

Industry and Infrastructure

Global Industrial activity continued to be affected by the disruptions caused by the COVID-19 pandemic. While the Indian industry was no exception to these disruptions, its performance has improved in 2021-22. Gradual unlocking of the economy, record vaccinations, improvement in consumer demand, continued policy support towards industries by the government in the form of AtmaNirbhar Bharat Abhiyan and further reinforcements in 2021-22 have led to an upturn in the performance of the industrial sector. The growth of the industrial sector, in the first half of 2021-22, was 22.9 percent vis a vis the corresponding period of 2020-21 and is expected to grow by 11.8 percent in this financial year. The industrial performance has shown improvement as reflected in the cumulative growth of the IIP. During April-November 2021-22 the IIP grew at 17.4 percent as compared to (-)15.3 percent in April-November 2020-21. According to RBI- Studies on Corporate Performance, which is based on the results of select listed companies in the private corporate sector, the net profit to sales ratio of large corporates reached an all-time high despite the pandemic. Buoyant FDI inflows amid improvements in overall business sentiments, foretells a positive outlook for the industry.

The introduction of the production linked incentive scheme (PLI) to encourage scaling up of industries and major boost provided to infrastructure-both physical as well as digital-combined with continued measures to reduce transaction costs and improve ease of doing business, would support the pace of recovery. Several initiatives such as the National Infrastructure Pipeline (NIP), National Monetization Plan (NMP), amongst others, have been taken to propel the infrastructure investment. Capital expenditure for the Indian Railways has been substantially increased from an average annual of Rs. 45,980 crores during 2009-14 to Rs. 155,181 crores in 2020-21 and it has been budgeted to further increase to Rs. 215,058 crores in 2021-22. This implies five times increase in comparison to the 2014 level. In addition, the extent of road construction per day increased substantially in 2020-21 to 36.5 kms per day from 28 kms per day in 2019-20, a rise by 30.4 percent as compared to the previous year. The Government has also heralded a major boost to the electronics hardware sector and brought in structural and procedural reforms in the telecom sector.

INTRODUCTION

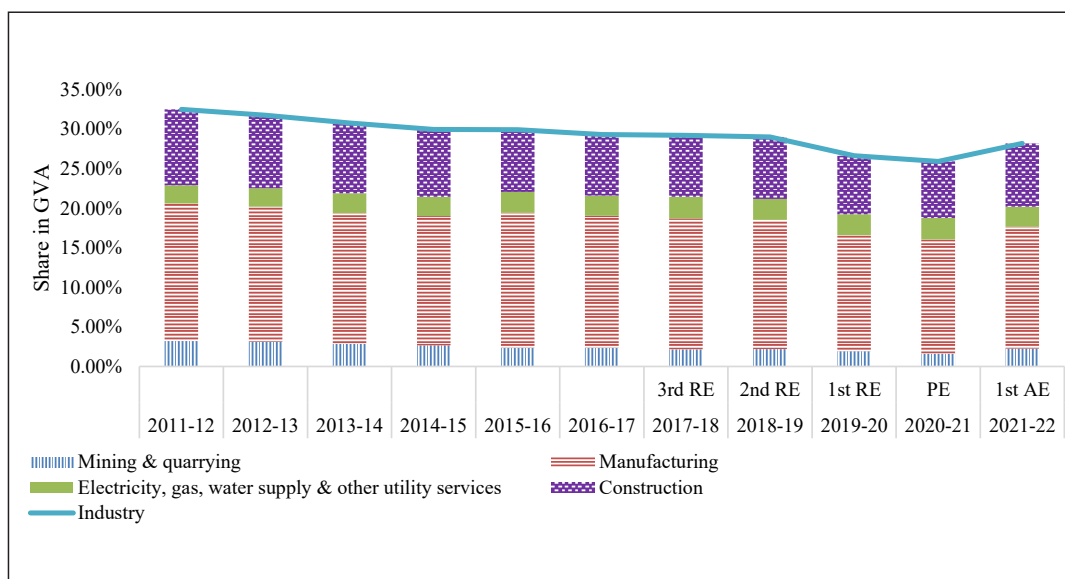
8.1 COVID-19 pandemic led to disruptions in global economic activity impacting not only the lives but also livelihoods. The Indian industry experienced interlude in business activity leading to slowdown in its performance. With the gradual unlocking of the country coupled

with supportive policy initiatives which included easing of supply side bottlenecks through easier access to credit especially, emergency credit line guarantee scheme to MSMEs, relief to the real estate sector, production-linked incentives for 14 champion sectors and other direct tax measures, the industrial growth started to recover. In the past few months, record vaccinations as well as improvement in consumer demand and business confidence have had a positive impact on the performance of the industrial sector. This period also saw a boost to digital infrastructure, structural reforms in telecommunications and big-ticket disinvestment in Air India. The pace of this recovery and further growth is likely to continue due to consistent efforts of the government to bring in various structural, fiscal and infrastructural reforms in addition to a slew of measures/schemes like the production linked incentive scheme (PLI) to support industries .

8.2 The gross value addition at constant prices (GVA) in the industrial sector grew at the compound annual growth rate (CAGR) of 4.53 percent between 2011-12 and 2019-20 while total GVA grew by CAGR of 5.63 percent over the same period. The share of the industrial sector in the nominal GVA(at current prices) was 25.9 percent in 2020-21. With the industrial sector recovering and expected to grow at 11.8 percent, as per advance estimates for 2021-22 by National Statistical Office, industry's share is expected to increase to 28.2 percent. (Figure 1).

8.3 Manufacturing, with an average share of 16.3 percent in nominal GVA over the last decade, has a dominant presence within the industrial sector. In 2020-21, the share of manufacturing fell to 14.4 percent but is expected to improve to 15.3 percent in 2021-22. The share of electricity has been showing an increasing trend since 2012-13 and was 2.7 percent 2020-21. Figures 1 and 2 show value added in the industrial sector and growth respectively. In 2020-21, electricity, gas, water supply and other utility services was the only sub sector that had experienced a positive growth of 1.9 percent (table 1). In 2021-22, the manufacturing sector is expected to grow by 12.5 percent, mining and quarrying by 14.3 percent, construction by 10.7 percent and electricity, gas and water supply by 8.5 per cent. This improvement is on the back of industrial contraction in the corresponding period of the last financial year.

Figure 1: Share of Industry and its components in Gross value added

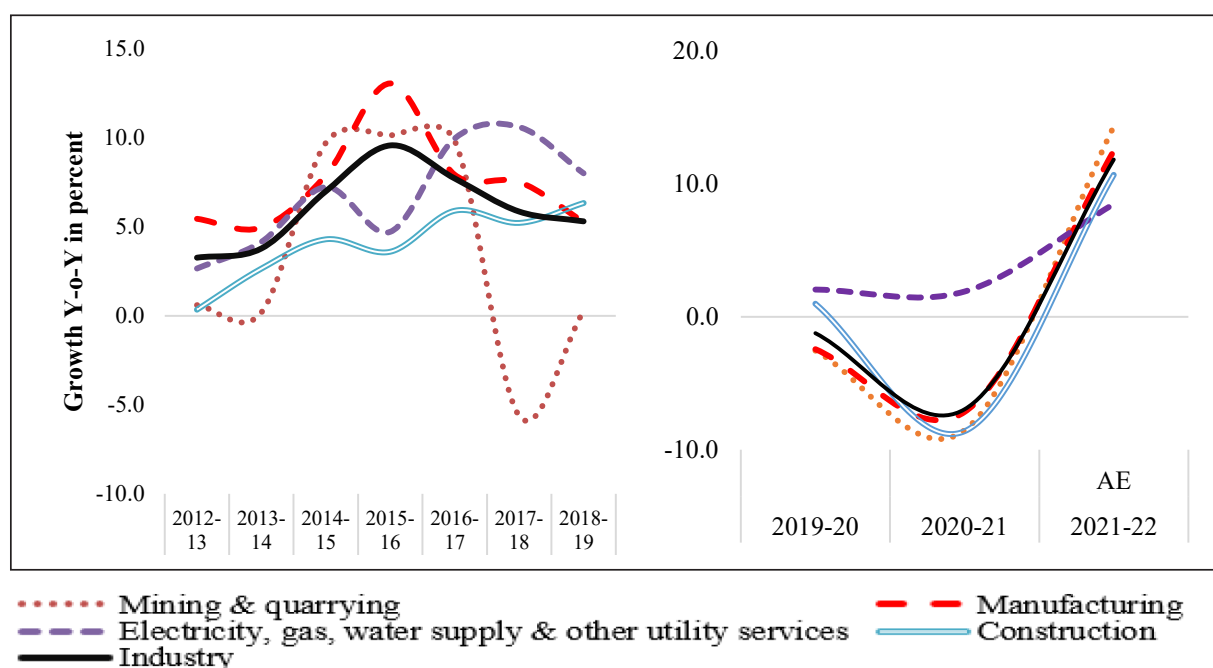


Source: Survey calculations based on MoSPI data. Data at current prices.

Table 1: Growth in Gross Value Added in Industry

| Sectors | Year | | | | | | | | | |
|---|---------|---------|---------|---------|---------|--------------------|--------------------|--------------------|---------|--------------------|
| | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| | | | | | | 3 rd RE | 2 nd RE | 1 st RE | PE | 1 st AE |
| Mining & quarrying | 0.6 | 0.2 | 9.7 | 10.1 | 9.8 | -5.6 | 0.3 | -2.5 | -8.5 | 14.3 |
| Manufacturing | 5.5 | 5.0 | 7.9 | 13.1 | 7.9 | 7.5 | 5.3 | -2.4 | -7.2 | 12.5 |
| Electricity, gas, water supply & other utility services | 2.7 | 4.2 | 7.2 | 4.7 | 10.0 | 10.6 | 8.0 | 2.1 | 1.9 | 8.5 |
| Construction | 0.3 | 2.7 | 4.3 | 3.6 | 5.9 | 5.2 | 6.3 | 1.0 | -8.6 | 10.7 |
| Industry | 3.3 | 3.8 | 7.0 | 9.6 | 7.7 | 5.9 | 5.3 | -1.2 | -7.0 | 11.8 |

Source: Survey calculations based on MoSPI data.

Figure 2: Growth trends in Industry's Value Addition and its components

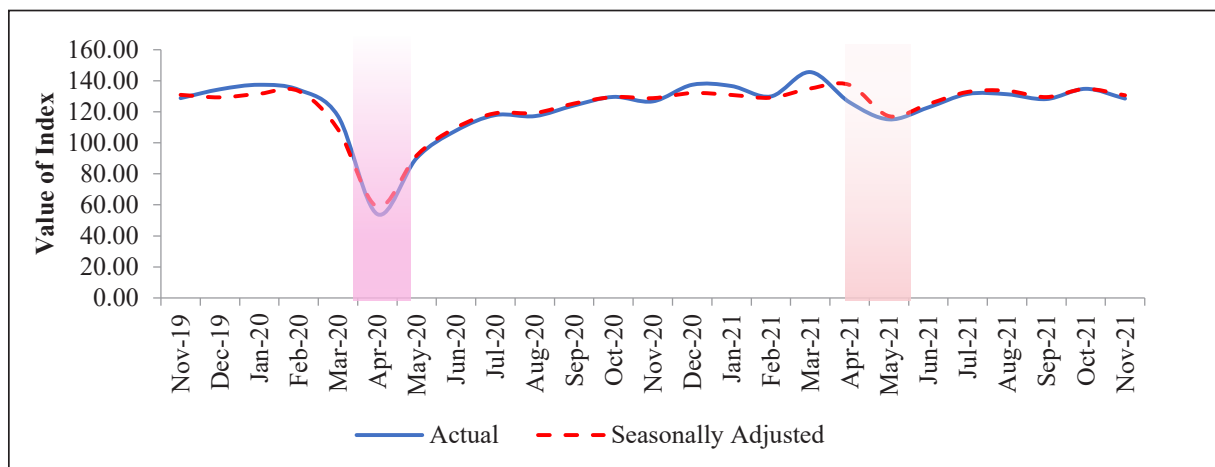
Source: Survey calculations based on MoSPI data.

Index of Industrial Production (IIP)

8.4 The impact of the pandemic on the industrial sector is reflected in the negative growth of 8.4 percent in 2020-21. In April-November 2021-22 the IIP grew by 17.4 per cent as compared to (-15.3) per cent in the corresponding period of the previous year. The supply side measures as also steps to bolster demand, taken to address the contraction, are responsible for the significantly improved performance of the industrial sector in 2021-22. In November 2021 the IIP index grew by 1.4 per cent with the mining sector recorded a growth of 5.0 percent followed by electricity at 2.1 percent and manufacturing at 0.9 percent. In terms of use-based classification also, the

index reflects broad-based recovery across all sectors (Table 2). Primary goods at 3.5 percent, infrastructure goods with 3.8 percent, consumer non-durables with 0.8 and intermediate goods at 2.5 percent led the recovery under the used based classification.

Figure 3: Value of Index of Industrial Production



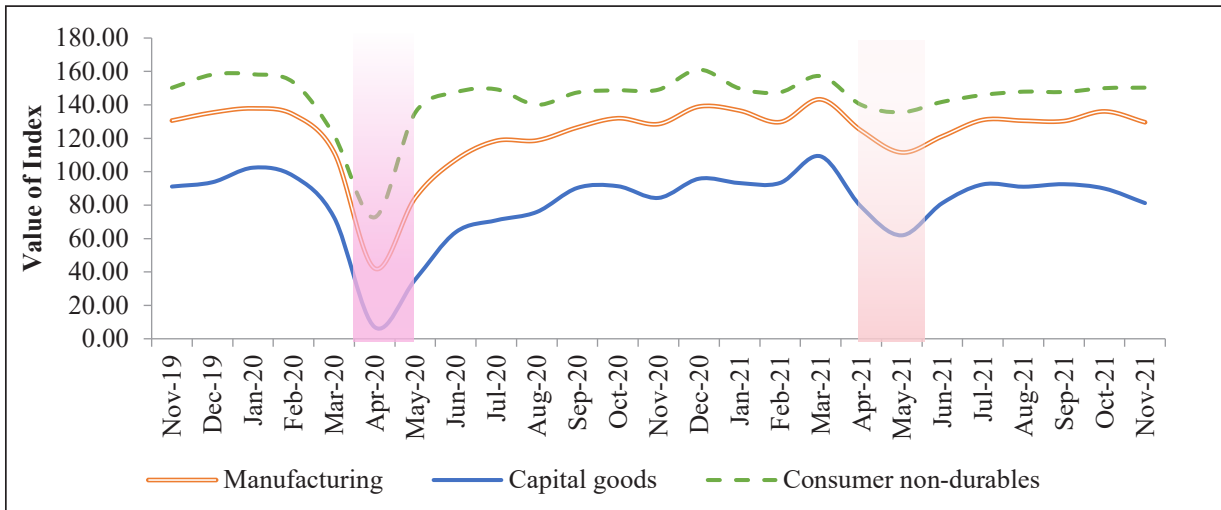
Source: Survey calculations based on MOSPI data

Table 2: Sector wise IIP - Growth in percent

| | Weight | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 | Apr-21 | May-21 | Jun-21 | Jul-21 | Aug-21 | Sep-21 | Oct-21 | Nov-21 |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| By Sector | | | | | | | | | | | | | | |
| Mining | 14.4 | -5.4 | -3 | -2.4 | -4.4 | 6.1 | # | 23.6 | 23.1 | 19.5 | 23.3 | 8.6 | 11.5 | 5 |
| Manufacturing | 77.6 | -1.6 | 2.7 | -0.9 | -3.4 | 28.4 | # | 32.1 | 13.2 | 10.5 | 11.1 | 3 | 3.1 | 0.9 |
| Electricity | 8 | 3.5 | 5.1 | 5.5 | 0.1 | 22.5 | # | 7.5 | 8.3 | 11.1 | 16 | 0.9 | 3.1 | 2.1 |
| General | 100 | -1.6 | 2.2 | -0.6 | -3.2 | 24.2 | # | 27.6 | 13.8 | 11.5 | 13 | 3.3 | 4 | 1.4 |
| Primary goods | 34 | -1.8 | 0.4 | 0.7 | -4.6 | 7.9 | # | 15.8 | 12 | 12.4 | 16.9 | 4.6 | 9 | 3.5 |
| Capital goods | 8.2 | -7.5 | 2.2 | -9 | -4.2 | 50.4 | # | 74.9 | 27.3 | 30.3 | 20 | 2.4 | -1.5 | -3.7 |
| Intermediate goods | 17.2 | -1.8 | 2.3 | 2 | -5.3 | 22.4 | # | 54.2 | 22.6 | 14.6 | 11.8 | 5 | 3.8 | 2.5 |
| Infrastructure/construction | 12.3 | 2.1 | 3.1 | 2.3 | -3.5 | 35.1 | # | 46.5 | 20 | 12.3 | 13.5 | 7.8 | 6.6 | 3.8 |
| Consumer durables | 12.8 | -3.2 | 6.5 | -0.1 | 6.6 | 59.9 | # | 80.4 | 28 | 19.4 | 11.1 | -1.9 | -3.6 | -5.6 |
| Consumer non-durables | 15.3 | -0.7 | 1.9 | -5.4 | -3.8 | 29.2 | # | 0.2 | -3.9 | -2.3 | 5.9 | 0.2 | 0.9 | 0.8 |

Red- Negative growth, Yellow- Growth rate positive but less than 5 per cent, Green- Positive and more than 5 per cent
Source: Survey calculations based on MOSPI data. # In view of the circumstances mentioned in the Press Release for IIP dated 11th June 2021, the indices for April 2021 are not comparable with those of April 2020 - MOSPI

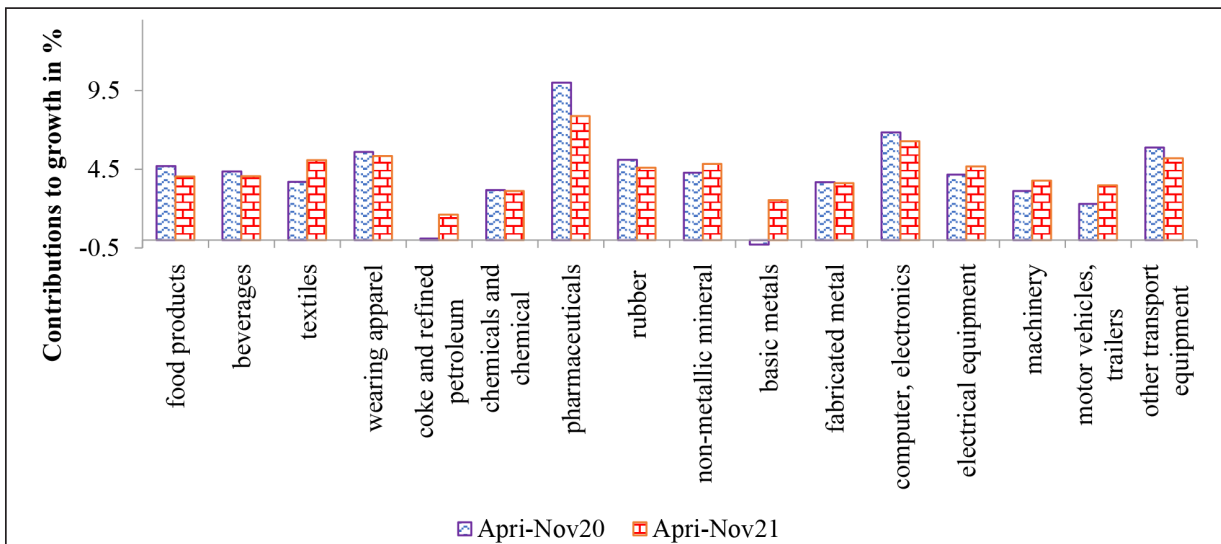
Figure 4: Indices for Broad Sectors in IIP



Source: Survey calculations based on MOSPI data

8.5 The IIP also provides data for 23 subgroups of the manufacturing sector. In the period, April-November 2021-22, all the 23 sectors recorded a positive growth. The major industrial groups like textiles, wearing apparel, electrical equipment, motor vehicles staged a strong recovery (Figure5). Improvement in the performance of the textiles and wearing apparel which is a labour-intensive industry has significant implications for employment creation.

