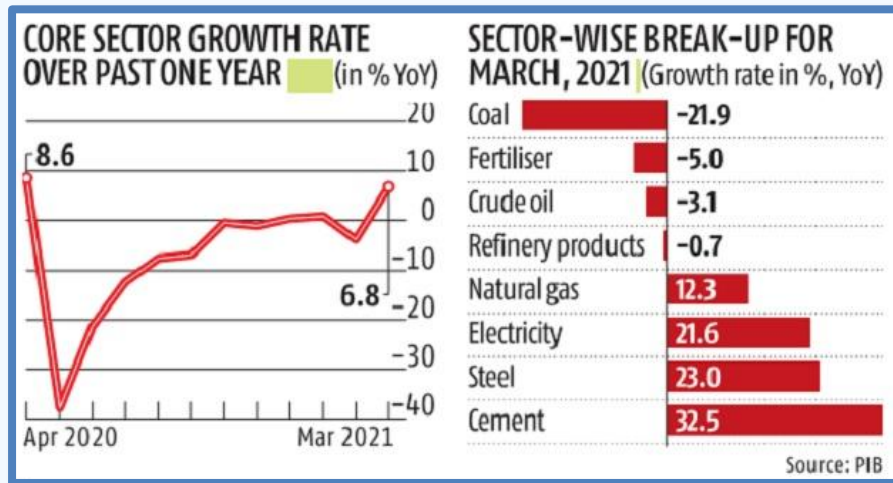
Experts have suggested a sharp growth in March should be interpreted with caution and the trend will continue to be the same over the next two months.

The March, April, and May growth numbers for the core sector and industrial growth were expected to be high and misleading as they come on the back of sharp declines registered last year. March was just the beginning of the lockdown, which pushed back economic activity after which there were even sharper declines.

Out of the eight sectors, steel, cement, electricity, and natural gas witnessed double-digit growth in March. A closer look at the data showed that steel and cement output also declined sharply in March as compared to a year earlier. The sharp rise to some extent can be attributed to the base effect as the government imposed a nationwide lockdown in the last week of March 2020.

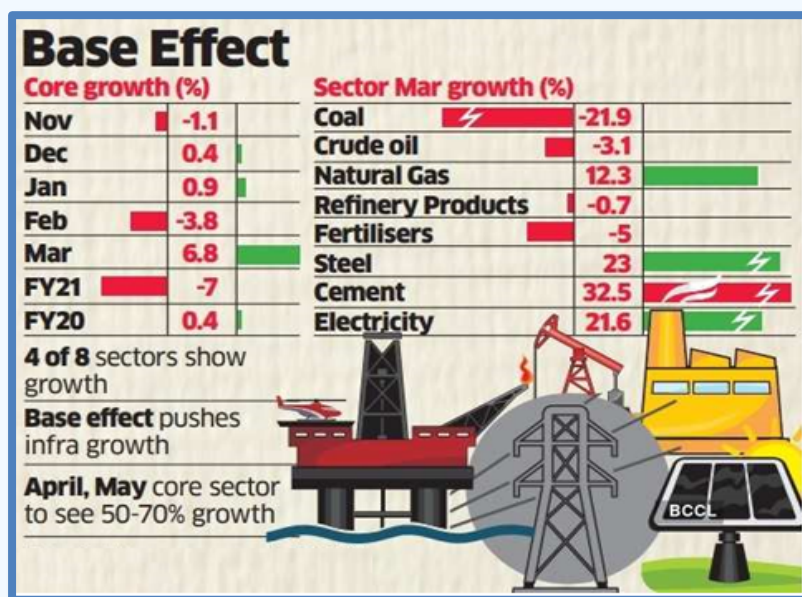
However, also the end-of-the-year phenomenon of infra projects being on track did provide impetus to cement and steel in particular. States and the Centre have been expediting their capex, which gets reflected in these numbers.

Figure 5: Core Industries Growth Rate (in percent)



Coal production declined by 21.9% in March, 2021 over the same period last year. Meanwhile, Crude Oil production declined by 3.1% in March. Steel production in the month increased by 23% in the month of March, showed government data. Cement production, which has a weight of 5.37% increased by 32.5%. Coal, crude oil, refinery products and fertiliser segments recorded negative growth during the month under review.

Figure 6: Core Industries Sectoral Growth Rate (in percent)



The low base of the lockdown-hit April 2020 would push up the year-on-year expansion of the index of eight core industries to a sharp 50-70% in April 2021, with exceptionally high growth expected in cement and steel.

IV. Current Account Deficit and Balance of Payments

India moved to a current account surplus for the first time in over a decade in the January-March quarter last year and touched a record \$19.2 billion in the April-June quarter. The three consecutive current account surpluses were largely caused by a decline in India's trade deficit, which narrowed due to the COVID-19 pandemic and was also impacted by a related drop-in domestic economic activity.

India's economy returned to growth in the three months to December, expanding 0.4% year-on-year, and the recovery is expected to gather pace as consumers and investors shake off the effects of the COVID-19 pandemic.

Capital account surplus improved to record high level in Q3FY2021.

India's current account balance recorded a deficit of US\$ 1.7 billion (0.2% of GDP) in Q3FY2021 after a surplus of US\$ 15.1 billion (2.4% of GDP) in Q2FY2021 and US\$ 19.0 billion (3.7% of GDP) in Q1FY2021; a deficit of US\$ 2.6 billion (0.4% of GDP) was recorded a year ago [i.e., Q3FY2020].

Underlying the current account deficit in Q3FY2021 was a rise in the merchandise trade deficit to US\$ 34.5 billion from US\$ 14.8 billion in the preceding quarter, and an increase in net investment income payments.

Net services receipts increased, both sequentially and on a year-on-year basis, primarily on the back of higher net export earnings from computer services.

Private transfer receipts, mainly representing remittances by Indians employed overseas, declined marginally on a y-o-y basis but improved sequentially by 1.5% to US\$ 20.7 billion in Q3FY2021.

Net outgo on the primary income account, primarily reflecting payments of investment income, increased to US\$ 10.1 billion from US\$ 7.4 billion a year ago.

In the financial account, net foreign direct investment (FDI) recorded robust inflow of US\$ 17.0 billion as compared with US\$ 9.7 billion in Q3FY2020.

Net foreign portfolio investment (FPI) was US\$ 21.2 billion as compared with US\$ 7.8 billion in Q3FY2020, primarily reflecting net purchases by foreign portfolio investors in the equity market.

With repayments exceeding fresh disbursements, external commercial borrowings to India recorded net outflow of US\$ 1.7 billion in Q3FY2021 as against an inflow of US\$ 3.2 billion a year ago.

On Balance of payments basis, there was an accretion of \$32.5 billion to the foreign exchange reserves in Q3FY21 as against \$21.6 billion in Q3FY20. Also, the addition to foreign exchange reserves was \$83.9 billion in April-December 2020 as against \$40.7 billion in April- December 2019.

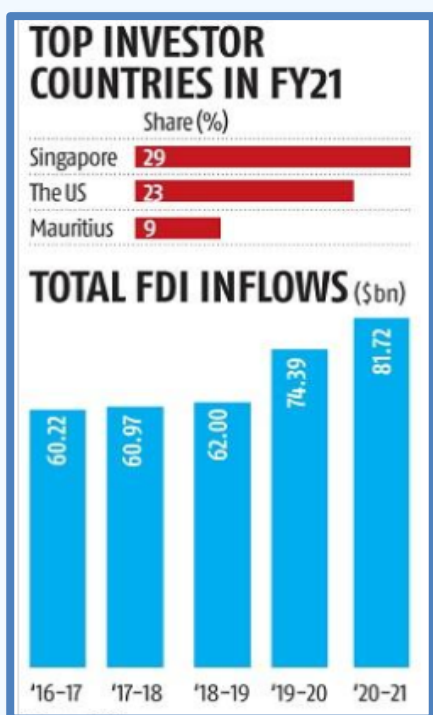
V. FDI

In a pandemic-ravaged year, India managed to rake in the highest ever foreign direct investment during financial year 2020-21.

India received \$81.72 billion foreign direct investment (FDI) in FY21, the highest ever and 10% more than what was received in the year before, with Singapore, US and Mauritius being the top investors.

The boost in FDI inflow in the year ending March comes in the backdrop of a series of policy steps taken to improve ease of doing business and to attract investments into domestic manufacturing capacity and an ambitious infrastructure project pipeline.

Figure 7: FDI Inflows



Foreign direct investments (FDI) into the country grew 19% to USD 59.64 billion during 2020-21 on account of measures taken by the government on the fronts of policy reforms, investment facilitation and ease of doing business.

Figure 7: FDI Inflows

In the year before, India had attracted \$74.39 billion in FDI, as per the commerce and industry ministry. Among major investing countries, Singapore accounted 29% of the total FDI inflow into India in FY21, followed by the US which accounted for 23%, and Mauritius which accounted for 9%.

Among industries, computer software and hardware topped the investment chart in FY21 accounting for 44% share of the total FDI inflow. It is followed by construction (infrastructure) activities which accounted for 13% and services that accounted for 8% respectively.

Investments from Saudi Arabia rose sharply in FY21 to \$2816.08 million from \$89.93 million in the year before. Inflows from the US and the UK grew by 227% and 44% respectively in FY21 from the year before.

VI. Forex Reserves

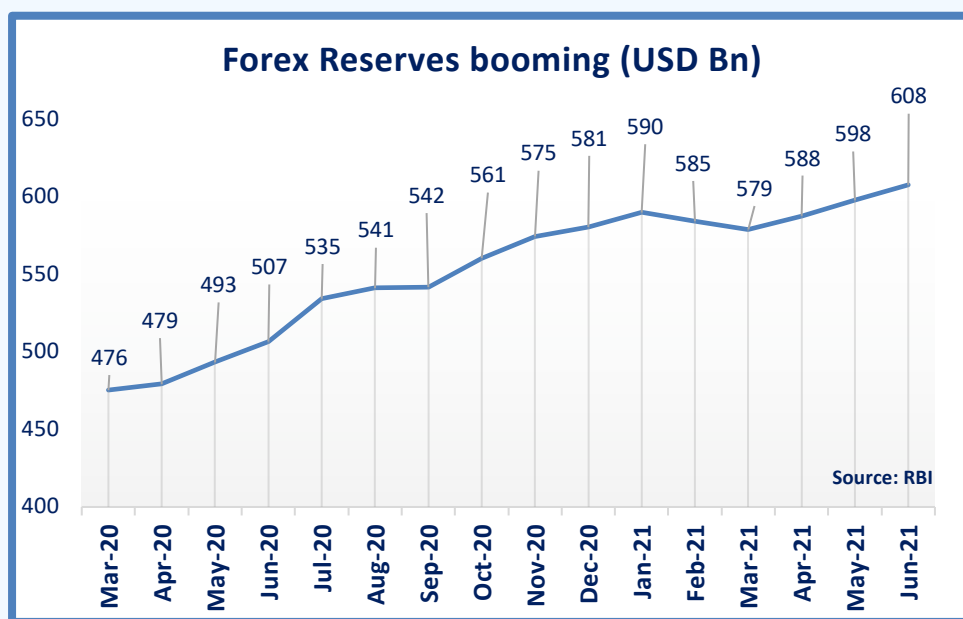
The country's foreign exchange reserves crossed the USD 600 billion mark for the first time after increasing by USD 6.842 billion in the week ended June 4, as per the Reserve Bank of India. Foreign exchange reserves surged to \$605 billion in the week to June 4 as the RBI mopped up dollars flowing into the nation's booming stock market as well as via foreign direct investments. The pile is the world's fifth-biggest after China, Japan, Switzerland and Russia, and is enough to cover 15 months of imports.

In the previous week ended May 28, 2021, the reserves had swelled by USD 5.271 billion to USD 598.165 billion.

Expressed in dollar terms, the foreign currency assets include the effect of appreciation or depreciation of non-US units like the euro, pound and yen held in the foreign exchange reserves.

Gold reserves declined by USD 502 million to USD 37.604 billion. The special drawing rights (SDRs) with the International Monetary Fund (IMF) dipped USD 1 million to USD 1.513 billion.

Figure 8: Forex Reserves

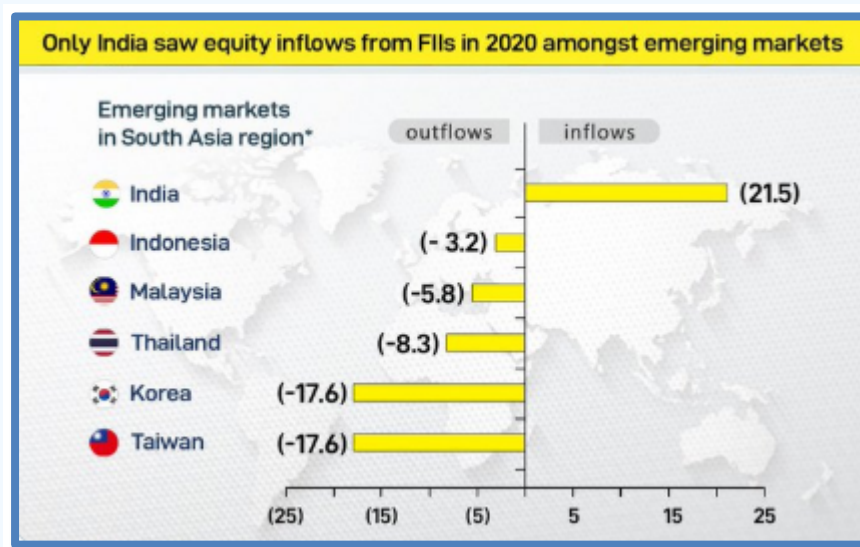


VII. FII Flow and Stock Market

For the first time, buying by foreign institutional investors (FIIs) had crossed Rs 50,000 crore in a month in November 2020. The inflow increased considerably, especially after the end of the election in the United States and weakness in the dollar index. Another major reason behind such a large inflow is the expected stimulus worth trillions of dollars from central banks to revive economies that are hit hard by the Covid-induced lockdown. 2020 was the second year in a row when FII inflows into Indian equities were highest among emerging markets. In 2019, the inflow was \$14.2 billion.

Indian equities received ₹1.6 lakh crore (\$23 billion) from foreign institutional investors in 2020, the highest among emerging markets. India was the only country that had significant inflows from foreign investors, while other emerging markets saw major outflow this year.

Figure 9: India saw highest FIIs inflows in 2020 amongst emerging markets



The broad theme is predicated on revival in consumer demand. FPIs have learnt that for an economy with a population of 1.30 billion and per capital income just \$2,000, there is a humongous opportunity for consumer stocks. Banks are not just a consumer story but they also represent the best proxy for the India story. After all, any bounce in consumer demand or capital investment revival has to be led by the banks. That consumer driven approach of FPIs also explained why they have been betting on themes like consumer discretionary, consumer staples, NBFCs and insurance. All these sectors represent the best front-loaded bets on the revival of consumer demand.

FPIs sold about \$2 billion or so in the last couple of months, but before that from January to March they bought about \$6-6.5 billion. If we look at it all the way from the early part of 2020, India and China got the bulk of FPI inflows.

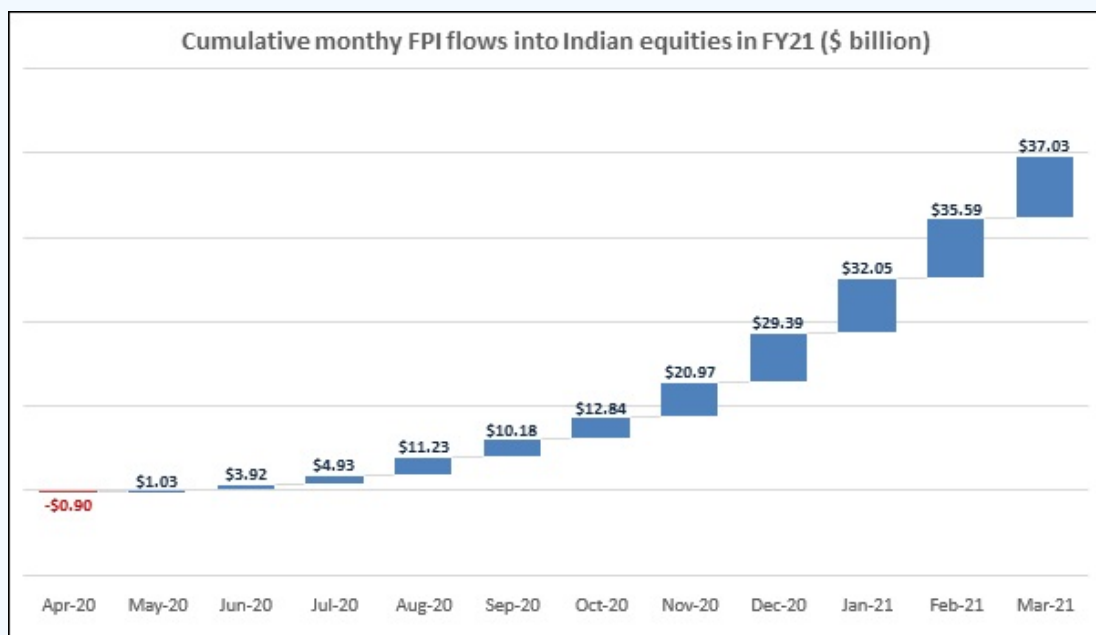
In the year-to-date period, foreign portfolio investors have bought local stocks worth a net of over \$2.1 billion, which is 10 times the inflow seen by South Korea in the same period and seven times that seen by Indonesia, according to data compiled by brokerage firm CLSA Asia-Pacific Markets. On a 12-month rolling basis, Indian equities have seen \$34.3 billion in net inflows from FPIs, almost \$20 billion more than the net inflows seen by Brazil.

India received more than \$23 billion in FII flows last calendar year when most Asian and emerging markets witnessed outflows. The flows were a combination of India's stronger economic recovery, weakness in Dollar Index and steady currency.

In March 2020, FPIs had withdrawn a total of \$16.50 billion from equity and debt combined, the biggest single month withdrawal in history.

The FPI flows into equities in FY21 are the highest single-year flows by a margin. The only other two occasions since the global financial crisis when we saw over \$20 billion infusion into equities were \$24.29 billion in FY11 and \$25.83 billion in FY13.

Figure 10: Cumulative monthly FPI flows into India FY 21



Data Source: NSDL

While FY21 was the best year in terms of FPI flows into equities at \$37.03 billion, FY15 remains the year that saw record overall FPI flows of \$45.7 billion. Expectations of major economic reforms from the Modi government and the opening up of debt market for FPIs in a bigger way led to record flows in FY15.

If one looks at overall FPI flows, then FY11 and FY13 are not too far behind FY21. What triggered this massive FPI flow into Indian equities in FY21?

There were a number of reasons that triggered this \$37 billion FPI flow into India in the previous fiscal year.

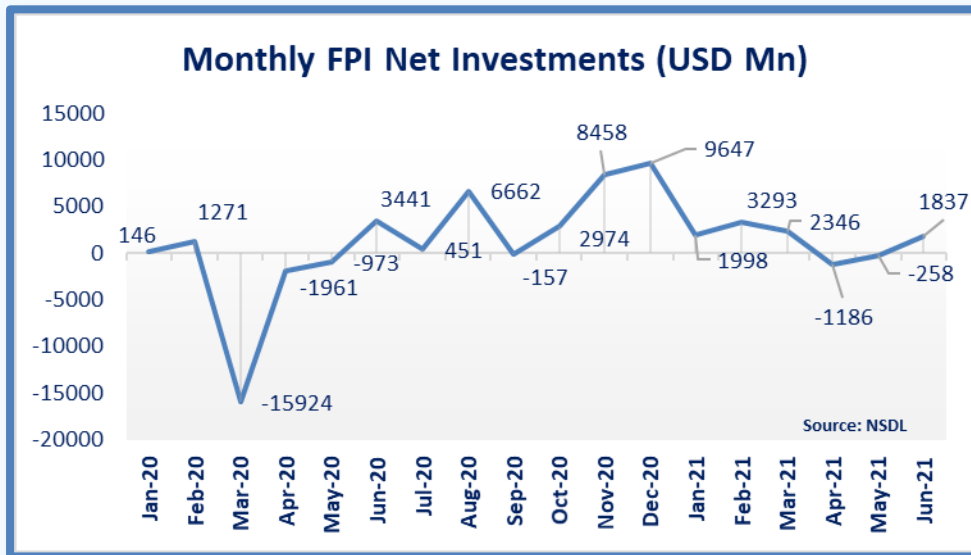
a) Government's reaction to the COVID pandemic was swift and decisive. Not only in terms of announcing the lockdown, but it also showed alacrity in announcing 125 bps rate cut and an overall fiscal-cum-monetary package of \$400 billion. That is something FPIs certainly appreciated.

b) Global liquidity was a factor and a good chunk of the \$10 trillion of liquidity infused by global central banks found its way into risky assets, including EM equities. With the kind of liquidity sloshing around, valuations and profits really did not seem to matter. Hopes that India would grow fastest among G-20 nations in FY22 also helped.

c) An important policy shift was to treat the overall sectoral cap for various industry groups as the FPI cap limit too. This offered sufficient legroom for FPIs to expand their exposure to various frontline stocks. This also effectively led to major index providers like MSCI raising India's weightage in the EM indices. This attracted a good deal of passive flows.

d) Finally, there were some procedural changes that also helped in terms of easing investment rules for FPIs. The implementation of the Common Application Form or CAF was a major boost to simplification of FPI onboarding. This CAF could be used for registration with SEBI, PAN application as well as opening bank and demat accounts.

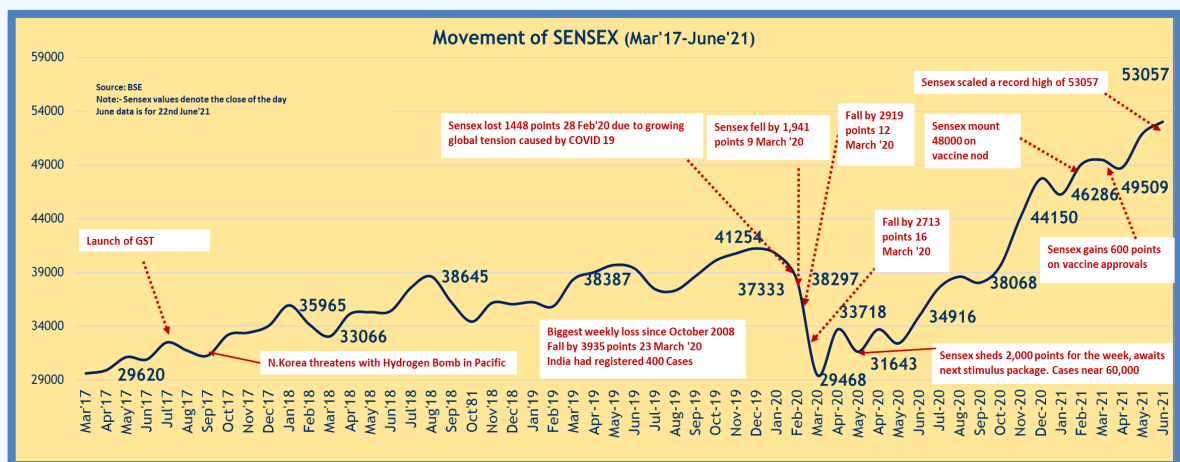
Figure 11: Monthly FPI Net Investments



Data Source: NSDL

FPIs admit that most Asian markets offer stocks at much better valuations than India. However, the risk is that they are either too commodity driven or too US dependent or too China dependent. India is perhaps one economy that offers the advantage of a huge captive domestic market. Till that advantage exists, Indian markets may continue to entice FPIs.

Figure 12: Stock Market Performance



Sensex climbed mount 48,000 as investors cheered Covid-19 vaccine nod in Jan 2021 first week. Investors were also enthused by the signs of a recovery in India’s manufacturing sector. The equity markets in Asia rose on the back of optimism about the roll-out of coronavirus vaccines and hopes of a continued central bank and government support to economic recovery, especially in the western nations.

BSE Sensex began the new decade with a milestone of breaching the 50,000-mark for the first time since its inception in 1986. The pulse of the domestic stock market of India recorded this high after a turbulent last year. The coronavirus crisis had directed the benchmark to hit record lows in the late March of 2020.

The comeback of Sensex began in April 2020, going through a bumpy ride on the back of government introduced stimulus measures. However, it largely remained between 30,000 and 40,000 for most of the months of 2020.

The rise in the index has been fueled by foreign buying, with overseas investors pouring \$2.6 billion into Indian equities in January after record net purchases last quarter. Prospects of a bounce back in earnings after the economy reopened following coronavirus-triggered lockdowns have spurred investor confidence. In 1990, the Sensex had touched the 1,000 mark for the first time.

The Indian stock market has ignored economic setbacks due to the pandemic, surging to a market capitalization that crossed \$3 trillion for the first time on 24th May 2021, marking a stellar run from the bottom of the crash last year. It comes 14 years after the combined value of listed companies in India crossed \$1 trillion for the first time, on 28th May 2007.

India stood 8th among the top 10 in market capitalization globally in May end.

Figure 13: India’s rank in market capitalization

United States	47,495
China	11,352
Hong Kong	7,000
Japan	6,746
United Kingdom	3,704
France	3,322
Canada	3,122
India	3,009
Germany	2,801
Saudi Arabia	2,566

India tops the one-year returns list among the major markets. (as on May end 2021)

Figure 14: India tops one-year return among major markets

Country	Return (%)	
	YTD	1Y
World	9.25	49.24
India	16.05	85.35
South Korea	6.18	80.92
Canada	20.65	63.53
Taiwan	11.42	62.97
Australia	8.6	62.77
France	12.9	62.38
China	4.13	55.31
United States	11.38	51.26
United Kingdom	12.79	47.95
Germany	12.38	46.26

It may be noted that Sensex has gained over 10% on over 4,800 points since the beginning of this year and nearly 57% in the one-year period. Meanwhile, Nifty has gained over 13% or over 1,800 points since the beginning of the calendar year 2021.

Stock markets have been on a dream run since last year after falling sharply post the first wave of the pandemic. While India's economy is yet to recover and is again staring at a slowdown, markets have not been affected.

Last year, markets witnessed a sharp correction for a few months after the strictest lockdown in the world was imposed in India to limit the pandemic. However, it did not take long for stock markets to recover the losses as soon as the unlock process started.

The pace at which markets took off after the recovery left many analysts surprised last year, but the rally made many investors much richer than they were before the pandemic. This year, however, analysts are confident about the market outlook as companies are better poised to tackle the evolving situation.

Stock markets have continued their strong run this year and are now hitting fresh record highs almost every day.

At this point, markets are likely to be supported by positive news about improving Covid situation and rising corporate profits.

There are chances that the market benchmarks will rise at a quicker pace after the Covid situation comes fully under control and there is no third wave. Therefore, the near-term sentiment looks good for Indian markets, especially at a time when global markets are doing very well.

Indian stocks will continue to command value, perhaps even more than now, depending on the pace at which the real economy canters back to normal activity. Until that happens, the risk of an asset bubble will always remain.

Benchmark stock market indexes have been gaining for the past few months despite the economic impact of the Covid-19 pandemic. Both S&P BSE Sensex and NSE Nifty 50 have hit fresh record highs with sentiments improving across the board.

Stock market analysts remain bullish about the future and are certain that the growth momentum will continue without any disruption. Several reports and polls also suggest that domestic stock markets are likely to grow rapidly due to positive company results and improving Covid-19 situation.

VIII. India's Trade

The country's exports jumped by 58.23% to \$34 billion, the highest ever reached in a month, in March as key sectors such as engineering, gems and jewellery and pharmaceuticals recorded healthy growth rate during the month. Such a whopping growth in exports during the month also helped in taking the merchandise exports to over \$290 billion during such difficult and torrid times.

Exports during April-March 2020-21, however, dipped by 7.4% to \$290.18 billion compared to \$313.36 billion in 2019-20.

Imports during 2020-21 contracted by 18% to \$388.92 billion compared to \$474.71 billion during 2019-20. In March 2020, the exports stood at \$21.49 billion, showing a decline of about 34% over March 2019 due to global slowdown induced by the Covid-19 crisis.

Led by a sharp growth in exports of gems and jewellery, engineering goods and petroleum products, and supported by base effect India's outbound goods shipments in April rose a record 197.03% to \$30.21 billion. Exports had contracted a sharp 60.28% in April last year due to the national lockdown and halt in manufacturing to curb the spread of the Covid-19 pandemic.

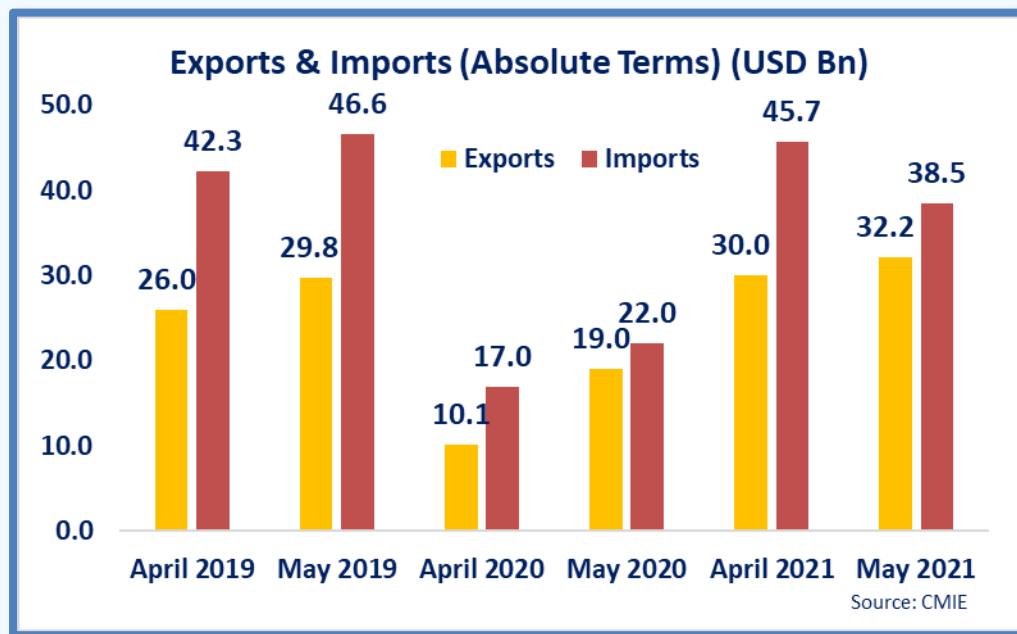
In the first month of 2021-22, goods imports rose 165.99% to \$45.45 billion, widening trade deficit to \$15.24 billion during the month which was 120.34 % higher than the deficit in the same month last year.

India was thus a net importer in April with a trade deficit of \$15.24 billion, which increased by 120.34% over the trade deficit of \$6.92 billion in April 2020.

Exports and imports in April grew 16.03% and 7.2%, respectively compared to April 2019, the pre-pandemic period.

May exports up 69% to \$32 bn; trade deficit at 8-month low.

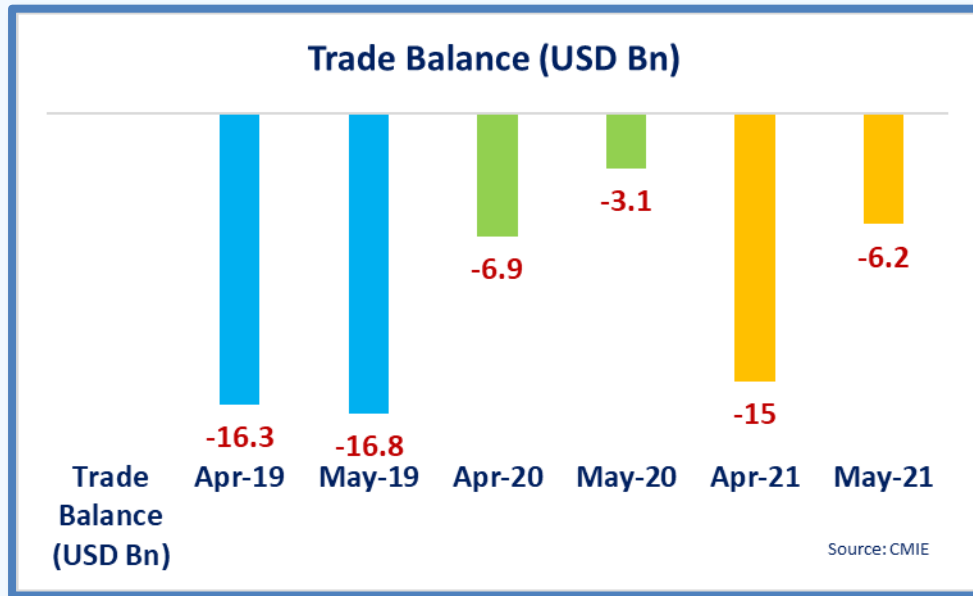
Figure 15: India's Exports and Imports



The trade deficit in goods stood at \$6.28 billion, the lowest in eight months. The trade deficit was \$15.10 billion in April and \$3.15 billion in May 2020. Imports in May were up 73.64% year-on-year to \$38.55 billion.

India's overall trade scenario continues to show a mix picture on a sequential and year-on-year comparison with the overall trade deficit in May'2021 falling sharply by around 58.4% to \$6.3 bn while on a year-on-year level, it has almost doubled. The sequential fall in the trade deficit in May'21 has been on account of sharp decline in imports (15.7% m-o-m) and higher exports (5.4% m-o-m).

Figure 16: Trade Balance



This is the third consecutive month in which exports have exceeded \$30 bn mark reflective of a faster than expected revival in the global demand following subsequent COVID19 waves and concomitant lockdowns imposed across various countries.

The sequential decline in imports has been primarily on account of 13% (m-o-m) decline in imports of crude oil and petroleum products, reflective of the lower consumption of petroleum products following the outbreak of the 2nd COVID-19 wave in India and the localized restrictions announced in most states. The decline in gold imports has also been significant in May'21 (m-o-m) while the non-oil, non-gold imports have been relatively stable in May'21.

The notable improvement across the key trade indicators compared with the corresponding month of the previous year is on account of the low base effect. Exports in May'21 have been higher than May'19, which is a positive sign for the economic recovery prospects for India.

Cumulatively for the first 2 months of the fiscal, trade deficit has widened significantly in FY22 compared with the corresponding period of the previous year, while it is lower by 35% compared with April-May'2019 (pre-pandemic year). The good sign is that total exports are almost 13% higher during April-May'21 compared with April-May'19. Imports for the first 2 months of FY22 have been 114% higher than the previous year but 5.3% lower than April-May'19.

Exports were \$32.3 bn in May'21, 5.4% higher than the previous month and 69% higher than the corresponding month of the previous year. The growth in the petroleum exports in May'21 (both m-o-m and y-o-y) has been robust. Non-petroleum oil exports grew by 55% year-on-year while they were relatively unchanged in May'21 v/s April'21. Imports dropped to \$38.5 bn in May'21, 15.7% below the April'21 number but 74% higher than May'2020. Imports are also 17% lower than May'2019. Lower oil and gold imports have been the key reason driving the decline in the total imports for May'2021.

IX. Inflation

Retail inflation hardened to a six-month high in May, joining the rising trend in wholesale inflation that also strengthened to a record, but experts said the Reserve Bank of India (RBI) may tolerate these levels for a while given concerns over growth.

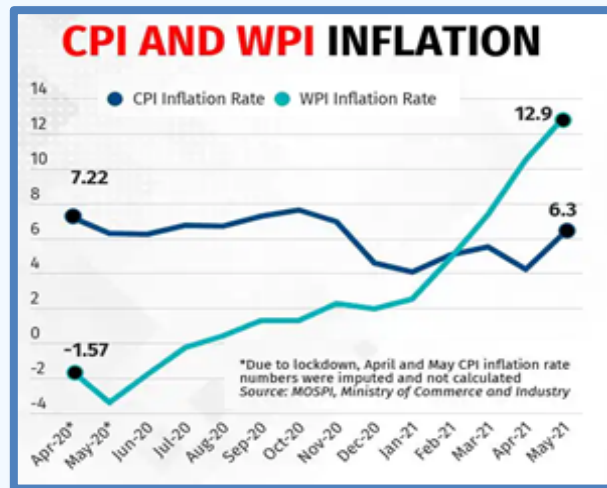
Retail inflation, as measured by the consumer price index (CPI), accelerated to 6.3% in May from 4.23% in April, breaching the upper band of the RBI's 2-6% range for the first time in six months, data from the statistics office showed.

The wholesale price index (WPI), released separately by the commerce department, showed inflation at 12.94% in May, the highest in the current series with 2011-12 as the base, magnified by the year-earlier low base. WPI inflation was -3.37% in May 2020 and 10.49% in April 2021.

In its monetary policy review earlier this month, the central bank had held rates and reaffirmed its accommodative policy as it pared the growth forecast for FY22 by a percentage point to 9.5%.

Most economists now expect the economy to grow at high single digits in FY22 against double-digit estimates at the beginning of the fiscal because of the severe second wave of the pandemic. The high rate of inflation in May 2021 is primarily due to low base effect and rise in prices of crude petroleum, mineral oils viz. petrol, diesel, naphtha, furnace oil etc. and manufactured products as compared to the corresponding month of the previous year.

Figure 17: CPI and WPI Inflation (in percent)



Food prices rose to 4.31% in May, as compared to 1.66% during the same period a year earlier and 4.92% in April. Inflation in non-food articles hit an eight-year high of 18.4% as compared to over 15.6% a month ago and a contraction of 3.9% in May 2020. Softening of food prices such as fruits, vegetables on a sequential basis is likely due to state-wise restrictions imposed to control the second wave of Covid-19.

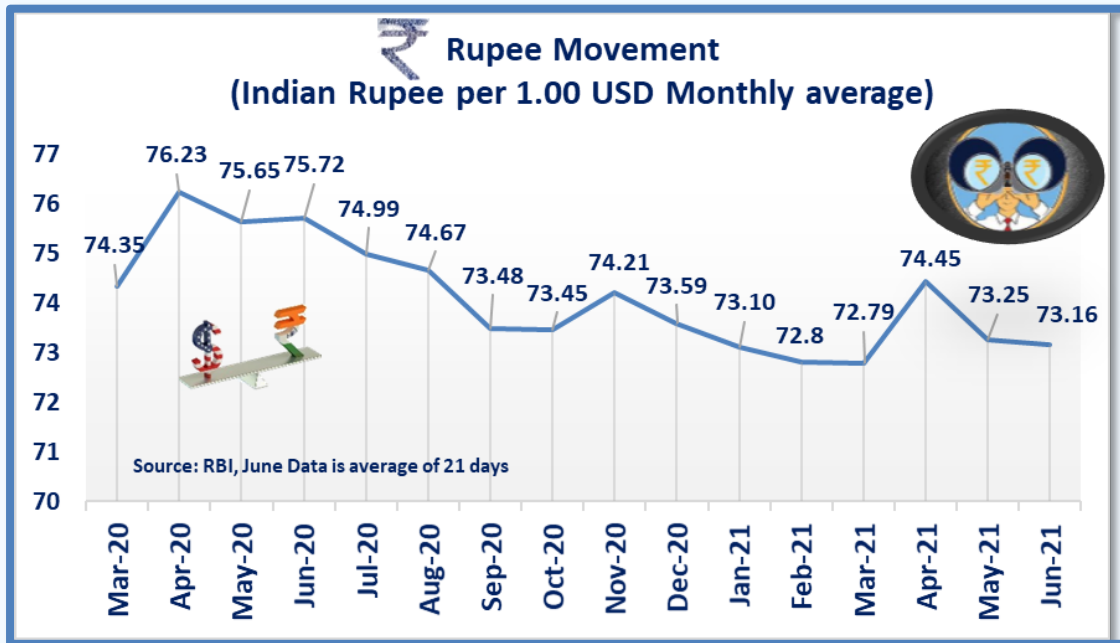
The core-WPI inflation (manufactured non-food products) hardened sharply to a series-high 10.0% in May 2021, with a broad-based uptrend across most of the sub-sectors. The core-WPI inflation is expected to climb further to a new series-high 10.4-10.9% in June 2021, and sustain in double-digits until September 2021.

X. Rupee

The Indian rupee is now the best performing currency across Asia. The financial year 2020-21 has been a roller-coaster ride for the rupee due to COVID-19. The pandemic-induced massive sell-off in the equity market led the rupee breach record low of 76.90. However, the optimism over vaccines, easing of lockdown restrictions, infusion of stimulus by governments and central banks all over the world enthused investors with a general sense of optimism, and the rupee vaulted back to the 72-73 zone.

The Indian rupee was one of the better performing Asian currencies in 2020. Right from March 2020 when the Fed started QE, a lot of currencies appreciated but Indian rupee did not appreciate that much because the central bank was buying dollars. It took INR a long time to move from 74.52-73. India's rupee was the only currency in Asia to strengthen amid march 2021 rout in risk assets, thanks to a spree of share-sale offers that are luring foreign investors.

Figure 18: Rupee Movement in last one year



The prospect of an economic recovery, a rare current-account surplus and foreign-exchange reserves more than \$600 billion have put India in a strong position to ward off the impact of the U.S. Treasury-led selloff that's roiled global risk assets. State-run companies raising dollar loans worth more than \$1 billion in March, and the central bank tolerating gains, as opposed to its preference for a weaker currency until a few months ago, have also boosted the currency's appeal.

The financial year 2020-21 has been a roller-coaster ride for the rupee due to COVID-19. The pandemic-induced massive sell-off in the equity market led the rupee breach record low of 76.90. Indian rupee had hit 8-month low as virus cases skyrocketed in second week of April.

However, the optimism over vaccines, easing of lockdown restrictions, infusion of stimulus by governments and central banks all over the world enthused investors with a general sense of optimism, and the rupee vaulted back to the 72 zone.

Shrugging off pandemic-induced economic woes, the Indian rupee has witnessed significant appreciation in the first two months of the current fiscal as dovish stance by the US Federal Reserve and other raft of factors steered the currency's overall positive trajectory, according to experts. Apart from relatively easy money approach of the US Federal Reserve, less aggressive intervention by the Reserve Bank of India (RBI) in forex market helped the rupee also emerge as the top-performing Asian currency in May.

Going ahead, analysts analyze, the USD-INR spot is likely to remain volatile amid a slew of events like hopes of plateauing Covid curve, rollout of vaccination programmes and expectations of a possible stimulus package by the Indian government to boost domestic economic activities.

Rupee depends on India's trade flows. The normalizing of trade flows should actually not be very positive for rupee but then at the same time we have a robust pipeline of FDI and FPI money coming in. Tapering by Fed, which people were expecting in May-June now looks deferred to August-September-October. From that perspective, emerging market flows would start a little bit and therefore the currency would appreciate unless the central bank intervenes.

The RBI would cap the rupee from appreciating sharply because of export competitiveness. So, the outlook for FY22 will be sideways, and analysts expect rupee to see-saw within 70-76, averaging around the 73.50-74 zone.

XI. Outlook for 2021-22: India

COVID-19, the accompanying lockdowns and the expected contraction in global output in 2020 weigh heavily on the growth outlook. The actual outturn would depend upon the speed with which the outbreak is contained and economic activity returns to normalcy. Significant monetary and liquidity measures taken by the Reserve Bank and fiscal measures by the government would mitigate the adverse impact on domestic demand and help spur economic activity once normalcy is restored.

The recent outbreak of COVID-19 and the subsequent lockdown enforced in the country are expected to bring down the aggregate demand drastically, both in rural and urban areas. The Government has announced a slew of measures like direct cash transfer to farmers, hiking wages under the MGNREGA scheme, and utilization of welfare funds for construction workers to offset the adverse impact on rural demand. However, given the severity of the pandemic, rural demand is expected to go down further at least in the near future.

Since February, India has been battling a devastating second wave of coronavirus that accelerated in April and peaked in early May. The infection forced most of India's industrial states to implement localized lockdown measures to slow the spread of the virus.

Many analysts suggest, the effect of the second wave of Covid-19 will have a negative impact on the economy. Most forecasters expect that the fall in output compared to pre-pandemic levels will be less than in the first quarter last year when the full lockdown was imposed. But while the economy will do better than last year, it is expected not to reach pre-pandemic levels this year due to the second wave.

Growth forecasts for Indian economy in 2021-22 were in double digits, mostly about 12 to 13%. These have been pared down after the second wave. JP Morgan has predicted that instead of 13%, GDP growth in India in 2021 will be 11%. Moody's is forecasting that instead of 13.7%, GDP growth in India in 2021 will be 9.3%.

Table 2: India's GDP Growth Projection – 2021-22 and 2022-23

S .No.	Agency	Earlier Estimates	Lates Estimates	2022-23 Projections
1	JP Morgan	13.0%	11.0%	
2	Moddy's Investor Services	13.7%	9.6%	7.0%
3	OECD	12.6%	9.9%	
4	S&P Global Ratings	11.0%	9.5%	7.8%
5	Goldman Sachs	11.7%	11.0%	
6	World Bank		8.3%	7.5%
7	IMF		12.5%	
8	Nomura	13.5%	12.6%	
9	Asian Development Bank			
10	UBS	11.5%	10.0%	
11	CRISIL		9.5%	
12	ICRA		8.5%	
13	Barclays		9.2%	
14	CARE Ratings	10.2%	9.2%	
15	NCAER		8.4 – 10.1%	
16	Credit Suisse	9.5% - 10%	8.5 – 9%	
17	RBI		10.5%	

Based on the OECD's Economic Outlook 2021, the Indian economy contracted by 7.7% in 2020 as domestic consumption declined. Despite the downturn last year, the OECD has projected India's economy to expand by 9.9% and become the fastest-growing G20 economy in 2021. Although the OECD's projections provided a positive outlook for the Indian economy, the second wave and new virus variants have now posed a new risk to growth.

ICRA has placed their baseline GDP growth forecast for FY2022 at 8.5%. ICRA continues to expect a prolonged negative impact of the second wave on consumer sentiment and demand with healthcare and fuel expenses eating into disposable income, and less pent-up replacement demand in FY2022 relative to FY2021.

Joining the league of global and domestic rating agencies and think-tanks that have reduced India's growth estimates for the current fiscal in view of the second wave, S&P said that the permanent damage to private and public sector balance sheets would constrain growth over the next couple of years.

While attributing the cut in its growth outlook to the second wave of the Coronavirus pandemic that forced most states in India to impose fragmented lockdowns in April and May 2021, S&P said the severity of restrictions adversely hit economic growth in India. S&P Global Ratings, on June 24, 2021, lowered India's growth forecast for FY 2022 to 9.5%, from its 11% growth prediction in March this year. The rating agency also indicated that further reductions in its growth forecast could not be ruled out, in the event of a third wave hitting the third-largest economy in Asia.

While stating that newer waves of the virus spread pose a risk to India's economic outlook, considering only 15% of the world's second most populous country in the world have so far been covered under its inoculation programme, the rating agency also forecast India's growth at 7.8% for FY 2023

Rating agency Barclays, on May 25, 2021, lowered its full-year 2021-22 economic growth forecast for India by 80 basis points (bps) to 9.2%, attributing the cut to economic setbacks caused by the fragmented, yet prolonged state lockdowns, following the tremendous rise in infections in the second wave of the Coronavirus pandemic. Economists at the brokerage said India would suffer economic losses to the tune of at least USD 42.6 billion, if a third wave of the virus forces states to put in place equally severe lockdowns for a period of eight weeks.

Rating agency CRISIL downgraded India's GDP growth forecast for 2021-22 to 9.5%.

The National Council of Applied Economic Research (NCAER) has projected India's real GDP growth for 2021-22 in the range of 8.4% to 10.1%, reflecting the potential impact of a third wave of Covid-19 at the lower end.

Credit Suisse has joined the list of rating agencies and think-tanks that have recently lowered India's growth projection, following the COVID-19 second wave in India, which has prompted states to initiate partial lockdowns. Citing economic disruptions caused by these fragmented lockdowns, the Swiss brokerage firm has lowered the growth projection for India to 8.5%-9% for FY 2022, against its earlier projection of between 9.5% and 10%.

Moody's slashed India's growth projection to 9.6% for 2021, from its earlier estimate of 13.9%, and said faster vaccination will be paramount in restricting economic losses to June quarter. It also predicted a 7% growth in 2022.

Wall Street brokerage firm Goldman Sachs has lowered its growth projection for India for FY 2022 (the period from April 2021 till March 2022), as a tremendous rise in Coronavirus infections and the fragmented lockdowns it has introduced in India, are expected to take a heavy toll on the economy. The brokerage firm expects the

Indian economy to grow at 11.1% in the current fiscal, as against its previous projection of 11.7%.

The intensity of the lockdown remains lower than last year. Still, the impact of tighter containment policy is clearly visible in the high-frequency mobility data across key India cities. Overall, most indicators still suggest that the impact has been less severe than it was in Q2 (April-June) last year, as per Goldman Sachs.

While activity is likely to rebound quite sharply from Q3 (July-September) onwards, assuming restrictions can ease somewhat over that timeframe, the net result is to lower our FY22 real GDP growth forecast to 11.1% (from 11.7% previously) and our 2021 calendar year growth forecast to 9.7% (from 10.5%).

Among the rating agencies that have also recently cut growth projections for India for FY 2022 include Nomura (to 12.6% from the previous 13.5%), JP Morgan (11% from 13%) and UBS (10% from 11.5%).

The IMF on the other hand expects Indian growth at 12.5% while the World Bank forecasts 8.3% growth in 2021 and 7.5% in 2022. The International Monetary Fund in June said, the recent jump in COVID-19 cases in India posed downside risks to the Fund's April forecast for 12.5% growth in India's economic output in fiscal years 2021 and 2022. The IMF will revisit that forecast when it issued a fresh World Economic Outlook in July.

Back home, the RBI (Reserve Bank of India) expects the India economy to grow at 10.5% in FY 2022. RBI also lowered the forecast for Q2 at 7.9 vs 8.3% earlier. The central bank had pegged Q3 growth at 5.4% and Q4 at 6.2%, both lower than the now revised growth figure.

According to McKinsey Global Institute's latest report, India's economy has reached a "decisive point", which requires reforms over the next 12 to 18 months to create jobs for millions of workers between now and 2030.

In the report's findings, India's manufacturing and construction sectors could amplify growth the most, potentially adding 9.6% and 8.5% in annual GDP growth and creating 11 million and 24 million jobs, respectively, from 2023 to 2030.

India's GDP growth surprised positively in the fourth quarter and financial year 2020-21. Initial estimates by CSO suggested GDP growth at (-) 8% in 2020-21. Accordingly, the imputed growth for the quarter ending March 2021 was (-) 1.1%. As against this, the latest estimates show GDP at (-) 7.3% and (+) 1.6%, respectively during 2021-21 and quarter ending March 2021. Most of the positive surprise was already seen in the last quarter.

What drives this outcome? On the demand side, government spending rose by 28.3% in the last quarter. In fact, the Centre's spending increased from Rs 22.8 trillion during the first nine months of the financial year to Rs 35.1 trillion for the entire financial year, an increase of Rs 12.3 trillion in a single quarter. The Centre's capital spending too increased from Rs 3.08 trillion during the first nine months of the financial year to Rs 4.24 trillion for the entire financial year. This also led to a 10.9% increase in capital formation in the last quarter compared which was (-) 18.9% during the first nine months of the financial year.

On the supply side, too, the last quarter saw a distinct change in growth. For instance, the manufacturing sector is estimated to have seen an increase of 6.9% in the last quarter compared with (-) 12.1% during the first nine months of the financial year. Construction activity rebounded strongly in the fourth quarter with an increase of 14.5%, highest growth rate in the current series (2011-12). Even in April 2021, cement and steel output have seen a large increase and outperformed the other sectors. If the government continues to build roads at the current momentum, this is likely to sustain.

However, consumption spending has been relatively weak. This is more to do with lockdowns impacting demand for services. Out of the total consumption, as much as 50% is driven by the demand for services, and has been impacted adversely. On the other hand, demand for goods has increased as seen in higher imports which increased by 12.3% in the last quarter.

What do these numbers imply for the current financial year, FY22?

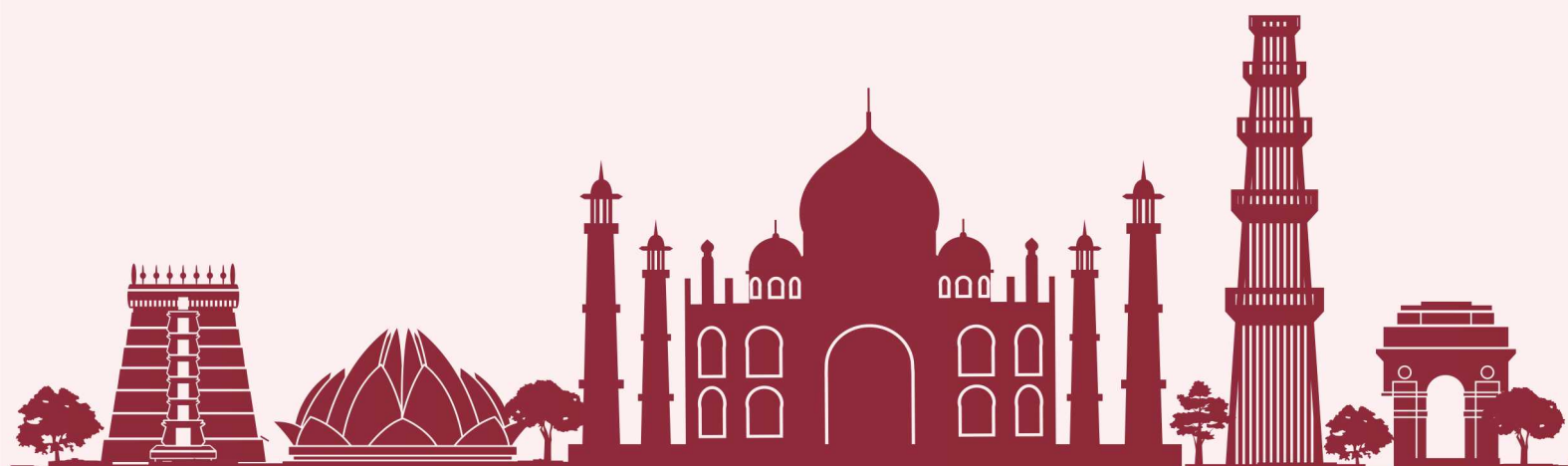
First, they show that if the economy opens up, the supply side can rebound sharply. Second, the better-than-estimated increase in output also leads to higher tax collections. For instance, indirect tax collections are higher than the revised estimates by as much as 8.5%. Even direct tax collections have shown an upward bias. Third, this gives room to the government to spend to push growth higher. For instance, Centre's overall expenditure is even higher than the revised estimates. Fourth, government spending is necessary to revive growth when private spending is constrained because of restrictions.

However, the numbers also show that consumption cannot rebound meaningfully till such time a larger proportion of the country is vaccinated. The vaccination rate is likely to see a steady improvement in the coming months. Once this happens, even consumption should rebound meaningfully, particularly when half of consumption is in the form of services. Only once consumption revives will capacity utilization levels increase and thus lead to a virtuous private investment cycle.

Until such time, country would need supportive monetary and fiscal policy. Government has already announced steps to mitigate the impact of the second wave by extending credit linked guarantees to a large number of borrowers. RBI has allowed restructuring and continues to maintain liquidity conditions supportive for revival of growth and meet government need for higher spending. Fiscal spending may have to be accelerated in the coming months to revive growth.

The outlook depends on how India takes care of three principal factors: a) Covid being completely neutralised; b) government pursuing the agenda of the future; and c) businesses regaining their animal spirits. If all these growth stimulants converge, India should be back on the path of high real growth of 7-8% from 2022-23. If either the government does not get its act together or businesses do not regain their spirits, India would slip into a low growth of 4-5%.





SECTION 2

INDIAN PETROCHEMICAL INDUSTRY

XII. Factors influencing future trajectory of Petrochemicals Manufacturing and Consumption Growth.

A. COVID impact on Indian Petrochemical Industry:

The petrochemical industry occupies a pivotal place in the country's economy. The sector serves as the backbone for the development of various other key sectors such as agriculture, infrastructure, health care, automobile, textiles and consumer durables. It is one of the fastest growing sectors, with demand growing at a CAGR of 8%-plus over the last five years with a blip in 2020-21. The penetration level of petrochemicals in India is, however, far lower than the global average. India's per capita consumption stands at 11 kg compared to the global average of 30 kg, indicating significant headroom for growth.

The pandemic has hampered the growth momentum of the petrochemical market in India, disrupting the supply chain along with weakening the demand. However, the level of impact and the recovery trajectory have been different across the petrochemical value chain. The supply of petrochemical has majorly been affected owing to labor shortage, logistical challenges, low utilization rates, and the reduction in operational expenses.

The petrochemical market witnessed a notable change in its consumption pattern amid the pandemic. Industries, such as the automotive, construction, electronics, textiles, and rigid packaging experienced a sudden slump in demand. On the other hand, the demand for petrochemicals from flexible packaging, personal care, and healthcare has risen sharply.

The pandemic is expected to bring about various changes in the India petrochemical market, including digitization, increased consolidation activities, and a focus on scenario-based planning.

For the Indian petrochemical industry in 2020-21- the key application industries like packaging, construction, and automobiles pulled down the demand specially in the first half of the year and year end, during which the industry faced turmoil of COVID which impacted demand across sectors with factory closures and lockdown situation impacting supply chains.

The recent pandemic has made a dent in the demand for petrochemicals but this is expected to be for a short-term period as the demand for food packaging has already witnessed huge increase than normal demand with demand for packed food and water bottles rising.