Figure 5: Contributions of product groups to manufacturing growth - percent



Source: Survey calculations based on MOSPI data

Table 3: Growth in Manufacturing sectors in percent

| Group | Weights | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 | Apr-21 | May-21 | Jun-21 | Jul-21 | Aug-21 | Sep-21 | Oct-21 | Nov-21 |
|---------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Food Products | 5.3 | 7.6 | -1.7 | -1.8 | -0.3 | 17.1 | # | 13.7 | 8.4 | 4.7 | 9.5 | 0.5 | 4.8 | -1.3 |
| Beverages | 1.0 | -15.3 | -7.7 | -7.6 | -12.9 | 26.5 | # | -0.2 | -2.3 | 14.3 | 12.4 | 2 | 5.6 | 0.8 |

| | | | | | | | | | | | | | | |
|--|------|-------|-------|-------|-------|------|---|-------|-------|-------|------|-------|-------|-------|
| Tobacco Products | 0.8 | -7.5 | -2.1 | -4.3 | -7.8 | 24.6 | # | 77.9 | -19.2 | -22.2 | 3.2 | 7.5 | 8.9 | 2.5 |
| Textiles | 3.3 | -9 | -7 | -5.6 | -2.7 | 19.2 | # | 161.9 | 76.4 | 25.5 | 24.4 | 13.5 | 11.2 | 8 |
| Wearing Apparel | 1.3 | -26.9 | -18 | -20.3 | -14.9 | 24.4 | # | 33.9 | 3.9 | 3.8 | 26.6 | -0.6 | 36.7 | 33.4 |
| Leather And Related Products | 0.5 | -8.7 | -5.6 | -4.4 | -7.5 | 22.4 | # | 28.1 | -5.6 | 3.6 | 0.5 | -11.1 | -11 | -8.4 |
| Wood And Products of Wood and Cork, | 0.2 | 3.6 | -4.2 | 7.5 | -6.4 | 46.1 | # | 85.4 | 32.3 | 24.2 | 28.9 | -5.8 | -2.4 | -4.3 |
| Paper And Paper Products | 0.9 | -22.2 | -17 | -12.6 | -10.9 | 29.6 | # | 56.5 | -8 | 27 | 4.8 | 19.9 | 21.6 | 11.9 |
| Printing And Reproduction of Recorded Media | 0.7 | -17.4 | -19.9 | -25.4 | -28.5 | 2.2 | # | 17.7 | -2.1 | -0.1 | 5.7 | 2.2 | 7.1 | 3 |
| Coke And Refined Petroleum Products | 11.8 | -3.3 | -0.7 | -0.5 | -9.4 | -1.1 | # | 18.7 | 5.4 | 7.8 | 11.4 | 5.1 | 13.3 | 3.3 |
| Chemicals Products | 7.9 | 0.2 | 7.2 | 5.4 | -2.2 | 26.5 | # | 13.8 | -0.9 | 4.7 | 5 | -1.8 | -2.4 | -1.9 |
| Pharmaceuticals, Medicinal Chemical and Botanical Products | 5.0 | -1 | 6.7 | -8.8 | -5 | 36.8 | # | -7.3 | -4.3 | -6 | 5.4 | 1.1 | -1.1 | 2.7 |
| Rubber And Plastics Products | 2.4 | 6.4 | 8.9 | 6 | 2.3 | 47.4 | # | 39.1 | 8.5 | 8 | 9.9 | 0.3 | -7.1 | -5.5 |
| Other Non-Metallic Mineral Products | 4.1 | -3.8 | -4.8 | -6.1 | -6.8 | 30.9 | # | 20.7 | 8 | 20.4 | 27 | 11.6 | 10.4 | -2.8 |
| Basic Metals | 12.8 | 3.1 | 6.3 | 6.6 | -3.5 | 29.2 | # | 54.8 | 24.3 | 11.8 | 9.8 | 6.2 | 7 | 7.3 |
| Fabricated Metal Products, Except Machinery and Equipment | 2.7 | -6.6 | 3.3 | -1 | -2.3 | 39.5 | # | 45.7 | 18.4 | 10.1 | 12 | -3.6 | -8 | -2.1 |
| Computer, Electronic and Optical Products | 1.6 | -15.3 | 21.4 | -1.7 | 20.9 | 105 | # | 47.6 | 9.4 | -4.5 | -4.6 | -2.2 | 0.1 | 8.5 |
| Electrical Equipment | 3.0 | -0.3 | 9.6 | -2.9 | 3.4 | 54.2 | # | 94.9 | 36.5 | 43.3 | 36.3 | 13.9 | -4.2 | -6.6 |
| Machinery And Equipment N.E.C. | 4.8 | -2.7 | 9.6 | -7.2 | -1.6 | 50.2 | # | 71.1 | 20.1 | 27.5 | 17.6 | 3.4 | -6.8 | -13.9 |
| Motor Vehicles, Trailers and Semi-Trailers | 4.9 | 0 | 6.8 | -0.6 | 5.6 | 79 | # | 186 | 63.5 | 37.7 | 10 | -9.1 | -11.7 | -9.2 |
| Other Transport Equipment | 1.8 | -0.1 | -8 | 6 | 2.7 | 34.8 | # | 128.9 | 43 | 18.3 | -6.3 | -17.1 | -15.7 | -22.4 |
| Furniture | 0.1 | -26.8 | -10.1 | -19.3 | -19.4 | 1.4 | # | 95.9 | 9.1 | 2.5 | -8.5 | 2.6 | 9.4 | 23.1 |
| Other manufacturing | 0.9 | 0.2 | -3.2 | -3.3 | 4.1 | 50.8 | # | 135 | 46.4 | 69.4 | 69.6 | 57.9 | 38 | 4.7 |

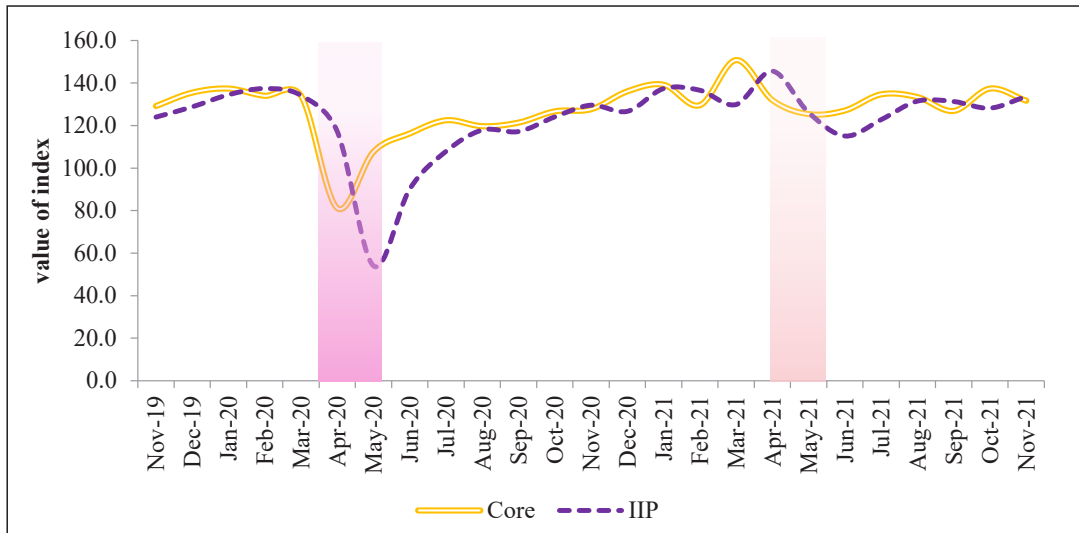
Red- Negative growth, Yellow- Growth rate positive but less than 5 per cent, Green- Positive and more than 5 per cent
Source: Survey calculations based on DPIIT data

In view of the circumstances mentioned in the Press Release for IIP dated 11th June 2021, the indices for April 2021 are not comparable with those of April 2020

Eight Core Index (ICI)

8.6 The monthly Index of Eight Core Industries (ICI) measures collective and individual performance of production in selected eight core industries like Coal, Crude Oil, Natural Gas, Refinery Products, Fertilizers, Steel, Cement and Electricity. This is an index of the eight most fundamental industrial sectors of the Indian economy and comprises 40.27 percent of the weight in IIP.

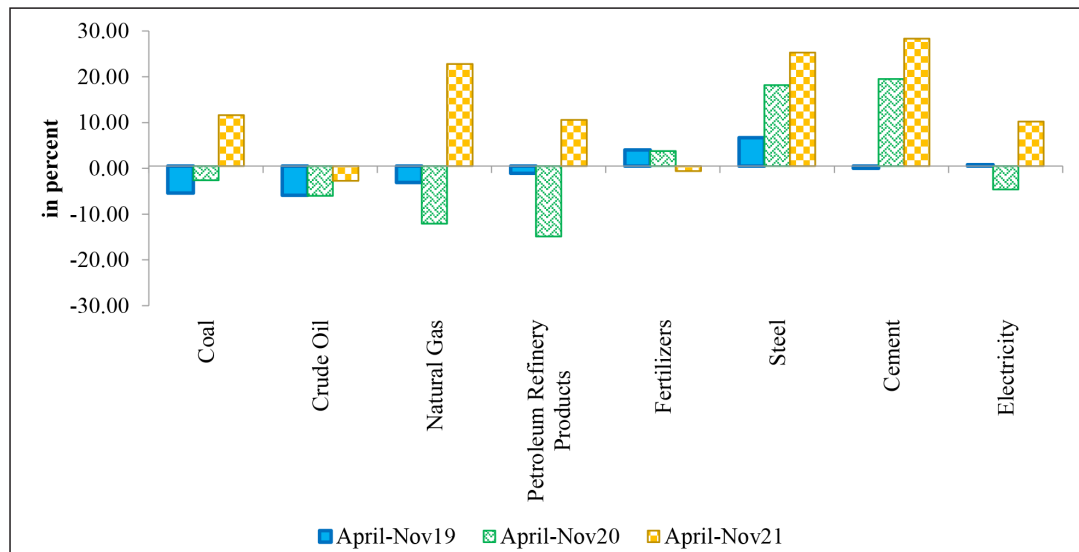
Figure 6: Index of Eight core industries and IIP



Source: Survey calculation based on data from MOSPI and DPIIT

8.7 The growth rate of the ICI index during the period of April-November 2021-22 was 13.7 percent as compared to (-)11.1 percent in the corresponding period of last financial year. This acceleration in ICI is mainly driven by improved performance in the steel, cement, natural gas, coal and electricity. Fertilizers and crude oil registered a negative growth of 0.6 percent and 2.7 percent respectively.

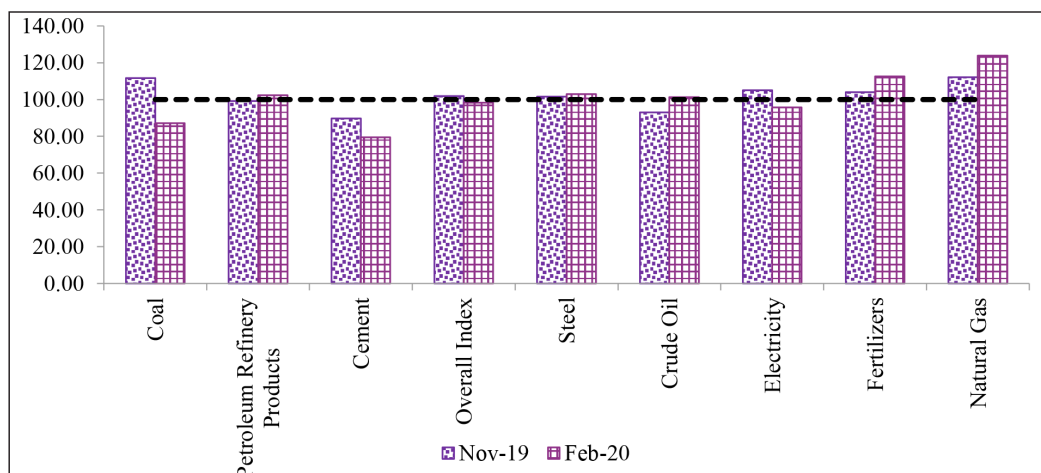
Figure 7: Index of Eight core industries and IIP



Source: Survey calculation based on data from DPIIT

8.8 The Index of eight core industries has shown a pickup in growth in almost all its components barring crude oil and fertilizers in 2021-22 (April-November) as compared to 2019-20 (April-November) (Figure 7). Figure 8 shows the recovery of core industries in November 2021 as a percentage of the values in February 2020 and November 2019. The steel, crude oil, fertilizers, electricity and natural gas have recovered as compared to February 2020 level. In addition, the value of index for steel, fertilizers, electricity, natural gas and coal is also higher than the pre lockdown level (November 2019).

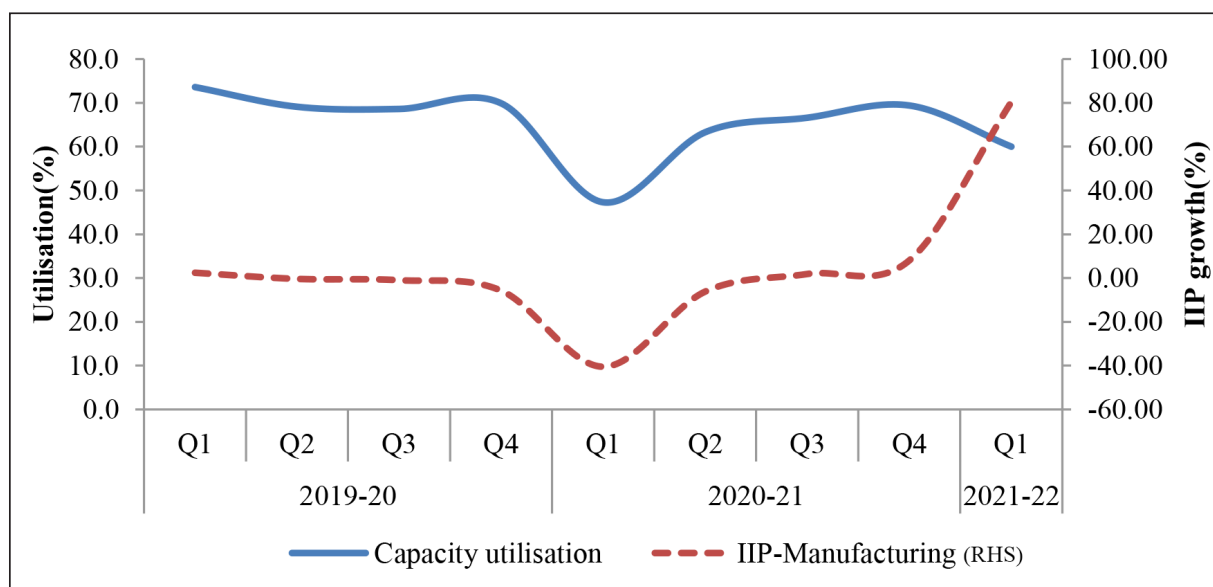
Figure 8: Eight Core Index in Oct-21 as percent of February-20 and November-19



Survey calculation based on data from DPIIT

8.9 Capacity utilization (CU) is an important economic indicator to assess demand and investment prospects of the economy. CU rates are largely able to track the pace of manufacturing activities in the economy. The growth rate of the IIP-manufacturing index and capacity utilization (Figure 9) provides a snapshot of the demand conditions for India’s manufacturing sector. It is clear that the extent of CU had decreased substantially during the first quarter of 2020-21 due to the COVID-19 pandemic as severe restrictions were imposed in the country. It was, however, less severe during the second wave of COVID-19 (Q1:2021-22) mainly because the lockdown was not imposed as a country wide measure, allowing states the flexibility to decide. At the aggregate level, CU for the manufacturing sector declined to 40 percent in Q1:FY21 and then rose to 69.4 in Q4:FY21, however it fell to 60.0 in Q1:FY22.

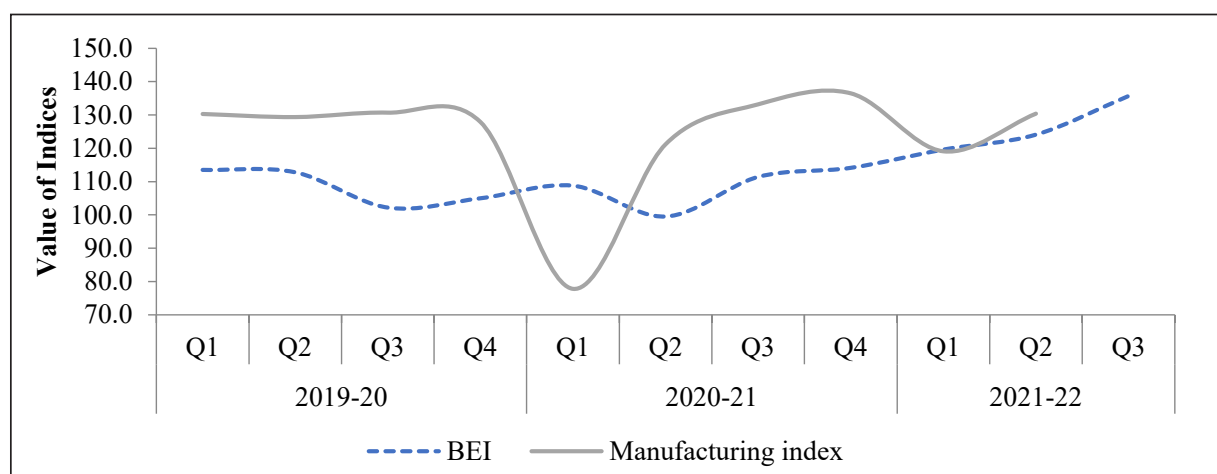
Figure 9: Capacity Utilization and IIP (manufacturing)



Source: Survey calculations based on data from MOSPI and RBI

8.10 Another indication of optimism about the economic performance is the RBI's Business Expectation Index (BEI). This index gives a glimpse of the demand conditions in the manufacturing sector by combining parameters which include overall business situation, production, order books, inventory of raw material and finished goods, profit margin, employment, exports and capacity utilization. BEI remained stable with only a slight downturn in the second quarter of 2020-21 owing to the onset of the pandemic in the first quarter of that year (figure 10). Since then, it has been on an upswing. It increased to 124.1 in the Q2:FY22 and to 135.7 in the Q3: FY22 as compared to 119.6 in the first quarter of the same year. The uptick in the data suggests that the manufacturers perceive further improvement in overall business situation in Q3:FY22; and exhibit optimism for Q4:FY22. Capacity utilization and employment conditions are expected to improve.