B. The Govt initiative driving Petrochemical's consumption growth

The vision for the next 5 years is to have investment-led growth, to be driven by the private sector. To achieve this vision, the Government is working incessantly on policies to attract investment, both from domestic and foreign sources. The work-plan includes further liberalizing our FDI policy, simplification of labour laws, further enhancing ease of doing business, power sector reforms, and reforms in banking, insurance and pension sectors. The Government is reportedly targeting some \$1.4 trillion of new infrastructure projects to be completed by 2025.

The Indian government has had announced many initiatives like Digital India, Swachh Bharat, Start-up India and Skill development program etc. which have started and will eventually expected to have a widespread multiplier effect.

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 2021 by IMD.

C. Factors which can accelerate growth in manufacturing:

Implementation of the above measures would go a long way in making India an attractive destination for investment and also making it a global hub for manufacturing. However, at present, the factor cost disadvantages disincentivize manufacturing in India. Compared with its ASEAN neighbours, India has among the highest cost of land, capital, power and inland freight. The cost of finance (PLRs) in India is 9.5% per annum whereas, the same is 0.95% in Japan, 3.42% in Korea, 4.35% in China, 5.35% in Singapore and 7.1% in Thailand. Likewise, the power rates in India are much higher at 8-12.5 Cents/KWH as compared to our competitors like China (5.5-8.8 Cents/KWH) and Korea (5.3 Cents/KWH).

A study of cross-country comparison of business facilitation measures shows that in respect of all listed parameters, viz. ease of doing business, competitiveness, infrastructure and logistics, India ranks poorly as compared to countries like Singapore, Korea, Japan, Malaysia, Thailand and China. Recently, India slipped 10 places to the 68th rank in the WEF's Global Competitiveness Index. Though in World Bank's ease of doing business ranking, India has recently climbed 14 places to reach 63rd rank among 190 countries, it is nowhere closer to the countries mentioned above. India maintained 43rd rank on an annual World Competitiveness Index compiled by the Institute for Management Development (IMD) that examined the impact of COVID-19 on economies around the world this year 2021.

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. Despite the factor cost disadvantages, the domestic manufacturers have committed thousands of crores of rupees to create new capacities in petrochemical products. Some of these projects are at a preliminary stage; final decisions are yet to be taken.

The Indian petrochemical industry could see around \$87bn worth of new projects as the country moves to bridge the gap between the shortage of domestic supply and increasing consumer demand. Due to COVID pandemic the announced investments are expected to be delayed by a year. Going forward the planned investments on drawing board would need some government support and benefits so that they fructify and able to generate and create more job opportunities in the country.

The overall outlook for the petrochemical industry in India is more positive than it was in 2020 as several state-owned energy corporations have made investments to boost petrochemical feedstock availability and extend their presence in the downstream derivatives market.

Under the Union Budget 2021-22, the government allocated Rs. 233.14 crore (US\$ 32.2 million) to the Department of Chemicals and Petrochemicals. The government is promoting domestic manufacturing projects via policy initiatives such as the Production Linked Incentive Scheme aimed at boosting domestic manufacturing and exports by providing incentives on incremental sales from products made at domestic plants.

The scheme has the potential of adding at least another \$55bn of production over the next five years across all manufacturing sectors. This will lead to a quantum jump in the demand for petrochemicals such as polymers, resins, fibres, bulk chemicals, paints, pigments, food additives, etc.

D. Sectoral view of Petchem consuming sectors:

Housing prices appeared to be recovering in Q4 of FY21 as the economy emerged gradually from the pandemic, and housing sales in April-June is expected to rise 93% compared to year-ago period, which augurs well with the plastics demand in the country.

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. Budget 2021 highlighted Metro services announced in 27 cities, plus additional allocations for Kochi Metro, Chennai Metro Phase 2, Bengaluru Metro Phase 2A and B, Nashik and Nagpur Metros

Government's flagship schemes like Pradhan Mantri Gram Sadak Yojna (PMGSY), UDAN (Ude Desh ka Aam Nagrik) reiterate the continued thrust to the plastic industry in years to come. Road construction witnessed a near 60% year-on-year jump in the first two months of financial year 2021-22 (FY22), despite restrictions being imposed in the wake of the second wave of Covid-19. Around 1,470 km of roads were constructed during the first two months of the current fiscal, as against 847 km in the corresponding period last year. The Budget 2021 allocated Rs 1,18,101 crore, the highest ever outlay, for Ministry of Road Transport and Highways, of which Rs 1,08,230 crore is for capital expenditure. Under the Bharatmala Pariyojana, with an estimated investment of Rs 5.35 lakh crore, already 13,000 km of roads worth Rs 3.3 lakh crore have been awarded for construction. A large amount of money has been earmarked for ongoing and new economic corridors/expressways

Measures taken in the last Budget by the government to incentivize domestic value addition, promote Make in India and create a level-playing field for the domestic industry are very positive steps towards making India a global manufacturing hub.

Rs 1,10,055 crore have been allocated to the Railways, of which Rs 1,07,100 crore is for capital expenditure with a promise to complete 100% electrification of broad-gauge routes by December 2023. The port infrastructure has been given a boost with the Budget promising Rs 2,000 crore worth seven projects to be offered in PPP mode in FY22 for operation of major ports. Seven 'Textile Parks' to be developed in the next 3 years.

Government's growing thrust on the water sector, includes a scheme to take piped drinking water to 18 crore rural households by 2024. To translate Prime Minister Shri Narendra Modi's vision of providing clean tap water to every household, Union Government has increased the Central grant by four-fold to Andhra Pradesh under the Jal Jeevan Mission in the year 2021-22 to Rs 3,182.88 Crore, which was Rs 790.48 Crore in 2020-21. The allocation for the overall Jal Jeevan Mission, which seeks to ensure water security across the country, is \$ 1.5 bn (Rs 11,500 crore), up from \$ 1.32 bn (Rs 10,000 crore) in 2019-20. The 'Har Ghar Nal Se Jal' scheme, to provide a functional tap connection to all households by 2024, is part of the Jal Jeevan Mission. A total allocation of \$ 1.62 bn (Rs 12,300 crore) in Swachh Bharat mission for 2020-21 has been done. Rs 1.7 lakh crore to be provided for transport infrastructure in the financial year 2020-21.

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 recent budget speech which augers well for the plastic sector and the demand for petrochemicals in India.

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.

XIII. Outlook for 2021-22

Overall, the outlook for the petrochemical industry in India remains positive in years to come and as the key end-use industries like automotive, packaging, and consumer durables start to witness demand again as slowly the impact of COVID will withers off.

The main focus of the industry is to plan capacity addition and meet the domestic as well as export demand. The industry needs to be nurtured with the right policies and fiscal support from the government.

Despite the below- par economic growth outlook in 2020, the rising living standards of the vast population, favourable demographics, huge investments in urban and rural infrastructure, low- cost housing, development of organized retailing, e-commerce, and technological developments in farming are some of the key growth drivers that will support polymer demand in the medium term.

XIV. Global Petrochemical Industry Review of 2020-21 & Outlook for 2021-22

E. Global Petrochemical Industry review

Last year, the COVID-19 pandemic and subsequent economic crisis brought unprecedented challenges to the petrochemicals industry. Early in the pandemic, quarantine measures, lockdowns, and economic uncertainties led to widespread project delays, and the last few months of the year were marked by extraordinary supply and freight disruptions. All things considered, the industry weathered the storm remarkably well, with relatively resilient volumes and profits.

By contrast, industries such as durables, construction, and automotive saw a demand downturn due to COVID-19-related shutdowns. Because the chemicals industry has such high exposure to consumer and packaging, it saw strong demand growth, especially with regards to PE and PP, which are widely used in food packaging and household goods. Furthermore, demand growth of polyethylene terephthalate (PET) in packaging was offset by lower demand for textiles, and demand declined for polymers commonly used in construction and automotive, such as polyvinyl chloride (PVC), polyurethane (PU), and styrene-butadiene rubber (SBR).

The global petrochemical industry finished 2020 on a strong note, a welcome change from most of the year. Petrochemical prices saw pressure from multiple fronts, across the globe, as the COVID pandemic, coupled with lower energy prices, negatively impacted demand.

Revenues and profits in the broader chemical industry recovered to pre-COVID-19 levels during the third and fourth quarters of 2020. For their part, petrochemical companies continued to produce amid the economic downturn.

Stay-at-home orders tied to the pandemic had a significant impact on demand for gasoline and associated blendstocks such as MTBE, toluene and xylenes. Products such as MEG and PET also saw demand battered by the pandemic. The pressure on petrochemical prices was exacerbated by the Saudi Arabia-Russia crude oil price war in late March as crude pricing plummeted and with US WTI futures turning negative in April as a result. The impact of these events culminated with at least two refinery closures announced in 2020.

Despite these obstacles, petrochemical prices rebounded in Q4 and a number of participants expressed optimism headed into 2021. This positive sentiment was supported further by the approval of pandemic vaccines. While many believe that 2021 will be a better year for chemicals, products such as MEG, PE and PX are expected to face continued pressure due to capacity growth and associated length.

Global textile industry is closely linked with the fundamental features, global growth and pattern of discretionary spending. The, dent in the global economy constricted the financial liquidity in the hands of the consumer and added to that the global enforcement of lockdowns across the various countries sharply impacted the global spending on clothing and apparel – which marks the primary source of polyester consumption. Consequently, global polyester markets’ overall demand was declined quickly in the early to late mid of the year, after which gradual economic revival across pockets boosted demand. However, overall demand for the year ended marginally lower by 6%. While the pandemic adversely affected the global demand in textiles and apparels, some sectors such as non-woven staple fibre (PPE kits, face masks, polyester swabs), became hotspots of demand growth. The fibres were extensively used in health and hygiene sectors. Towards the end of the year, Polyester markets witnessed cost push from high feedstock values and escalating freight cost. However, low inventory levels, rising cost boosted uptrend in prices supporting healthy operating rates, albeit at squeezed margins.

At the end of 2020, operating rates at ethylene plants around the world stood at a healthy 88–89%. But they will likely fall to 86% this year and 82% in 2022, according to IHS.

Such operating rate declines will put pressure on some industry participants to shut plants. For instance, China’s coal-based ethylene production, which is also under environmental scrutiny, might be vulnerable. With all the new production, chemical makers will likely slow the pace of projects that are still on the drawing board. All this capacity has to be absorbed and until that happens, everyone’s a bit shy about building new projects.

F. Outlook for 2020-21

The global petrochemical industry is expected to keep feeling COVID-19 fallout in the second half of 2021, with prices maintaining record highs in some regions balanced by new capacity startups in others. As global COVID-19 vaccine availability increases, more industrial activity should follow and consumption from end-users should in turn trend higher.

Despite the fears of growing COVID infections, the global economy continues to march upwards as economic activity shows signs of a health rebound.

The global aromatics market is also expected to remain focused on China as vast new capacity growth is expected this year in the paraxylene and PTA markets. Since downstream PET demand is expected to increase, feedstock producers may have support in maintaining their margins.

In styrenics, capacity expansions in China are also expected to impact prices in the coming year, as nearly 1.5 million mt of new capacity comes online in 2021 with an additional nearly 2.75 million mt slated to come onstream in 2022. This growth has the potential to push China into a net export position, which would be bearish for global prices, but at least in the near-term, styrene is expected to see continued support from its derivatives.

Polystyrene demand has been relatively strong during the first half of the year and is expected to remain so should the global economy remain firm and projected GDP growth be realized. Despite higher crude oil values, the record-high prices seen for resins and intermediates in the first half of the year were expected to soften, as new capacity startups and post-freeze, post-turnaround ramp-ups in the US ease its tight supply situation.

Lower prices were also expected to bring back some end-users who stepped back from the market when they were unable to pass on higher costs to their customers. A normalization of supply in the US should also see the US reduce prices enough to compete in exports markets. US producers have not had to look abroad to soak up their output as they have playing catch up to mitigate the supply issues, they faced in the first half of 2021.

In Asia, the demand outlook is still unclear as the region continues to slowly recover from COVID-19, however, overall operating rates are expected to be high for the coming half of the year. Global trade flows were expected to be impacted by continued record-high freight rates, especially from Asia, which could shift spot flows. Buyers with sufficient inventory can choose lower values and longer transits, while buyers who need prompt delivery pay higher cost for the convenience.

Petrochemical producers have played a major role in helping society with the challenges of the pandemic. As an industry, it has transitioned into 2021 strongly, and we are seeing strong profitability. Petrochemical players should use the current good times to get ready for a new and exciting future, one that combines the power of petrochemical products and solutions within a business context. This vision entails producers that embrace a sustainability agenda, including climate change mitigation, to help further transition to a more circular model for plastics.

As the price of oil increases to more than \$75 per barrel (Brent) and GDP continues to recover after the initial shocks of COVID-19, petrochemical revenues will become less volatile, making incredible drops, such as those seen in 2020, increasingly unlikely. On this point, regional cost advantages will resume as cost curves become steeper, and the steady recovery of indexes are expected across regions and end markets, supporting a more even recovery of volume across all types of chemicals.

While some bans on single-use plastic packaging were lifted during the pandemic for hygiene concerns, the acceleration of sustainability and recycling is expected to continue, as we see more commitment from consumer-packaged goods and chemical companies as well as government pushes, such as the EU levy on unrecycled plastic packaging.

As per IHS Markit, capacity start-up delays, plant outage, severe supply chain bottlenecks and growth in online business, drive prices and margins of polymers in Q1 and Q2 2021. Polymer demand is set for steady recovery, as discretionary expenditure picks up, even while focus on health and wellbeing continues. US producers regained cost advantaged over Asian producers after a difficult 2020, while Middle East producers enjoys better margins. The energy transition is no longer part of a distant forecast but has arrived in many places around the world. This change will impact the refinery and petrochemical industries in a profound way. With by-product credits decreasing, integrated competitiveness getting critical vs single product cost and margin.

XV. Indian Petrochemical Industry review 20-21 & outlook 21-22: Product wise

XVI. 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. However, In the year 2020-21, Naphtha exports were down to 6509 KT as well as production and imports due to the pandemic. Naphtha consumption witnessed a de-growth as well of 1% in 2020-21. Next fiscal the demand is expected to see an improvement due to increase in demand from downstream products like Ethylene, Propylene demand.

Table 3: Naphtha Demand Supply

Naphtha (MT)	2018-19 A	2019-20 A	2020-21 A
Production	19600	20577	19287
Imports	2082	1662	1364
Exports	6963	8897	6509
Apparent Demand	12889	14131	14436
Demand Growth%	9.6%	1.0%	-1.0%



B. Natural Gas

Prime Minister Narendra Modi has set a target of raising the share of natural gas in the energy basket to 15% by 2030 to cut carbon emission in the economy.

With gas demand (growing at) CAGR (of) 8%, gas is expected to account for around 10% of India's primary energy supply by 2025. India is making investments worth billions of dollars to expand pipeline network as well as build import capacities to meet growing gas demand in the country. Also, city gas distribution networks are being expanded to raise the share of gas as a transportation fuel as well as kitchen fuel. Currently, the total natural gas pipeline network in India is about 17,500 km, of which 12,500 km is operated by GAIL.

The Budget in February 2021 saw some announcements.

2021-22 Budget speech highlights for Petroleum and Natural Gas¹ Pradhan Mantri Ujjwala Yojana to be extended to cover one crore more households. 100 more districts to be added to the City Gas Distribution network in three years. Gas pipeline project for Jammu and Kashmir. Independent Gas Transport System Operator to be set up for facilitation and coordination of open access natural gas pipelines.

India is planning to spend \$60 billion in creating gas infrastructure till 2024, including for pipelines, liquefied natural gas (LNG) terminals and city gas distribution (CGD) networks. Prime Minister Narendra Modi In January 2021 inaugurated the 450-km Kochi-Mangaluru natural gas pipeline built at cost of Rs 3,000 crore. The 450-km pipeline will help set up 700 compressed natural gas (CNG) stations and 2.1 million people avail piped natural gas (PNG). The pipeline will also help supply clean fuel for households, vehicles and industries in Kerala and Karnataka.



Note that the pipeline will transport natural gas from Kochi in Kerala through Ernakulum, Trissur, Palakkad, Malappuram, Kozhikode, Kannur and Kasargod districts to Mangaluru in Dakshina Kannada district of Karnataka and provide industrial fuel and feedstock for petrochemical and fertilizer sectors.

The pipeline is part of India's journey towards 'one nation-one gas grid.' A total of 1,544 km pipeline had been laid as part of the National Gas Grid in 2020 and India is planning to spend \$60 billion in creating gas infrastructure till 2024, including for pipelines, liquefied natural gas (LNG) terminals and city gas distribution (CGD) networks.

This comes in the backdrop of India's push for a gas-based economy especially at a time when India has become the biggest emitter of greenhouse gases after the US and China and is among countries most vulnerable to climate change. India plans to reduce its carbon footprint by 33-35% from its 2005 levels by 2030, as part of its commitments to the United Nations Framework Convention on Climate Change.

As per the data shared by the government, gas comprises about 6.2% of India's primary energy mix, far behind the global average of 24%. The government is working to increase this share to 15% by 2030. India's gas demand is expected to be driven by fertilizer, power, city gas distribution, and steel sectors. The govt also plans to boost domestic gas production by 40 million standard cubic meters a day (mmscmd), from the current 80 mmscmd. Centre committed to bringing natural gas under GST regime; plans to spend Rs 7.5 lakh crore on infrastructure: PM Modi addressed in Feb 2021 while dedicating pipelines to nation. He dedicated Ramanathapuram – Thoothukudi Natural Gas pipeline to the nation and also dedicated Gasoline Desulphurization unit at Chennai Petroleum Corporation Limited, Manali and laid the foundation stone for Cauvery Basin Refinery at Nagapattinam.

In February 2021, Petronet LNG announced its plans to increase in its Dahej terminal's capacity by 29% to 22.5 million tonnes per annum (mtpa) to meet the rising demand. In February 2021, ONGC announced that by May 2021, it would increase natural gas output from a KG basin block to 2.5-3 million standard cubic meters per day.

In February 2021, the government launched key oil & gas projects in Assam, such as INDMAX Unit at Indian Oil's Bongaigaon Refinery, Oil India Limited's secondary tank farm at Madhuban, Dibrugarh and a 'Gas Compressor Station' at Hebeda Village, Makum and Tinsukia remotely from Dhemaji in Assam.

In February 2021, the government launched key oil and gas projects such as the Ramanathapuram – Thoothukudi natural gas pipeline and Gasoline Desulphurization Unit at Chennai Petroleum Corporation Limited, Manali.

In February 2021, Indian Oil Corp. Ltd. signed a 'statement of intent' with Greenstat Hydrogen India Pvt. Ltd. to establish a centre of excellence for Hydrogen value chain and other related technologies such as hydrogen storage, fuel cells, etc.

Foreign investors will have opportunities to invest in projects worth US\$ 300 billion in India as the country looks to cut reliance on oil import by 10% by 2022.

India's first Floating Storage and Regasification Unit (FSRU) arrived at H-Energy's Jaigarh Terminal in Maharashtra. As per H-Energy, the FSRU 'Hoegh Giant', which sailed from Keppel Shipyard, Singapore, was berthed at Jaigarh terminal in Maharashtra. The LNG (liquefied natural gas) regasification terminal will be ready to start testing and commissioning activities soon.

Total imports of natural gas as a percentage of consumption (production plus import) have risen from 28% in 2011-12 to 53% in 2019-20. Between 2011-12 and 2019-20, import of natural gas increased from 17,997 MMSCM (Million Metric Standard Cubic Meters) to 33,867 MMSCM, at an average rate of 8%. Whereas the production of natural gas has fallen from 46,453 MMSCM to 30,257 MMSCM.

Natural gas production during May, 2021 was 2739.65 MMSCM which is 19.11% higher when compared with production of May, 2020 but 4.09% lower than the monthly target.

Cumulative natural gas production during April-May, 2021 was 5391.14 MMSCM which is 20.84% higher than production during corresponding period of last year but 2.61% lower when compared with target for the period.

The Phulpur-Dhamra-Haldia (PDH) Pipeline is being developed by GAIL India to transport natural gas. The project connects five states to the National Gas Grid. In 2021-22, Rs 250 crore has been allocated for the project, which is 34% lower than the revised estimate for 2020-21.

The natural gas requirement is projected to more than triple to 201 billion cubic meters and coal demand is seen rising to 772 million tonnes in 2040 from the current 590. To meet its energy needs, India will be more reliant on fossil fuel imports as its domestic oil and gas production stagnates.

As per IEA, India's Natural gas import dependency increased from 20% in 2010 to almost 50% in 2019 and is set to grow further to more than 60% in 2040. The dynamics look quite different for coal, where India's demand for imported coal barely gets back to pre-crisis levels over the next decade.

Reliance-BP 'bubble' delivered two deep water gas fields despite massive COVID-19 challenge. RIL and BP, overcame the challenges and commissioned the field in December 2020. RIL is on course towards reaching 30 million standard cubic meters per day of gas production by 2023 catering to 20% of India's gas demand. This will position the company as a significant contributor to India's gas-based economy. The third deep water field - KG D6 MJ field is expected to come on stream in the last Quarter of 2022.

IOC also owns two natural gas pipelines - 132-km Dadri-Panipat and 1,421 km Ennore-Tuticorin line, and two LPG lines - 280-km Panipat-Jalandhar and 873-km Paradip-Haldia-Durgapur.

GAIL too plans to retain a majority stake in the pipelines that run from Dahej in Gujarat to Dabhol in Maharashtra and from there to Bengaluru in Karnataka. GAIL owns and operates a natural gas pipeline network that spans 12,502 kilometers, mostly in the western, southern, and northern parts of the country. It is building more pipelines in the eastern part of the country.

GAIL too is planning to launch an InvIT of its two gas pipelines between Dahej and Bengaluru. The nation's top gas marketing and transportation firm plans to monetise the Dahej-Uran-Panvel-Dabhol pipeline and Dabhol-Bengaluru pipeline by setting up an Infrastructure Investment Trust (InvIT).

The much-delayed Kochi-Mangalore natural gas pipeline project is finally ready for commissioning any day as the GAIL (India) Ltd has completed the final 540-metre treacherous stretch across the Chandragiri river in northern Kerala. The 444-km long natural gas pipeline was launched in 2009 at an estimated cost of ₹29.15 bn and was to be commissioned in 2014.

Table 4: Natural Gas Demand Supply

Natural Gas (MMSCM)	2018-19 A	2019-20 A	2020-21 A
Production	32649	32875	31359
Imports	27429	28740	33613
Exports	0	0	0
Apparent Demand	59170	60798	64059
Demand Growth%	6.2%	2.8%	5.4%

A 1,212-km pipeline project crosses 16 districts in three States. There is hectic activity along the ambitious \$ 0.5 billion (₹3,800 crore) Paradip, Hyderabad Pipeline Project (PHPL), linking Paradip refinery in Odisha to Hyderabad in Telangana via Andhra Pradesh, being executed by the Indian Oil Corporation (IOC). The project to augment fuel supplies in the three States was formally launched in December 2018 by Prime Minister Narendra Modi.

The Rs 3,800 crore Paradip-Hyderabad Pipeline project being executed by the Indian Oil Corporation is at an advanced stage of completion. The pipeline would terminate at the new petroleum terminal of IOC coming up in Malkapur near here with a storage capacity of 180 thousand kilo litres at an investment of Rs 611 crores and it would be ready within 18 months. The Paradip-Hyderabad Pipeline project is at an advanced stage of completion with some smaller segments to be patched up. As a part of this initiative, a Rs 611-crore storage terminal with a capacity of 180 thousand kilo litres is being developed at Malkapur on a 69.35-acre site. The 1,212 km Paradip-Hyderabad petroleum products pipeline passes through Odisha, Andhra Pradesh and Telangana.

The pipeline will ensure transportation of 4.5 MMTPA of petrol, diesel, and aviation fuel in economic, reliable and environment-friendly manner, with negligible pollution compared to other modes of transportation.

The complex operational aspects of transporting of petroleum products will be handled by the latest SCADA systems, backed by leak-detection system and surveillance system operated by IOC officers 24×7 at the site near Rajahmundry.

On its journey from Paradip, the pipeline would feed the new depots being set up in Berhampur, Odisha; Achchutapuram near Vishakhapatnam, and in Vishakhapatnam as well as in Malkapur, near Hyderabad. IOC will optimize use of the existing depots in Rajahmundry and Vijayawada.

Indian Oil has won New Geographical Area in Telangana comprising of Jagityal, Pedappalli, Karimnagar and Rajanna Sircilla districts as per the latest round of bidding. City Gas Distribution would result in emergence of fuels like PNG for industrial and domestic applications and CNG for auto fueling.

IOCL is planning to invest Rs 1,689 crore in new projects in Andhra Pradesh. This includes Rs 1,522 crore on petro-products infrastructure and Rs 167 crore on LPG storage facilities.

The country's overall energy basket is changing and the government is keen that dependence on gas must rise from 6.3% now to 15% by 2030. As a part of this, the oil and gas company are creating additional capacities across the country, in Andhra Pradesh and Telangana. The investment includes revamping, setting up of facilities and storage capacities in Vijayawada, Visakhapatnam, Rajahmundry and Hyderabad, worth Rs 600 crore investment in Telangana and various other facilities in Andhra Pradesh.

At the existing Vijayawada petroleum storage terminal at Kondapalli, Rs 316 crore terminal will operate as a tap-off point terminal on the upcoming Paradip-Hyderabad Pipeline (PHPL) being set up at an investment of Rs 3,800 crore. The terminal is expected to be commissioned by September 2021.

The company is also setting up a new grassroots terminal on a 60-acre site at Atchutapuram in Visakhapatnam with a storage capacity of over 74,000 kilo ltr. The project will see an investment of Rs 466 crore. The terminal, which would be a tap-off point on the upcoming Paradip-Hyderabad Product pipeline, will cater to the petroleum product (MS/HSD) requirements of Visakhapatnam, Vizianagaram and Srikakulam districts. The project is expected to be completed by July 2021.

The Malkapuram terminal near Visakhapatnam is being revamped at a cost of Rs 355 crore and expected to be completed by February 2023. Moreover, 120 TTPA grassroots LPG bottling plant at an investment of Rs 167 crore is being developed at Chittoor, which will add another 36,000 LPG cylinders to the daily output of IOCL in the state. The project will be ready by July 2022 and take the bottling capacity of Indane LPG to 1.4 lakh cylinders per day.

The 1,656-km North-East Natural Gas Pipeline Grid will connect Guwahati in Assam to major cities in the region such as Itanagar, Dimapur, Kohima, Imphal, Aizwal, Agartala, Shillong, Silchar, Gangtok, and Numaligarh. The pipeline will enable the supply of piped cooking gas to households and CNG to automobiles, besides fuel to industry. However, in the absence of anchor customers, the \$1.22 Bn (₹9,265 crore) pipeline is not economically viable.

The CCEA headed by Prime Minister Narendra Modi approved a viability gap funding of 60% of the project cost. The North-East pipeline grid is to be implemented by Indradhanush Gas Grid, a joint venture of state-owned GAIL India, Indian Oil Corp (IOC), Oil and Natural Gas Corp (ONGC), Oil India Ltd (OIL) and Numaligarh Refinery Ltd (NRL).

GAIL is also laying a 750-km line from Barauni to Guwahati as part of the \$1.71 bn (₹12,940 crore) JHBDPL project, which is also known as the Pradhan Mantri Urja Ganga' project. This is proposed to be connected to the North-East via the Indradhanush grid. All other pipelines in the country have been funded by public or private sector companies. The project is critical towards implementing the government's Hydrocarbon Vision 2030 for the North-East.

The vision envisages the development of the region by leveraging its hydrocarbon potential, enhancing access to clean fuel and accelerating the growth.

About 20% of India's natural gas production comes from the North-East. Out of about 75 million standard cubic meters per day of gas output, 15 mmscmd come from North East. Currently Assam, Arunachal Pradesh and Tripura have established gas production potential while there are possibilities for the same in Nagaland and Manipur.

The funding support to the gas grid is a part of a broader goal of the government to raise the share of natural gas in the country's energy mix to 15% by 2030 from current 6.2%.

IOC commissioned its 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. As per IOC an LPG pipeline from Gujarat coast to Gorakhpur in eastern Uttar Pradesh is being laid 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 tonnes 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 is 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 tonnes 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.

The Ministry of Petroleum and Natural Gas wants to capitalize on the government's move to partly ease the ongoing nationwide lockdown and allow limited economic activity, the sources said. State oil companies have assessed that 511 projects can be started immediately. These projects would require expenditure of \$ 5.66 bn (Rs 42,790 crore) in the current fiscal year.

GAIL currently operates 12,160-km of pipeline network and markets two-thirds of all-natural gas sold in the country. It is currently executing more than 5,500 kilometers of pipeline projects and a similar length is at the planning stage. Projects at hand include the ambitious Urja Ganga Project to take gas to Bihar, West Bengal, Odisha, and Jharkhand as well as Kochi-Kootanad-Bangalore-Mangalore line and the Indradhanush North East Gas Grid. These pipelines will connect supply and demand centers envisaged under the National Gas Grid.