Figure 10: Manufacturing Index and Business Expectation Index

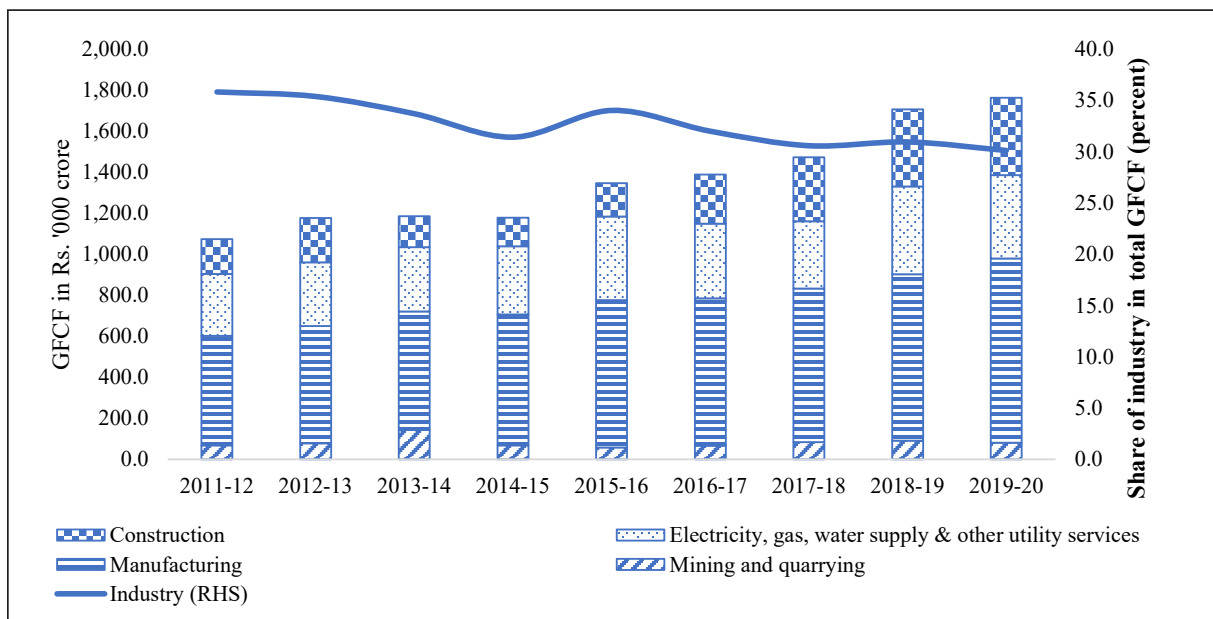


Source: Survey calculations based on data from MOSPI and RBI

GROSS FIXED CAPITAL FORMATION

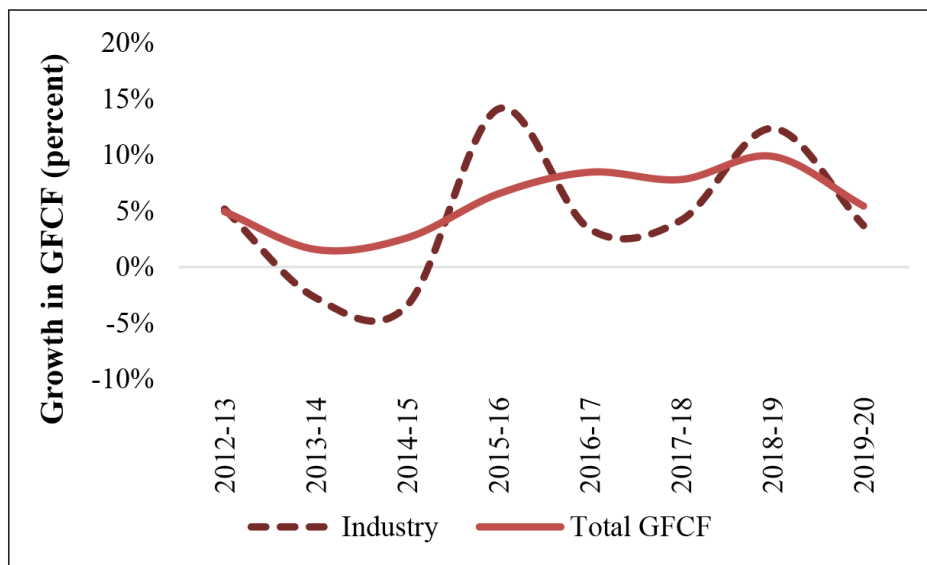
8.11 Gross fixed capital formation (GFCF) is the gross addition to fixed assets like machinery and equipment, intangible assets and indicates the state of investments in the economy. During 2019-20, the share of industrial sector in total GFCF in the economy (at current prices) was recorded at 30.1 per cent, which is slightly lower than 31 per cent in the previous financial year (Figure 11). Within the industrial sector, the share of manufacturing in GFCF was 51 per cent, followed by electricity at 23 per cent, construction at 21 per cent, and mining with 5 per cent. While aggregate GFCF (at constant prices) grew by 9.9 per cent and industrial GFCF grew by 12.4 per cent in 2018-19, it grew by 5.4 per cent and 3.7 per cent respectively in 2019-20 (Figure 12). During 2019-20, GFCF in the mining and electricity sectors registered a negative growth of 12.9 per cent and 6 per cent respectively, but the GFCF grew by 10.2 and 4.4 per cent in the manufacturing and construction sector respectively on y-o-y basis.

Figure 11: GFCF in Industrial sectors



Source: Survey calculations based on MoSPI data, based on GFCF at constant prices.

Figure 12: Total and Industrial GFCF - Growth in percent



Source: Survey calculations based on MoSPI data, based on GFCF at constant prices.

Credit in Industry

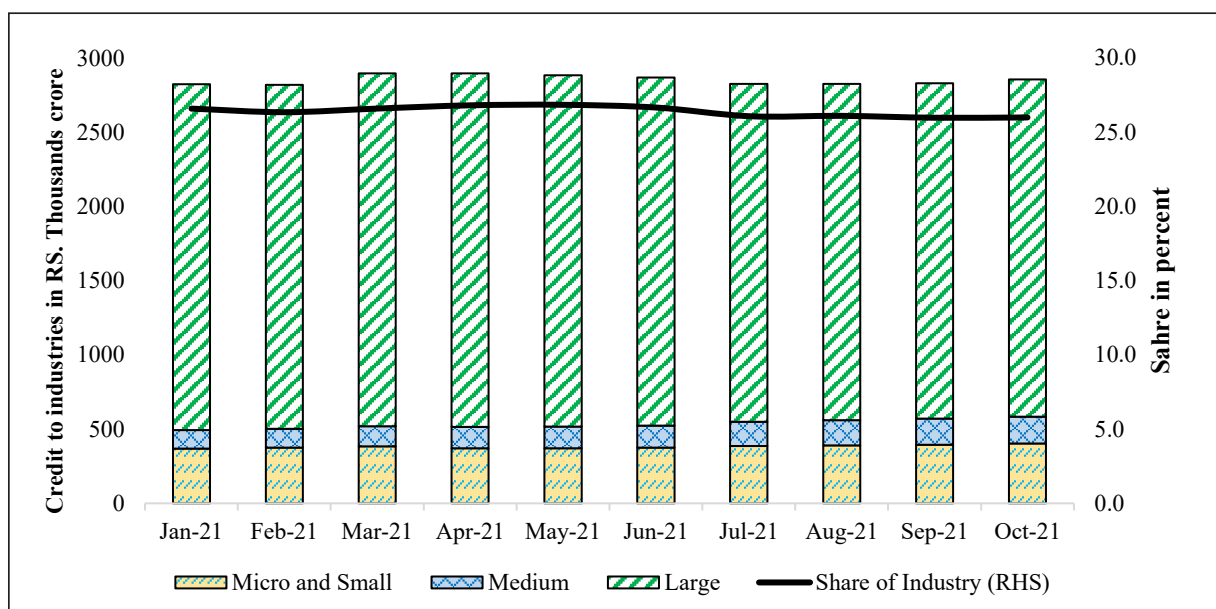
8.12 Gross bank credit to the industrial sector, recorded a growth of 4.1 percent in October 2021 (Y-o-Y basis) compared to a negative growth of 0.7 percent in October 2020. The share of industry in non-food credit stood at 26 percent in October 2021. Certain industries such as mining, textiles, petroleum, coal products and nuclear fuels, rubber, plastic and infrastructure have shown consistent improvement in credit growth.

Table 4: Industry wise Deployment of Gross Bank credit - Variation in prenent (Year-on-Year)

| Industry | Oct-20 | Mar-21 | Oct-21 |
|---|-------------|------------|------------|
| Mining and Quarrying (incl. Coal) | 4.2 | 4.9 | 16.5 |
| Food Processing | 5.1 | 7.8 | 6.5 |
| Beverage and Tobacco | 2.5 | -3.6 | 0.5 |
| Textiles | -0.2 | 4.7 | 7.0 |
| Leather and Leather Products | 6.3 | 1.8 | -3.3 |
| Wood and Wood Products | 7.0 | 8.6 | 6.1 |
| Paper and Paper Products | 10.2 | 14.7 | 9.9 |
| Petroleum, Coal Products and Nuclear Fuels | 14.9 | -8.1 | 13.1 |
| Chemicals and Chemical Products | -2.3 | -6.5 | 7.1 |
| Rubber, Plastic and their Products | 5.4 | 6.2 | 23.8 |
| Glass and Glassware | 1.4 | -5.1 | -15.8 |
| Cement and Cement Products | -4.6 | -10.1 | -21.5 |
| Basic Metal and Metal Product | -4.7 | -6.1 | -16.3 |
| All Engineering | -16.8 | -6.3 | 6.6 |
| Vehicles, Vehicle Parts and Transport Equipment | 7.1 | 1.3 | -6.1 |
| Gems and Jewellery | -3.4 | -1.6 | 9.2 |
| Construction | 4.1 | -8.2 | -6.0 |
| Infrastructure | 0.1 | 3.7 | 8.9 |
| Other Industries | 0.6 | 4.5 | 10.9 |
| Industries | -0.7 | 0.5 | 4.1 |

Source: Survey calculations based on RBI data.

Figure 13: Credit to Industry and its share in Total Non-food credit (percent)



Source: Survey calculations based on RBI data.

FDI in Industries

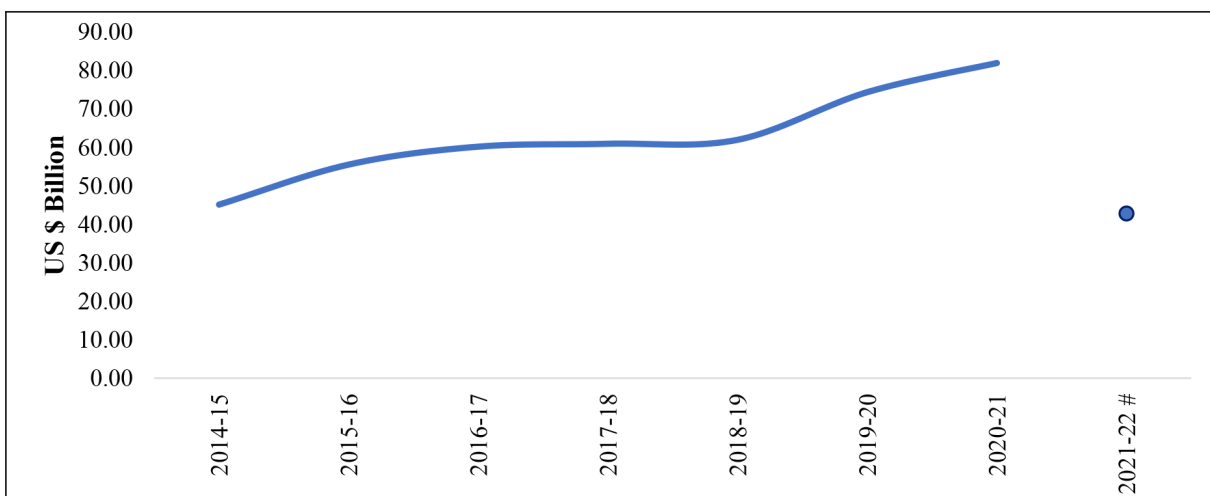
8.13 Measures taken by the Government to put in place an enabling investor friendly FDI Policy has resulted in increased FDI inflows setting up new records. FDI inflows in India stood at US \$

45.14 billion in 2014-15 and have continuously increased since then. India registered its highest ever annual FDI inflow of US\$ 81.97 billion (provisional) in the 2020-21 reflecting a growth of 10 percent as compared to the previous year. The increase has been on the back of growth of 20 per cent in 2019-20. In the year 2021-22, FDI inflow grew by 4 per cent in the first six months to reach US\$ 42.86 billion as compared to US\$ 41.37 billion for the same period of last year.

8.14 Over the last seven financial years (2014-21), India received FDI inflow worth US\$ 440.27 billion which is nearly 58 percent of the FDI received by the country in the last 21 years (US\$ 763.83 billion).

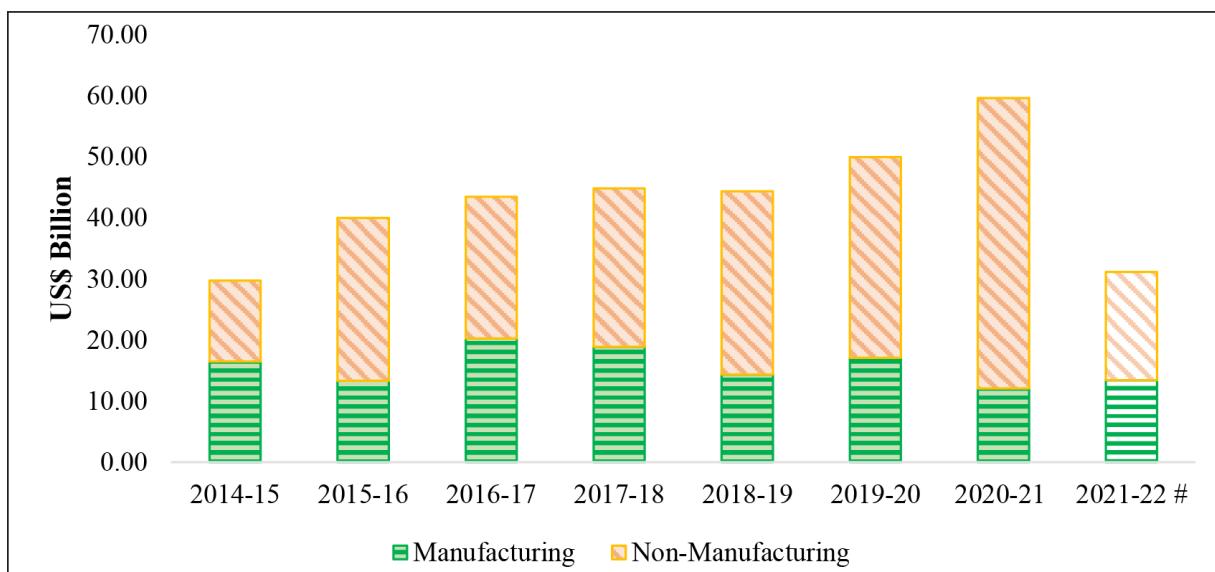
8.15 Several initiatives (Box 1) have been taken by the Government since April 2020 to further reform the FDI policy framework to ensure against opportunistic takeovers and acquisitions while also facilitating an increased flow of long-term capital, global technology, processes and international best practices to support the growth of these sectors.

Figure 14: Total FDI Inflows



Source: Survey calculation based on data from DPIIT. #April to Sept 2021

Figure 15: FDI Equity Inflows in Manufacturing & Non-Manufacturing Sector



Source: Survey calculation based on data from DPIIT. # April to Sept 2021

Box 1: FDI Policy reforms and Other Measures during the Covid-19 Pandemic period

The changes in the FDI policy can be broadly categorized into measures taken to improve foreign participation while protecting Indian industry from opportunistic takeovers, to enhance transparency and rationalization of processes and steps to monitor and expedite implementation.

a. Measures taken to allow greater foreign participation

- (i) **Defence Sector:** The FDI policy amendments, notified vide Press Note 4 (2020 series) dated 17.09.2020, have been carried out to realize the vision of an AtmaNirbhar Bharat. Now, FDI in defence sector is allowed up to 74 per cent through automatic route (from earlier 49percent) for companies seeking new industrial licenses. FDI beyond 74 percent and up to 100 per cent will be permitted under Government route. For existing FDI approved holders/defence licensees, infusion of fresh foreign investment up to 49percent resulting in change in equity/ shareholding pattern can be done by making declaration within 30 days.
- (ii) **Insurance Sector:** Government issued Press Note 2(2021) dated 14.06.2021 to raise the permissible FDI limit from 49percent to 74percent in Insurance Companies under the automatic route and allow foreign ownership and control with safeguards.
- (ii) **Petroleum & Natural Gas sector:** Press Note 3 (2021) dated 29.07.2021 has been issued to permit foreign investment up to 100percent under the automatic route in cases where the Government has accorded an 'in-principle' approval for strategic disinvestment of a Public Sector Undertaking (PSU) engaged in the Petroleum and Natural Gas Sector.
- (iv) **Telecom sector:** Press Note 4 (2021) dated 06.10.2021 has been issued to permit foreign investment up to 100percent under automatic route in Telecom services sector.

b. Curbing opportunistic acquisitions/takeovers: vide Press Note 3 (2020) dated 17.04.2020, Government amended the FDI policy according to which an entity of a country, which shares land border with India or where the beneficial owner of an investment into India is situated in or is a citizen of any such country, can invest only under the Government route. Further, in the event of the transfer of ownership of any existing or future FDI in an entity in India, directly or indirectly, resulting in the beneficial ownership falling within the restriction/purview of the said policy amendment, such subsequent change in beneficial ownership will also require Government approval.

c. Measures to improve transparency and to rationalize processes include amendment of the Standard Operating Procedure (SOP) to improve ease of processing FDI proposals.

d. 'FDI Monitoring Cell' has been formed which follows up with applicant/ investor, to expedite FDI proposals with a view identify and hurdles if any. An Inter-Ministerial Committee (IMC) has been constituted under the Chairpersonship of Secretary, Department for Promotion of Industries and Internal Trade to take appropriate decision on delayed proposals and those escalated by Administrative Ministries/ Departments.

Performance of Central Public Sector Enterprises

8.16 CPSEs are an important constituent of the Indian industry. As on 31.03.2020, 256 CPSEs were operational. The overall net profit of operating CPSEs during 2019-20 stood at

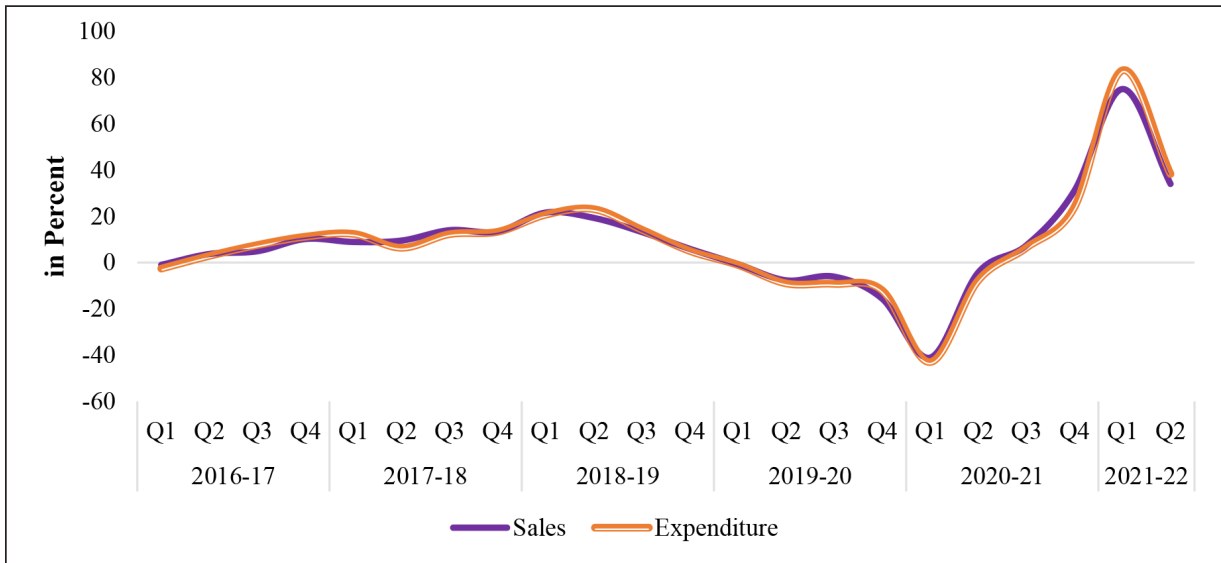
Rs. 93,295 crore Contribution of all CPSEs to central exchequer by way of excise duty, GST, corporate tax, dividend, etc. stood at Rs. 3,76,425 crore. The CPSEs across sectors employed 14,73,810 persons, of which 9,21,876 were regular employees. There were 58 listed CPSEs as on 31.03.2020 with market capitalization of Rs. 8.2 lakh crore. In 2021-22 till 31st Oct, 2021, 2021-22 CPSEs incurred capital expenditure of Rs. 1,06,749 crores against the annual target of Rs. 2,69,742 crore. During 2020-21, a total expenditure of Rs. 2,04,243 crore was incurred as CAPEX against a projected expenditure of Rs 2,20,249 cr.