Besides pipelines, GAIL is also expanding city gas distribution (CGD) networks for retailing of CNG to automobiles and piped natural gas to household kitchens. Investments are also planned for the expansion of petrochemical plants. GAIL is looking to put up 400 CNG stations and give out a record 10 lakh piped natural gas (PNG) connections to household kitchens in the next 3-5 years.

As per IEA, as India recovers from a COVID-induced slump in 2020, it is re-entering a very dynamic period in its energy development. Over the coming years, millions of Indian households are set to buy new appliances, air conditioning units and vehicles.

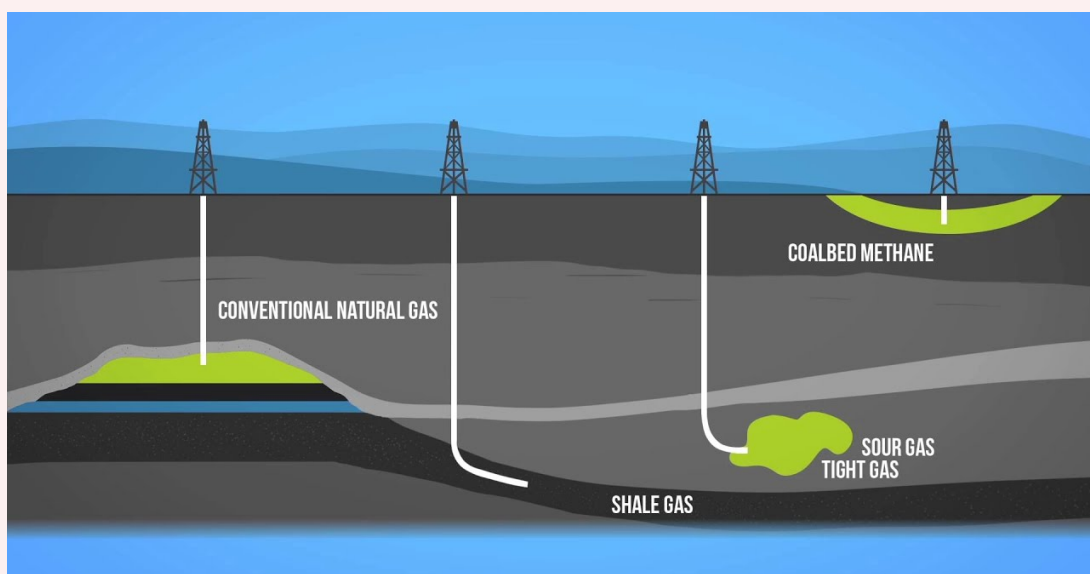
As per IEA, Prior to the global pandemic, India's energy demand was projected to increase by almost 50% between 2019 and 2030, but growth over this period is now closer to 35%. "An expanding economy, population, urbanization and industrialization mean that India sees the largest increase in energy demand of any country. India's natural gas consumption is recovering in June after declining in the previous two months, as states ease restrictions in the wake of a drop in coronavirus infections. Gas consumption in April and May fell by about 10% to 15% compared to a 50% reduction last year when there was a nationwide lockdown to stem the spread of the virus.

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. 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.

In February 2021, Reliance sought bids for 0.82 million standard cubic meters per day of gas from the Sohagpur coal-bed methane (CBM) block, according to a notice inviting offer (NIO).

Bids have been sought for supply of gas, which can be used in industries as fuel or feedstock as well as by city gas operators for supply as CNG to automobiles and piped cooking gas to households, for one year beginning April 1, 2021. Reliance started commercial gas production from the CBM blocks in March 2017 and reached the peak of 3 mmscmd before the end of 2018.



Reliance Industries Ltd has sold three-fourth of the gas from coal seams in Madhya Pradesh to an affiliate of the company at a price of just over \$6 at current oil prices.

India Gas Solutions Private Limited, a 50: 50 joint venture of RIL and UK's BP, bought 0.62 million standard cubic meters per day out of 0.82 mmscmd gas bid out in an auction in March 2021. State-owned gas utility GAIL India Ltd cornered 0.17 mmscmd while 0.03 mmscmd was picked by Reliance Gas Pipeline - the entity that transports gas from the coal-bed methane (CBM) blocks in Madhya Pradesh to consumers. The price bid was 9.2% of the prevailing rate of Brent crude oil price, which translated into a rate of over \$6 per million British thermal units at current oil prices.

Raniganj coal bed methane (CBM) block of Essar Oil & Gas Exploration & Production Ltd (EOGEPL) in West Bengal can generate annual revenue in a range between Rs 1,700 crore and Rs 1,800 crore at peak production levels. The Raniganj CBM field has 350 wells, associated gas gathering and compressor facilities and about 300 km of infield and customer pipelines. The company is planning to drill 250 additional wells in the block according to the approved field development plan.

The company has so far invested Rs 4,000 crore towards the development of the Raniganj East Coal Bed Methane (CBM) Block in West Bengal which is also the highest producing CBM field in the country having recorded a production of 1 million standard cubic metres per day (mmscmd) of gas.

CBM development in Eastern India will be a key focus area for the company since there is lack of conventional oil and gas in that region. Upcoming opportunities in CBM and Shale in the Damodar Valley belt will be on EOGEPL radar.

According to the Directorate General of Hydrocarbons, the potential CBM resources in the country stand at around 92 trillion cubic feet (TCF). Out of the 92 TCF of the estimated CBM resources, about a third is available in the Damodar Valley Coalfields

The Damodar Valley Basin in Eastern India has been reasonably proved to be the best area for CBM development with six of the eight development blocks located there. Apart from the CBM blocks under development, Coal India under its 2015 CBM policy framework is also in the process of developing CBM across several blocks within their leasehold area. Two such blocks have already been offered.

CBM development needs hundreds of wells to be drilled, and hence land acquisition is a big hurdle in an agricultural economy like India. Apart from this, about 40 odd clearances are required through CBM exploration to development cycle. The stranded nature of the blocks has also led to lack of interest in developing them. Operators have to invest a huge additional sum for pipeline infrastructure. These issues are compounded by the fact that cheap coal is widely available in the Damodar Valley which makes end users reluctant to use CBM gas.

Coal India has plans to outsource CBM production to global operators by appointing global Mine Development Operators from Coal India's blocks. The set target is for producing 1 Million Metric Standard Cubic Meter Per Day (MMSCMD) of CBM by 2023-24

Essar Oil and Gas Exploration and Production Ltd (EOGEPL), India's leading coal seam gas producer, on Wednesday said it has signed a pact with IIT Dhanbad (Indian School of Mines) to jointly carry out research and development on coal bed methane (CBM) technologies.

Table 5: Coal Bed Methane Demand Supply

Coal Bed Methane (MMSCM)	2018-19 A	2019-20 A	2020-21 A
Production	710	655	642
Imports	-	-	-
Exports	-	-	-
Apparent Demand	-	-	-
Demand Growth%	-	-	-

June 2021 saw, state-owned Coal India Limited (CIL) has forayed into extraction of coal bed methane (CBM). Useful exploitation of CBM would not only lead to its efficient use as energy fuel, but would also prevent its release into the atmosphere during coal mining.

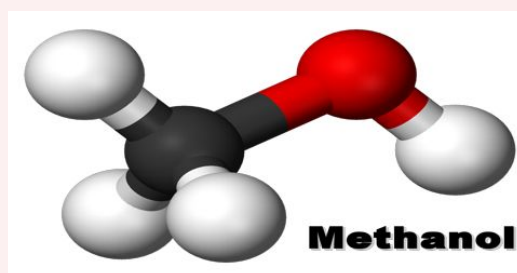
CIL's arm Bharat Coking Coal would invest around 20 per cent in the Jharia CBM Block-I project. Coal India Ltd (CIL) has issued a Letter of Acceptance to a CBM developer to extract coal bed methane (CBM) within its leasehold area. CBM is the unconventional form of natural gas found in coal seams. The bid for Jharia CBM Block-I of Bharat Coking Coal Ltd (BCCL), the Jharkhand-based subsidiary of CIL, was won by the CBM developer through a global bidding process.

BCCL will be investing around 20 per cent in the project, which is estimated to entail an estimated capital of ₹1,880 crores as per the project feasibility report. The remaining would be put up through the CBM developer.

CIL has also floated global bids looking for developers for two more projects having a combined resource potential of 2.7 BCM (Billion Cubic Metres). Raniganj CBM block under Eastern Coalfields Ltd, West Bengal, has a 2.2 BCM resource, while Sohagpur CBM block under South Eastern Coalfields has 500 million cubic metres of methane. Jharia CBM Block-I, spread over 27 sq.kms, has a CBM resource of over 26 BCM. Average production capacity is pegged at 1.3 million metric standard cubic metres per day once the commercial operation kick starts. With the life span of this methane extraction project spread over 25 years, the development and production are expected to start from 2026. This is a big step for Coal India. It is for the first time that the company has taken up CBM extraction on its own in its leasehold area.

D. Methanol

Methanol consumption and production over last couple of years in India were stable, however consumption witnessed a de growth in 2020-21 of 2.3%. India has an installed Methanol Production capacity of 2 MMT per an num. As per the plan prepared by NITI Aayog, using Indian High Ash coal, Stranded gas, and Biomass can produce 20 MMT of methanol annually by 2025.



India, with 125 Billion Tonnes of proven Coal reserves and 500 million tons of Biomass generated every year & the huge quantities of Stranded & Flared gases has a huge potential for ensuring energy security based on alternate feedstock and fuels. NITI Aayog has drawn out a road map to substitute 10% of Crude imports by 2030, by Methanol alone. This requires approximately 30 MMT of Methanol. Methanol & DME are substantially cheaper than Petrol and Diesel and India can look to reduce its fuel bill 30% by 2030.

Table 6: Methanol Demand Supply

Methanol (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	631	631	631	631	631
Production	200	210	225	300	300
Imports	2007	1983	1911	2033	2169
Exports	7	6	0	0	0
Apparent Demand	2134	2186	2136	2333	2469
Demand Growth%	4.5%	2.4%	-2.3%	9.2%	5.8%

Methanol as a low carbon, hydrogen carrier fuel” produced from high ash coal, agricultural residue, CO₂ from thermal power plants and natural gas is the best pathway for meeting India’s commitment to COP 21. Methanol Economy program initiated by NITI Aayog is aimed at reducing our oil import bill; reducing greenhouse gas (GHG) emissions & converting Indian coal reserves and municipal solid waste into methanol leading to independence from import while creating new jobs by setting up Methanol Production Plants.

Methanol, although slightly lower in energy content than petrol and diesel, can replace both petrol and diesel in transport sector (road, rail and marine), energy sector (comprising of DG sets, boilers, process heating modules, tractors and commercial vehicles) and retail cooking replacing LPG (partially), Kerosene and wood charcoal. Blending of 15% methanol in gasoline can result in at least 15% reduction in import of gasoline/ crude. In addition, it would bring down GHG emissions by 20% in terms of particulate matter, NO_x, and SO_x thereby improving urban air quality.

Methanol Economy will result in minimum 15% of reduction in fuel bill annually for the country by 2030 and it will also create close to 5 million jobs through methanol production/ application and distribution services. Additionally, Rs. 6000 Crore can be saved annually by blending of 20% DME (Di-methyl Ether – a derivative of methanol) in LPG.

Going by the Department of Science and Technology’s report for February 2021, it is clear that the government is growing serious about a clean fuel that has been asking for attention for some time — namely, methanol. Eight of the 18 points under ‘technology development’ relate to reviews of methanol projects.

They include utilization of methanol and di-methyl ether in automotive engines using advanced combustion modes; production of ultra-pure hydrogen from methanol for fuel cells; and the development of an electronically controlled high-performance, hot-surface, methanol-powered ignition engine. The message is Mainstreaming methanol is high on priority. This is significant because it shines a light on an alternative for electric vehicles, particularly for heavy-duty commercial vehicles.

Most of the global methanol production comes from natural gas — replace one hydrogen atom in a methane molecule with a hydroxide molecule, one gets methanol — it is quite a simple process. But India has no natural gas, and to produce methanol using imported natural gas (it’s being done) is uneconomical. So, that route is out.

The next best route is to make use of India's abundant coal. Gasifying coal and making methanol (and DME) from the coal gas is a route that coal-rich China has adopted in a big way. Now, coal gasification is a broad area. government-owned Fertilizer Corporation of India is implementing a ₹13,000-crore project to make coal gas and produce fertiliser from it.

That such an important project is limping along slowly shows the difficulties in coal gasification. Technology for this project, incidentally, is being sourced from the US company Air Products.

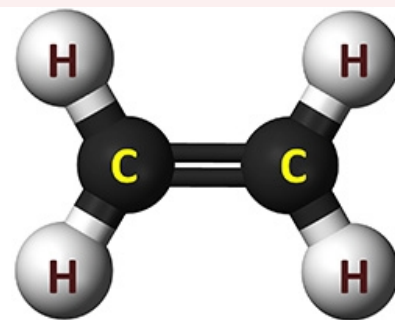
As part of efforts to produce methanol affordably, some steps have been taken. For example, the Bureau of Indian Standards has notified standards for 20% blending of DME with LPG and for mixing 15%, 85% and 100% methanol with diesel. One immediate application is DME-blended LPG for mass cooking. This is being implemented at the Ramachandra Mission, Hyderabad, where thousands of meals are cooked daily.

The government has decided to go ahead with 15% methanol-blended petrol in the North-East, where Assam Petrochemicals has surplus methanol. The company is also raising its methanol production six-fold from 100 tpd. However, methanol vehicles are not covered by the FAME-II scheme, under which the government provides subsidies for EV purchases. At best, methanol-powered vehicles are exempted from "the requirements of permit". Increase in Methanol consumption in past has been 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.

XVII. Building Blocks

A. Ethylene & Propylene

Ethylene Capacity is expected to increase to 8001 KT in next fiscal 2021-22 with capacity addition of 524 KT by HMEL by Q4'21. And when then plant becomes fully operational, the total ethylene capacity in the country will touch 8677 KT by 2023.



Ethylene consumption in the country rose from 6843 KT in 2019-20 to 6925 KT in 2020-21 and is forecasted to witness a de-growth next fiscal, before growing at around 6% in 2023, when the demand in the country is expected to touch 7268 KT.

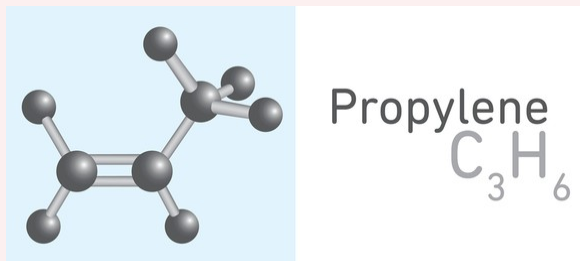
Exports of Ethylene witnessed a dip from 2019-20 from 166 KT in 2019-20 to 100 KT in 2020-21 and is projected that exports will remain in similar range for next two fiscals. While production rose from 6959 KT to 6987 KT in 2020-21. It is forecasted to dip in next fiscal year i.e., 2021-22 to 6964 KT and then bounce back to 7353 KT by 2023.

Propylene demand rose from 5479 KT in 2019-20 to 5767 KT in 2020-21 and is expected to rise further to 6459 KT by 2023. Capacity is expected to witness an increase from 6554 KT presently to 6774 KT next fiscal 2021-22 with HMEL adding capacity and further to 7117 KT as its plant becomes fully operational by 2023. Production rose from 5481 KT in 2019-20 to 5777 KT in 2020-21. It is projected to witness a further rise and touch 6034 KT in 2021-22 and touch 6459 KT by 2023.

Table 7: Ethylene & Propylene net availability

Ethylene (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	7477	7477	7477	8001	8677
Production	6546	6959	6987	6964	7353
Imports	63	50	39	25	25
Exports	149	166	100	110	110
Net Availability	6460	6843	6925	6879	7268
Propylene (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	6394	6554	6554	6774	7117
Production	5022	5481	5777	6034	6459
Imports	4	13	4	14	0
Exports	41	16	14	0	0
Net Availability	4985	5479	5767	6048	6459

The world's largest refinery was being planned in Ratnagiri district of Maharashtra, is commonly referred to as the Nanar project. Following the objection by a political party, the last state government had proposed an alternative location for the refinery at Roha, off the east coast of the megapolis. As per IOC they are on course to finalize the technical configuration for the refinery (both Engineers India Ltd and American engineering consultancy Jacobs have submitted their final proposals), and are also engaging the state in the right earnest. However, IOC officials have added that unless there is finality on the location, the company cannot go ahead as identifying the land is crucial, considering it needs around 15,000 acres.



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.

Indian Oil Corporation, equity partner in the proposed mega West coast refinery, has held many rounds of talks with the new Maharashtra government and is hopeful of the project coming on-stream.

The Kochi refinery processed a total of 16.52 million tonnes (Mt) of crude oil during the financial year ending March 2020, while a propylene derivative petrochemical project (PDPP) was inaugurated at the refinery complex in February 2021.

The recently launched (14th February 2021) propylene derivative petrochemical project (PDPP) at the refinery enables the production of various petrochemicals including, acrylic acid, oxo alcohols and acrylates. The polymer grade propylene (250 KTPA) produced from the Petro fluid catalytic cracking unit in the refinery is used as feedstock for the PDPP project.

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.

Numaligarh Refinery Limited (NRL) is expanding its refining capacity from three to nine million metric tons per year. The project is expected to be completed by 2024.

The refinery expansion project is part of the government of India's initiative towards "Hydrocarbon Vision 2030" for the northeast region of India. The efforts are aimed at exploiting the region's hydrocarbon sector to facilitate economic development, enhance the access to clean fuels, increase the availability of petroleum products and create employment opportunities.

Numaligarh Refinery Ltd (NRL) will use Honeywell UOP technology to produce cleaner-burning diesel fuel in compliance with India's BS-VI emission standards and increase crude oil conversion.

State-owned Indian Oil Corporation (IOC) in June 2021 signed up an investment pact for adding petrochemical and lube plants to its previously announced plan to expand crude oil processing capacity at its Koyali refinery at Vadodara in Gujarat. Company is expanding refining capacity by 4.3 million tonnes per annum to 18 million tonnes and adding plants to produce 500,000 tonnes per annum of polypropylene and 2,35,000 tonnes of lube oil base stock at the site would see total investment of about Rs 24,000 crore.

The LuPech project will produce import substitutes like Lube Oil Base Stock (LOBS) and Polypropylene. The Acrylics/Oxo Alcohol Project at Dumad and Gujarat Refinery will manufacture value-added Butyl Acrylate, a key ingredient for paints, coatings, adhesives, textile chemicals, plasticizer industry, and other similar products.

The inclusion of the petrochemical-lube integration component comes as part of IOC's strategy to create a building block for future production of niche chemicals with a potential to increase petrochemical and specialty products integration index on incremental crude throughput to improve margins.

These projects will strengthen the IOC's readiness for venturing into petrochemical projects like PVC, Styrene, Acrylonitrile, Poly-Methyl Methacrylate and Ethylene Oxide in future. The Petrochemicals & Specialty products (Gr-II/III LOBS) integration index based on additional crude oil added under this project is estimated to be 20.7%.

IOC said MoU was also signed for infrastructure facilities at Dumad for Koyali-Ahmednagar-Solapur Pipeline and tank truck loading facility for Linear Alkyl Benzene (LAB) - a feed-stock for detergent industries.

The other infrastructure projects envisaged are a new flare system at the Gujarat refinery and a hydrogen dispensing facility for Fuel Cell Electric Vehicles (FCEV). The refinery will be implementing India's first hydrogen dispensing facility as a clean fuel initiative. This facility aims to fuel hydrogen buses plying between Vadodara and Kevadia /Sabarmati Ashram.

Gujarat Refinery is now poised to grow to 18 MMTPA capacity. New units for the production of polypropylene, butyl acrylate and lube oil base stocks will also be added to the refinery's portfolio.

State-owned Indian Oil Corp (IOC) board in Sep 2020 approved an investment of Rs 1,268 crore for setting up a needle coker unit at the firm's Paradip refinery in Odisha.

Haldia Petrochemicals has proposed to expand its capacity by 50%, entailing an investment of Rs 8,500 crore. The company is embarking on a project which will enable it to produce 345,000 tonnes per annum of additional polymer, making HPL a 1-million-tonne capacity plant. At present, HPL has an installed capacity of 700,000 TPA. HPL would import 300,000 tonnes additional naphtha to make polymer. The port has allotted 6 acres for the project. Haldia Petrochemicals Ltd (HPL) had announced in 2019-20 that company would be investing over USD 4 billion in setting up a mega petrochemical complex in Odisha.

In January 2020, the state government has begun the process of acquiring 3320.21 acres of land in Baliapal block of Balasore district for the same. Once complete the project is expected to generate employment of around 10,000 people.

The hydrocarbon processing complex comprising a light crude oil refinery, aromatics complex and ethylene cracker units.

The proposal envisaged 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 West Bengal-based company had proposed investment of \$10 billion at the Make in Odisha Conclave global investors' meet held in November 2018. 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 product 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 proposed textile park of Indian Oil Corporation Limited (IOCL) in Bhadrak will be functional in 2023-24.

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.

GAIL (India) Ltd has revised its petrochemical expansion plan of Pata petrochemical complex and has decided to add some offsite storage facilities to ensure efficient feedstock and product storage. As per the GAIL's initial strategy, the investment capital over the addition of 60KTPA Polypropylene unit at the gas-based Pata petrochemical complex in Uttar Pradesh was estimated around INR 7.50 billion. However, the PSU came up with some manipulations after a detailed study of the project plan wherein it suggested some necessary additions, particularly with respect to the feedstock and product storage facilities.

The company has henceforth escalated the project cost by over 20% to INR 9.10 billion. According to a company official, since the petrochemical site is landlocked, one of the important additions to the project plan will be an offsite warehouse capable of holding nearly two months of Polypropylene inventory.

As per the project proposal, GAIL plans to use around 50,000 tpy of polymer grade Propylene produced at the Pata plant as the key feedstock for the new PP unit. Currently, GAIL is selling the Propylene produced at its Pata complex to several clients. In addition, the Pata complex has the capacity to produce 810 KTPA of Polyethylene (PE) and 20 KTPA of Butene-1. Polypropylene, popularly known as PP, is a tough crystalline thermoplastic produced from Propylene serving versatile applications such as plastic, fibre, in automobiles, consumer goods and furniture, apart from other industrial uses. By stepping into Polypropylene production, GAIL is expanding its petrochemicals portfolio and entering the league of major manufacturers of the country when India is already following the footsteps of becoming a global manufacturing hub.

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. Nayara Energy Limited have finally got environmental clearances (Feb 2021) for expansion at the existing refinery complex and for setting up a new petrochemical complex in Vadinar.

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. Thyssenkrupp Industrial Solutions (India) has recently signed a contract with Nayara Energy, under which it will provide project management consultancy (PMC) services for Nayara's new petrochemical project to be built at the site of Nayara's 20-million-t/y Vadinar refinery in India

The planned investment is for 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. 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.

In a recent development, (June 2021) The National Green Tribunal (NGT) has constituted a three-member committee to evaluate the risk associated with the expansion of oil refinery of Nayara Energy Limited, owned by Russian giant Rosneft, in Gujarat and suggest remedial measures.

A consortium of Tecnimont SpA and Tecnimont Private Ltd., subsidiaries of Maire Tecnimont SpA, have received a contract from Indian Oil Corp. Ltd. (IOCL) to set up a new paraxylene unit and relevant offsite facilities in Paradip, Odisha, India. The project will involve construction of a new 800,000-t/y paraxylene plant, which will feed an adjacent 1.2- million-t/y purified terephthalic acid (PTA) unit. Both facilities are expected to be complete by early 2024.

Under the lump-sum contract, valued at around \$450- million, the consortium will be responsible for the engineering, procurement, construction and commissioning activities of the paraxylene unit up to the performance guarantees test run. IOCL is currently building a 357,000-t/y ethylene glycol (EG) plant at Paradip, which is scheduled to begin operations towards the end of this year. EG from the new complex will be used as feedstock in the PTA plant.

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.

Asian and Global Scenario

Asian ethylene and propylene forward curves have stayed in backwardation for the past few weeks. Sentiment has remained bearish as demand concerns persist over the lackluster performance of downstream markets. Adding to the pricing pressure is also concern over lengthening supply in Northeast Asia, of both ethylene and propylene.

Although current supply in Northeast Asia is still tight, most of the cracker maintenance turnarounds will be completed by July. Of immediate concern for ethylene, is the start-ups of South Korean crackers from June through August. South Korea's GS Caltex, the second largest refiner after SKGC, is building a mixed-feed cracker with 700,000 tons/year ethylene and 350,000 tons/year propylene capacities. The cracker is expected to start up around June 2021. The producer will have an additional 200,000 tons/year of ethylene for commercial sales. LG Chemical's third cracker at Yeosu will be operational around July-August 2021. The cracker will have 800,000 tons/year of ethylene capacity.

China being the major importer of ethylene, will be adding eight ethylene crackers in 2021, with a total capacity of 7.8 million tons. This will raise China's ethylene capacity to around 40 million tons by the end of this year, or an estimated 23% increase from 2020.

Wanhua Chemical's propane-fed 1 million tons/year ethylene cracker started up in late 2020. Ningbo Huatai Shengfu's 600,000 tons/year gas cracker, which started up in the first quarter, and Gulei refinery's 1 million tons/year naphtha cracker in Fujian, which is expected to come onstream in the third quarter - are expected to each supply around 9,000 to 10,000 tons/month of ethylene to the merchant market. Petrochemical producer Zhejiang Satellite's 1.25 million tons/year ethane-feed cracker has started up recently.

On propylene, China's Fujian Meide Petrochemical started up its new 660,000 tons/year PDH facility in Fuzhou, Fujian in early February. Oriental Energy also started up its Ningbo phase-two 600,000 tons/year PDH plant in late February, increasing its total propylene capacity to 1.86 million tons/year.

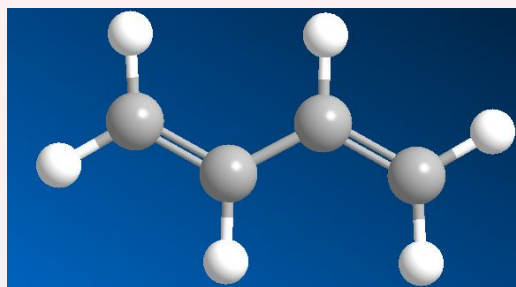
The Chinese producer has two other PDH facilities, a 600,000 tons/year unit in Zhangjiagang and the 650,000 tons/year unit in Ningbo, making it China's largest PDH operator.

The weakness of downstream markets and the lack of pricing support is particularly evident from downstream PE, PP and MEG. PE prices fell for the eleventh straight week (June 2021), and with LLDPE/HDPE at \$1040-1130/ton CFR China/SEA, it is at negative margin for China PE producers and just breakeven for Southeast Asia PE producers.

With the nascent arbitrage trade for ethylene from the USG to Asia ended, and arbitrage now mainly focused on USG/Mexico to Europe, there will at least be little supply pressure from the USG on either ethylene or propylene. Additionally, there will be upcoming planned cracker turnarounds in SEA between July and September. This will help to tighten supply in SEA. Hopefully when crude turns bullish again, there will be more support for naphtha and this may aid to cap the bottom on olefins prices.

B. Butadiene

Butadiene market on application basis is segmented into plastic, chemical and rubber industry. It is a raw material for PBR, SBR, NBR, ABS, Adiponitrile, Styrene Butadiene Latex, and other applications. Last year, was a challenging for Butadiene, just like any other product due to the pandemic. The market was negatively impacted by COVID-19 in 2020.



Prices slashed to historical low in April '20, and it was so because of rising infection and lockdowns in place. The automotive manufacturing units and building construction projects were temporarily halted, which negatively impacted the demand of tyre, building crack fillers, concrete additives, etc.

This severely impacted the BD demand, leading to increased inventory levels at producers end and thus we observed a sharp fall in BD prices. However, the use of protective gloves made from nitrile rubber peaked in this pandemic situation, thus stimulating the demand for the butadiene market.

With gradual recovery in economy and lowering infection rate the industry reopened. As lockdown eased, several automakers resumed operations in May strictly in accordance with the government regulations and guidelines.

This increase in demand coupled with multiple plant turnarounds in NEA and Europe led to supply pressures, which helped BD prices to rise back to normal levels. Further uptick in upstream also helped the producers to work on pre-COVID margins. The condition still depends on the how various regions deals with the post pandemic normalcy, and whether a V-shaped or a U-shaped recovery is possible.

The current situation on the butadiene market, (which has been highly volatile for many years), remains uncertain, with a significant level of dynamism, though market fundamentals are robust. For instance, H1 2021 saw a quick recovery in China following the outbreak of the COVID-19 pandemic.

Demand for butadiene rubber is driven by the rising downstream markets, including the automotive industry (especially in tire applications), construction, and electronics. The near-future scenarios of the Chinese butadiene market will depend on the consistency of the market recovery. An important driver is a rate of adding new production capacity in China in 2021.

If strong demand and limited supply persevere further in 2021, as it was evident in H1 2021, the butadiene rubber market is likely to tighten significantly with prices demonstrating a clear upward trend. The dynamics of the Indian butadiene market are heavily affected by the so-called second wave of the pandemic and will be predicated on the ability of national and regional authorities to control the situation as some Indian states remain in a lockdown, while others perform relatively better.

It is vital to mention that Asia is and will remain a key region with respect to butadiene rubber consumption and production.

Table 8: Butadiene Demand Supply

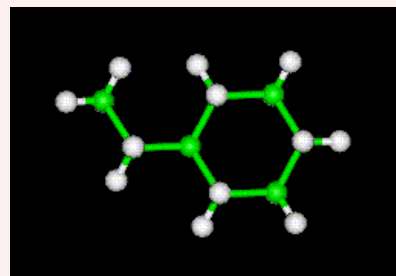
Butadiene (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	605	605	605	605	605
Production	485	501	461	513	518
Imports	0	0	0	0	0
Exports	167	172	134	153	148
Apparent Demand	318	329	327	360	370
Demand Growth%	6.7%	3.6%	-0.6%	10.1%	2.8%

From a modest growth of 3.6% in 2019-20, there was a de-growth in demand in 2020-21. However, with likely support robust domestic consumption of synthetic rubber, especially styrene-butadiene rubber (SBR) and polybutadiene rubber (PBR). A robust growth is expected next year growing at 10%.

There was an exportable surplus of 172 KT in 2019-20, which saw a dip due to pandemic. While the same is expected to increase to be around 153 KT in this fiscal 2021-22. There are no imports expected going forward in next two years.

C. Styrene

The Indian Styrenics Market stood at 799 KT in 2020-21. The demand of Styrene has been continuously increasing in Indian plastics market from past few years. The end segment with high styrene consumption was a automobiles, packaging, building and constructions, consumer products, medical devices and others. 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.

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.

In Asia, spot styrene prices on FOB Korea and CFR China basis gained around 10% since early May to reach \$1320/ton and \$1340/ton respectively. These marked the highest levels since February 2020 for both terms. As styrene surged to \$1340/ton CFR China within a week in May 2021, it became a major concern for all ABS producers, as styrene monomer forms 55% of ABS production. Meanwhile the coronavirus pandemic and rising infection rates across Southeast Asian countries, as well as the ongoing Indian health crisis, all had depressed the recovery of downstream markets.

India's total imports for Styrene witnessed a de-growth in 2020-21, owing to reduced demand in user industries primarily due to the lockdowns and restricted movement of goods, services and people. Imports are projected to increase 15% in next fiscal in 2021-22, and a similar increase further in 2023 to reach 1065 KT.

Table 9: Styrene Demand Supply

Styrene (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Imports	1064	877	799	920	1065
Exports	0	0	0	0	0
Apparent Demand	1064	877	799	920	1065
Demand Growth%	4.8%	-17.5%	-8.9%	15.1%	15.8%

New styrene capacity totaling 3.6 million mt/year is slated to start up in China in H2 2021, including Sinopec Gulei, Shandong Lihuaya and phase two of the giant Zhejiang Petrochemical. The expected capacity expansion volumes outstrip China's 2020 import of 2.83 million mt and are expected to accelerate China's transition from a net importer toward self-sufficiency and exports.

The Indian styrene market, which is reeling under the second coronavirus wave, may remain highly uncertain through H2 2021. Downstream producers were forced to cut rates in Q2 because of low domestic demand, which may pick up starting in July if the vaccine drive gathers pace. However, if demand weakens, that could impact international suppliers as well, and they may have to cut operations.

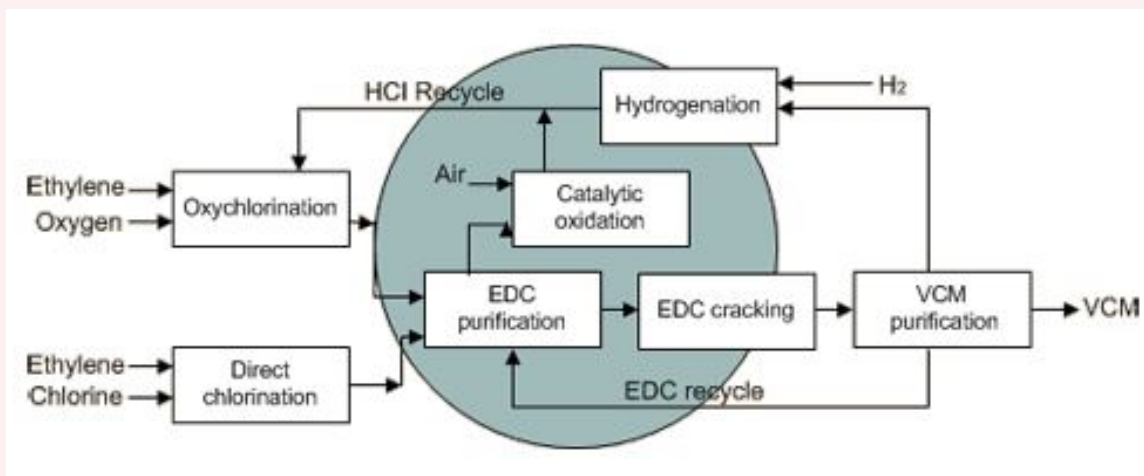
D. EDC and VCM

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 10: EDC & VCM Import into India

EDC (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	237	247	247	247	247
Production	229	246	254	254	256
Imports	498	627	540	540	580
Exports					
Apparent Demand	727	873	794	794	836
Growth (%)	2.5%	20.1%	-9.1%	0.0%	5.3%
VCM (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	996	996	996	996	996
Production	950	1026	944	1007	1010
Imports	458	512	500	500	500
Exports	0	0	0	0	0
Apparent Demand	1430	1559	1527	1527	1527
Growth (%)	1.7%	9.0%	-2.1%	0.0%	0.0%

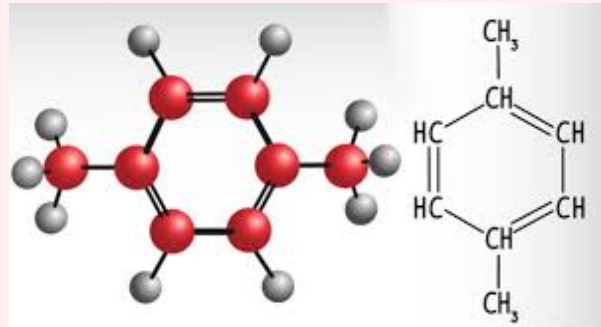
EDC demand witnessed a robust growth in 2019-20 before witnessing a negative growth of -9.1% in 2020-21. While the next financial year demand is expected to see flat growth, it is forecasted to grow at a modest level of 5.3% by 2023. While VCM too witnessed a dip in 2020-21 and is expecting a flat growth in next two fiscals. In case of EDC imports, there was a dip in 2020-21 after a surge in 2019-20 of 627 KT. Imports in case of VCM is expected to remain around same level as of 500 KT, in coming next two years.



E. Aromatics – Paraxylene

Asian Market

Although polyester and paraxylene market demand has been positive in 2020, margins have generally struggled and remained in negative territory, a situation which began in March 2019 when a large PTA producer, Hengli Petrochemical started up its first paraxylene line in Dalian, China. This was the first of a



swathe of new paraxylene capacity additions which occurred in mainland China over the last two years comprising Zhejiang Petrochemical, Sinop ec Hainan and Sinochem Hongrun. In total, almost 12 million metric tons of paraxylene capacity was added in mainland China during 2019 and 2020 at these four sites, dramatically lifting the country's self-sufficiency in paraxylene from 47% to 77%, using nameplate capacity. The global average paraxylene plant operating rate dropped from 88% in 2018 to just 76% in 2020. There was a slow decline of the paraxylene to naphtha spread in Asia from \$530 per mt in March 2019 to \$260 per mt by December 2019 as each new site came online in China. Margins swung heavily negative and this trend continued throughout 2020, putting huge pressure on paraxylene producers, that was only briefly lifted when energy prices collapsed in March as the COVID-19 pandemic took hold globally.

By June of 2020, the paraxylene to naphtha spread in Asia had sunk to a new low of \$160 per mt and it hovered at this level until February 2021.

This was a unique situation for the paraxylene industry as previous periods of global overcapacity had led to paraxylene to naphtha spreads falling to \$250 per mt for just a few months, followed by the closure of inefficient plants and a recovery of paraxylene to naphtha spreads above \$350 per mt shortly thereafter. This did not occur during this current downcycle and sustained low spreads of \$150-160 per mt prolonged negative margins for the industry in 2019 and 2020 and, although some operators turned plant rates down, producers largely chose to keep making paraxylene despite the losses.

Paraxylene to naphtha spreads climbed dramatically again in March 2021, rising as high as \$295 per mt on a spot basis in Asia but they have now subsided to around \$235 per mt. Various unplanned outages in mainland China, Vietnam, Japan and reduced rates in Brunei created unexpected tightness in the paraxylene market in Asia.

Despite the commissioning of major new paraxylene capacity in mainland China over the last two years and an increase in the country's paraxylene self-sufficiency, imports remained robust in 2020 at an estimated 14 million mt. This is just 2 million mt lower than the peak of paraxylene imports seen in 2018. The reasons for this slow reduction in purchases from the merchant market include technical difficulties during start-up of some of the new Chinese plants, a continued expansion of massive PTA capacity in mainland China and low production rates for some existing Chinese paraxylene units due to negative margins. This gives some hope to paraxylene exporters, particularly in NE Asia and the Middle East, who rely heavily on the mainland Chinese paraxylene market.

However, excess paraxylene supply is expected continue to dominate the landscape over the next two years. In mainland China, Zhejiang Phase II will be commissioned this year, possibly as early as the summer, possibly adding up to 5 million mt of paraxylene capacity.

Additionally, as per IHSMarkit, CNPC Jieyang to deliver a 2.6 million mt facility mid-2022 and Shenghong Petrochemical may be able to bring online their new 2.8 million mt facility by the end of 2022. Outside of mainland China, Saudi Aramco is expected to start an 800 kt paraxylene unit in Jizan, Saudi Arabia in the second half of 2021. Consequently, with an expected 9 million mt of additional paraxylene capacity operational in the next two years, IHS Markit foresees a further softening of the nameplate capacity global operating rate to just 72% by 2022. This will have significant consequences for paraxylene margins.

Asian paraxylene hit 26-month high on improved short-term balance, rising oil prices on 24th June 2021.

Indian Market

India takes up to about 8% of world's total PX capacity, as world's third largest PX producer following China and South Korea. India is one of the major suppliers of PX to China. In 2019-20, China received 1.55 million tons of PX from India. It made India the third largest origin of China's PX imports, following South Korea and Japan.

Polyester chain recovery amid the easing of lockdowns globally would be a gradual process on the back of the high PX, PTA inventories that requires time to be consumed. For PX, the direct impact that it may bring is on its exports, which depends not only on India's port policy, but also on the overall local demand in the later period. Similar to China, the impact of lockdown on downstream consumption is more obvious. It is forecasted that PX exports would decline from 2242 KT in 2020-21 to 2138 KT by 2021-22.

Table 11: Paraxylene Demand Supply

(KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	5786	5860	5860	5860	5860
Production	5377	5086	5109	5381	5381
Imports	762	690	615	650	650
Exports	2262	1955	2242	2138	2138
Apparent Demand	3841	3908	3297	3925	3925
Demand Growth%	-3.0%	1.7%	-15.6%	19.0%	0.0%

PX imports fell to 615 KT in 2020-21 and it is expected to increase to 650 KT in next two fiscals. In 2020-21, PX registered a decline of 15.6% due to COVID-19 pandemic.

In 2020, local markets were severely impacted by lockdowns following the COVID pandemic outbreak. For almost four months, the polyester industry operated at only about half capacity. While 2020-21 saw demand rising in food packaging as consumers stocked up with more prepacked foods from grocery stores and supermarkets.

The bottled drinks market suffered reduced consumption of carbonated drinks as bars, restaurants, and hotels had to close and fewer people traveled. Demand was more deeply impacted by the pandemic as retail clothing stores were forced to close and online shopping did not compensate for reduced footfall in the shops. Home furnishings sales softened and polyester carpet demand declined. Additionally, auto plants shut down, which hurt polyester carpet sales and new car purchasing declined as people lost their jobs.

PX consumption is expected to touch 3925 KT by 2023 in India. PX demand is expected to increase in coming years, mainly on account of the PTA capacity increase. Growing polyester demand will necessitate PTA additions and almost 3.6 MMT of PTA capacity is expected to be added by 2030.

While, by 2025, mainland China is anticipated to add another 12 million metric tons or 50% more PX capacity relative to 2020.

IOC has given the EPCC contract for its new PX plant to Tecnimont SPA and Tecnimont Private Ltd. which will deliver engineering, procurement, construction, and commissioning (EPCC) of the complex's new PX plant and related offsite installations.

Once completed, the new plant will have a PX production capacity of 800,000 tpy, which will be used as feedstock for an adjacent 1.2-million tpy PTA plant to be built as part of complex. The PX plant will receive its feedstock of reformate from the refinery's existing UOP LLC-licensed continuous catalyst regeneration (CCR) platforming unit, according to official project documents from IOC and the government of India.

Maire Tecnimont—which valued the lump-sum EPCC contract at about \$450 million—said mechanical completion of the PX plant is scheduled for 33 months from the award date, or sometime in late 2023 or early 2024.

In official project documents filed by IOC with the government of India, the operator said the PX plant will consist of an integrated, UOP-licensed aromatics block that includes the following proprietary units and technologies: a xylene fractionation unit, a Sulfolane unit, a benzene-toluene fractionation unit, a Tatoray unit, a Parex unit, an Isomar unit. While IOC has yet to officially confirm specific process technologies to be implemented at the PTA plant, the operator previously said it had selected proprietary technology originally developed and licensed by BP PLC.

On Jan. 1, 2021, however, INEOS AG confirmed it completed its purchase of much of BP's petrochemicals business, including most of the latter's technology and licenses offerings. INEOS Aromatics is now responsible for licensing of INEOS-owned PX-PTA technologies, the company said in the early 2021 release.

The complex's PTA will consist of two sections, the first of which will use a feedstock of PX to produce crude terephthalic acid (CTA). A second section of the plant will then use the CTA to produce high-purity PTA, according to IOC.

XVIII. Intermediates

A. Fibre Intermediates

Indian Market

The impact of COVID-19 pandemic has been quite severe in India in 2020 and the drastic lockdowns to control the pandemic led to an extended shutdown of the textile industry.

The primary or key raw materials used to make polyester are Purified Terephthalic Acid (PTA) and Mono Ethylene Glycol (MEG). The prices of PTA and MEG had declined in the range of 20%-23% in April 2020 from their levels in January 2020 due to Covid-19 disruptions. The Brent crude oil prices had fallen by a sharper 71.1% to USD 18 per barrel in April 2020 from January 2020. PTA and MEG are derivatives of crude oil and thus their prices are influenced by the movement in crude oil prices.

Later on, while the prices of PTA remained stable at Rs.45 per kg during June-October 2020, the prices of MEG either remained stable or increased by Rs.1-2 per kg during this period. The crude oil prices also had seen some improvement during this period. The prices of both the raw materials grew in November 2020 and increased by 12%-18% in December 2020 backed by improved downstream demand amid lower inventory in China.



India is net importer of PTA and MEG and thus the demand-supply situation in the international market has an influence on the domestic prices. In January 2021, while the prices of PTA increased by 9.9% to Rs.58 per kg, the prices of MEG declined by 9% to Rs.50 per kg on m-o-m basis. India's PTA market was tight throughout H1 2021 domestically, leading to increased imports.

India is second largest PTA market in Asia, typically importing 50,000–60,000 mt per month before the pandemic, according to Indian customs data. The Indian PTA market has been facing domestic supply shortage since mid-September 2020 amid planned and unplanned shutdowns.

Meanwhile, some PTA producers integrated their downstream August onwards and increased PTA supply to the newly acquired polyester units, cutting some supply to the market. The supply tightness from H1 2021 in Indian domestic PTA market may continue in H2 2021, when there is no new PTA capacity expected to be commissioned locally. Hence, trade participants expect greater PTA import demand from India, though uncertainties persist from potentially stricter import control, container availability and COVID-19 pandemic.

In the purified terephthalic acid (PTA) market, spot cargoes from northeast Asia have been delayed, and could affect suppliers in Taiwan and China, as Indian polyester facilities have reduced production. India had a 35% share to China's total PTA exports in the first quarter of the year, and a 30% share in Taiwan's PTA exports in January-February 2021 as per ICIS.

Though India, is a net importer of PTA, but weak domestic demand has been prompting some local producers to export some volumes to Europe to prevent a massive build-up in inventory. PTA supply in the local market is expected to lengthen in the near term as previously booked import cargoes start arriving and amid dwindling run rates at downstream polyester units.

In the MEG market, India has shipped out a huge volume of around 10,000 tonnes of cargoes to China, a reversal of its usual role as an importer of the material.

A new plant that was being built by JBF Industries in Mangalore, India, could not start on schedule in 2017, mainly because of the company's financial situation. As the company's creditors continue to search for a sustainable plan for future operations, the start-up of the new PTA asset has been delayed.

The prospect of this project being revived diminishes further each day and we have pushed back a possible restart of this asset until 2025-26. Indian Oil has announced that it has firmed up plans to develop a new petrochemical complex at Paradip on India's east coast and will build a large PTA plant at that site.

HPL, in the second phase of revamp of Nagarjuna Oil Corp Ltd (NOCL) refinery, the company plans to setup a 1.6m tonnes/year paraxylene (PX) line and a 1.25m tonnes/year purified terephthalic acid (PTA) plant.

Table 12: Fibre Intermediate Demand Supply

ACN	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	0	0	0	0	0
Production	0	0	0	0	0
Imports	182	176	135	175	189
Exports	0	0	0	0	0
Demand	182	176	135	175	189
Demand Growth (%)	13.8%	-3.3%	-23.3%	29.6%	8.0%
Caprolactam	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	70	70	70	70	70
Production	89	83	81	85	85
Imports	65	68	58	65	65
Exports	0	0	6	0	0
Demand	154	155	145	155	155
Demand Growth (%)	6.9%	0.6%	-6.5%	6.9%	0.0%
PTA	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	6410	6420	6420	6420	6420
Production	5792	5734	5072	5457	5778
Imports	420	861	519	800	900
Exports	160	81	135	0	0
Demand	6052	6514	5457	6257	6678
Demand Growth (%)	3.3%	7.6%	-16.2%	14.7%	6.7%
MEG	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	2215	2215	2215	2215	2565
Production	2067	1982	1994	2025	2299
Imports	632	768	625	650	640
Exports	232	160	284	50	105
Demand	2467	2590	2335	2625	2834
Demand Growth (%)	5.0%	5.0%	-9.8%	12.4%	8.0%

In 2020-21, the combined production of fibre intermediates viz. ACN, Caprolactam, PTA and MEG reached 7147 KT, which was 8.3% down from the previous year of 7799 KT. It is however forecasted the and in 2021-22 also the production will see a further decline due to pandemic. By 2023, the production is expected to see a jump to touch 8162 KT.

Exports of fibre intermediates from India in 2020-21 were 424 KT while imports were 1337 KT in the same period. ACN production was stopped by RIL and demand is being met by imports on the back of pesticide industry doing well.

The export scenario of the Indian textiles industry remains weak. In addition to this, spread of COVID-19 will further aggravate the industry's difficulties. The pandemic has disturbed the demand-supply situation of the textiles industry. PTA import volumes into India dipped in 2020-21 to 519 KT from 861 KT in the previous year.

Imports are expected to see a rise again in next fiscal and further more increase by 2023. It is to be noted that the anti-dumping duty on PTA was abolished in the Union Budget 2020-21.

The demand for textiles will face headwinds in both the markets, domestic and international. The closure of retail stores and malls on account of lockdown situation across the nation will affect the industry's sales. Even after the lockdown is lifted, demand for textiles will take time to pick up. This is because footfalls will be low in malls and retail stores as people will avoid visiting crowded markets.

India's petrochemical giant, Indian Oil Corp. (IOCL) gave a nod for an investment of INR 13,805 crore towards setting up a plant in Odisha's seaport city of Paradip, solely dedicated towards manufacturing raw materials for the textile sector.

The construction of this PX and PTA plant is slated to complete by 2024. The petrochemicals complex will have PX production capacity of 800 KTPA which would serve as the feedstock for manufacturing purified terephthalic acid which is a key raw material for the production of polyester yarns. The PTA plant capacity would stand nearly at 1200 KT post the commissioning. In addition to bringing its petrochemicals product portfolio closer to India's textile-yarn manufacturing units, the project assures to generate about five million man-days of employment over the next three-years of the plant's construction.

Plant backed by IOCL's upcoming MEG facility in Paradip would serve as a source of feedstock for the company's upcoming 300 KT per annum textile yarn manufacturing project located in the city of Bhadrak in Odisha. The 357 KTPA MEG facility is already under implementation and is expected to turn operational by the end of FY21.

In the medium to long-term, some demand from the US and the EU markets is expected to shift (though gradually) from China to other major garment manufacturers viz. Vietnam, Bangladesh, India and Cambodia.

Trade participants are closely monitoring Indian demand amid the second wave of the coronavirus pandemic, since India became the biggest Asian PTA importer around end-2020 after China achieved self-sufficiency. In India, the timeline for demand recovery along the polyester chain is unclear, although market hopes that the COVID-19 situation will improve around mid-June. Normalization of trade activity and demand recovery may slip into H2 even if COVID-19 cases reduce in response to stringent lockdowns by Indian states.

India's new wave of the infection has disrupted supply chains and manpower availability, and even though the manufacturing sector has been allowed to operate during the lockdown, it may take some time for the country to get back on track.

Indian domestic PTA supply is expected to tighten once the demand revives in H2, sources said. This could lead to import demand within India, but unavailability of containers and expensive freight are likely to dampen that demand.

Asian Market

Market sentiment is generally bearish for the Asian purified terephthalic acid, or PTA, market due to new capacity expansions in China lined up towards the second half of 2021 -- which is putting pressure on both domestic and international prices -- and an uncertain demand outlook.

The demand outlook for H2 remains unclear amid new waves of the coronavirus infection in Asia, especially in India, with bottlenecks created by global logistics challenges arising from container shortages.

Despite the bearish PTA outlook, some market players are pinning their hopes on potential run-rate adjustments and capacity normalizations in China, while the effective vaccine rollout may control the pandemic and create some price support in H2.

A total of 6.6 million mt/year new PTA capacity is expected to come online in China in H2. China's Yisheng Petrochemical will operate the two new PTA lines which have a capacity of 3.3 million mt/year each, with one unit expected to start in July, while the other may come online around end-2021. This is in addition to 4.9 million mt/year new Chinese PTA capacity added in the first quarter of 2021, and earlier expansion of 7.2 million mt/year in 2020. Such intensive expansion dragged Chinese PTA profit margins into negative territory towards end-2020 and will likely persist in H2. Besides the uncertain demand from India, the outlook for Asian PTA highly depends on the progress of China's new PTA startups, potential capacity rationalization and how much China plans to export in H2 2021.

China's PTA exports hit consecutive records in February and March at 196,592 mt and 338,675 mt, respectively, much higher than the monthly average of 70,565 mt in 2020, China customs data showed.

Caprolactam

Demand for Caprolactam was lacklustre in Q1 2020. A decline in demand, resulting from the slowdown in the auto segment (the key end-user market) and the ongoing US-China trade war led to dumping of caprolactam in the Indian markets.

Even as Asia slowly recovered from the pandemic through the second half of 2020, demand for nylon 6 textile filaments remained lackluster compared with nylon 6 engineering applications. As a result, many nylon 6 producers focused on the production of the general chip grade used in tire cords and the automotive sector, which helped them ride through a tough year. Almost all through Q1-2021, nylon 6 and feedstock markets have remained weak.

The Caprolactam supply in various Asian countries, majorly northeast Asia had declined in Q3'21 due to plant shutdowns and reduced run rates maintained to balance out the inventory levels. Producers were operating their manufacturing plants at curtailed rates, at around 75% in economies such as China & Taiwan. Also due to the reduction in demand from the downstream nylon markets-the major demand driving segment for Caprolactam, there was a consistent pressure over the profit margins of various Capro producers.

Caprolactam supply in Asia (outside mainland China) was extremely tight after the Lunar New Year due to unexpected outages. At the same time, the energy market was on a strong upward trend, and Asian buyers were eager to replenish stocks. These factors supported Asian caprolactam producers to raise prices and improve margins.

Majority of the Caprolactam produced in India is utilized during the production of nylon 6 fibres and nylon 6 resins, to cater textile and engineering plastic product manufacturers, respectively. In 2020-21 the demand was in negative while it is expected to see a rebound next fiscal and grow at 7%.



XIX. Polymers, Fibres and Elastomers

Polymers

The business environment started improving in the second half of 2020. However, with the huge surge in April and May, the demand was badly hit. There was an urgent need for oxygen and plants across the country were seen augmenting the production to cater to the rising demand in the county. Some of India's major petrochemical - Indian Oil Corp (IOC) and Reliance Industries - and automotive producers - Maruti Suzuki and Hero Motocorp - had to divert resources to producing medical oxygen amid a severe shortage in the country's raging battle against the pandemic.

Asia PE demand in packaging, consumer and healthcare markets was expected to remain resilient in 2021. However, demand may remain weak for other sectors amid lower exports of finished goods and cash flow problems, leaving the overall pace of demand recovery uncertain in 2021.

The domestic polymer prices had witnessed some downtrend in prices during the latter part of FY20 compared to the prices in the initial months of FY20. The prices of Poly Vinyl Chloride (PVC) however were not much volatile during FY20 compared to the other 3 varieties. Following this, the polymer prices were affected to some extent during April-May 2020 due to the outbreak of Covid-19 pandemic.

Slow-down in supply of polymers in the domestic market due to lower production and imports amid higher exports are believed to have led the price rise. While polymer imports declined by 13.4% in April 2020 – January 2021, exports of polymers increased by 14.9% during the period. In FY19, polymer imports accounted for about 45% of total polymer consumption in India which indicates India's dependence on polymer imports while exports accounted around 19% of the total domestic polymer production during the year.



Apart from these factors, recovery in polymer feedstock prices (propylene and ethylene) have also contributed to the growth in polymer prices. While the prices of propylene improved sequentially in each of the months May 2020 onwards till March 2021, the prices of ethylene recovered in most of the months during this period. Polymers however had reported strong growth in prices in FY21 primarily on account of lower supplies.

During the period April 2020 – January 2021, cumulative polymer production in India declined. The output which had decreased by a sharp 43.5% y-o-y in April 2020 and a slower 6.3% in May 2020 due to Covid-19 induced lockdown witnessed some recovery as the production increased in some of the following months and the fall in output narrowed to the range of 1.3%-4.6%. Unlocking of economy and easing of lockdown restrictions are believed to have supported the improvement in polymers output during June 2020-January 2021.

Several petrochemical products in India hit record-low, according to S&P Global Platts data, after the country imposed a nationwide lockdown to fight the fast-spreading coronavirus outbreak.

Petrochemical plants were shut down and few lowered operations due to a lack of labour and limited logistics. However, certain petrochemical operations were exempted by the lockdown as the government sets some exceptions for industrial establishments.

The partial shutdown of non-essential services in all major states had hindered transportation and distribution of chemicals such as methanol and polymers. Chemicals supplied through a land-based distribution network covering India's 29 states were affected.

Table 13: Polymer Demand Supply

Polymers (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	13111	14125	14134	14696	14947
Production	12053	12502	12347	13544	14412
Op Rate (%)	92%	89%	87%	92%	96%
Import	4065	4310	3712	4149	4313
Exports	1880	1518	1854	971	994
Net Trade	-2185	-2793	-1858	-3178	-3319
Demand	14849	14800	14804	16619	17691
Demand Growth %	9.5%	-0.3%	0.0%	12.3%	6.4%

The Indian domestic polymer industry (like global industry) was dominated by Polyolefins (PE & PP), representing about 77% of all commodity resins consumed in 2020-21. After clocking a negative growth in 2019-20, in 2020-21 the growth remained flat owing to the lockdowns and dip in demand. However, going further in 2021-22 the demand is forecasted to bounce back significantly and grow at a rate of 12.3%.

Polymer import dependency witnessed a dip at 25% in 2020-21, and is expected to remain around the same level in the next two fiscals. In 2020-21 the net trade deficit of total polymers stood at 31858 KT which was lower than the previous year which stood at 2793 KT. It is expected to spike again in 2021-22 to touch 3178 KT and further to 3319 KT by 2023.