8.17 In accordance with Union Budget 2021-22 announcement, the government has approved a policy of strategic disinvestment of public sector enterprises that will provide a clear roadmap for disinvestment in all non-strategic and strategic sectors. The guideline for implementation of new public sector enterprise policy for CPSEs have been notified on 13th December, 2021. This will help the government to make use of disinvestment proceeds to finance various social sector and developmental programmes while disinvestment shall infuse private capital, technology and best management practices in the disinvested CPSEs. The Government notified the new Public Sector Enterprise (PSE) Policy on 4 February 2021. The new PSE Policy envisages classification of CPSEs into Strategic and Non-Strategic Sectors and exempts certain CPSEs such as those setup as not-for-profit companies under the Companies Act, 2013 or those supporting vulnerable and weaker sections of society, from the scope of the Policy. The strategic sectors as per the policy are as under: atomic energy; space and defense; transport and telecommunication; power; petroleum; coal and other minerals; banking, insurance, and financial services. Under the 4 broad baskets in which the strategic sectors are classified-i.e., national security, critical infrastructure, energy and minerals and financial services- only a bare minimum presence of CPSEs in the aforesaid strategic sectors is to be maintained. The non-strategic CPSEs will be privatized or otherwise shall be closed. Thus, the policy on public sector enterprises provides a clear path for disinvestment in all non-strategic and strategic sectors and strengthens the idea of Minimum Government - Maximum Governance

Corporate performance

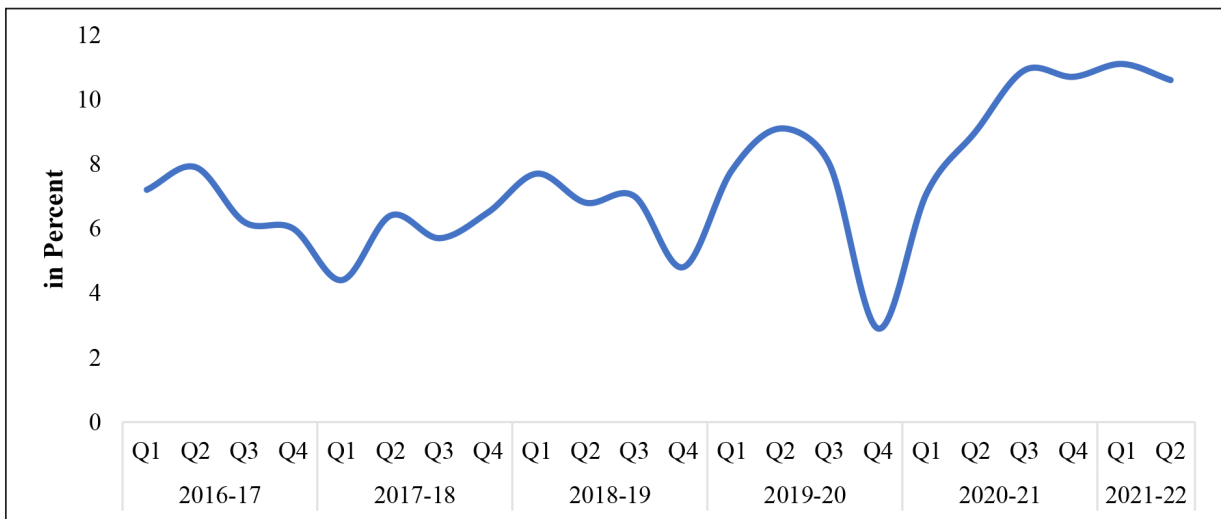
8.18 With economic recovery, concomitant improvement in demand and improved business sentiments have had a positive effect on the performance of corporate sector. Further, in response to favourable base effect, sales of 1,687 listed manufacturing companies recorded steady and broad-based growth of 34.0 percent in Q2:FY22 as compared to (-)4.3 percent growth in Q2:FY21, on an annual (y-o-y) basis. Expenditure in these companies also increased by 38.3 percent in Q2:FY22 as compared to a decrease of 7.7 percent in Q2:FY21. The net profit to sales ratio of these companies was increasing despite the pandemic shock to reach a level of 10.6 percent in Q2:F22 reflecting better profit prospects for these companies in the current financial year. The improvement in profitability of large corporates on the whole indicates that the companies withstood the pandemic shock well and many have rebounded.

Figure 16: Listed Manufacturing Companies in the Private Corporate Sector - Growth (Y-o-Y)



Source: Survey Calculations based on data from RBI

Figure 17: Net Profit to Sales ratio of Listed Manufacturing Private Companies

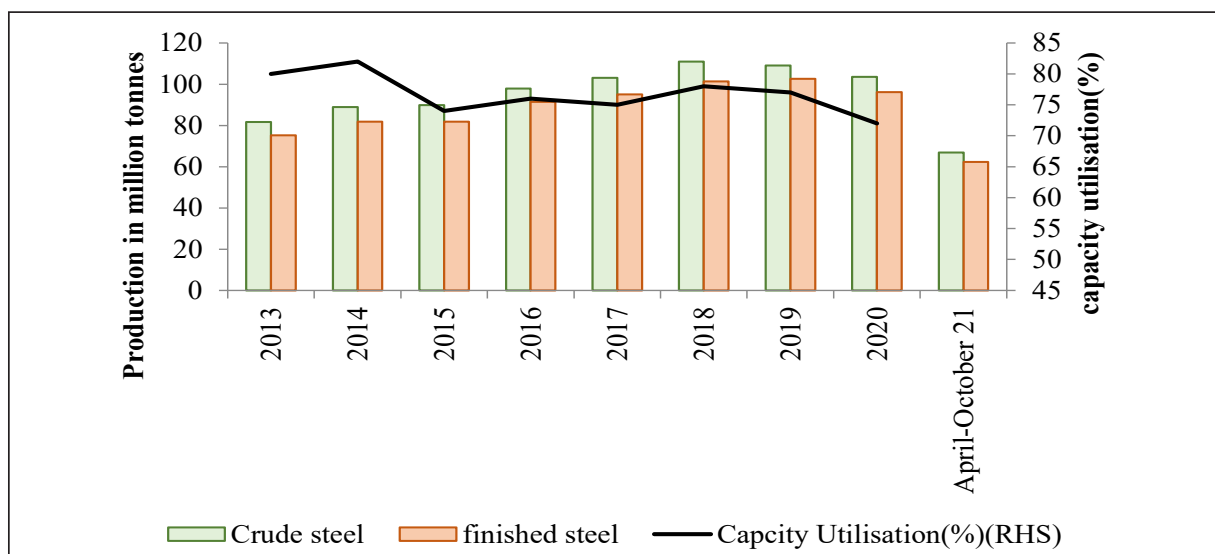


Source: Survey Calculations based on data from RBI

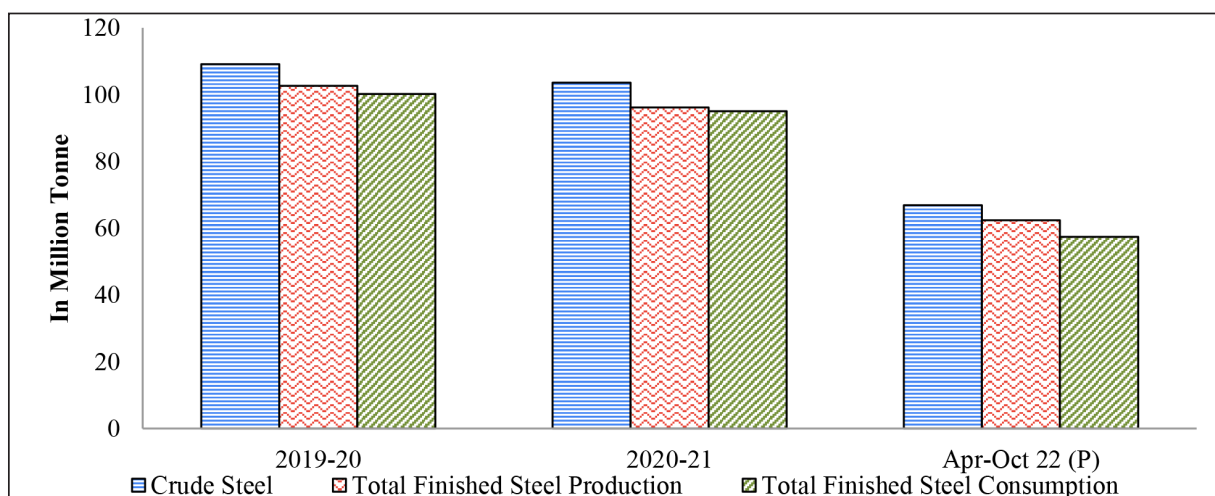
SECTOR WISE PERFORMANCE AND ISSUES IN INDUSTRY

Steel

8.19 The performance of the steel industry is pivotal for the growth of the economy. Despite being hit by COVID-19, the steel industry has bounced back with cumulative production of crude and finished steel in 2021-22(April-October) at 66.91 MT and 62.37 MT, an increase of 25.0percent and 28.9percent respectively (Figure 18), over corresponding period last year while consumption of finished steel at 57.39 MT increased by 25.0percent over the same period (Figure 19).

Figure 18: Production and capacity utilization

Source: Survey calculations based on data from Ministry of Steel *indicates provisional figure

Figure 19: Production and Consumption - Steel

Source: Survey calculations based on data from M/o Steel. P-provisional

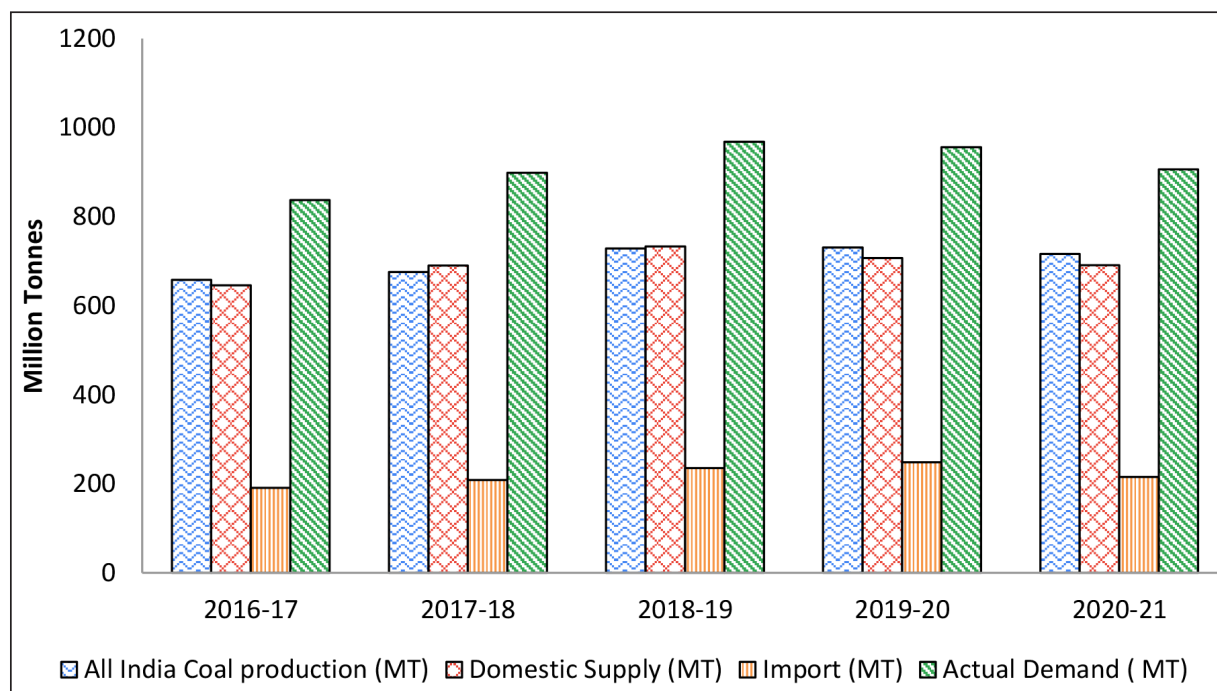
8.20 It is important to point out that global steel production has slowed down. The reduction in world output of steel is because of reduced global production. According to press release by World Steel Association (November, 2021) world crude steel production was 143.3 million tonnes (Mt) in November 2021, a 9.9 percent decrease compared to November 2020. With economic recovery, the global demand for steel is slated to increase this year and the next. The steel industry is expected to face increase in demand in the next financial year also. This is mainly on account of the Government of India's focus on infrastructure development including roads, railways and defence production. The PLI Scheme for specialty steel is well timed to provide the necessary incentive towards investment in value added steel -a step in the direction to increase its production for internal consumption as well as exports. Additional measures such as Domestically Manufactured Iron and Steel Products (DMI&SP) Policy, Quality Control Order (QCO) covering carbon steel, alloy steel, tin plate, tin free steel and stainless steel and a R&D scheme viz. "Promotion of R&D in Iron & Steel Sector" to address the technological

issues faced by the sector also aim to strengthen the industry and to ensure that increase in production of steel is achieved in a sustainable manner.

Coal

8.21 Coal is the most important and abundant fossil fuel in India and accounts for 55percent of the country's energy need. Coal production increased by 12.24 percent in April-October 2021 as compared to (-) 3.91 percent in April-October 2020. Overall production of raw coal in India during the year 2020-21 was 716.08 million tonnes (provisional) as compared to 730.87 million tonnes achieved in the previous year 2019-20 (figure 20).

Figure 20: Coal - Production, Demand and imports of Coal



Source: Survey calculations based on data from M/o Coal

8.22 Despite the push for renewables, as per the Draft National Energy Policy of Niti Aayog, the demand for coal is expected to remain in the range of 1.3-1.5 Billion Tonnes by 2030. Nonetheless, several initiatives are being taken by the coal lignite producing PSUs to reduce their carbon footprints. By 2020-21, the PSUs had brought 56000 Ha land under green cover creating a carbon sink of about 5.0 Lakh Ton of CO₂ equivalent/Year. It is envisaged to bring about 30000 Ha of addition land (in and around coal mining areas) under green cover by plantation of around 75 million trees by 2030. Further, as on 31.03.2021, the PSUs have installed renewable capacity of 1496 Megawatts and during the next 5 years it is planned to install additional 5560 Megawatts of renewable capacity with substantial carbon offset potential.

8.23 Opening up of coal mining for private sector is the most ambitious coal sector reform. This will bring efficiency & competition in coal production, attract investments & best-in-class technology, and help create more jobs in the coal sector. So far, 28 coal mines have been successfully auctioned. Out of these, 27 coal mines have been auctioned to private companies. Auction process for 88 coal mines is underway.

Micro Small Medium Enterprise

8.24 Micro, Small & Medium Enterprises (MSMEs) contribute significantly to the economic and social development of the country by fostering entrepreneurship and by generating employment opportunities. The relative importance of MSMEs can be gauged from the fact that the share of MSME GVA in total GVA (current prices) for 2019-20 was 33.08 per cent.

8.25 The Government has taken several initiatives to nurture and promote the MSMEs. The revision in the definition of MSMEs brought in w.e.f. 1st July, 2020 as part of the AtmaNirbhar Bharat package introduced a composite-criteria of investment and annual turnover- and identical limits for manufacturing and services sector (Table 5). The modified definition of MSMEs will facilitate expansion and growth of these enterprises. The resulting economies of scale can enhance productivity without the MSMEs losing out on several government incentives including market support, export promotion, preferential procurement in the public sector and incentives through the Micro Small Enterprises- Cluster Development Programme (MSE-CDP), Prime Minister Employment Generation Programme (PMEGP) and Scheme of Fund for Regeneration of Traditional Industries (SFURTI) and enabling of IT ecosystems. This enabling environment will promote competition and avoid dwarfism among MSMEs. The recent measures taken by the Government to improve the ease of doing business for the MSMEs include the launch of the new Udyam Registration Portal in July 2020. The registration process under this is fully online, digital, paperless and is based on self-declaration. No documents or proof are required to be uploaded for registering as a micro, small and medium enterprise. Aadhaar and PAN are required for registration and details on investment and turnover of enterprises are taken automatically from relevant Government databases. New registration process has boosted the ease of doing business for MSMEs by reducing transaction time and costs. As on 17.01.2022, 66,34,006 enterprises have registered on the Udyam portal, out of which 62,79,858 are micro; 3,19,793 are small; and 34,355 are medium enterprises. Further, among the new measures, the retail and wholesale trades were included as MSMEs and they are allowed to be registered on Udyam Registration Portal. However, the benefits to retail and wholesale trade MSMEs are to be restricted to Priority Sector Lending only. In this regard, now, street vendors can also register as retail traders on Udyam Registration (UR) portal and avail the benefit of priority sector lending.

Table 5: Definition of MSMEs - Old and New

| | Old Definition | | New Definition | |
|-------|--|--|---|----------|
| | Manufacturing | Services | Manufacturing | Services |
| Micro | Investment in Plant and Machinery: Does not exceed Rs. 25 Lakh. | Investment in Equipment: Does not exceed Rs. 10 Lakh. | Investment in Plant and Machinery or Equipment and turnover: The investment in plant and machinery or equipment does not exceed Rs. 1 Crore and turnover does not exceed Rs. 5 crores. | |
| Small | Investment in Plant and Machinery: More than Rs. 25 lakh but does not exceed Rs. 5 crore | Investment in Equipment: More than Rs. 10 Lakh but does not exceed Rs. 2 crore | Investment in Plant and Machinery or Equipment and turnover :The investment in plant and machinery or equipment does not exceed Rs. 10 crore and turnover does not exceed Rs. 50 crore. | |

| | | | |
|--------|---|--|--|
| Medium | Investment in Plant and Machinery: More than Rs. 5 crore but does not exceed Rs. 10 crore | Investment in Equipment: More than Rs. 2 crore but does not Rs. 5 crore. | Investment in Plant and Machinery or Equipment and turnover: The investment in plant and machinery or equipment does not exceed Rs. 50 crore and turnover does not exceed Rs. 250 crore. |
|--------|---|--|--|

8.26. The CHAMPIONS portal (www.champion.gov.in) is an ICT based technology system for making the smaller units big by helping and handholding them. A network of control rooms is created in a Hub & Spoke Model where hub is situated in the Ministry of MSME, New Delhi whereas 68 spokes are located across the country in various offices and institutions of Ministry. As on 16.01.2022, 42,304 grievances have been received, out of which 41,965 (99.1%) grievances have been replied.