The coronavirus-related lockdowns also spurred demand for flexible packaging going into food, cleaning and pharmaceuticals segments, helping boost producer margins as lower feedstock costs and a slowdown in imports would help to balance the market and reduce competition. The difference in costs of various methods of production had narrowed and had eroded low-cost producers' margins.

Stretch LLDPE film demand has benefited from stricter hygiene requirements, which require more film to be used to wrap finished goods. Pockets of demand started to appear for certain PE grades in June 2021 as market prices were stabilizing. PE prices are expected to remain range-bound in the next few weeks with a small risk of a further downtrend for certain grades such as LDPE and mLLDPE due to a relatively wide price gap with the other commodity PE grades.

Last year witnessed many petrochemical plants running at lower operating rates due to lockdowns. The situation in the first half of 2021 was much better than 2020 and saw players announcing expansions and many downstream converters were able to ramp up operation even due to manpower shortage by convincing workers to continue working after the government announced a slew of relief packages.

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 but cautiously.

XX. Polyolefins

All PE registered a robust demand growth of 7.6% in 2020-21 to touch 6366 KT. By 2023, it is expected to touch 6786 KT with demand resurging.

Table 14: Polyolefin Demand in India Actual & Projected

(KTA)	Actual			Projected		0% change year on year			
	2018-19	2019-20	2020-21	2021-22	2022-23	2019-20	2020-21	2021-22	2022-23
LDPE+EVA	1012	1060	1073	1107	1139	5%	1%	3%	3%
LLDPE	2122	2301	2518	2706	2850	8%	9%	7%	5%
HDPE	2448	2551	2775	2973	3083	4%	9%	7%	4%
PP	5678	5260	5370	6146	6705	-8%	2%	14%	9%
Polyolefins	11280	11172	11736	12932	13777	-1%	5%	10%	7%

Source: Industry Estimates

Polypropylene registered a growth of 2.1% in 2020-21 from a negative growth in the previous year. It is forecasted to grow at a robust rate of 15% in next fiscal 2021-22. Polyolefins overall registered a modest growth of 5% in 2020-21 and is expected to see robust demand growth of 10.2% in 2021-22.

Packaging demand went through the roof as people ate more at home and less in restaurants, increasing surface area demand for polymers. Greatly increased hygiene needs further supported packaging end-use markets. Consumption of PP non-woven grades and polyester was boosted by the huge uptick in sales of face masks and hospital gowns, which are made from these two polymers.



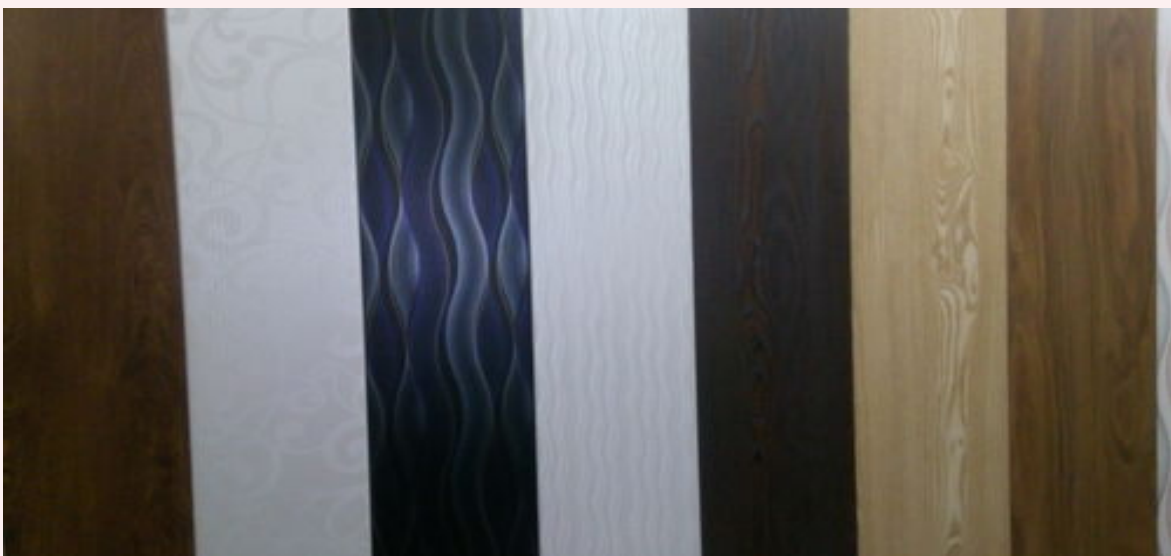
XXI. Vinyl's: PVC

India is the world's biggest importer of PVC. With domestic production unable to meet consumption needs, processors and converters rely heavily on the import markets to keep their plants running. However, the market had been plagued by an unexpectedly tight supply in H2 2020, and prices in the spot market have more than doubled since July. PVC is seen as a key economic indicator as its growth is tied to GDP with a particular link to demand from the construction sector.

India witnessed an appetite among Indian traders to buy as supplies within India were limited until April 2021 due to turnaround at two of Reliance's PVC resin units. Reliance's 375,000 mt/year PVC plant at Hazira was under maintenance till March 16, while its 360,000 mt/year PVC plant in Dahej was scheduled for a turnaround for two weeks in April. Import prices remain elevated, while domestic PVC prices in India eased due to poor end-user demand, sources said. India's domestic price had also eased as demand for pipes from government projects has weakened ahead of elections in three states. Many converters in India were working at lower capacities, as raw material supply is tight, while pipe sales are poor.

Converters in India are reporting better run rates at 35%-50% in June compared with barely 20%-25% in May but analysts suggest India's buying appetite has not yet returned fully. In addition, low demand season is approaching in India due to the monsoon season, which runs from June to September.

As a result, there is only need-based buying in India as the outlook for PVC remains bearish at least till the monsoon season is over. Demand for pipes is typically strong after the monsoon season and Diwali festivities, but pipe makers have struggled to sell finished goods this year amid the higher-than-usual prices.



The demand for PVC declined 16% in 2020-21, however, it is expected to rebound in 2021-22 by a staggering rate of 20.4% in 2021-22. India has a deficit of 2 MMT for a long time now, where industry needs government policy intervention. In 2020-21, despite no capacity addition the deficit and imports had come down on account of demand destruction due to the pandemic.

As the situation becomes normal the PVC deficit is going revert to the 2 MMT mark and increase overtime. Indian conglomerate Adani Group plans to build a 2m tonne/year coal-to-polyvinyl chloride (PVC) plant at Mundra in the western Gujarat state at a cost of Indian rupees Rs 292 billion (\$4bn).

Table 15: PVC Demand Supply

PVC (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	1557	1579	1579	1579	1579
Production	1409	1436	1367	1439	1438
Imports	1813	1852	1394	1910	2065
Exports			74		
Apparent Demand	3199	3261	2740	3300	3492
Demand Growth%	4.9%	1.9%	-16.0%	20.4%	5.8%

XXII. Styrenics

A. Polystyrene

Packaging is the largest segment for HIPS. It is used for food packaging (of meat trays, egg cartons, fruit trays, dairy packaging, etc.), industrial packaging, and consumer packaging (of cassettes, CD covers, etc.). The food packaging sector has kept demand positive during the coronavirus pandemic that has destroyed styrene demand from other sectors.

2020 saw, strong demand for high impact polystyrene (HIPS) around October 2020 on the back of increased sales for downstream home appliances.

HIPS goes into the inner linings of home appliances such as refrigerators, washing machines and air conditioners. PS imports, however, remained poor on continued uncertainty over plans to impose anti-dumping duties on material from six origins. Most trades and transactions took place in the domestic market, while local supply was tight with LG Polymers' PS plant shut since early May following a gas leak.



Table16: Polystyrene Demand Supply

Polystyrene (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	490	490	490	512	580
Production	290	270	212	250	325
Imports	30	28	42	60	30
Exports	53	42	27	30	50
Apparent Demand	260	252	227	275	300
Demand Growth%	-0.8%	-3.1%	-9.9%	21.1%	9.1%

Home appliance purchases in India witnessed a rise as people devoted some spare funds - which would otherwise go to travel and entertainment in normal times - to home improvement amid pandemic-induced lockdowns. To draw in more consumers, sellers in the country were seen offering interest-free payment schemes and extended credit repayment facilities for product purchases, thus lending an overall boost to packaging demand.

Further demand growth will however rely on global economic recovery for both domestic and export markets, given great uncertainties amid the ongoing pandemic. After witnessing a negative demand growth in 2019-20, demand for Polystyrene witnessed another year of negative demand due to lockdowns and lower purchases of appliances by buyers. It is forecasted that next year will see a rebound and the demand will grow at a robust rate of 21.1% before slowing down again by 2023. Imports witnessed a decline in 2020-21 and is expected to rise again next fiscal and further by 2023 to 50 KT. Demand is expected to touch 300 KT by 2023 fiscal. Supreme Petrochem Limited (SPL) is planning an establishment of a new line for production of Polystyrene which is likely to be completed by December 2021. The expansion is expected to enhance the production capacity of the company by 80,000 TPA. Revamp of EPS plant resulting in increased production capacity by 20,000 TPA.

B. Acrylonitrile-Butadiene-Styrene (ABS)

Covid-19 has shown a declining impact on the growth of global acrylonitrile butadiene styrene market as ABS is used as a raw material in various industries such as automotive, appliances, construction and others and all these industries have shown a decline growth in the Covid-19 which has also affected the demand for Acrylonitrile Butadiene Styrene.



Demand in India continued to be supported as the second quarter 2021 typically saw bullish demand from the air-conditioning sector with air-conditioning producers procuring cargoes in preparation. The shift to home schools and offices means that computers and the peripherals such as monitors, mice, and keyboards are now essential products, and being cooped up at home had led to rising demand for television sets and refrigerators. Increasing use of ABS in fabrication industry, 3D printing or injection molding process is also supplementing the growth of the market. Little support is seen for styrene from other polymer markets such as SBR or ABS.

While both markets appeared to have been battered badly in last year, the recent opening up of the lockdowns is expected to see a demand revival and return of the automobile sector as automobile manufacturers are once again starting operations and also the tyre manufacturers.

Overall, in Asia, ABS and PS fundamentals are likely to weaken in the second half of 2021 amid the startup of new plants in China, with the earliest to come online in July. Limited supply of ABS underpinned the market in H1 2021, the total Chinese ABS capacity will increase by nearly 1 million mt/year in the second half of 2021.

Demand for ABS and PS is expected to return to pre-pandemic levels, as support from food packaging and white goods will boost on easing of lockdown conditions. Sentiment in the ABS market has improved as more economics are to reopen after the pandemic outbreak. Although the market is progressively returning to normal, uncertainties over the coronavirus and global trade tensions continue to loom the market and some sources were cautiously optimistic about the outlook amid market volatility.

Table 17: ABS Demand Supply

ABS (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	210	240	240	240	240
Production	145	140	128	135	140
Imports	90	95	88	92	109
Exports	0	0	0	0	0
Apparent Demand	235	235	216	227	249
Demand Growth%	4.9%	0.0%	-8.1%	5.1%	9.7%

ABS demand in India witnessed a negative growth of 8.1% in 2020-21. The demand is expected to further improve next fiscal and grow around 5% before further growing at a double digit of 10% in 2022-23. Demand scenario is expected to be a key determinant for ABS pricing.

C. Styrene-Acrylonitrile (SAN)

SAN had been witnessing healthy growth in last two years due to its wide-ranging usage in consumer electronics, appliances and automotive sector.



Table18: SAN Demand Supply

SAN (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	210	240	240	240	240
Production	145	140	128	135	140
Imports	90	95	88	92	109
Exports	0	0	0	0	0
Apparent Demand	235	235	216	227	249
Demand Growth%	4.9%	0.0%	-8.1%	5.1%	9.7%

However, in 2020-21, the demand plummeted to a negative 19.4% and is expected to improve to 3% next fiscal, as the demand picks up across the end user industries. It is forecasted to grow in double digits by 2023, to touch 138 KT from 115 KT in 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 10 KT by 2023 to meet the rising domestic consumption.

XXIII. PET (Polyethylene Terephthalate)

During the pandemic, people experienced stay at home orders, restrictions on domestic and international travel, the closure of restaurants, bars, hotels and retail outlets as well as the temporary shutdown of automobile plants. Many people were either furloughed from their jobs at reduced pay or laid off completely. Consequently, we saw significant changes in consumer behavior around the world. Initially, there was widespread stocking up of food and drinks from the grocery stores, leading to outages of basic products.

As inventory was replenished and the lockdowns continued, we saw good growth for large bottled drinks such as water or carbonated soft drinks from supermarkets, as well as more demand for pre-packaged food including fruits, meats etc. due to heightened sanitation concerns. However, this was offset by reduced small pack carbonated soft drinks sales as travel through airport, train stations and petrol stations curtailed. However, the polyester industry benefitted from the installation of protective screens at stores, increased use of face shields and an explosion in demand for bottled hand sanitizer, all made from PET resin. Consequently, there was strong performance in the PET resin sector of the polyester industry throughout the year.



Table 19: PET Demand Supply

PET (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	1925	1975	2020	2200	2200
Production	1624	1718	1757	1892	1892
Imports	183	250	165	140	130
Exports	793	843	802	812	692
Apparent Demand	1014	1125	1120	1220	1330
Demand Growth%	12.9%	10.9%	-0.4%	8.9%	9.0%

India's PET consumption in 2020-21 was 1120 KT and 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 10% plus per year growth of PET material last year. Most beverages are served in PET bottles. However, owing to the ongoing plant shutdowns and lock down situation in the entire country which seems to be slowly easing up in few parts India's polyethylene terephthalate demand slowed down to a negative -0.4% in 2020-21. However, it is expected to see a rebound and touch 9% growth in next year 2021-22 and grow at the same rate by 2023.

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 high pandemic-related demand, such as those used for hygiene, beverage bottles, PET food packaging, personal care and home care. Most of PET products are classified as essentials in the current pandemic.

XXIV. Synthetic Fibres

Indian polyester downstream industry bore the brunt of the nationwide lockdown and closure of downstream units due to mass labour exodus. Extensive closure of retail outlets lent a blow to the textile consumption and polyester. Till the mid of the year demand witnessed double digit declines, which however eased as industry revived operations and labour returned to work. Towards end of third quarter industry revived with gradual easing of the lockdown as well festive season demand and reached pre-Covid levels by end of 2020. Run rates across most Indian polyester producers had dropped by 25%-30% to around 50%.

Towards the end of the year, domestic polyester demand revived backed by healthy downstream operations: highest ever. Firm operating rates, declining inventories across the textile chain supported the markets. In spite of all this full year demand was still below last year.

It is estimated that the global economy would bounce back in coming year, with India expected to have growth above global average (despite a second wave of COVID 19). This bodes well for the future polyester consumption which is expected to rise back strongly. In India, the timeline for demand recovery along the polyester chain is unclear, although market participants hope that the COVID-19 situation will improve around mid-June.

In 2020-21, the combined production of synthetic fibre (PSF, ASF, PPSF, PFY, PPFY, VFY, VFS and NFY, PIY) declined to 4296 KT from the previous year of 5353 KT. The same is expected to touch 5822 KT by 2021-22 and further improve to 6237 KT by 2023. The demand derailed to a negative 16.5% in 2020-21 owing to the current pandemic situation.



However, the same is expected to rebound to a record high level of 31% next fiscal on the opening up of the economy in phased manner.

Demand across end-user industry is also expected to rebound along with the textile demand as shoppers are already being seen at shops and demand across entire textile value chain.

The capacity is expected to touch 76737602 KT by 2023. In the downstream textile and garment industries, low labour costs and a strong emerging economy make the Indian Subcontinent a highly competitive producer along the length of the value chain, from PX to polyester.

Table 20: Demand Supply Balance of Synthetic Fibre

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
PSF					
Capacity	1248	1410	1410	1410	1410
Production	955	1009	835	1066	1172
Imports	36	60	25	12.471	24
Exports	168	200	216	231	211
Demand	829	897	683	854	978
Demand Growth (%)	-5.9%	8.2%	-23.8%	25.1%	14.5%
ASF	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	167	167	167	167	167
Production	105	115	81	105	105
Imports	36	50	43	38	38
Exports	25	22	22	22	22
Demand	106	121	89	102	114
Demand Growth (%)	1.3%	14.0%	-26.9%	14.7%	11.8%
PPSF	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	13	13	13	13	13
Production	3	4	1	3	3
Imports	3	3	2	3	3
Exports	8	10	10	9	9
Demand	5	5	4	5	5
Demand Growth (%)	0.0%	0.0%	-20.0%	25.0%	0.0%
PFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	4942	5209	5107	5164	5220
Production	3301	3605	2833	4037	4292
Imports	37	62	203	86	71
Exports	148	147	120	130	107
Demand	3194	3513	2940	3993	4256
Demand Growth (%)	7.7%	10.0%	-16.3%	35.8%	6.6%
PPFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	18	18	18	18	18
Production	11	12	13	11	13
Imports	1	1	1	1	1
Exports	1	1	1	1	1
Demand	12	12	13	12	13
Demand Growth (%)	20.2%	0.6%	4.5%	-4.0%	8.1%

VSF	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	566	578	578	578	578
Production	425	405	380	400	434
Imports	38	30	42	43	43
Exports	90	120	91	91	90
Demand	266	315	331	352	387
Demand Growth (%)	-0.4%	18.4%	5.1%	6.3%	9.9%
VFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	82	82	82	82	82
Production	47	46	37	47	47
Imports	14	22	17	17	17
Exports	6	6	6	6	6
Demand	66	68	70	70	70
Demand Growth (%)	3.1%	3.0%	2.9%	0.0%	0.0%
NFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	108	114	114	114	114
Production	105	110	75	98	113
Imports	21	23	16	21	21
Exports	5	6	5	5	5
Demand	121	130	79	112	128
Demand Growth (%)	-3.8%	7.7%	-39.2%	41.4%	14.1%
NFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	57	57	62	69	71
Production	49	47	41	55	58
Imports	26	24	36	39	42
Exports	11	10	9	8	9
Demand	63	60	71	82	88
Demand Growth (%)	1.6%	-5.1%	18.3%	15.3%	7.4%

XXV. Synthetic Rubber

In the yearly sales report by the Society of Indian Automobile Manufacturers (SIAM) for the last financial year, April 2020 to March 2021, the industry body has stated that sales of passenger vehicles have contracted by 2.24 % as compared to the previous financial with 27,11,457 vehicles sold against 27,73,519 in FY20.

The two-wheeler industry has been worse hit, with a significant 13.19 per cent contraction in sales, 1,51,19,387 two-wheelers were sold the past year against 1,74,16,432 the year before.

Total commercial vehicle sales declined by 20.77 per cent to 5,68,559 units last financial year, as against 7,17,593 units in 2019-20. Dispatches of three-wheelers saw a drop of 66.06 per cent in the 2020-21 fiscal at 2,16,197 units, as against 6,37,065 units in 2019-20.

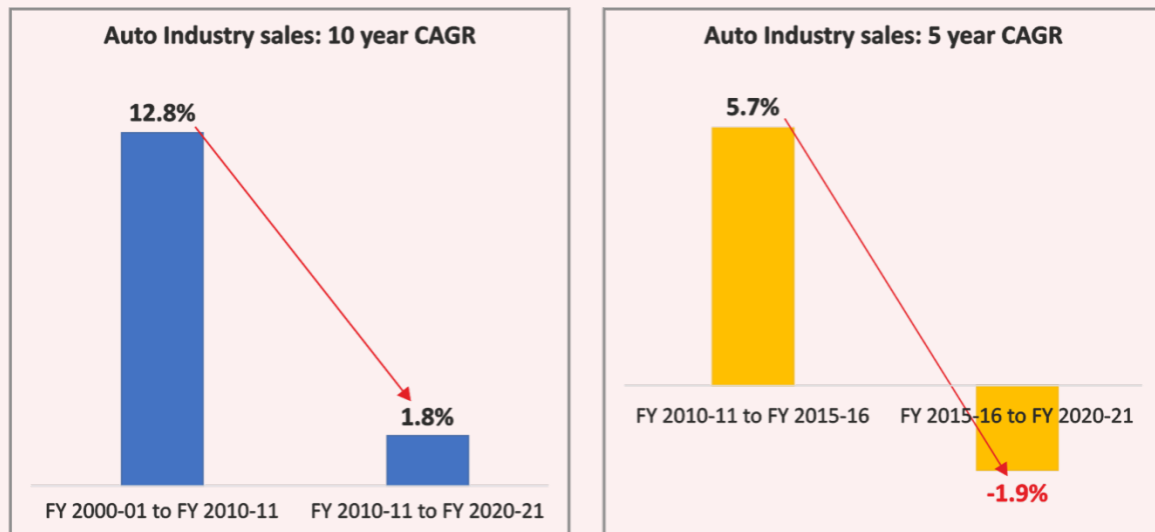
Vehicle sales across categories declined by 13.6 per cent to 1,86,15,588 units, as against 2,15,45,551 units in the year-ago period.

This dip in sales has largely been a fallout of the COVID19 pandemic, when sales came to a complete halt in April 2020. While monthly passenger vehicles sales in the last few months have set new records, the surge fueled by more discretionary spending on cars and an affinity towards personal mobility hasn't been able to compensate for the subdued months during last year's lockdown.



Figure 19: Indian auto Industry Growth

Indian Auto Industry growth slowing



The Indian auto industry looks set to have a tough coming year. Although there have been positive signs the last few months for four-wheelers, the second COVID19 wave and the new round of restrictions that have come with it could lead to a similar situation as last year.

The auto industry has contracted by 1.9% in the past five years (FY 15-16 to FY 20-21) as compared to the 5.7% growth seen between FY 2010-11 to FY 2015-16. In a ten-year period for FY 2010-11 to FY 2020-21, the growth has only been a marginal 1.8%.

SIAM has cited data in the past to show that the pandemic is not the only reason for the auto sector slowdown, which is facing deeper structural issues that need attention.

According to the findings of research conducted by the industry body, compounded annual growth rates of all segments, including passenger vehicles, commercial vehicles, three-wheelers and two-wheelers have witnessed a continuous drop over the last three decades.

Figure 20: Indian Auto Industry domestic sales

DOMESTIC SALES PERFORMANCE



(Sales Figures in 000')

MONTHLY						QUARTERLY					
	Mar-18	Mar-19	Mar-20	Mar-21	CAGR %	Jan-Mar					
						FY 18	FY 19	FY 20	FY 21	CAGR %	
PVs*	278	272	135	291	1.5	862	844	656	934	2.7	
3Ws	72	66	28	32	-23.7	282	284	147	210	-9.4	
2Ws	1,742	1,441	867	1,497	-4.9	197	180	130	86	-24.1	
						5,113	4,653	3,503	4,354	-5.2	

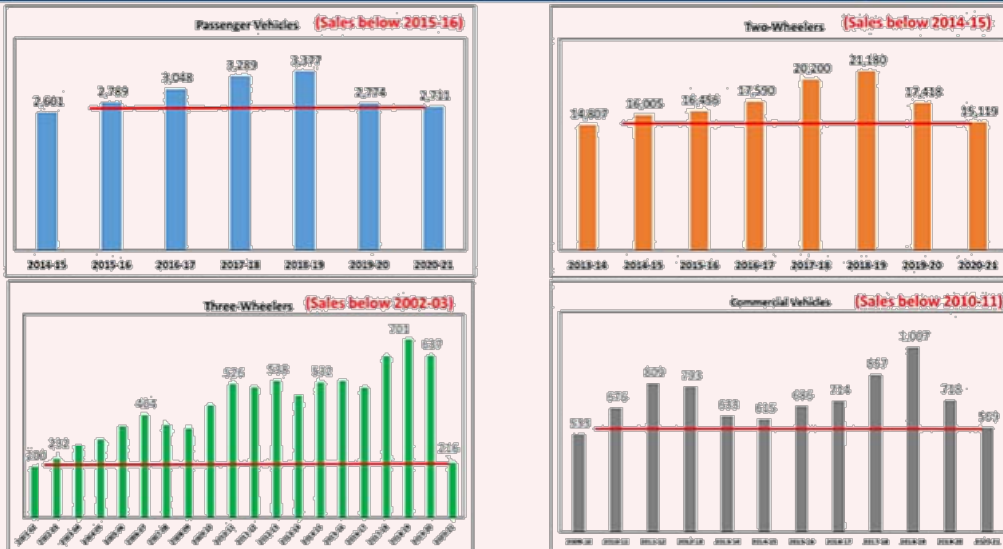
ANNUAL					
	Apr-Mar				
	FY 18	FY 19	FY 20	FY 21	CAGR %
PVs	3,289	3,377	2,774	2,711	-6.2
CVs	857	1,007	718	569	-12.8
3Ws	636	701	637	216	-30.2
2Ws	20,200	21,180	17,416	15,119	-9.2

*Tata Motors Data Not Included

Figure 21: Indian Auto Industry domestic sales comparison

Domestic Sales: April 2020 – March 2021 – Comparison with Past Years

(Numbers in '000)



On a positive note, the Indian carmakers ended the Financial Year 2020-21 on a very strong note with the total domestic sales of the passenger vehicles rising 115% in March 2021 as against March 2020, the latest report from SIAM.

As several states announced lockdowns or Covid curfew in April, passenger vehicle wholesales witnessed a dip over March numbers. According to data released by Society of Indian Automobile Manufacturers (SIAM), passenger vehicle sales witnessed a month-on-month decline of 10% in April. Vehicle manufacturing had been restricted in April and OEMs came forward to augment oxygen supply for medical use.

Industry was seen putting all efforts to increase the availability of oxygen by providing oxygen generating plants, concentrators, cylinders, mobile oxygen vans, setting-up vehicle tracking systems in oxygen carrying vehicles to reduce their turn-around-time.

The second wave of COVID has left the entire country devastated as there may not be a single household which did not get affected. Apart from urban markets, this time, even rural areas were badly hit. May saw continued lockdown in most of the states. Automobile retail sales in the country declined by 55 per cent in May as compared to April.

Accelerated vaccination drives throughout the country, a strong line-up of launches, all-time low auto loan rates and a favourable monsoon are all expected to boost automobile consumption; companies predict a strong rebound in volumes in June month on expectations of pent-up April-May demand.

Rubber prices saw a sharp decline in first half of the fiscal – 2021, while firmed up moderately in Q3 2021. Rubber prices dropped sharply starting amid Covid lockdown-related concerns in April 2021. June 2021 witnessed the gap between the domestic and global rubber prices widened putting further pressure.

The prices of the replacement tyre market across categories are going up in March-April 2021 due to the higher prices for the materials used for manufacturing the tyres. This is the third time; the prices of the tyres were being increased by the manufacturers after the lockdown in 2020.

The listed tyre manufacturers in the country hold nearly 70-80% of the ₹60,000 crore worth Indian tyre market. Major tyre manufacturers present in the domestic market such as Ceat, Apollo Tyres, JK Tyre and Michelin have already announced around 3%-8% price hike, depending on segments. While the major role behind this price hike move is the increased raw material cost, the import restrictions on rubber, the key raw material have created supply constraints and further pushing up the prices claims the tyre makers.

With vehicle production slowing down in FY2020 and hitting multi-year lows in FY2021, the domestic tyre demand and production has been consequently affected. Nevertheless, its impact has been relatively less in comparison to other auto components as the demand skew towards the replacement segment is higher in tyres (~55-60% in units and over 65% in tonnage) against sub-30% in most other auto components.

In commercial segments like T&B and LCV tyres, the share of replacements is high at ~74% and 66% respectively (units). The industry also generates over 20% of revenues from exports. While tyres have historically outperformed other components given the large share of replacements, nevertheless tyre demand contracted by 8.8% in FY2020.

The contraction is the sharpest fall seen in the last 25-years and FY2021 will see incremental fall due to the lockdown and weak consumer demand effect. For 9m FY2021, tyre demand fell by ~16.4% and segment wise, OE fell at higher rate of over 25% while replacements fell by ~10%.

Quarter-wise, Q1 FY2021 saw the sharpest fall of 67% hit massively by the pandemic-induced lockdown but with pent-up replacement demand (especially T&Bs) and better rural output supporting tractor and motorcycle demand, tyre demand recovered to a 1% YoY growth in Q2 FY2021. Nevertheless, factors like negative GDP growth, bearish consumer sentiments, weak infra-related spend, etc continued to act as headwinds. The demand however picked up sharply in Q3 as demand grew by ~16% YoY partly aided by festive season and the momentum has been stronger in Q4 as well with estimated YoY growth of over 25% partly aided by a weak base. For full year, the contraction to be at 5-7% range.

As per ICRA report, with expected recovery in economic activities and sustenance of rural output support, tyre demand is estimated to grow by 13-15% (units) in FY 2022 with OE segment likely to fare better with a 16-18% growth while growth in replacements are seen at 12-14%. In tonnage terms, a 7-9% growth is estimated for FY2022 given the relatively lower growth seen in replacement part of commercial segments like T&B and tractors. Between FY022 and FY2025, demand growth is pegged at 8-10% (units) and 6-8% (tonnage) during FY2022-25 (CAGR) aided by stable replacements. Product wise -consumer segments are likely to outperform commercial segments.