The key features of the portal include:

- Information dissemination: Regular updates on recent development in MSME sector.
- With a view to resolve the grievances in a fast track manner, all Nationalised Banks, a good number of Private/Regional Rural Banks, State Financial Corporations, Central Government Ministries/ Departments, State Governments and CPSEs have been onboarded on the portal.
- Scheme/Programme wise mapping of officials of the Ministry for fast track responses of grievances.
- Integration with various portals such as MSME Samadhaan, Udyam Registration, CPGRAM etc.

Textiles

8.27 Textile industry is the second largest employment generator in the country, next only to agriculture. In the last decade, close to Rs. 203,000 crores have been invested in this industry with direct and indirect employment of about 105 million people, a major part of which is women. Despite the industry being deeply affected by the lockdown, it has shown a remarkable recovery with positive contribution to growth, as reflected by IIP, of 3.6 percent during April-October 2020.

8.28 Production-Linked Incentive (PLI) Scheme for Man Made Fiber (MMF) segment and technical textiles, notified in September 2021, for enhancing India's manufacturing capabilities and enhancing exports will focus on promotion of 40 MMF apparel and 10 Technical textiles lines and create global champions. It is estimated that over the period of five years, the PLI Scheme for Textiles will lead to fresh investment of more than Rs.19,000 crore, cumulative turnover of over Rs.3 lakh crore will be achieved under this scheme and, will create additional employment opportunities of more than 7.5 lakh jobs in this sector.

8.29 Further in a major support to enhance the competitiveness of the sector, the government notified the setting up of 7 PM MEGA INTEGRATED TEXTILES REGION AND APPAREL PARK (MITRA) in October 2021 with a total outlay of Rs. 4,445 crores. The scheme is expected to further the vision of *AtmaNirbhar Bharat* and to position India strongly on the

global textiles map. PM MITRA inspired from 5F's -*farm to fibre; fibre to factory; factory to fashion; fashion to foreign* -will strengthen the textile sector by developing integrated large scale and modern industrial infrastructure facility for entire value-chain of the textile industry. It is expected to reduce the logistics cost and will help India in attracting investments, and boosting employment generation. Competitiveness Incentive Support (CIS) of ₹300 Crore will also be provided to each PM MITRA Park for early establishment of textiles manufacturing units in PM MITRA Park. Such support is crucial for a new project which has not been able to break even and needs support till it is able to scale up production and be able to establish its viability. PM MITRA Park will be developed, by a Special Purpose Vehicle which will be owned by the State Government and Government of India, in a Public Private Partnership (PPP) Mode.

Electronics Industry

8.30 World over, electronics is recognised as a 'meta-resource'. Electronics industry is the world's largest and fastest growing industry and is increasingly finding applications in all sectors of the economy. With its impact in developing infrastructure, raising productivity, increasing efficiency in delivery of services, and enabling social transformation, it is accepted as a key enabler in the country's economic development.

8.31 Government accords high priority to electronics hardware manufacturing. The government has therefore notified the National Policy on Electronics 2019 (NPE 2019) on 25.02.2019 to position India as a global hub for Electronics System Design and Manufacturing (ESDM) by encouraging and driving capabilities in the country for developing core components, including chipsets. Additionally, NPE 2019 attempts to catalyze the growth of Indian electronics ecosystem through the (i) Production Linked Incentive (PLI) Schemes for Large Scale Electronics Manufacturing, (ii) PLI Scheme for IT Hardware; (iii) Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECs); and (iv) Modified Electronics Manufacturing Clusters 2.0 (EMC 2.0). PLI for Large Scale Electronics Manufacturing has been notified on April 01, 2020 which provides an incentive of 4 to 6 percent on incremental sales (over base year) to eligible companies involved in mobile phone manufacturing and manufacturing of specified electronic components, including Assembly, Testing, Marking and Packaging (ATMP) units (See box 3 for details on PLI scheme). As per June 2021 Quarterly Revenue Recover (QRR) the scheme has resulted in investment of Rs. 2,595 crore and production worth Rs. 67,275 crore of which, 31 percent or Rs. 20,568 crore was exported. PLI scheme for IT Hardware was notified on March 03, 2021 which extends an incentive in the range of 1 to 4 percent on net incremental sales (over base year) of goods manufactured in India and covered under the target segment, to eligible companies, for a period of four years. The target segment under PLI Scheme includes (i) Laptops (ii) Tablets (iii) All-in-One PCs and (iv) Servers. As per Q2:FY21-22QRR, total sales of manufactured goods in target segment stood at Rs. 503 crores with Rs. 16.50 crore investment. Further, the government has through the SPECs scheme and the EMC 2.0 provided an enabling environment in the form of financial incentive for capital expenditure and by creating plug and play facilities with the view of attracting major electronics manufacturers.

8.32 Recently, the government has approved an outlay of Rs. 76,000Crore (>US\$ 10 Bn) for the development of Semiconductors and Display Manufacturing Ecosystem. Government's intervention to boost this industry has come at a time when the global economy is facing an acute shortage of semiconductors due to severe disruptions in supply chains. Several companies from diverse industries have been forced to either shut or curtail production in response to breakdown of supply chains. The PLI and other schemes to boost semiconductors will not only help domestic companies to overcome the challenges posed by COVID 19 but also assist them to become globally competitive especially in chip making. Semiconductors are integral part of modern technology used in automobiles and its components, electronic and medical devices. The comprehensive interventions being introduced by the government will aid in the establishment of an ecosystem that boosts semiconductor production in India.

Box 2: PARAKH - A Unified Laboratory Network

Recognizing that testing and certification are crucial for enhancing the competitiveness of Indian goods and services, a portal called "PARAKH" has been set up in June 2021, wherein all the accredited, certified and recognised laboratories in the country would be mapped on a Geographic Information System (GIS). This united laboratory network has been developed with the support of Ministry of Electronics and Information Technology (MEITY), Bhaskaracharya National Institute of Space Applications and Geo Informatics, Gujarat (BISAG) and the concerned line ministries/ departments of the Government of India. Over 6,580 laboratories have already been mapped on the portal including NABL accredited laboratories. These also include 477 BIS empaneled and recognized laboratories. Laboratories recognized by FSSAI, EIC, APEDA and CSIR have also been mapped on the portal. The portal makes it possible to search labs for a particular product, standard, test method in a state or a city and also find nearby labs. It also enables finding the scope of accreditation and test methods of a laboratory. The portal allows for adding new private laboratories and booking a test through it.

Box 3: Production Linked Incentives Schemes

PLI Schemes launched in March 2020, are a cornerstone of the Government's push for achieving an AtmaNirbhar Bharat. The idea is to provide support to the sectors, regain dominance in global trade and be more prepared for the volatilities and shocks in global supply chains as opposed to the protectionist approach of the pre-1991 era. The objective of the scheme is to boost domestic manufacturing in sunrise and strategic sectors, improve cost competitiveness of domestically manufactured goods, enhance domestic capacity and economies of scale. The scheme is specifically designed to attract investments in sectors of core competency and cutting-edge technology. The selection of sectors has been done based on the sectors' abilities to introduce latest technology, generate direct and indirect employment by reaching global scales while increasing competitiveness to ensure penetration of Indian companies in the global value chains.

This scheme is expected to make domestic manufacturing globally competitive and will create global champions in manufacturing. The Government has already committed Rs.1.97 lakh crores, over 5 years starting from 2021-22 in 13 sectors. Recently, PLI in the 14th sector - drones and drone components has been included with an additional layout of Rs. 120 crores. The initial 13 sectors are Electronic/Technology Products, Medical devices, Drug intermediaries and APIs, Mobile Manufacturing and Specified Electronic Components, Pharmaceuticals drugs, Telecom & Networking Products, Telecommunications, Food Products, White Goods (ACs & LED), High Efficiency Solar PV Modules, Automobiles & Auto Components, Advance Chemistry Cell (ACC) Battery, Textile Products: Man Made Fabrics segment and technical textiles and Specialty Steel.

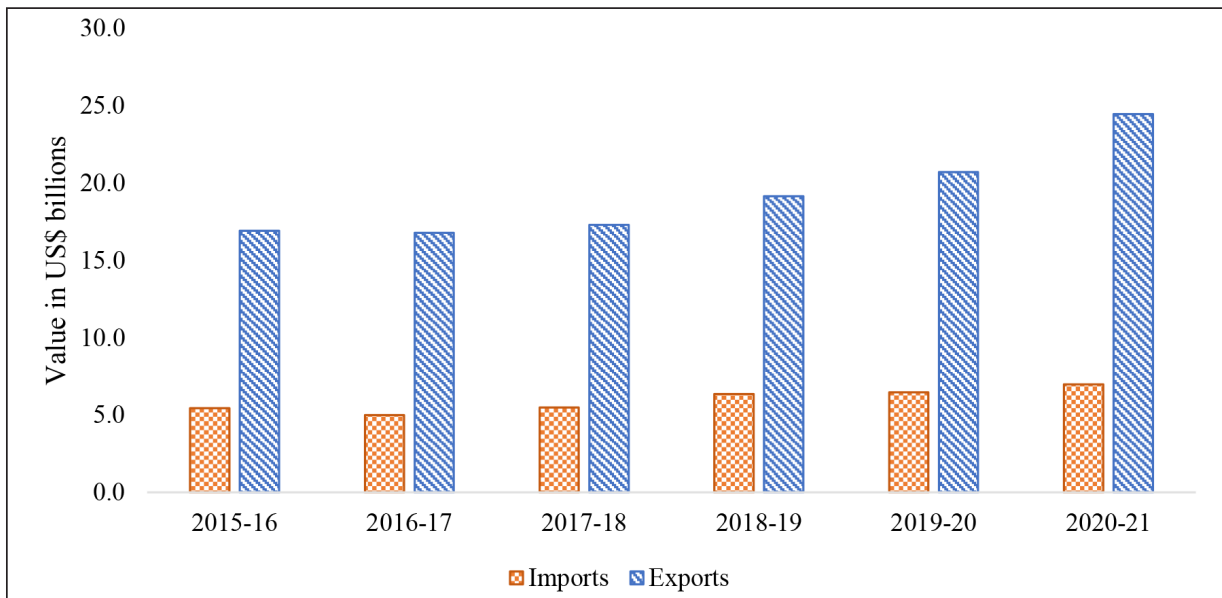
So far, the 13 initial schemes have been notified and guidelines have been issued where required. The first three schemes notified were for mobile phones and specified electronic components, APIs/Drug intermediates and medical devices. In case of mobile phones and specified electronic components, in the first round, 16 applications worth Rs. 36440 crores were approved and in the second round, 18 applications worth Rs. 483 crores were approved by the competent authority. In case of APIs/drug intermediates and medical devices, 42 applications worth Rs. 4347.26 crore and 13 applications with a committed investment of Rs. 798.93 crores have been approved so far by the competent authority, respectively.

Pharmaceuticals

8.33 Indian Pharmaceutical industry ranks third in the world in pharmaceutical production by volume. During 2020-21, total pharma export US\$ 24.4 Bn against the total pharma import of US\$7.0Bn (Figure 21), thereby generating trade surplus of US\$17.5 Bn. India is the largest supplier of generic medicines with a 20percent share in the global supply. Price competitiveness and good quality has enabled Indian medicines producers to be dominant players in the world market, thereby making the country the “*Pharmacy of the world*”. FDI in the pharmaceutical sector has seen a sudden spurt in 2020-21 vis a vis the previous year showing a 200percent increase. In 2021-22 (April-September) the FDI inflows continued to be buoyant at Rs. 4413crore, growing at the rate of 53 percent over the same period in 2020-21. The extraordinary growth of foreign investments in pharma sector is mainly on account of investments to meet COVID-19 related demands for therapeutics and vaccines.

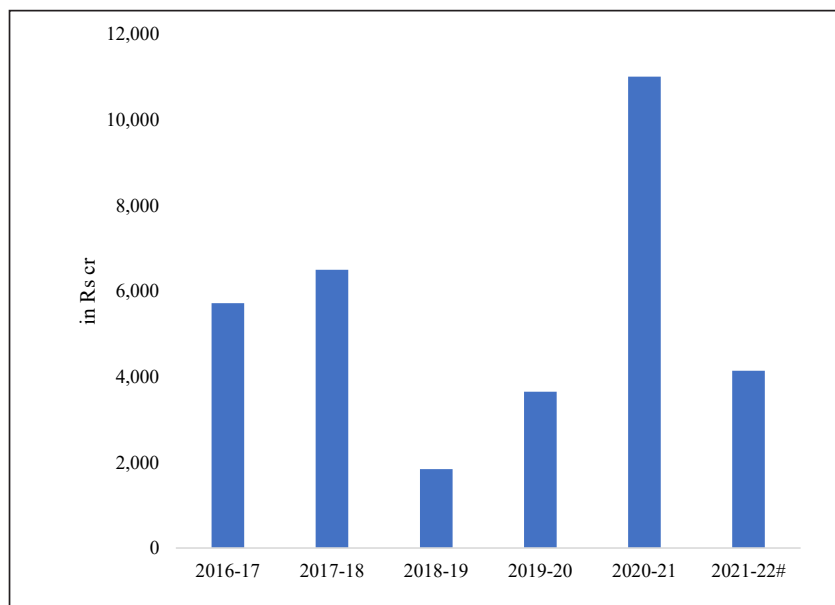
8.34 Although a prominent player in formulations, the country is significantly dependent on the import of bulk drugs that are used in the formulation of medicine. In certain cases, import dependence varies between 80-100 percent. This issue of import dependence for critical bulk drugs was examined by a High-Level Committee and a composite set of actions to incentivize bulk drug production have been initiated.

Figure 21: Trade of Pharmaceutical industry



Source: Survey calculations based on data from D/o Commerce. Data includes trade in Aayush and herbal products; bulk drugs, drug intermediates; drug formulations, biological; surgicals.

Figure 22: FDI Inflows in Pharma sector



Source: Survey calculations based on data from D/o Pharma and DPIIT. # April-September

8.35 The initiatives taken by the government to address the requirement of the pharmaceutical and medical devices industry are as follows:

- The Scheme for Promotion of Bulk Drug Parks that envisages creation of world class infrastructure facilities in order to make Indian bulk drug industry a global leader was approved by the Government of India on 20th March, 2020. Easy access to world class common infrastructure facilities to bulk drug units located in these parks have the potential of increasing the competitiveness of the domestic bulk drug industry.

- Production linked incentive (PLI) scheme for Bulk drugs has been approved for promotion of domestic manufacturing of 53 critical APIs in the country with a budget of INR 6,940 crore for the next eight years.
- Production linked incentive (PLI) scheme for Pharmaceuticals has been approved by the Government of India on 24th March, 2021 with a total financial outlay of Rs. 15,000 crore and three categories (biopharmaceuticals, API/KSM/drug intermediates, and drugs not covered under Category 1 and Category 2) of pharmaceutical goods will be incentivized under the scheme based on their incremental sales for 6 years. Among the three identified product categories under the scheme as noted above, this scheme excludes the 41 bulk drugs covered under the PLI for Bulk drugs.
- Production Linked Incentive (PLI) Scheme for Promoting Domestic Manufacturing of Medical Devices was approved on 20th March, 2020. The total financial outlay of the Scheme is Rs. 3,420 crore. The Scheme is applicable only to the greenfield projects and intends to attract large investments in the medical devices sector. The four target segments of medical devices are cancer care/ radiotherapy medical devices; radiology & imaging medical devices and nuclear imaging devices; anesthetics & cardio-respiratory medical devices; renal care medical devices and all implants including implantable electronic devices.

INFRASTRUCTURE

8.36 Infrastructure is the back bone for any economy. The extent and quality of infrastructure determines the ability of the country to utilize its comparative advantage and enables cost competitiveness. Given the strong backward and forward linkages and the positive externalities that infrastructure generates, it can be a vehicle for social and economic transformation.

National Infrastructure Pipeline (NIP)

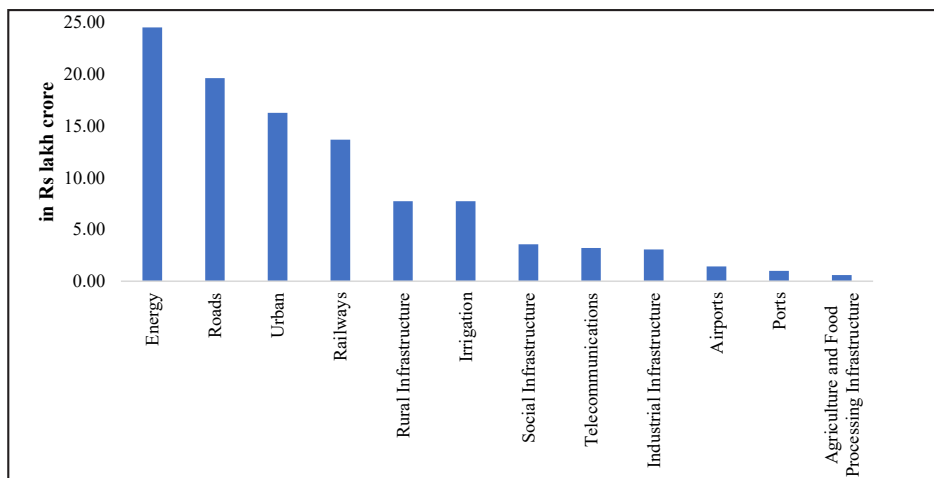
8.37 Public Private Partnership in infrastructure has been an important source of investment in the sector. As per the database of the World Bank on private participation in infrastructure, India is ranked second among developing countries both by the number of PPP Projects as well as the associated investments. Much of the Indian success in PPPs is attributed to development of robust institutional structure, financial support, and use of standardized documents, both process documents like Model Request for Qualification and Model Request for Proposal as well as substantive documents like the Model Concession Agreements across infrastructure sectors.

8.38 The Public Private Partnership Appraisal Committee (PPPAC) which is responsible for the appraisal of PPP projects has cleared 66 projects with a total project cost of Rs. 137218 crores from 2014-15 to 2020-21. The government launched the Viability Gap Funding (VGF) scheme for providing financial assistance to financially unviable but socially/ economically desirable PPP projects. Up to 20percent of the project cost is funded under this scheme as a grant. Based on the above, the total VGF amount disbursed between 2014-15 to 2020-21 by DEA is Rs. 2943 crores. Further, the Government of India has in November 2020 approved continuation of and revamping of the Scheme for Financial Support to Public Private Partnerships (PPPs) in Infrastructure Viability Gap Funding (VGF) Scheme till 2024-25. The revamped VFG scheme

is expected to attract more PPP projects and facilitate private investment in social sectors such as health, education, waste water, solid waste management, water supply etc.

8.39 In order to achieve the GDP of \$5 trillion by 2024-25, India needs to spend about \$1.4 trillion over these years on infrastructure. During FYs 2008-17, India invested about US\$1.1 trillion on infrastructure. However, the challenge is to step up infrastructure investment substantially. Keeping this objective in view, National Infrastructure Pipeline (NIP) was launched with projected infrastructure investment of around Rs. 111 lakh crore (US\$ 1.5 trillions) during FY 2020-2025 to provide world-class infrastructure across the country, and improve the quality of life for all citizens. It also envisages to improve project preparation and attract investment, both domestic and foreign in infrastructure. NIP was launched with 6,835 projects, which has expanded to over 9,000 projects covering 34 infrastructure sub-sectors. During the fiscals 2020 to 2025, sectors such as energy (24percent), roads (19percent), urban (16percent), and railways (13percent) amount to around 70percent of the projected capital expenditure in infrastructure in India. Sector wise break-up of the pipeline for the period 2019-20 to 2024-25 is given in figure 23. NIP has involved all the stakeholders for a coordinated approach to infrastructure creation in India to boost short-term as well as the potential GDP growth.

Figure 23: Industry wise breakup of pipeline



Source: Survey calculations based on data from the Report of the Task Force on National Infrastructure Pipeline for 2019-2025

National Monetisation Pipeline (NMP)

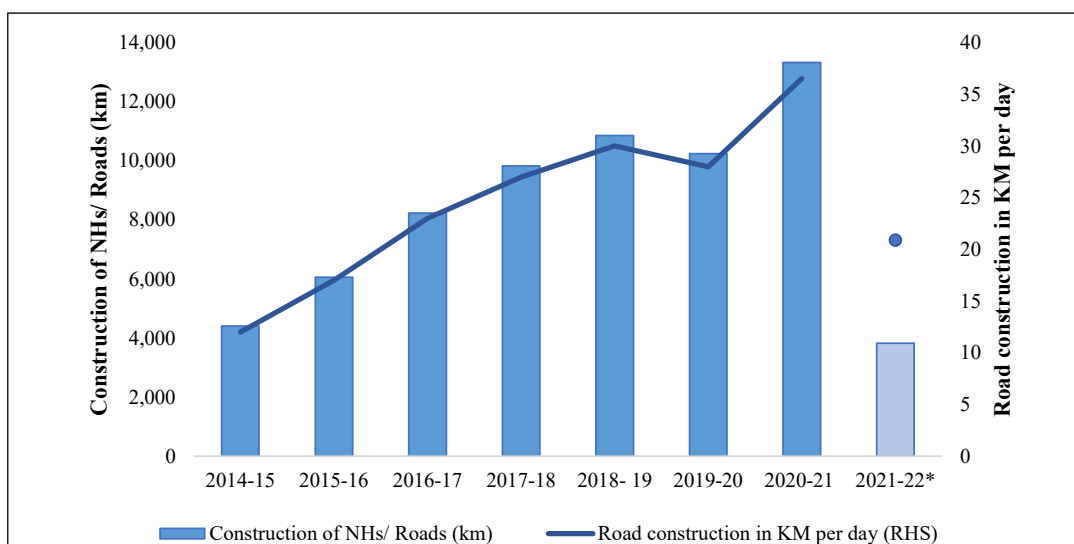
8.40 NITI Aayog has developed the ‘National Monetisation Pipeline (NMP Volumes 1 & 2)’ in consultation with infrastructure line ministries. Asset monetisation, entails a limited period license/ lease of an asset, owned by the government or a public authority, to a private sector entity for an upfront or periodic consideration. The private sector entity is expected to operate and maintain the asset based on the terms of the contract/concession, generating returns through higher operating efficiencies and enhanced user experience. Funds, so received by the public authority, are reinvested in new infrastructure, or deployed for other public purposes. Such contracts include provision for transfer of asset back to the authority at the end of the period.

8.41 A robust asset pipeline has been prepared to provide a comprehensive view to investors and developers of the investment avenues in infrastructure. The pipeline includes selection of de-risked and brownfield assets with stable revenue generation profile (or long rights) which will make for an attractive investment option. Total indicative value of NMP for core assets of the Central Government has been estimated at Rs 6.0 lakh crore over 4-year period (5.4percent of total infrastructure investment envisaged under NIP).

Road Transport

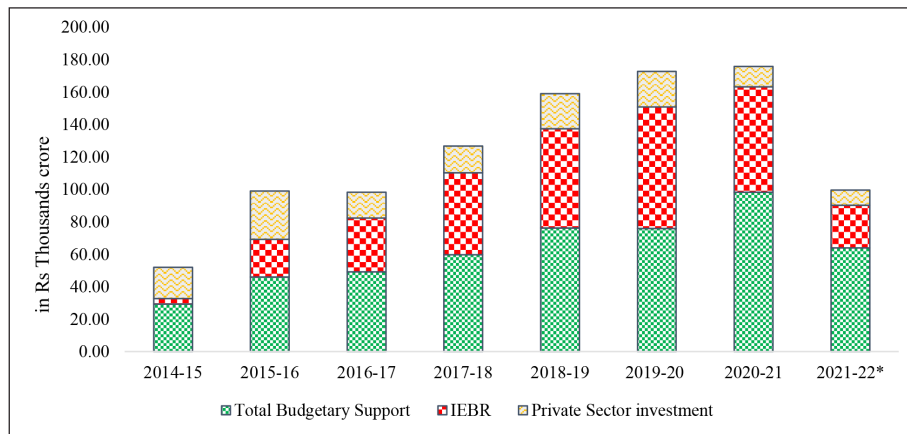
8.42 Road transport is one of the most cost effective and convenient modes of transportation in India both for freight and passengers as it has high penetration level with door-to-door delivery. Importance of road infrastructure is widely recognized as a potent means of socio-economic integration and is vital for the economic development of the country. The road network of the country consists of National Highways (NH), State-Highways (SH), District Roads, Rural Roads, Urban Roads and Project Roads of over 63.71(Provisional) lakh km of roads as on 31 March 2019, which is the second-largest in the world, after the United States with 66.45lakh kms of roads. There has been a consistent increase in the construction of National Highways/roads since 2013-14 with 13,327 kms of roads constructed in 2020-21 as compared to 10,237 kms in 2019-20, indicating an increase of 30.2 per cent over the previous year. In the 2021-22 (till September), 3,824 kms of road network were constructed. The extent of road construction per day increased substantially in 2020-21 to 36.5 kms per day from 28 kms per day in 2019-20, a rise by 30.4 percent as compared to the previous year (Figure 24). The significant upturn in road construction in 2020-21 is due to the increase in public expenditure by 29.5 percent as compared to the previous year- a reflection of the impetus given by the Government of India to a critical sector that generates employment and supports infrastructure during a pandemic year. In addition to action taken to increase the network of national highways, the govt has taken measures to address village level road network through the Gram Sadak Yojana discussed in chapter 9. A comparison of National Highway network in the country in 2011 and 2021 may be seen in chapter 10.

Figure 24: Road Construction



Source: Survey calculations based on data from M/o RTH. For year 2021-22 -As on 30.9.2021

Figure 25: Investments in Roads sector

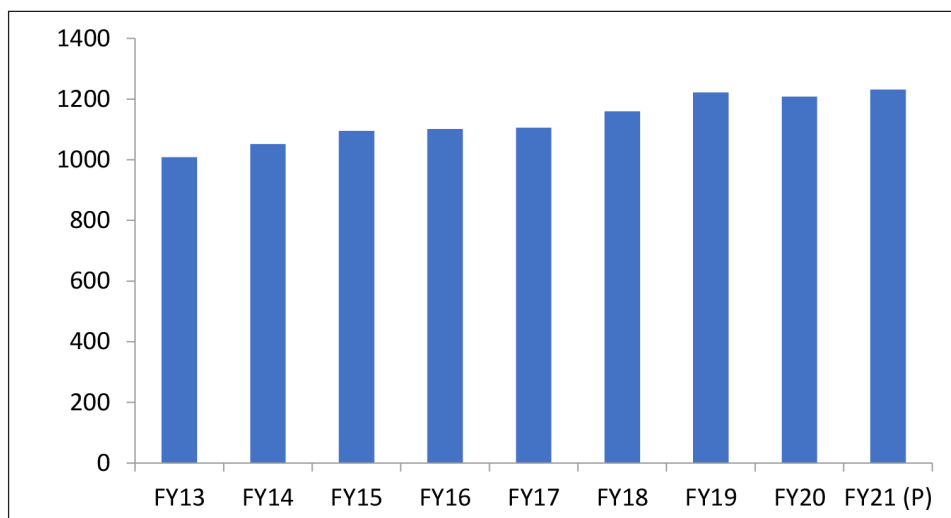


Source: Survey calculations based on data from M/o RTH. For year 2021-22 -As on 30.9.2021

Railways

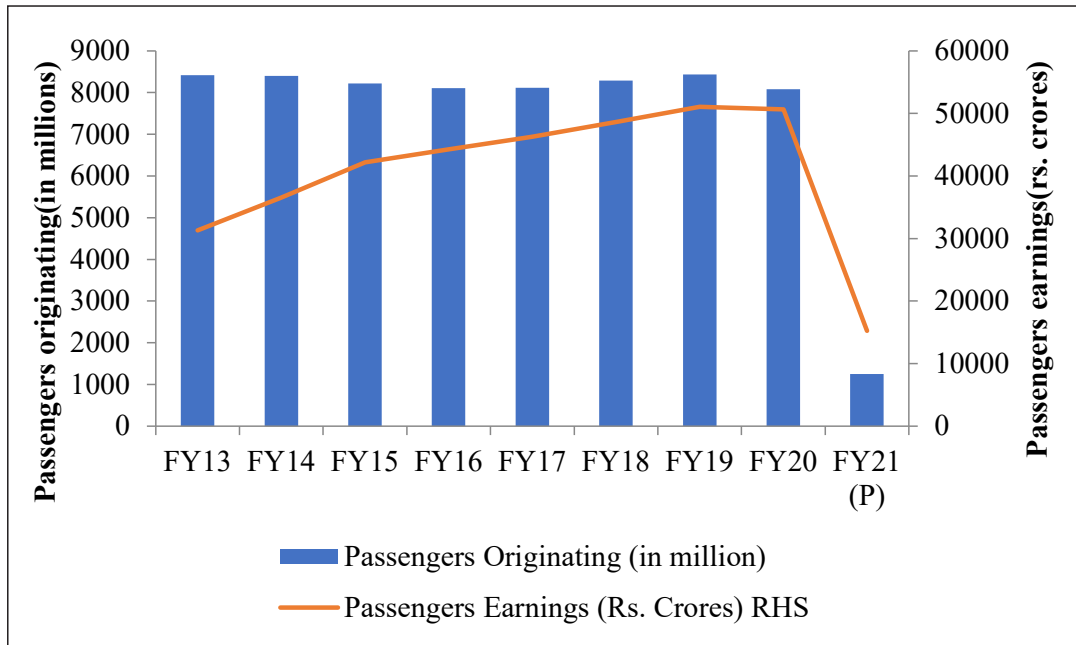
8.43 Despite facing the unprecedented COVID related challenges Indian railways (IR) has not only been able to move millions of people but also able to keep national supply chain running. Being the third largest network in the world under single management and with over 68,102 route kms IR strives to provide safe, efficient, competitive and world class transport system. An average of 1835 track km per year of new track length has been added through new-line and multi-tracking projects during 2014-2021 as compared to the average of 720 track kms per day during 2009-14. IR is also adopting indigenous new technology such as KAVACH, Vande Bharat trains and redevelopment of stations to have safe and better journey experience. During FY21, IR carried 1.23 billion tonnes of freight and 1.25 billion passengers. In addition, despite COVID -19 pandemic revenue earning freight loading (excluding loading by Konkan Railway Corporation Ltd. (KRCL) was 1230.9 million tonnes in 2020-21 as compared to 1208.4 million tonnes during 2019-20(Figure 26). Passengers originating were 1250 million in 2020-21 as compared to 8086 million in 2019-20(Figure 27)

Figure 26: Revenue earning freight loading originating traffic (million tonnes)



Source: Ministry of Railways. Excludes loading by Konkan Railway Corporation Ltd. (KRCL). P-provisional

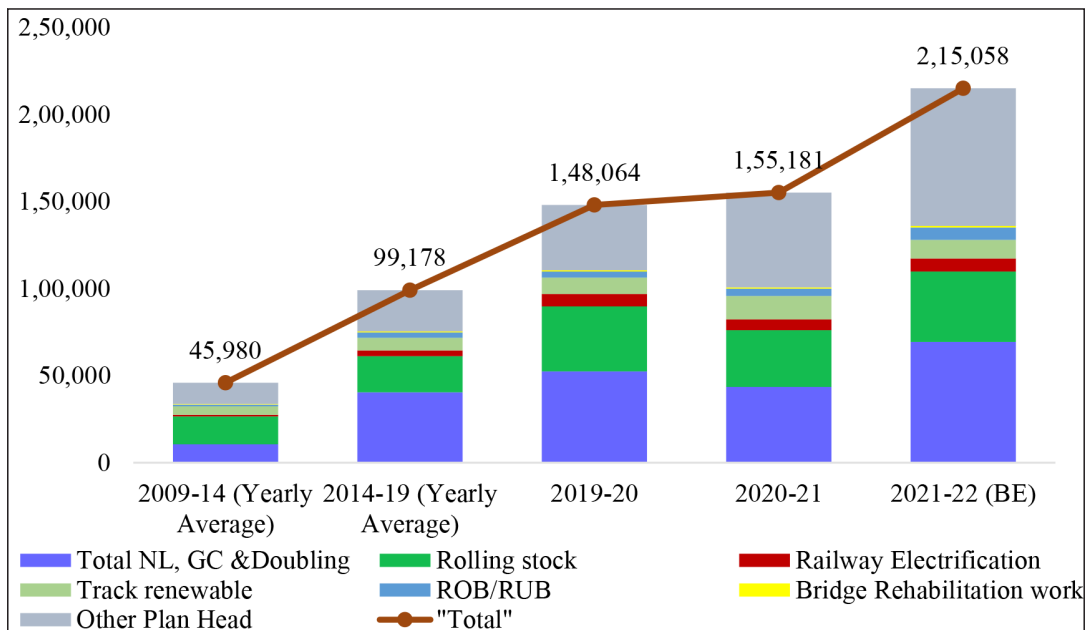
Figure 27: Passengers originating (in millions) and passengers earnings (Rs crores)



Source: Ministry of Railways. Includes metro railway Kolkata

8.44 Safety of the passengers and safe upkeep of railways assets is the topmost priority of IR. With a continuing focus on safety of passengers the number of consequential train accidents has come down from 59 in 2018-19 to 55 in 2019-20 (pre-Covid) and further to 22 in the last in 2020-21. In addition, in order to strengthen the agriculture sector, as on 31st December 2021, IR has operated 1,841 Kisan Rail services, transporting approximately 6.0 lakh tonnes of perishables including fruits and vegetables.

Figure 28: Major Capital Expenditure in IR

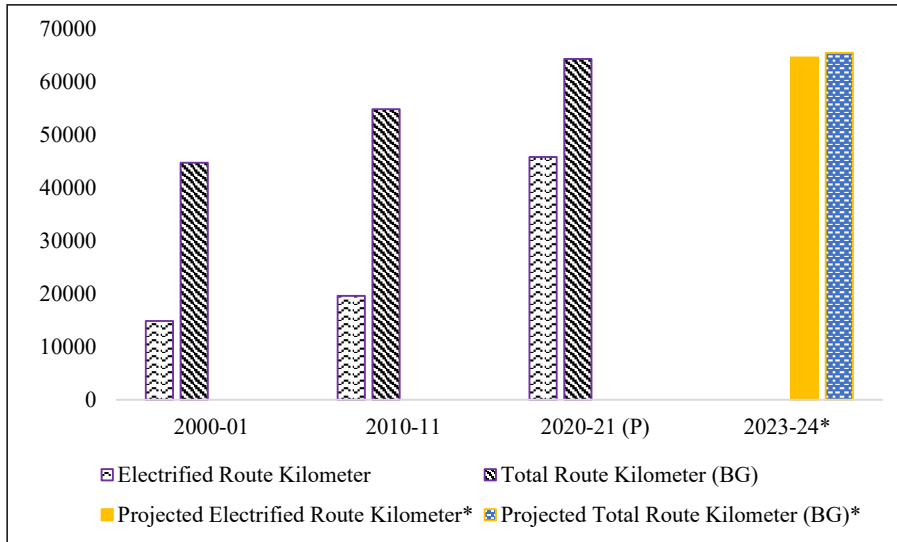


Source: Ministry of railways

8.45 CAPEX has been increased substantially for IR from an average annual CAPEX during 2009-14 of Rs. 45,980 crores to Rs. 2,15,058 crores during 2021-22 (BE) Figure (28).

IR is targeting for 100% electrification of its network by December 2023 (figure 29)

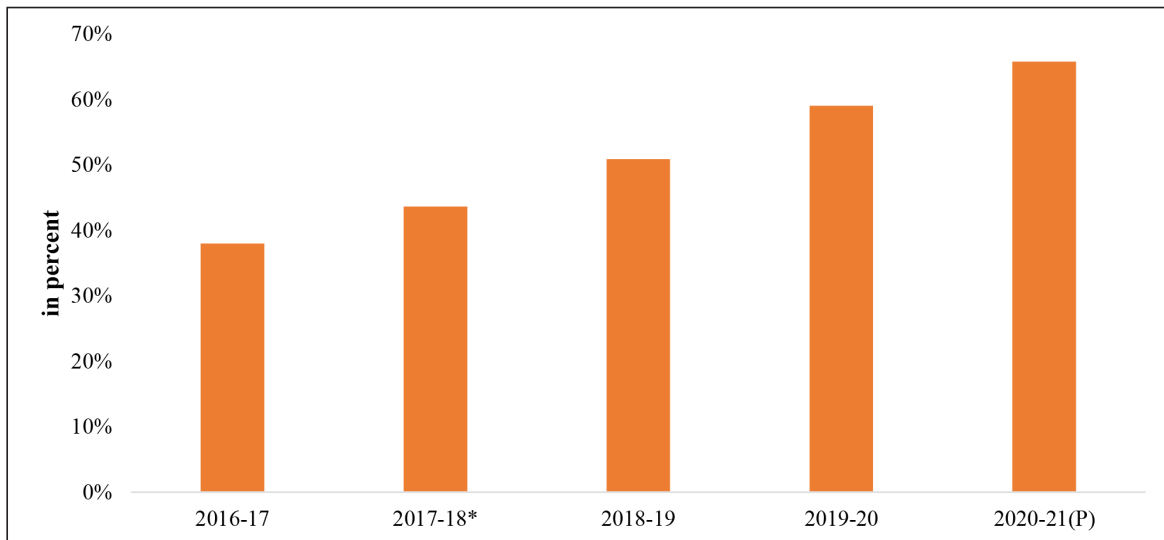
Figure 29: Electrified Route km as a percent of total route km



Source: Ministry of Railways. * Projections

8.46 In order to provide better amenities IR has embarked on providing Wi-Fi internet services at all stations (excluding halt stations). As on 5th December 2021, total 6,087 Railway Stations have been equipped with Wi-Fi facility (figure 30).

Figure 30: No. of Stations equipped with Wi-Fi



Source: Ministry of Railways

8.47 In addition to the above, projects connecting difficult terrain such as Rishikesh - Karnaprayag line as also the rail network to connect all capitals of north east states are ongoing. Further, a number of infrastructure development initiatives are envisaged in the National Rail Plan (NRP) being prepared by Indian Railways (Box 5)

Box 5: National Railway Plan

The National Rail Plan lays down the road map for capacity expansion of the railway network by 2030 to cater to growth up to 2050. It envisages the creation of a future ready railway system that is able to not only meet the passenger demand but also increase the modal share of railways in freight to 40-45% from the present level of 26-27%. The target of 40-45% modal share for railways is necessary from the perspective of sustainability and also from the national commitments made globally for reducing emission levels.(see chapter 6 on sustainable development and climate change).