Tyre exports (excluding bicycles) from India witnessed a marginal contraction in FY2020. Muted demand in the overseas markets, coupled with the impact of Covid-19 pandemic on global automotive demand in Q4 FY2020 had impacted tyre exports from India. Due to the Covid-19 impact on demand, tyre exports declined by ~19% (volume) and ~7% (value) in H1 FY2021. However, rising preference for Indian tyres over China (post pandemic) and recovery in global demand for agri/construction tyres has resulted in stable growth in tyre exports in the recent months.

In June 2020, to support the domestic tyre industry from the effects of Covid-19 pandemic, the DGFT placed categories of tyres imported under restricted category (vs. free category earlier), thus necessitating DGFT permission (or) licence for all tyre imports. Following this move and amidst the weak domestic demand, tyre imports fell by ~77% and 54% respectively in volume and value terms during 9M FY2021.

ICRA expects the TBR tyre imports to remain low over the next 15-18 months given the surplus capacity available in the domestic market and the ADD on Chinese tyres being in effect till Aug'22. With sharp fall in import of other segments (especially T&B), the share of agriculture/ construction tyres increased to 46% in 9m FY2021.

With stable buildup of accruals, the industry players continued to invest heavily with a highest ever annual capex spend of ~Rs. 7,800 crores in FY2020. However, post pandemic and continuing uncertainties, all tyre majors had deferred the earlier announced capex to FY2022. But with improving domestic and export demand, capex executions have resumed in the last two months.

Balkrishna Industries, the country's leading off-highway tyre manufacturer, has said that its ₹1,000-crore capacity expansion programme is on track. It has also identified a few focus areas for growth.

The company, which sells its products under BKT brand, is establishing a fully integrated facility at a capex of about ₹500 crore to replace the existing plant to enhance productivity.

Similarly, the company is setting up an ultra large-sized all-steel OTR (off-the-road) radial tyre unit with a capacity of 5,000 tonnes per annum at its Bhuj factory in Gujarat. This is reported to be the first of its kind plant in India. Also, the company is building a warehouse and mixing plant there. The estimated capex for these is about ₹500 crore.

One of the fastest-growing tyre manufacturing companies in India, Maxxis Rubber India Pvt. Ltd., plans to set up at least five manufacturing units in India in addition to the expansion of current units that cater to the two- and four-wheeler markets.

Tyre major JK Tyre will take a call on expansion of capacity at its Chennai plants in the "next couple of quarters," once the demand uptick becomes more stable.

Apollo Tyres commissioned its seventh manufacturing unit globally and the fifth in India with the first tyre rolling out from the Andhra Pradesh greenfield facility in southern India in June 2020. Located at Chinnapanduru village in Chittoor district of Andhra Pradesh, the facility is spread over 256 acres. The company will invest close to Rs 3,800 crore in the first phase of this greenfield facility. While the capacity will be ramped up gradually in the next 12 to 18 months as the demand improves, the plant will have a capacity to produce 15,000 passenger car tyres and 3,000 truck-bus radials per day by 2022.

Apollo Tyres forays into truck and bus tyre segment in US, Canada. The north American range of truck and bus tyres will be produced at the company's manufacturing units in Hungary and Chennai, India.

Last year in July 2020, Apollo Tyres inaugurated 2W radial tyre facility in Gujarat. Spread over more than 10,000 square metre area, the two-wheeler tyre manufacturing unit is housed within Apollo Tyres Limda plant in Vadodara, in the western Indian state of Gujarat. This facility, which has an initial capacity to produce 30,000 motorcycle radials and 60,000 motorcycle cross-ply tyres per month, would cater to the premium segment of the two-wheeler industry.

Off-highway tyre-maker Alliance Tire Group (ATG), owned by the Japanese major Yokohama Group, is setting up its third plant in the country in Visakhapatnam with an investment of USD 165 million (around Rs 1,240 crore). The proposed USD 165-million plant will add over 20,000 tonnes per annum (55 tonne per day rubber weight) capacity to the 2.3-lakh-tonne annual production from two India plants and will be commissioned by the first quarter of 2023. ATG has one plant at Dahej in Gujarat with an annual capacity of 1.3 lakh tonne (360 tonne per day) and another at Tirunelveli in Tamil Nadu with an annual capacity of 1 lakh tonne

JK Tyre and Industries has lined up a Capex plan of about INR 200 crore for the current fiscal which will largely be spent on maintenance and debottlenecking of all its plants. According to the company, debottlenecking exercise is set to expand capacity by about 10% over the next 2-2.5 years.

In December 2020, Continental announced expanded truck tyre manufacturing capacity at Modipuram plant. The expansion will include increased product range for 20" and 22.5" tyres and capacity hike to cater to the domestic and export markets.

Tyre maker TVS Srichakra Ltd in December 2020 announced a Rs 1,000 crore investment over a period of three years to ramp up its manufacturing capacity. The capital expenditure of Rs 1,000 crore will be used to ramp up manufacturing at its Madurai and Pantnagar plants. The investment, when fully made, will result in an increase in two and three-wheeler tyre capacity by 25-30 per cent and doubling of off-highway tyre capacity from current levels. TVS Srichakra has manufacturing facilities at Madurai in Tamil Nadu and Pantnagar in Uttarakhand with a production capacity of over 3 million tyres a month.

With COVID-19 situation easing across various states, leading automobile companies in the country have initiated steps to ramp up production to "normal levels" to meet pent-up demand, clear backlog and reduce waiting periods on their products. Auto firms, which were forced to down shutters temporarily due to lockdowns and curfews, expect business activity to pick up going ahead with the opening of dealerships across states.

Revenue growth is likely to be sharp next year and given the lesser threat of imports (given the prevailing ADD on Chinese TBR tyre imports till Sep 2022), long-term revenue growth is projected at 9-11% (4-year CAGR ending FY2025). While FY2021 will have higher margins, going forward profit margins will remain vulnerable to the movement in input prices and capacity utilization levels. Over the long-term, profit margins are expected at ~13-15%% at operating level and 6-7% at a net level.

Automotive Tyre Manufacturers' Association (ATMA), the apex body of major tyre makers in India, have initiated a Rs 1,100-crore five-year project by planting rubber in 200,000 hectares in the north eastern states will go on stream in June 2021. ATMA will provide financial support of Rs 50,000 per hectare either through a credit linked scheme or by direct payment for the planting materials.

The project is expected to boost the rubber production in the country that has stagnated in the range of 600,000 to 700,000 lakh tonnes in the last few years as low prices prevented growers from increased tapping.

Since most of the tyre factories are situated in the West and South of the country, the idea of water transportation can be explored to bring down the transportation cost. Non-tyre units located mostly in North India, however, can save the cost of transportation from Kerala with increased supply from north eastern states.

As the production in Kerala has plateaued, the board and the industry have decided to focus on northeast where rubber is grown in all the states. The region together accounts for 23% of the total rubber production with Tripura leading with over 10% share followed by Assam. The total acreage under rubber in northeast is 160,000 hectares.

The Ministry of Road Transport and Highways (MoRTH) in May 2021 end issued a draft notification, proposing new tyre norms. These norms would be incorporated as a part of the Automotive Indian Standards (AIS) 142:2019 as an amendment, subject to clearance and no objection.

- Existing tyres designs to meet norms by October 2022
- Norms lay out new requirements for rolling resistance, wet grip, and rolling sound emissions

The proposal states, that tyres of all cars, buses and trucks shall meet the requirements of rolling resistance, wet grip, and rolling sound emissions, in line with the Stage-II limits of the European regulations.

The new norms will be incorporated as a part of the Automotive Industry Standard (AIS 142). Tyre industry has collaborated actively with the government in formulation of AIS 142 which defines norms for tyres.

According to the draft norms, the proposed standards will become applicable for all new tyre designs on October 1, 2021, and for all other existing tyre designs across the three vehicle segments of Passenger Cars, LCV and HCV by October 1, 2022.

ATMA, along with its technical wing Indian Tyre Technical Advisory Committee (ITTAC), is putting together a detailed response on the draft notification to the Ministry for effective implementation of the new standards without disrupting production lines of its members. Coinciding with the MoRTH draft notification is the NABL certification granted to Indian tyre manufacturer Apollo Tyres to conduct wet grip and coast-by-noise tests on track. The company is the first tyre manufacturer to have been accredited with ISO/IEC 17025 for carrying out these tests. The new proposal is linked to the Indian government's plans to implement a 'Star Rating' system for tyres in the country, in line with the 'Tyre Labelling' regulations (UNECE R 117) in Europe. Testing capabilities at the nodal automotive test agency in the South – Global Automotive Research Centre (GARC) in Chennai – have been strengthened to pioneer these tyre labelling and certification tests in India.

Table 21: Demand Supply Balance of PBR, SBR, NBR, EPDM & BUTYL RUBBER

PBR	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	124	124	124	124	124
Production	122	130	128	135	136
Imports	82	80	83	86	89
Exports	13	20	23	10	4
Demand	193	185	192	211	221
Demand Growth (%)	3.0%	-4.0%	3.8%	9.9%	4.7%
SBR	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	290	270	270	270	270
Production	220	225	205	233	242
Imports	66	51	72	72	75
Exports	28	18	22	8	8
Demand	257	252	265	295	310
Demand Growth (%)	3.7%	-1.9%	5.4%	11.3%	5.1%
NBR	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	20	20	20	30	45
Production	18	20	20	25	40
Imports	38	40	45	43	37
Exports	0	0	0	0	0
Demand	56	60	67	70	75
Demand Growth (%)	-2.5%	7.7%	10.9%	4.5%	7.1%
EPDM	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	0	0	0	0	0
Production	0	0	0	0	0
Imports	53	51	50	53	56
Exports	0	0	0	0	0
Demand	53	51	50	53	56
Demand Growth (%)	17.4%	-3.0%	-2.4%	6.0%	5.7%
BUTYL RUBBER+HALO BUTYL RUBBER	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	0	120	120	120	120
Production	0	15	52	75	62
Imports	112	89	83	63	42
Exports	0	4	25	33	37
Demand	112	99	112	113	125
Demand Growth (%)	10.9%	-11.5%	12.9%	1.0%	10.5%

The commerce ministry in May 2021, recommended imposition of anti-dumping duty on a certain type of rubber imported from China, EU, Japan, and Russia, in order to guard domestic manufacturers from cheap inbound shipments. Directorate General of Trade Remedies (DGTR) has recommended the duty after concluding in its probe that "Acrylonitrile Butadiene Rubber" from these regions has been exported at dumped prices into India, which impacted the domestic industry.

The recommended duty is the difference between the landed value of the product and USD 2,086 per tonne.

The product is used in the manufacture of various rubber articles where resistance to oil, abrasion and heat applications are involved, such as oil seals, hoses, automotive products, gaskets, rice dehusking rolls, printers, and fabrics.

In Oct 2020, the commerce ministry recommended an increase in import duty on a Korean synthetic rubber, used in tyre making, for two years in order to guard domestic industry from significant jump in inbound shipments of the product, according to a notification.

The ministry's investigative arm Directorate General of Trade Remedies (DGTR) has recommended the increase in customs duty after concluding in its probe that increased imports of 'Polybutadiene Rubber' have caused "serious injury" to the domestic industry.

Reliance Industries Ltd had filed the application before the directorate in accordance with a free trade agreement (FTA) between India and South Korea for initiation of bilateral safeguard investigations concerning increased imports of this rubber. The probe was started in November last year.

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.

Low rolling resistance tires are acquiring significant popularity, with heightened emphasis on improving vehicular performance outcomes catalyzing growth. Furthermore, growing consciousness about environmental sustainability is prompting manufacturers to incorporate several changes in the nature of materials used during the production process. This trend has boded well for overall market growth.

In the long-run, low rolling resistance tires with a wide band width are expected to account for bulk of the overall demand, while sales across the aftermarket segment are anticipated to surge incredibly.

Apollo Tyres introduced a new age comfortable and eco-friendly tyre, which is BS-VI compliant and electric vehicle ready. These low rolling resistance coefficient (RRc) tyres come with superior comfort and silent ride without compromising on the tyre wear life. The Apollo Amazer XP tyres cater to the eco-friendly and fuel-efficient space of passenger vehicles, which is a fast-emerging segment.

The company had also revealed its plans of manufacturing the high-end Vredestein-branded tyres in India, after the government's move to curtail tyre imports into the country.

Demand suffered a significant setback in the initial half of 2020, attributed to the imposition of stringent lockdowns amid the COVID-19 pandemic. This led to cessation of manufacturing activities across the automotive industry, causing automobile output to decline considerably, leading to curtailed demand for low rolling resistance tires. However, as restrictions eased in the latter half, growth projections were restored.

In the future, the market is poised to accrue significant gains, with a majority of the manufacturers increasing their inroads into Asian markets. India, China and Japan are likely to yield highly opportunistic prospects, leading the market to register a staggering double-digit CAGR exceeding 11% through 2031.

In 2020-21, SBR demand grew at a modest rate of 5.4% and is expected to clock a double-digit growth next year. EPDM demand was in negative in 2020-21 and is expected to rebound and witness a healthy growth of 6% in 2021-22.

Reliance is the only producer of PBR in India. PBR demand grew at 3.8% in 2020-21 and is forecasted to grow double digit at 10% next fiscal, before slowing down to 5% in 2023. Butyl rubber and Halo butyl rubber demand combined grew at a robust 13% in 2020-21. It is however, expected to remain flat in next fiscal, before once again clocking a double-digit growth of 11% in 2023.

XXVI. Surfactants

Due to COVID-19, due to lockdown regulations and a deficient number of workers, the production in various chemical and other industries has decreased. However, Surfactant-based products, when used correctly, can help to stop the spread of the coronavirus infection. As a result, cleaning products and surfactant manufacturers have seen an increase in demand.

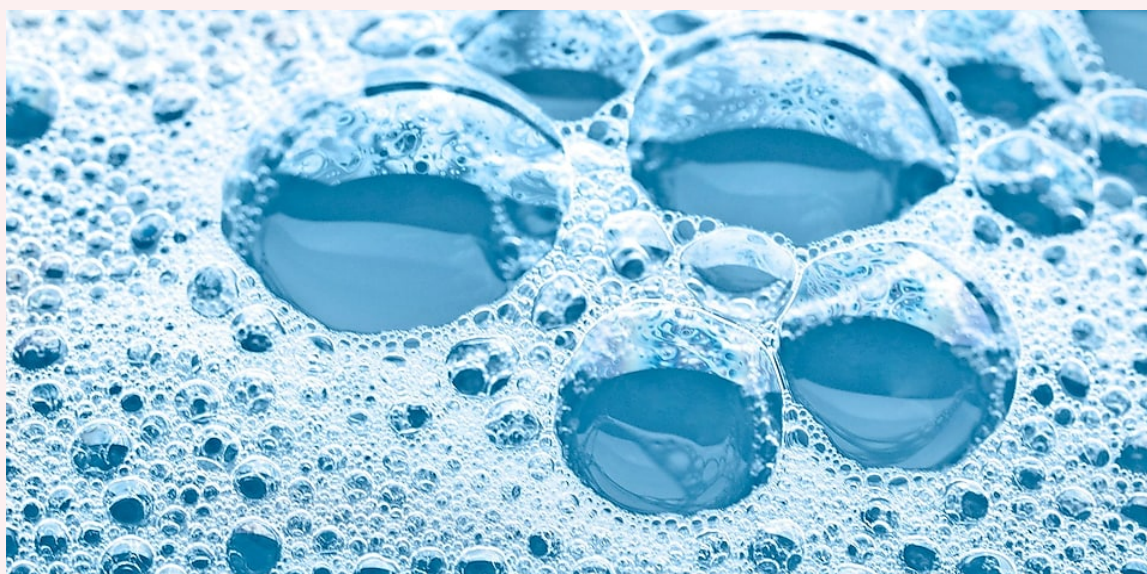
For linear alkylbenzene (LAB), domestic demand saw getting stronger due to its end-use in biodegradable detergents and other cleaners amid the second COVID-19 wave.

In recent times, India is one of the largest producers of soaps and detergents, globally. Government initiatives, such as the Swachh Bharat Mission, promote health and hygiene.

Such initiatives, along with growing usage of soaps and detergent, have led to the growth of the manufacturing industry, which is further boosting the demand for LAB in the country.

Detergent manufacturers in India are expected to continue facing pressure on their operating margins as they find it difficult to pass on the entire rise in the cost of a key ingredient, while sporadic lockdowns and prospects of a fall in income levels make demand outlook hazy.

Prices of Linear Alkyl Benzene and its derivative, Linear Alkyl Benzene Sulphonic Acid, have shot up globally over the past few weeks (June 2021) as supply is short while demand is rising.



The heightened focus on home and personal hygiene due to COVID-19 has bolstered the demand for detergents, liquid soaps, industrial cleaners, and sanitisers, most of which require the benzene-based chemical in their production.

However, sales of such cleaning agents remain much lower than their peak because of sporadic lockdowns around the country, which have limited working hours for millions of Indians, analysts said.

Prices of LAB followed an upward trend across the region in quarter ending March 2021. In the Indian markets, LAB value surged from USD 1383.7 per MT (January 2021) to USD 1467.5 per MT (March 2021) despite stable demand fundamentals in the market. Recently, in June 2021, the spot prices of Linear Alkyl Benzene in India have shot up to \$1,810-\$1,910/ton from \$1,600-\$1,650/ton over the past eight weeks, according to a report by ICIS. The upcoming monsoon season in India and an uptick in related diseases thereof is expected to keep the demand intact. The spreads of the chemical—the difference between manufacturing and distributor price—have increased over 3.5 times in the last few weeks as the supplies in the domestic market have sold out due to the tight demand situation, analysts said.

Table 222: Demand & Supply of LAB & EO

LAB	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	550	550	550	550	572
Production	449	400	449	456	475
Imports	228	261	253	256	262
Exports	6	0	0	0	0
Demand	670	669	706	711	737
Demand Growth (%)	3.1%	-0.1%	5.6%	0.6%	3.7%
EO	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	269	279	301	301	341
Production	236	255	268	300	321
Imports	0	0	0	0	0
Exports	0	0	1	1	1
Demand	236	255	269	301	322
Demand Growth (%)	11.5%	8.2%	5.4%	11.9%	6.9%

The imbalance in terms of supply and demand of Linear Alkyl Benzene still persists, and this could mean that prices remain elevated for some time. The Indian market of these raw materials is dominated by players such as Tamil Nadu Petro Products Ltd, Reliance Industries Ltd, Indian Oil Corp Ltd, Ultramarine and Pigments Ltd, and Bodal Chemicals Ltd. Hindustan Unilever, P&G Group, Nirma Group and Jyothy Laboratories Ltd command a lion's share in the detergent market in India. Tamil Nadu Petro Products board had approved increasing the capacity of its linear alkyl benzene plant for Rs 2.4 billion rupees in March. Over 50% of the company's revenue comes from the sale of the specialty chemical, analysts said. Indian Oil Corp, too, has a 120-KT-capacity plant in Gujarat.

Demand for key surfactant LAB witnessed a modest growth in 2020-21, while with the second wave still lingering on, it is expected to clock a flat growth of 0.6% in this fiscal. Further it is expected to grow at 4% - a modest growth by 2023. LAB import was seen higher in 2019-20, which was reduced to 253 KT in 2020-21. While, no exports are also expected to take place in next two fiscals.

Ethylene Oxide (EO) is widely used in the production of solvents, antifreeze, textiles, detergents, adhesives, polyurethane foam, and pharmaceuticals. Smaller amounts are present in fumigants, sterilant for spices and cosmetics, as well as during hospital sterilization of surgical equipment.

Persistent hike in demand for the product is due to enormous production of MEG for polyester fabrics and PET. Increasing consumption of DEG in plasticizers industry is also contributing to the rising demand of the product. Sudden outbreak of Covid-19 in the fourth quarter of FY '20 is anticipated to have a positive impact on the demand of Ethylene Oxide as it is utilized in an abundant amount in many products of specialty chemicals, which is being regarded as the most leveraging sector in times of the pandemic due to its vast influence in the hygiene and healthcare industry.

EO capacity stood at 301 KT in 2019-20 and is expected to climb to 341 by 2022-23. Demand for EO grew at 6.1% in 2017-18 and at a staggering rate of 11.5% in 2018-19 before a tad slower at 8.2% in 2019-20. It is forecasted to dip further to 5.4% in 2020-21 and will rise again to 11.9 % in 2021-22.

XXVII. Carbon Black Feedstock & Carbon Black

Carbon black is one of the reinforces that frequently used in tire industry owing to its effect on mechanical and dynamic properties of tires. It is used in various formulations with different rubber types to customize the performance properties of tires. It is used in various formulations with different rubber types to customize the performance properties of tires.

- Growth in the adoption of electric cars and self-driving cars is likely to act as an opportunity in the future.
- Asia-Pacific dominated the market across the globe with the largest consumption from the countries such as China and India.

In December 2020, commerce ministry in India had recommended for extension of anti-dumping duty for five years on carbon black used in the rubber and tyre industry from China and Russia, with a view to guard domestic players from cheap imports from these two countries. The directorate had recommended two duties, USD 494 per tonne for imports coming from China and USD 36.17 per tonne from Russia.



In its probe, the directorate has concluded that there is a continued dumping of the product from these countries and the imports are likely to enter the Indian market at dumped prices in the event of expiry of duty.

The Carbon Black Manufacturers Association, on behalf of domestic producers, had filed the application before the DGTR for continuation of the duty on the product from these two nations.

The finance ministry recently, decided not to impose anti-dumping duty on imports of carbon black (used in rubber applications) from China and Russia.

The move is expected to bring down the cost of imports of carbon black for tyre makers and small and medium-sized rubber goods manufacturers, while reducing the protection levels for domestic makers of carbon black such as Philips Carbon, Birla Carbon and Himadri Speciality, as per industry sources. It remains to be seen if consumers will benefit as much would depend on the rubber good producers passing it on to the customers, they added.

The recommendation was made under the final findings of the Sunset Review investigations. As per, All India Rubber Industries Association (AIRIA), removal of the anti-dumping duty on carbon black was a step in the right direction. The non-tyre rubber industry is highly vulnerable to supply disruptions and a fair pricing of these essential raw materials is key to the growth of the industry.

It was added, that at a time when there is shortage of carbon black supply for the non-tyre rubber product manufacturing industry, the omission (non-continuation) of anti-dumping duty on the imports of 'carbon black' used in rubber applications by the Government comes as a major relief for the MSMEs and the sector at large.

CBFS demand is high but availability from US refineries are limited. Under COVID situation poor demand of gasoline was witnessed. Refineries are running with lower throughput. Whereas high demand for Carbon Black is there both for domestic as well as in international market. USGC market is therefore under premium \$7-9 per bbl instead of conventional discounted rate.

Balkrishna Industries plans a capex of Rs 1,900 crore over the next two fiscal years. Of this, Rs 800 crore will be invested to expand the tyre capacity by 50,000 tonnes to 3,30,000 tonnes while Rs 450 crore will be used for plant modernization. The balance will be invested towards ramping up the carbon black capacity.

The tyre capacity expansion, which will be completed by the second half of FY23 is aimed at catering higher demand and has an estimated payback period of four years at the profit before tax level.

Over the past three years, the company has put up a carbon black plant as a part of backward integration to lower the cost of tyre production and to assure the supply of the key raw material. It spent Rs 450 crore for a 1.15 lakh metric tonnes per annum (MTPA) capacity. Under the latest capex cycle, it plans to spend Rs 650 crore to increase the capacity by 85,000 MTPA.

Continental Carbon India Limited (CCIL) is in process of establishing a state-of-the-art green field plant in Visakhapatnam, Andhra Pradesh, India. The new plant will comprise of two manufacturing lines of name plate capacity totaling 150,000 TPA of furnace grade carbon black for application mainly in the rubber industry. About 40 MW Power and 35 TPH steam will be by-products of the manufacturing process.

Continental Carbon Eco Technology Private Limited (CCET), a subsidiary of CSRC, plans to build a new Carbon Black Plant with a design annual capacity of 150000 TPA Carbon Black Plant with 16 MW cogeneration (waste heat recovery) power plant in GIDC, Dahej Industrial Estate Gujarat, India.

In January 2021, Epsilon Carbon commissioned Carbon Black Unit in Karnataka with an investment of Rs.450 cr.

Epsilon has successfully commissioned its Carbon Black Unit in January 2021 with a capacity of 115,000 tonnes per annum (TPA). The integrated facility produces both Tread and Carcass grades of ASTM carbon blacks. ECPL also operates a 220,000 TPA Coal tar distillation plant in the same integrated carbon complex. In Phase II it plans to expand its capacity by another 90,000TPA of Carbon Black and eventually have a capacity of 300,000 TPA of Carbon Black making it India's largest single location carbon black plant and bring cost efficiencies.

The unit enjoys natural competitive advantage by providing a complete backward integration support for Raw material sourcing. The Anthracene oil generated in the coal tar distillation process will be used as a clean feedstock in the carbon black unit

The carbon black unit will provide gas and steam to the coal tar distillation unit. The integrated carbon complex is the first of its kind manufacturing facility in India to use waste coke oven gas from the steel plant as a fuel, the tail-gas from the Carbon black unit is fed back to the steel complex for pre-heating operations. This plant uses captive low-Sulphur feedstock (0.3-0.5% Sulphur) compared with many others who use high Sulphur feedstock (3% Sulphur). All these parameters have enabled the carbon black plant setting up a new benchmark in low SOx/NOx and CO2 emissions and make it highly environment friendly and best in class.

Phillips Carbon in 2020 commissioned a 32,000 MT specialty carbon black capacity at its Gujarat plant and is on track to commission a greenfield plant of 150 ktpa and 25 MW captive power plant by end FY2023E at a capex of nearly Rs 600 crore.

Table 23: Demand Supply Balance of CBFS & Carbon Black

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
CBFS (KT)					
Capacity	2200	2633	2822	2822	3002
Production	1935	2503	2258	2258	2702
Imports	1475	1687	2032	2032	2432
Exports	480	650	480	650	650
Demand	1935	2503	2258	2258	2702
Demand Growth (%)	5.8%	29.3%	-9.8%	0.0%	19.7%
Carbon Black (KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	1190	1423	1542	1542	1902
Production	1150	1284	1234	1311	1522
Imports	85	45	30	30	0
Exports	110	117	210	400	600
Demand	1235	1329	1264	1341	1522
Demand Growth (%)	8.5%	7.6%	-4.9%	6.1%	13.5%

The company had in December quarter clocked its highest-ever carbon black volumes of 114,525 tonnes, which was up 16% on a YoY basis. Operations of Philips Carbon Black plants at Palej and Mundra in the State of Gujarat and at Kochi in the State of Kerala had partially resumed by May 2020 and the operations of their plant situated at Durgapur in the State of West Bengal had also partially resumed.

Demand-supply environment for carbon black is expected to remain favourable supported by strong demand outlook, which bodes for high carbon black margin in the near term. 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.

Indian Carbon black manufacturers are expecting positive demand and adding capacities as well. Carbon black industry de-grew at 5% in 2020-21 and is expected to grow at a healthy growth of 6.1% next fiscal before clocking a double-digit growth in 2022-23. Meanwhile, CBFS too registered a de-growth of 9.8% owing to the pandemic and this year the growth is expected to remain flat, while a robust growth of 19.7% is expected going ahead in 2022-23.

XXVIII. Other Key Petrochemicals

Overall other key petrochemicals demand in 2020-21 witnessed a de-growth of 12% and is expected to grow at a staggering rate of 22% in this fiscal 2021-22. Benzene demand which saw double digit growth in previous two years witnessed a de-growth of 23.5% in 2020-21 due to negative impact caused by COVID-19. While the next fiscal it is expected to cover up the same and grow at a robust double-digit growth of 25% in 2021-22. In the last few years, Benzene export volume has been larger than domestic demand.



Table 3: Demand Supply Balance of Benzene, Toluene, MXS & OX

(KT)	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Benzene					
Capacity	2415	2470	2470	2470	2470
Production	2095	2140	2003	2100	2140
Imports	0	0	0	0	0
Exports	1485	1460	1483	1450	1440
Demand	610	680	520	650	700
Demand Growth (%)	15.1%	11.5%	-23.5%	25.0%	7.7%
Toluene	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	175	175	175	175	175
Production	140	145	120	120	120
Imports	420	437	510	530	550
Exports	4	8	8	0	0
Demand	556	574	622	650	670
Demand Growth (%)	9.9%	3.2%	8.4%	4.5%	3.1%

MXS	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	90	90	90	90	90
Production	68	73	57	60	70
Imports	183	268	160	260	275
Exports	0	0	0	0	0
Demand	234	328	206	324	339
Demand Growth (%)	4.9%	40.2%	-37.2%	57.3%	4.6%
OX	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	420	420	420	420	420
Production	345	386	522	547	547
Imports	16	16	12	15	15
Exports	105	121	252	209	209
Demand	288	280	284	368	368
Demand Growth (%)	-0.6%	-2.9%	1.5%	29.6%	0.0%

Since the second half of 2020, the price spread between caprolactam and benzene had increased steadily, rising from approximately \$700 per mt to around \$900 per mt by the end of 2020. This was further amplified earlier this year, with the price spread hitting above \$1,000 per mt.