Unlike growth, which is linear, capacity grows in surges (sawtooth curve) depending on project completion timelines.As per the National Rail Plan, the freight ecosystem is expected to grow from the present level of 4700 MT to 8200 by 2030. At present the railway capacity is barely able to carry 1220 MT which is around 26-27% of the modal share. The Plan provides a pipeline of projects,which on completion will increase railway capacity to capture 45% of freight traffic. Since the railways is already having a large number of sanctioned projects that need to be completed before taking up new projects, it has been planned to increase railway capacity in two surges. The first surge is to be provided by the Vision 2024 plan to prioritize and complete sanctioned projects so that railway capacity does not fall far behind the targeted modal share such that by the time capacity is finally created, the traffic would have shifted to another mode. To prevent further bleeding away of modal share, railway capacity enhancing projects have been categorized as Super Critical and Critical. 58 projects have been identified as Super Critical and are targeted for completion by December2022. 68 projects have been identified as Critical and have been targeted for completion by March 2024. These projects are focussed at increasing capacity on routes that serve major mineral, industrial hubs along with ports and major consumption centres.

In addition to these critical projects, the Ministry of Railway has also targeted 100% electrification of its network by December2023 upgrading Delhi-Mumbai & Delhi-Kolkata corridors to 160 kmph and also elimination of level crossings on the Golden Quadrilateral/Golden Diagonal routes. On completion of Vision 2024 projects, in the second half of the decade, the aim is to commission new Dedicated Freight Corridors and also High Speed Passenger Corridors, besides multitracking and signaling upgradation of congested routes

The next 10 years will see a very high level of CAPEX in the railway sector as capacity growth has to be accelerated such that by 2030 it is ahead of demand. Up to 2014,CAPEX on railway was barely Rs45,980 crore per annum and consequently the railway was characterized by high levels of inefficiency and highly congested routes unable to meet the growing demand. Post 2014, a conscious effort was made to improve the railway sector by substantially increasing the CAPEX. The CAPEX outlay for 2021-22 is Rs 2,15,000 crs which is more than five times the 2014 level. As more projects are taken on hand and several sources of capital funding are developed, the CAPEX will increase further in coming years and the railway system will actually emerge as an engine of national growth.

Civil Aviation

8.48 India has emerged as one of the fastest growing aviation markets in the world. The domestic traffic in India has more than doubled from around 61 million in 2013-14 to around 137 million in 2019-20, registering a growth of over 14 percent per annum.

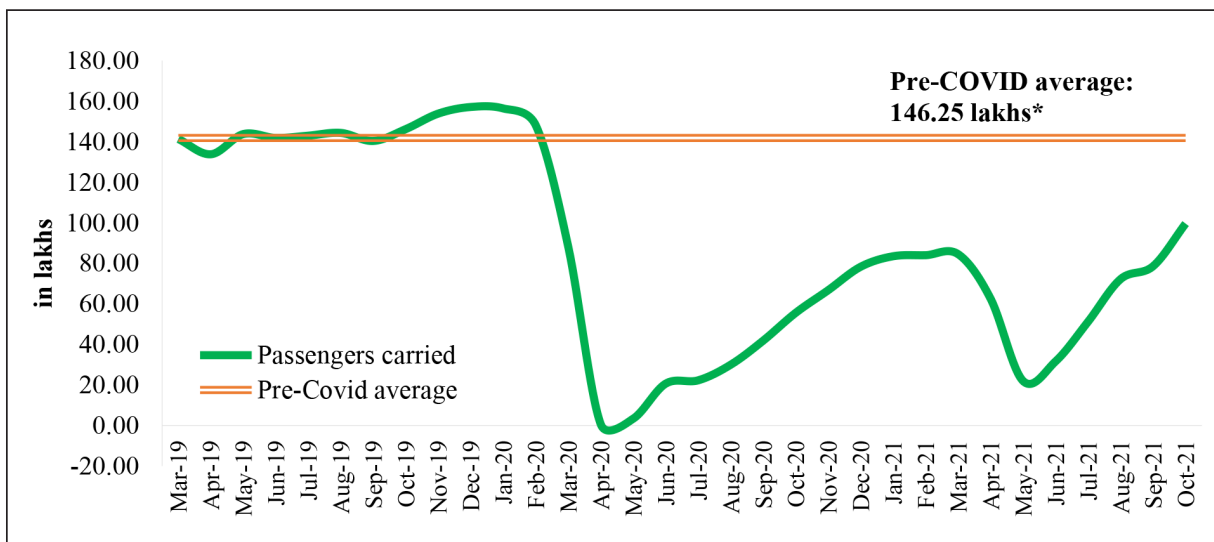
8.49 Government of India took various initiatives to boost the aviation sector which included calibrated opening of the domestic sector as the first wave of the pandemic ebbed, introduction of air transport bubbles or air travel arrangements with specific countries, disinvestment of Air India (Box6), privatization and modernization/expansion of airports, boost to the regional connectivity scheme - UDAN, incentivization of maintenance, repair and overhaul (MROs) operations etc.

8.50 UDAN is a regional airport development program of the Government of India and part of the Regional Connectivity Scheme (RCS) of upgrading underserviced air routes. Till launching of UDAN in 2016, India had 74 airports having scheduled operations. But, within 4 years under UDAN, four rounds of bidding under RCS-UDAN have taken place and 153 RCS airports including 12 water aerodromes & 36 Helipads have been identified for operation of RCS flights. During the last four years after commencement of the scheme, 948 valid awarded routes have been allotted to various airlines and out of which 389 RCS routes connecting 62 unserved and underserved airports (including 6 heliports & 02 water aerodromes) have been operationalized so far.

8.51 With the help of these supportive measures, India's aviation sector is on the path of gradual recovery from the turbulence caused by the COVID-19 pandemic. In addition, Unmanned Aircraft Systems (UAS), also known as drones, offer tremendous benefits to almost all sectors of the economy and can become an important propeller for growth due to their reach, versatility, and ease of use, especially in India's remote and inaccessible areas. Thus, government has liberalized drone rules 2021 on August 2021 and released PLI scheme for drones on 15 September 2021. The policy reforms will therefore catalyze super-normal growth in the upcoming drone sector. A resurgence of the sector is foreseen as a result of swift measures adopted by the government and industry.

8.52 With the accelerated pace of vaccine roll-out and easing of travel restrictions globally, Indian aviation sector has started to rebound. Despite the travel restrictions, the total passengers carried in October, 2021 reached 99.58 lakhs which was near 68 percent of the pre-Covid level (146.25 lakh) (figure31).

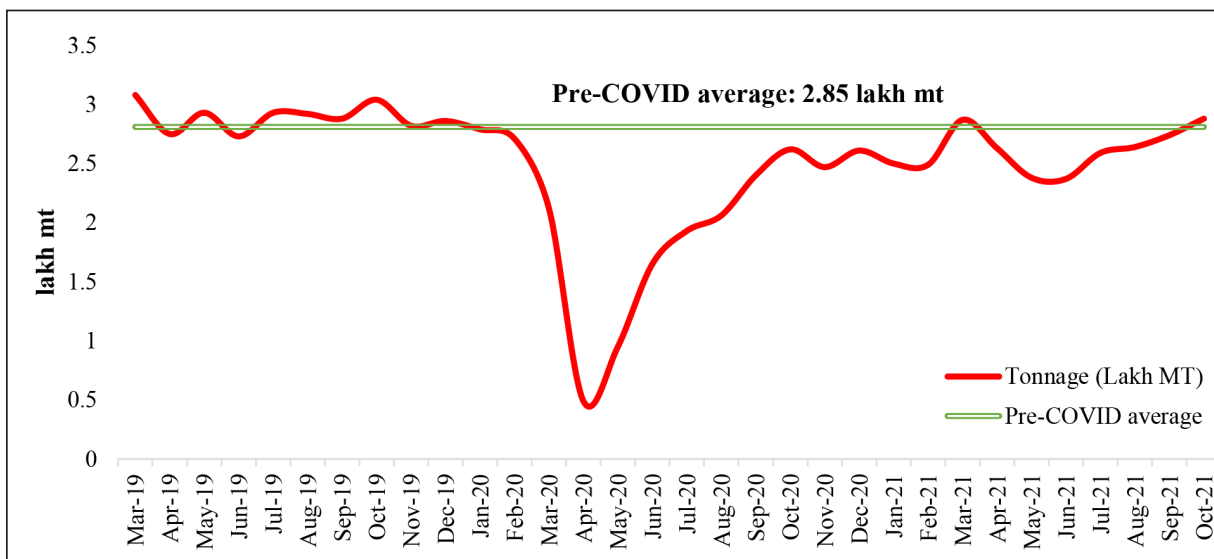
Figure 31: Month-wise Total Passengers Carried (in Lakh)



Source: Ministry of Civil Aviation. * Pre-COVID average is calculated for 11 months of 2019-20 starting from April, 2019 to February, 2020.

8.53 Besides growing month-on-month, air cargo operations are already performing strongly with the resurrection of the economy, supported by a robust rebound in business confidence, and boosted by resilient domestic demand, including through e-commerce. The total air cargo tonnage carried in October, 2021 reached 2.88 lakh MT which surpassed the pre Covid level (2.81lakh MT) (figure 32).

Figure 32: Month-wise Total air cargo tonnage (in Lakh MT)



Source: Ministry of Civil Aviation. * Pre-COVID average is calculated for 11 months of 2019-20 starting from April, 2019 to February, 2020

Box 6: Privatization in the Aviation sector

Disinvestment of Air India: The process for disinvestment of Air India and its subsidiaries commenced in June 2017 with the ‘in-principle’ approval of Cabinet Committee on Economic Affairs (CCEA). CCEA also approved creation of an Air India Specific Alternative Mechanism (AISAM) for the disinvestment process. The AISAM decided the strategic disinvestment of 100percent stake of Government of India in Air India along with 100percent stake in Air India Express Ltd and 50percent stake in Air India SATS (joint venture between Air India (AI) and Singapore Airport Terminal Services (SATS)).

Subsequently, M/s Talace Pvt Ltd, a wholly owned subsidiary of M/s Tata Sons Pvt. Ltd which was the highest bidder was awarded 100percent equity shareholding in Air India along with equity shareholding of Air India in Air India Express Ltd. (AIXL) and AISATS. The winning bid was for Rs 18,000 crore as Enterprise Value (EV) consideration for AI (100percent shares of AI along with AI’s shareholding in AIXL and AISATS). Share - Purchase Agreement has been executed on 25th October, 2021 and the transaction is likely to be completed by December 2021 - January 2022.

Privatization of Airports: In order to improve efficiency and performance, service quality, encourage greater investment and to reduce government influence, Airports Authority of India (AAI) has awarded six airports namely, Ahmedabad, Jaipur, Lucknow, Guwahati, Thiruvananthapuram and Mangaluru for Operations, Management and Development to the highest bidder i.e., M/s Adani Enterprises Limited (AEL) under Public Private Partnership (PPP) mode for a lease period of 50 years. Besides, AAI had leased out Delhi and Mumbai Airports in 2006 to M/s Delhi International Airport Limited and M/s Mumbai International Airport Limited respectively for Operations, Management and Development under PPP mode for a period of 30 years. As per National Monetization Pipeline (NMP), 25 AAI airports have been earmarked for asset monetization over the years 2022 to 2025 namely Bhubaneswar, Varanasi, Amritsar, Trichy, Indore, Raipur, Calicut, Coimbatore, Nagpur, Patna, Madurai, Surat, Ranchi, Jodhpur, Chennai, Vijayawada, Vadodara, Bhopal, Tirupati, Hubli, Imphal, Agartala, Udaipur, Dehradun and Rajahmundry.

The criteria adopted for Monetization of airport assets under NMP is as following:

- (i) Airports having annual traffic above the threshold of 0.4 million passengers (in 2019 and 2020);
- (ii) Airports with a sizeable ongoing/proposed capex plan as per the National Infrastructure Pipeline (NIP).

Ports

8.54 Port performance in an economy is crucial for trade competitiveness of that economy. Expansion of port capacity has been accorded the highest priority by the Government through implementation of well-conceived infrastructure development projects. The capacity of 13 major ports which was 871.52 million tonnes per annum (MTPA) at the end of March 2014, has increased by 79 percent to 1,560.61 MTPA by the end of March 2021. Traffic handled at these ports was to the tune of 672.68 MT during 2020-21, which was 4.6 percent lower than that in the previous year on account of the worldwide disruptions in international trade due to the pandemic. The average turnaround time at these major ports has reduced from 62.11 hours in 2019-20 to 55.99 hours in 2020-21 (Figure 33) due to the various measures taken by government to improve the ease of doing business.

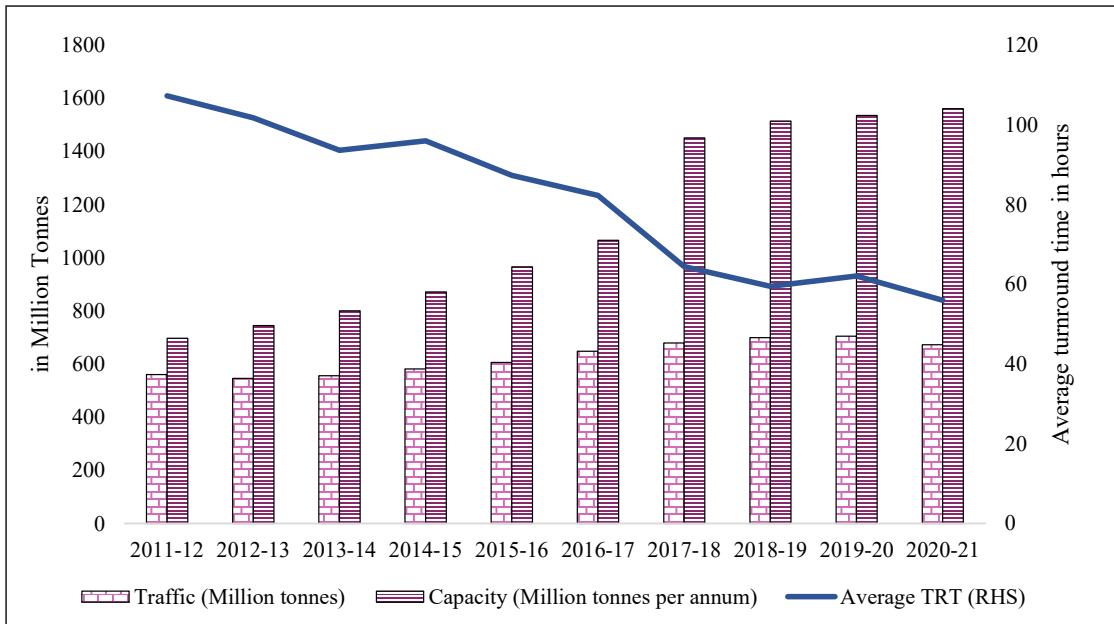
8.55 As on 31st December 2021, India had a fleet strength of 1463 vessels with Gross tonnage (GT) of 13,011 thousand compared to 1429 vessels and 12,746 thousand of GT at the end of 2019. However, Indian fleet is just 1.2 percent of world's fleet in terms of capacity and carries only 7.8 percent (for 2018-19) of India's EXIM trade. With the cost of using services of foreign shipping company is less than that of a local shipping company, most freight moves in foreign ships leading to a huge foreign exchange outflows. In order to address the cost disadvantage suffered by Indian flag ships, in July 2021 the Union cabinet has approved a scheme providing subsidy support of Rs.1,624 crore to Indian shipping companies in global tenders floated by Ministries and CPSEs over five years to promote flagging of merchant ships in India.

8.56 Many initiatives have been taken by the government to improve port governance, augment capacity utilization, enhance port efficiency and connectivity. The measures include the following among others:

- Sagarmala which is a National Programme aimed at accelerating economic development in the country by harnessing the potential of India's 7,500 km long coastline and 14,500 km of potentially navigable waterways. The Sagarmala projects include port modernization & new port development, connectivity enhancement, port-led industrialization, coastal community development, coastal shipping and Inland water transport. Currently, there are 802 projects worth investment of Rs. 5.54 lakh crore for implementation under the Sagarmala Programme by 2035. Out of which, 181 projects worth Rs. 94,712 crore have been completed and 223 projects worth Rs. 2.11 lakh crore are under implementation. Further, 398 projects worth Rs. 2.48 Lakh crore are under various stages of development.
- The Major Port Authorities Act 2021 was notified on 18.2.2021. This act provides for inter alia regulation, operation and planning of major ports in India and vests the administration, control and management of such ports upon the Boards of Major Port Authorities.
- A new Captive Policy for Port Dependent Industries has been prepared to address the challenges of renewal of concession period, scope of expansion, and dynamic business environment.

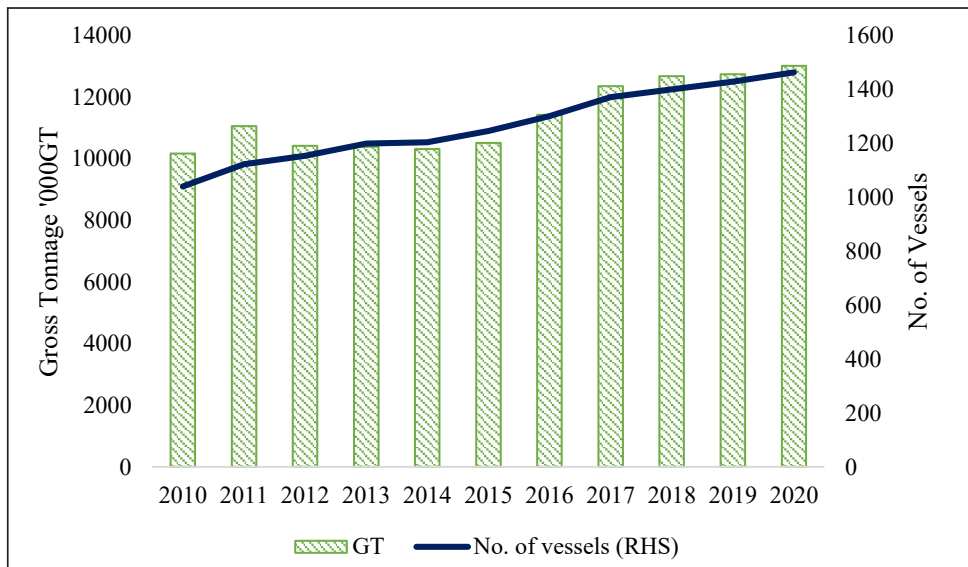
8.57 With the objective of propelling India to the forefront of the Global Maritime Sector, the Maritime India Vision 2030 (MIV 2030), a blueprint to ensure coordinated and accelerated growth of India's maritime sector in the next decade was released on March 2021. The objective is to develop world-class mega ports, transshipment hubs and ensure infrastructure modernization. MIV 2030 estimates that development of Indian ports will drive cost savings of Rs. 6,000-7,000 crore per annum for EXIM clients. Further, the augmented operations are estimated to create an additional ~700,000-1,000,000 jobs in the sector. MIV 2030 estimates the investment requirement for capacity augmentation and development of world class infrastructure at Indian Ports to be to the tune of Rs. 1, 00,000 – 1, 25,000 crore.

Figure 33: Performance of Major ports



Source: Survey calculations based on data from Ministry of Ports, Shipping and Waterways. Average TRT during 2020-21 is based on Pilot boarding till de-boarding. Port Capacity was re-rated based on Berthing Policy as per international norms. Major Ports re-rated capacity during 2016-17 was 1359 MTPA.

Figure 34: Growth of Indian Shipping



Source: Survey calculations based on data from Ministry of Ports, Shipping and Waterways.

Inland waterways

8.58 Regulatory amendment through the Inland Vessels Act, 2021, replaced the over 100 years old Inland Vessels Act, 1917 (1 of 1917) and ushered in a new era in the inland water transport sector. The objective of the Act is to promote economical, safe transportation and trade through inland waters. It will ensure transparency and accountability in the administration of inland water transportation and promote the ease of doing business.