The Asian market showed resilient demand for Benzene derivatives during the first quarter of 2021. Q3 plant shutdowns and Chinese lunar holidays significantly impacted the Benzene supply in China, that took too long to resume the production completely.

Overall production margins remained constrained over surging Brent crude oil rates which touched USD 60 per barrel in March. Meanwhile in the Indian market, strong demand from downstream ABS and LAB manufacturers pushed up the price curve of Benzene. During the March quarter, FOB Korea Benzene price was assessed around USD 800-830 per MT in March.

The global supply tightness that unusually characterized the benzene market in the second half of 2020 is likely to persist into 2021, although demand for the byproduct chemical of aromatics units, crackers and reformers will hinge on the impact of new downstream plant startups in China. With incredible benzene margins in H1, producers in Asia had been heard running at high rates to maximize profit, leading to a rise in export volumes from Asian countries. Benzene-naphtha spreads in Asia averaged \$240/mt between January and April, and briefly touched a high of \$475/mt mid-April.

India is a major benzene exporter and will remain so over the next few years. Reliance Industries accounts for slightly more than half of the benzene capacity in the Indian Subcontinent in 2020-21. From 2022, HPCL Mittal Energy is expected to start a pygas-based extraction unit with a benzene capacity of 240,000 metric tons per year in line with a new naphtha cracker. Benzene production will reach almost 2.1 million metric tons in 2025, with pygas, reformate, and transalkylation continuing to be the major supply sources.

Toluene witnessed rising demand in Oct 2020, during the festive season and tight availability from producers based in the Middle East and Southeast Asia are pushing India's import prices higher. The price spread between FOB Korea and CFR India prices hit a nearly four-month high of \$72/mt Oct. 27, as sellers raised their offers to India's domestic distributors in the expectation of further tightness ahead. The spread was last higher July 3, at \$74.50/mt.

India imported only 9,522 mt of toluene from Singapore over July-August, less than a third of the 30,493 mt it imported in the second quarter, statistical data from Ministry of Commerce and Industry showed.

Bureau of India Standards proposed in late June to revise the specification of toluene imports, raising the minimum purity content level to 99.8%, according to an amendment note

With the unprecedented surge in Covid-19 cases in Q2 in India, much uncertainty lingered on Toluene demand recovery. Previously, India tried to implement new measures on toluene imports for 2021. With the pandemic bouncing back, such norms are unlikely to take off, however. With India heaving in length, supply pressure could weigh on Southeast Asia suppliers unless gasoline-blending re-emerges in the zone.

Toluene demand witnessed a healthy growth of 8.4% in 2020-21, however, a tad slower growth is predicted in the next year 2021-22 around 5%.

MXS had witnessed a double-digit staggering growth in demand at 40.2% in 2019-20, however in 2020-21 it nosedived to a negative 37.2%, mainly due to the dip in the paint demand in the country. MXS mainly goes into Paint's sector. Paints were not classified as essential goods in the pandemic and due to the lockdowns and surge in cases across the country the paint demand was badly affected. It is expected the growth will see a much better rebound and once again see a double-digit growth of 57.3% in 2021-22. Imports in case of MXS are expected to rise to 70 KT by 2022-23.

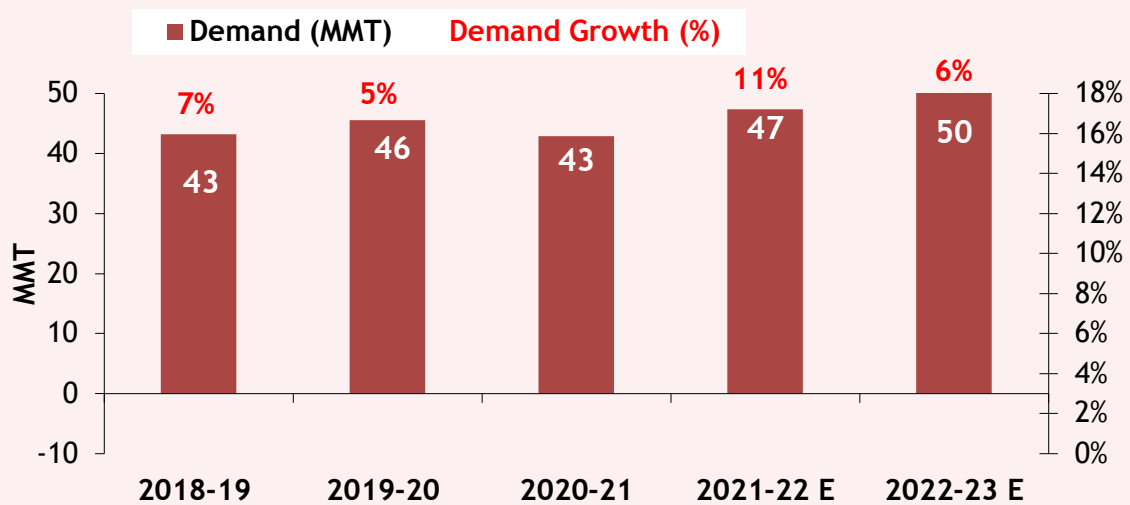
Meanwhile, OX registered almost a flat demand growth of 1.5% in 2020-21 which is forecasted to witness a huge spike and grow at a robust rate of 30% in next fiscal of 2021-22. There is no new capacity addition lined up for OX.

XXIX. Outlook for the Overall Indian Petrochemical Industry

Petrochemical's demand

India's aggregated demand for petrochemicals declined by 6% in 2020-21 due to the pandemic which affected the demand supply and affected the supply chains. The forecast for next year 2021-22 shows the demand to grow at double-digits clocking 11%. It is forecasted that the overall industry would have a healthy growth in next fiscal and the demand will touch 47 MMT and a further increase to touch 50 MMT by 2023, which reinstates the increase in consumption of petrochemicals across value chains in the future and healthy growth of the industry.

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



Polymers are likely to register a robust growth in the coming year 2021-22 and lock around 12% growth. Polyolefins are also expected to grow at double digit around 10.2% in 2021-22. Surfactants are projected to grow at ~4% in the same period. Synthetic rubbers are expected to register demand growth of 8% in the said period. Other key petrochemicals expected to grow at a robust 22% in the same period.

How fast the economy rebounds will depend on how fast the war against COVID is won and also on the labour availability who are needed to run the factories.

Investments in petrochemicals

Huge investments are lined up despite poor reinvestment economics and high factor costs. New investments require level playing field for the Indian manufacturers. In spite of the planned investments, much more investments are required to keep pace with demand growth and meet the objective of Atmanirbharta (Self-reliant nation)

Table below gives the projects which are at various stages of Planning, announcements or implementation. These 24 projects, if fructified, will need an investment of US\$ 123.5 Bn.

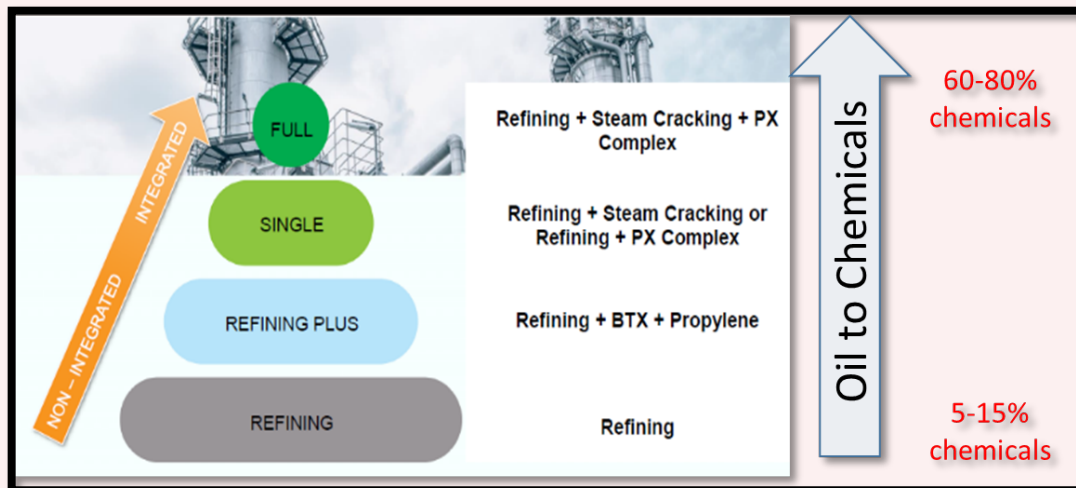
Figure 23: Proposed Investments in Petrochemical Projects in India

S. No.	Status of Investments	No. of Projects	Projects	Proposed Investments	
				Rs Crores	US\$Bn
1	Under Implementation	9	HMEL, JBF, CHEMPLAST, GAIL, BPCL, APCOTEX, NAYARA, IOC, HPCL	2,61,492	35.8
2	Announced	5	RATNAGIRI REFINERY, RIL JAMNAGAR, IOC, ADNOC-ADANI, BASF, BOREALIS	4,57,700	62.7
3	Projects on Drawing Board	10	HPL, BPCL, ISRL, GAIL/OPAL	1,82,389	25.0
	Total Investments	24		9,01,581	123.5

Structural changes foreseen in the Petrochemicals Sector

The industry is likely to see major irreversible changes in its structure. Electric vehicles will lead to fuel demand destruction and refineries will produce more chemicals to maintain their operating rates. This is leading to emergence of Oil to Chemicals development taking place across the continents and more feedstocks are likely to be available for the Petrochemicals industry from refineries in the coming decade.

Figure 24: Fuel demand destruction leading to rise of O2C



Imperatives for the Indian Petrochemicals Industry

At 8% pa growth, India's Consumption will double every 9 years.

In 27 years, it will be doubling 3 times to ~8 to 10-fold.

Indian Industry has to produce 10 times the present consumption or import the same.

The choice is to – Grow in a scattered manner as at present or go for a clustered approach.

Industry has to take a decision now for shaping tomorrow's chemical industry.

The present manufacturing units may become suboptimal or become too old to exist in next 30 years.

India needs to create brand new capacity 10 times the present consumption to meet the demand for 2050.

Self-Reliance or Atmanirbharta is already becoming a Mantra for the future for India for almost all sectors of economy.





SECTION 3

STATISTICAL APPENDIX

Feedstock

Naphtha (MT)					
	2018-19 A	2019-20 A	2020-21 A		
Production	19600	20577	19287		
Imports	2082	1662	1364		
Exports	6963	8897	6307		
Apparent Demand	14131	14268	14257		
Demand Growth%	9.6%	1.0%	-0.1%		
Natural Gas (MMSCM)					
	2018-19 A	2019-20 A	2020-21 A		
Production	32875	31184	28541		
Imports	28740	33867	32993		
Exports	0	0	0		
Apparent Demand	60798	64123	60638		
Demand Growth%	2.8%	5.5%	-5.4%		
Coal Bed Methane (MMSCM)					
	2018-19 A	2019-20 A	2020-21 A		
Production	710	655	642		
Imports	--	--	--		
Exports	--	--	--		
Apparent Demand	--	--	--		
Demand Growth%	--	--	--		
Methanol (KT)					
	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	631	631	631	631	631
Production	203	210	225	300	300
Imports	2007	1983	1911	2033	2169
Exports	7	6	0	0	0
Apparent Demand	2134	2186	2136	2333	2469
Demand Growth%	4.5%	2.4%	-2.3%	9.2%	5.8%

Building Blocks (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Ethylene					
Capacity	7477	7477	7477	8001	8677
Production	6546	6959	6987	6964	7353
Imports	63	50	39	25	25
Exports	149	166	100	110	110
Net Availability	6460	6843	6925	6879	7268
Propylene	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	6394	6554	6554	6774	7117
Production	5022	5481	5777	6034	6459
Imports	4	13	4	14	0
Exports	41	16	14	0	0
Net Availability	4985	5479	5767	6048	6459
Butadiene	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	605	605	605	605	605
Production	485	501	461	513	518
Imports	0	0	0	0	0
Exports	167	172	134	153	148
Apparent Demand	318	329	327	360	370
Demand Growth%	6.7%	3.6%	-0.6%	10.1%	2.8%
Styrene					
Imports	1064	877	799	920	1065
Exports	0	0	0	0	0
Net Trade	1064	877	799	920	1065
Demand Growth%	4.8%	-17.5%	-8.9%	15.1%	15.8%
	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
EDC					
Capacity	237	247	247	247	247
Production	229	246	254	254	256
Imports	498	627	540	540	580
Exports					
Apparent Demand	727	873	794	794	836
Demand Growth%	2.5%	20.1%	-9.1%	0.0%	5.3%
VCM	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	996	996	996	996	996
Production	950	1026	944	1007	1010
Imports	458	512	500	500	510
Exports					
Apparent Demand	1430	1559	1527	1527	1527
Demand Growth%	1.7%	9.0%	-2.1%	0.0%	0.0%
Aromatics	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
PX					
Capacity	5786	5860	5860	5860	5860
Production	5377	5086	5109	5381	5381
Imports	762	690	615	650	650
Exports	2262	1955	2242	2138	2138
Apparent Demand	3841	3908	3297	3925	3925
Demand Growth%	-3.0%	1.7%	-15.6%	19.0%	0.0%

Intermediates (KT) Fibre Intermediates (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
ACN					
Capacity	0	0	0	0	0
Production	0	0	0	0	0
Imports	182	176	135	175	189
Exports	0	0	0	0	0
Apparent Demand	182	176	135	175	189
Demand Growth%	13.8%	-3.3%	-23.3%	29.6%	8.0%
Caprolactam	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	70	70	70	70	70
Production	89	83	81	85	85
Imports	65	68	58	65	65
Exports	0	0	6	0	0
Apparent Demand	154	155	145	155	155
Demand Growth%	6.9%	0.6%	-6.5%	6.9%	0.0%
PTA	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	6410	6420	6420	6420	6420
Production	5792	5734	5072	5457	5778
Imports	420	861	519	800	900
Exports	160	81	135	0	0
Apparent Demand	6052	6514	5457	6257	6678
Demand Growth%	3.3%	7.6%	-16.2%	14.7%	6.7%
MEG	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	2215	2215	2215	2215	2565
Production	2067	1982	1994	2025	2299
Imports	632	768	625	650	640
Exports	232	160	284	50	105
Apparent Demand	2467	2590	2335	2625	2834
Demand Growth%	5.0%	5.0%	-9.8%	12.4%	8.0%

Polymers, Fibres and Elastomers (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
LDPE					
Capacity	605	605	605	605	605
Production	556	614	617	644	644
Imports	274	294	265	237	224
Exports	126	115	119	38	48
Apparent Demand	723	760	783	809	834
Demand Growth%	-2.0%	5.1%	3.1%	3.4%	3.1%
EVA	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	0	0	0	0	0
Production	0	0	0	0	0
Imports	289	301	290	298	305
Exports	0	0	0	0	0
Apparent Demand	289	301	290	298	305
Demand Growth%	1.1%	3.9%	-3.5%	2.8%	2.3%

LLDPE	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	2395	2545	2545	2545	2595
Production	2157	2333	2372	2679	2750
Imports	448	477	476	462	450
Exports	502	384	452	425	426
Apparent Demand	2122	2301	2518	2706	2850
Demand Growth%	10.8%	8.5%	9.4%	7.5%	5.3%
HDPE	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
HDPE Capacity	2605	2665	2665	2665	2775
LLDPE Capacity	2395	2545	2545	2545	2595
Total Capacity	5000	5210	5210	5210	5370
Production	2440	2538	2473	2548	2548
Imports	530	503	547	633	633
Exports	431	455	370	209	209
Apparent Demand	2448	2551	2775	2973	3083
Demand Growth%	-0.2%	4.2%	8.8%	7.1%	3.7%
All PE	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	5605	5815	5815	5815	5975
Production	5153	5485	5462	5871	5942
Imports	1252	1274	1287	1332	1307
Exports	1059	954	941	671	683
Apparent Demand	5293	5612	6076	6488	6767
Demand Growth%	3.7%	6.0%	8.3%	6.8%	4.3%
PP	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	5320	6100	6100	6600	6600
Production	5091	5191	5210	5881	6590
Imports	680	855	693	539	600
Exports	765	519	811	269	260
Apparent Demand	5698	5260	5370	6146	6705
Demand Growth%	19.8%	-7.7%	2.1%	14.5%	9.1%
Polyolefins	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	10925	11915	11915	12415	12575
Production	10244	10676	10672	11752	12532
Imports	2221	2429	2270	2169	2212
Exports	1824	1473	1752	940	943
Apparent Demand	11280	11172	11736	12932	13777
Demand Growth%	11.2%	-1.0%	5.0%	10.2%	6.5%
PVC	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	1557	1579	1579	1579	1579
Production	1409	1436	1367	1439	1438
Imports	1813	1852	1394	1910	2065
Exports			74		
Apparent Demand	3199	3261	2740	3300	3492
Demand Growth%	4.9%	1.9%	-16%	20.4%	5.8%
PS	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	490	490	490	512	580
Production	290	270	212	250	325
Imports	30	28	42	60	30
Exports	53	42	27	30	50
Apparent Demand	262	260	261	274	289
Demand Growth%	-0.8%	-3.1%	-9.9%	21.1%	9.1%

EPS	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	139	141	150	190	213
Production	110	120	97	103	117
Imports	1	1	6	10	6
Exports	3	3	1	1	1
Apparent Demand	110	115	101	112	122
Demand Growth%	5.8%	4.5%	-12.2%	10.9%	8.9%
Polymers	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	13111	14125	14134	14696	14947
Production	12053	12502	12347	13544	14412
OR (%)	92%	89%	87%	92%	96%
Imports	4065	4310	3712	4149	4313
Exports	1880	1518	1780	971	994
Net Trade	-2185	-2793	-1932	-3178	-3319
Apparent Demand	14849	14800	14889	16619	17691
Demand Growth%	9.5%	-0.3%	0.6%	11.6%	6.4%

Vinyls (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
PVC					
Capacity	1557	1579	1579	1579	1579
Production	1409	1436	1367	1439	1438
Imports	1813	1852	1394	1910	2065
Exports			74		
Apparent Demand	3199	3261	2740	3300	3492
Demand Growth%	4.9%	1.9%	-16%	20.4%	5.8%

Styrenics (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
PS					
Capacity	490	490	490	512	580
Production	290	270	212	250	325
Imports	30	28	42	60	30
Exports	53	42	27	30	50
Apparent Demand	260	252	227	275	300
Demand Growth%	-0.8%	-3.1%	-9.9%	21.1%	9.1%
ABS	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	210	240	240	240	240
Production	145	140	128	135	140
Imports	90	95	88	92	109
Exports	0	0	0	0	0
Apparent Demand	235	235	216	227	249
Demand Growth%	4.9%	0.0%	-8.1%	5.1%	9.7%

SAN	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	170	170	170	170	170
Production	121	133	107	111	128
Imports	7	9	8	7	10
Exports					
Apparent Demand	128	142	115	118	138
Demand Growth%	10.1%	11.0%	-19.4%	3.0%	16.9%

PET (KT)

PET	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	1925	1975	2020	2200	2200
Production	1624	1718	1757	1892	1892
Imports	183	250	165	140	130
Exports	793	843	802	812	692
Demand	1014	1125	1120	1220	1330
Demand Growth (%)	12.9%	10.9%	-0.4%	8.9%	9.0%

Synthetic Fibres (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
PSF					
Capacity	1248	1410	1410	1410	1410
Production	955	1009	835	1066	1172
Imports	36	60	25	12.471	24
Exports	168	200	216	231	211
Demand	829	897	683	854	978
Demand Growth (%)	-5.9%	8.2%	-23.8%	25.1%	14.5%
ASF	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	167	167	167	167	167
Production	105	115	81	105	105
Imports	36	50	43	38	38
Exports	25	22	22	22	22
Demand	106	121	89	102	114
Demand Growth (%)	1.3%	14.0%	-26.9%	14.7%	11.8%
PPSF	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	13	13	13	13	13
Production	3	4	1	3	3
Imports	3	3	2	3	3
Exports	8	10	10	9	9
Demand	5	5	4	5	5
Demand Growth (%)	0.0%	0.0%	-20.0%	25.0%	0.0%
PFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	4942	5209	5107	5164	5220
Production	3301	3605	2833	4037	4292
Imports	37	62	203	86	71
Exports	148	147	120	130	107
Demand	3194	3513	2940	3993	4256
Demand Growth (%)	7.7%	10.0%	-16.3%	35.8%	6.6%

PPFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	18	18	18	18	18
Production	11	12	13	11	13
Imports	1	1	1	1	1
Exports	1	1	1	1	1
Demand	12	12	13	12	13
Demand Growth (%)	20.2%	0.6%	4.5%	-4.0%	8.1%
VSF	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	566	578	578	578	578
Production	425	405	380	400	434
Imports	38	30	42	43	43
Exports	90	120	91	91	90
Demand	266	315	331	352	387
Demand Growth (%)	-0.4%	18.4%	5.1%	6.3%	9.9%
VFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	82	82	82	82	82
Production	47	46	37	47	47
Imports	14	22	17	17	17
Exports	6	6	6	6	6
Demand	66	68	70	70	70
Demand Growth (%)	3.1%	3.0%	2.9%	0.0%	0.0%
NFY	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	108	114	114	114	114
Production	105	110	75	98	113
Imports	21	23	16	21	21
Exports	5	6	5	5	5
Demand	121	130	79	112	128
Demand Growth (%)	-3.8%	7.7%	-39.2%	41.4%	14.1%

Synthetic Rubber (KT)

PBR	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	124	124	124	124	124
Production	122	130	128	135	136
Imports	82	80	83	86	89
Exports	13	20	23	10	4
Demand	193	185	192	211	221
Demand Growth (%)	3.0%	-4.0%	3.8%	9.9%	4.7%
SBR	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	290	270	270	270	270
Production	220	225	205	233	242
Imports	66	51	72	72	75
Exports	28	18	22	8	8
Demand	257	252	265	295	310
Demand Growth (%)	3.7%	-1.9%	5.4%	11.3%	5.1%

NBR	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	20	20	20	30	45
Production	18	20	20	25	40
Imports	38	40	45	43	37
Exports	0	0	0	0	0
Demand	56	60	67	70	75
Demand Growth (%)	-2.5%	7.7%	10.9%	4.5%	7.1%
EPDM	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	0	0	0	0	0
Production	0	0	0	0	0
Imports	53	51	50	53	56
Exports	0	0	0	0	0
Demand	53	51	50	53	56
Demand Growth (%)	17.4%	-3.0%	-2.4%	6.0%	5.7%
BUTYL + HALO BUTYL RUBBER	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	0	120	120	120	120
Production	0	15	52	75	62
Imports	112	89	83	63	42
Exports	0	4	25	33	37
Demand	112	99	112	113	125
Demand Growth (%)	10.9%	-11.5%	12.9%	1.0%	10.5%

Other Key Petrochemicals (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Benzene					
Capacity	2415	2470	2470	2470	2470
Production	2095	2140	2003	2100	2140
Imports	0	0	0	0	0
Exports	1485	1460	1483	1450	1440
Apparent Demand	610	680	520	650	700
Demand Growth%	15.1%	11.5%	-23.5%	25.0%	7.7%
Toluene	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	175	175	175	175	175
Production	140	145	120	120	120
Imports	420	437	510	530	550
Exports	4	8	8	0	0
Apparent Demand	556	574	622	650	670
Demand Growth%	9.9%	3.2%	8.4%	4.5%	3.1%
MXS	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	90	90	90	90	90
Production	68	73	57	60	70
Imports	183	268	160	260	275
Exports	0	0	0	0	0
Apparent Demand	234	328	206	324	339
Demand Growth%	4.9%	40.2%	-37.2%	57.3%	4.6%

OX	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	420	420	420	420	420
Production	345	386	522	546.654	547
Imports	16	16	12	15	15
Exports	105	121	252	208.854	209
Apparent Demand	288	280	284	368	368
Demand Growth%	-0.6%	-2.9%	1.5%	29.6%	0.0%

Surfactants (KT)

	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
LAB					
Capacity	550	550	550	550	572
Production	449	400	449	456	475
Imports	228	261	253	256	262
Exports	6	0	0	0	0
Apparent Demand	670	669	706	711	737
Demand Growth%	3.1%	-0.1%	5.6%	0.6%	3.7%
EO	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	269	279	301	301	341
Production	236	255	268	300	321
Imports	0	0	0	0	0
Exports	0	0	1	1	1
Apparent Demand	236	255	269	301	322
Demand Growth%	11.5%	8.2%	5.4%	11.9%	6.9%

Carbon Black & CBFS (KT)

CBFS	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	2200	2633	2822	2822	3002
Production	1935	2503	2258	2258	2702
Imports	1475	1687	2032	2032	2432
Exports	480	650	480	650	650
Demand	1935	2503	2258	2258	2702
Demand Growth (%)	5.8%	29.3%	-9.8%	0.0%	19.7%
Carbon Black	2018-19 A	2019-20 A	2020-21 A	2021-22 E	2022-23 E
Capacity	1190	1423	1542	1542	1902
Production	1150	1284	1234	1311	1522
Imports	85	45	30	30	0
Exports	110	117	210	400	600
Demand	1235	1329	1264	1341	1522
Demand Growth (%)	8.5%	7.6%	-4.9%	6.1%	13.5%



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.

CPMA has various sub-committees constituted to effectively focus on key areas within petrochemicals like Polyolefins, Vinyl's, Styrenics, Glycols, Elastomers, Fibre Intermediates and Surfactants. CPMA has also taken the lead to set up and promote the India Centre for Plastics in the Environment (ICPE) to deal with all environmental issues connected with the usage of plastics.

CPMA Members

1. Aarti Industries Ltd.
2. Apcotex
3. Bharat Petroleum Corporation Limited
4. Chemplast Kuddalore Vinyls Limited
5. DCM Shriram Ltd.
6. DCW Ltd.
7. Engineers India Ltd.
8. Finolex Industries Ltd.
9. GAIL (India) Ltd.
10. Gujarat State Fertilizers & Chemicals Ltd (GSFC)
11. Haldia Petrochemicals Ltd.
12. HPCL – Mittal Energy Ltd.
13. Hindustan Petroleum Corporation Ltd (HPCL)
14. Indian Oil Corporation Ltd (IOCL)
15. Indian Synthetic Rubber Private Limited
16. NEOS Styrolution India Ltd.
17. LG Polymers (India) Pvt. Ltd.
18. MCPI Private Limited
19. Mangalore Refinery and Petrochemicals Ltd.
20. Meghmani Finechem Ltd.
21. ONGC Mangalore Petrochemicals Limited
22. OPAL - ONGC Petro Additions Limited
23. Reliance Industries Ltd.
24. Supreme Petrochem Ltd.
25. Tamilnadu Petroproducts Ltd.
26. Thirumalai Chemicals Limited

Associate Members

SABIC India Pvt Ltd., Indorama Industries Ltd., HPL Additives Ltd.
Jindal Poly Films Ltd., KLJ Group, ICIS, Braskem SA

Address

Chemicals & Petrochemicals Manufacturers' Association
708, 7th Floor, Kailash Building, 26, Kasturba Gandhi Marg, New Delhi-110001, INDIA
Phone: 91-11- 43598337, Fax: 91-11-43598337
Email: cpmai@airtelmail.in | Website: www.cpmaindia.com

Contact Person: **Mr. Mahinder Singh**, Secretary General CPMA

CPMA Members

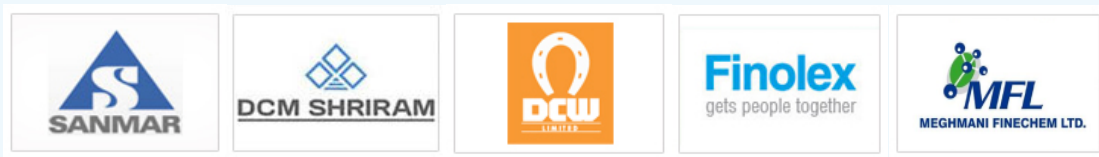
INTEGRATED



STYRENICS



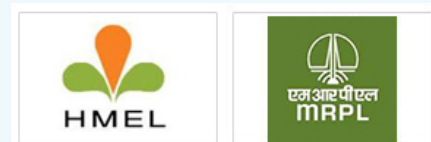
PVC



EPC



PP



OTHERS



ASSOCIATE MEMBERS





Chemicals & Petrochemicals
Manufacturers' Association, India

708, 7th Floor, Kailash Building, 26,
Kasturba Gandhi Marg, New Delhi-110001, INDIA

Phone: 91-11- 43598337, Fax: 91-11-43598337

Email: cpmai@airtelmail.in | Website: www.cpmaindia.com