8.59 Augmentation in navigation capacity of National Waterway-1 (NW-1) is being implemented since 2018 through the Jal Marg Vikas Project from Varanasi to Haldia stretch of Ganga-Bhagirathi-Hooghly River System to enable large barge movements. Construction of multi-modal terminals at Varanasi and Sahib Ganj have been completed and that of the multimodal terminal at Haldia and the Navigational Lock at Farakka have achieved substantial progress. The other projects such as comprehensive development of NW-2 and NW-16 & Indo-Bangladesh Protocol (IBP) route are proposed to be undertaken for a period of 5 years at a cost of Rs. 461 crores and Rs.145.29 crores respectively, from 2020-21 to 2024-25.

8.60 There has been a continued increase in traffic and augmentation of capacity of major ports (figure 33). In the backdrop of COVID-19 the traffic at major ports has suffered, declining by 4.57 percent between 2019-20 and 2020-21, but capacity of major ports has been rising, though at slower pace in recent years.

Box 7: Connecting PILLARS OF INDIA PM-GATI SHAKTI

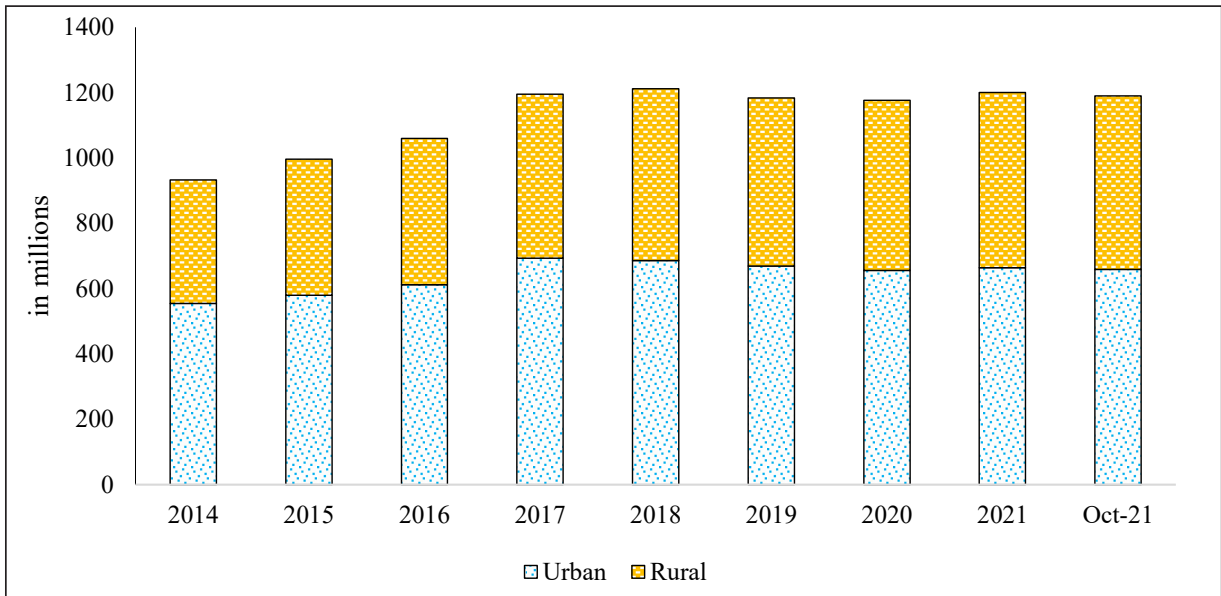
Another milestone achieved which has heralded a new chapter in governance is the PM Gati Shakti an integrated plan ensuring multi-modal and seamless connectivity for people, goods and services. It covers 16 ministries and infrastructure like Bharatmala, Sagarmala, inland waterways, dry/land ports, UDAN etc. It is also expected to include social infrastructure like hospitals and universities. With continuous improvement in digital infrastructure along with development of economic zones like textile clusters, pharmaceutical clusters, defence corridors, electronic parks, industrial corridors, fishing clusters, agri zones, GATI-SHAKTI will improve connectivity and make Indian businesses more competitive. It will also leverage technology extensively including spatial planning tools with ISRO imagery developed by Bhaskaracharya National Institute for Space Applications and Geoinformatics. This is a constant endeavor to build next generation infrastructure to improve ease of living as well as ease of doing business.

Telecom

8.61 India is the world's second-largest telecommunications market. The telecommunication sector is one of the most powerful sectors impacting social and economic development of a country. A strong and a responsive regulatory framework has kept the service access at reasonable prices. The Government has taken further measures to ensure fair competition among service providers with the view to benefit the consumers (BOX 8).

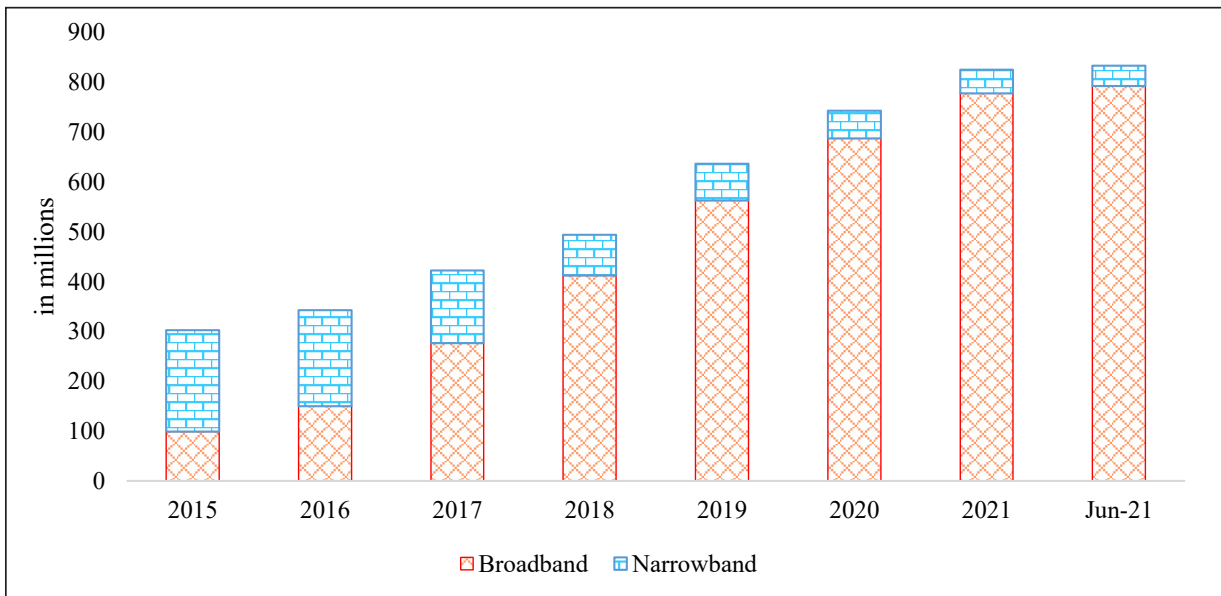
8.62 The relevance of telecom sector has increased immensely. This can be gauged from the fact that the total telephone subscriber base in India has increased from 933.02 million in March 2014 to 1200.88 million in March 2021. In March 2021, 45 percent of subscribers were based in rural India and 55 percent in urban areas (figure 35). Internet penetration in the country is increasing steadily with internet subscribers increasing from 302.33 million in March 2015 to 833.71 million in June 2021. While 67.2 percent of internet subscribers had narrow-band connections and 32.8 percent had broadband connections in 2015, the composition had reversed by June 2021 with only 4 percent of subscribers having narrowband and 96 percent with broadband connections (Figure 36).

Figure 35: Number and Composition of Telephone Subscribers (in millions)



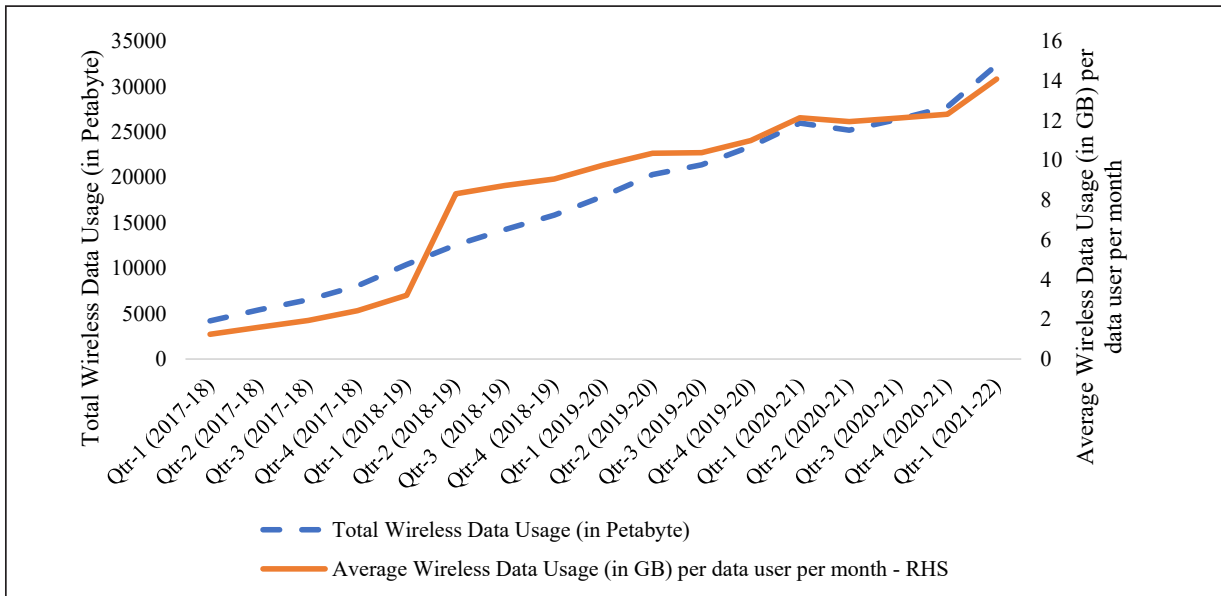
Source: DoT. As in March month of each year

Figure 36: Number and Composition of Internet Subscribers



Source: TRAI As in March month of each year

Figure 37: Total and Average Wireless Data usage

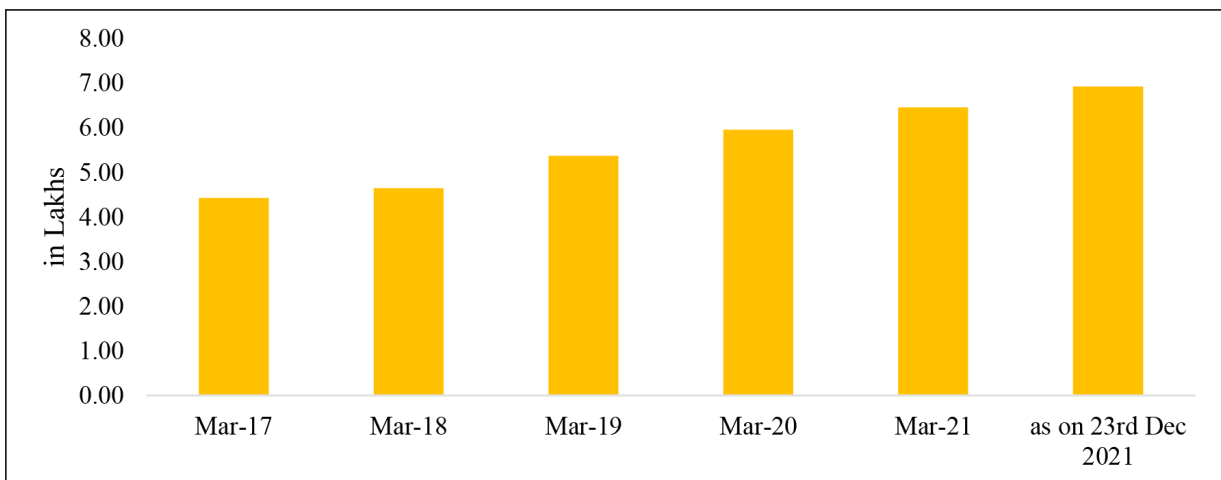


Source: TRAI

8.63 Over the last few years, telecom sector in India has become data driven and reducing costs of data due to the fierce competition in the sector. This has boosted data usage even further. Total volume of wireless data usage increased by more than 7 folds from 4206 petabyte in Q1:FY18 to 32397 petabytes in Q1:FY22. Average wireless data usage in gigabyte (GB) per data user per month has also increased tremendously from just 1.24 GB per month in Q1:FY18 to a whopping 14.1 GB per month in Q1:FY22 (Figure 37).

8.64 The number of mobile towers has also increased substantially (Figure 38) reaching 6.93 lakhs towers in December 2021, reflecting that the telecom operators have well realized the potential in the sector and seized the opportunity to build up an infrastructure that will be fundamental in boosting the Government’s Digital India campaign.

Figure 38: Number of mobile towers (lakhs)



Source: DoT. As in March month of each year.

8.65 Under the flagship BharatNet project, as on 27.09.2021, 5.46 lakh km Optical Fiber Cable has been laid, a total of 1.73 lakh Gram Panchayats (GP) have been connected by Optical Fiber Cable (OFC) and 1.59 lakh Gram Panchayats are service ready on OFC. In addition, 4173 GPs have been connected over satellite media. Wi-Fi hotspots have been installed at 1.04lakh Gram Panchayats of which services are being provided at 0.64 lakh Gram Panchayats, catering to more than 16.17 lakh subscribers with a data usage to the tune of 5670.42 TB per month. The scope of BharatNet has now been extended to cover all inhabited villages beyond Gram Panchayats. On 30.06.2021, Government accorded approval for a revised strategy for implementation of BharatNet through Public-Private Partnership (PPP) model in 16 States of the country covering about 3.61 lakh villages (including 1.37 lakh GPs). Other projects include improving connectivity in 354 villages in the border areas of Jammu & Kashmir, Ladakh, Himachal Pradesh, Uttar Pradesh, Bihar, Rajasthan, Gujarat and Uttarakhand. As on 27.9.2021, around 161 villages out of 354 villages have been covered with mobile service. A boost to the telecom infrastructure is also being given under the aspirational district scheme.

8.66 The Government of India is implementing a Comprehensive Telecom Development Plan (CTDP) for the North-Eastern Region and Comprehensive Telecom Development Plan for Islands to provide mobile connectivity in the uncovered villages and along National Highways in the North-east. As on 30.08.2021, towers at 1,358 sites have been installed and are providing services. The undersea 2,313-km optic fiber-based telecom connectivity between Chennai and Andaman & Nicobar Islands was inaugurated in August 2020. Government has approved the proposal for provision of submarine Optical Fiber Cable Connectivity by laying approximately 1891km of cable between Kochi and Lakshadweep Islands. With the implementation of this project, the high-speed internet/ broadband connectivity will be available in Lakshadweep Islands.

8.67 In addition to the expansion in the telecom infrastructure, a number of measures have been taken to bring about structural and procedural reforms (see Box 8 for details). In the backdrop of the outstanding performance of the telecom sector in meeting COVID-19 challenges and with huge surge in data consumption due to online education, work from home, interpersonal connect through social media, virtual meetings etc., the reform measures will further boost the proliferation and penetration of broadband and telecom connectivity. The reforms are also expected to boost 4G proliferation, infuse liquidity and create an enabling environment for investment in 5G networks.

Box 8: Reforms in the Telecom Sector

Structural Reforms

1. Rationalization of Adjusted Gross Revenue: Non-telecom revenue will be excluded on prospective basis from the definition of AGR
2. Bank Guarantees (BGs) against License Fee (LF) have been rationalized. One BGs in different Licensed Service Areas (LSAs) regions in the country has been allowed.
3. Interest rates rationalized/ Penalties removed: From 1st October, 2021, delayed payments of License Fee (LF)/Spectrum Usage Charge (SUC) will attract interest rate of SBI's MCLR plus

2percent instead of MCLR plus 4percent; interest compounded annually instead of monthly; penalty and interest on penalty removed.

4. For Auctions held henceforth, no BGs will be required to secure instalment payments.
5. Spectrum Tenure: In future auctions, tenure of spectrum increased from 20 to 30 years.
6. Surrender of spectrum will be permitted after 10 years for spectrum acquired in the future auctions.
7. No Spectrum Usage Charge (SUC) for spectrum acquired in future spectrum auctions.
8. Spectrum sharing encouraged- additional SUC of 0.5percent for spectrum sharing removed.
9. To encourage investment, 100 percent Foreign Direct Investment (FDI) under automatic route has been permitted in Telecom Sector with all safeguards applying.

Procedural Reforms

10. Auction calendar fixed - Spectrum auctions to be normally held in the last quarter of every financial year.
11. Ease of doing business promoted - cumbersome requirement of licenses under Customs Notification for wireless equipment has been removed. This is replaced with self-declaration.
12. Know Your Customers (KYC) reforms: Self-KYC (App based) permitted. E-KYC rate revised to only one rupee. Shifting from prepaid to post-paid and vice-versa does not require fresh KYC.
13. Customer Acquisition Forms (CAF) in physical form will be replaced by digital storage of data. This is a cost saving measure as it would allow the Telecom Service Providers (TSPs) to release several warehouses that was being required to store 300-400 crore paper CAFs. Further, with this measure, warehouse audit of CAF would also not be required.
14. Standing Advisory Committee on Radio Frequency Allocation (SACFA) clearance for telecom towers eased. Department of Telecommunication will accept data on a portal, based on self-declaration basis which is to be linked to portals of other Agencies (such as Civil Aviation).

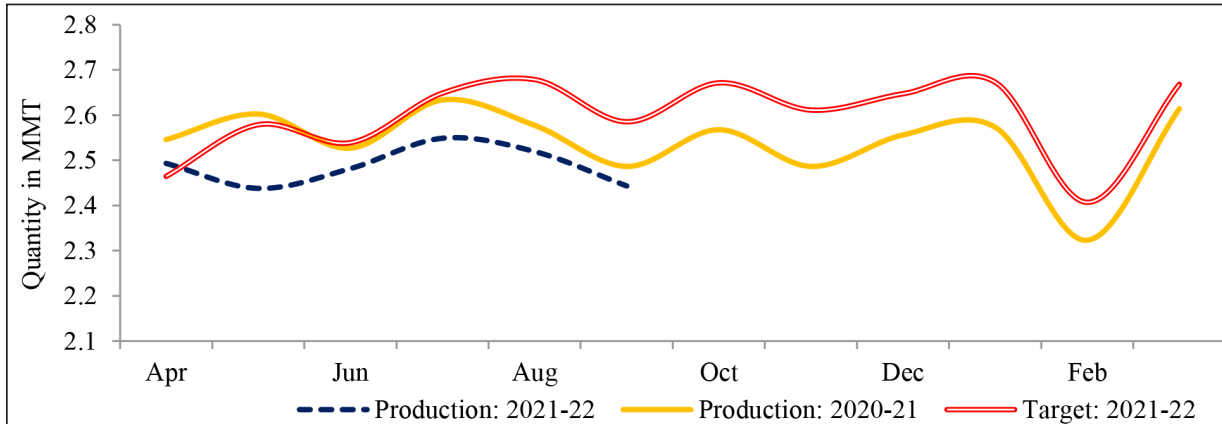
Addressing Liquidity requirements of TSPs: The Government approved the following for all the TSPs:

15. Moratorium/Deferment of up to four years in annual payments of dues arising out of the AGR judgement, while protecting the Net Present Value (NPV) of the due amounts.
16. Moratorium/Deferment on due payments of spectrum purchased in past auctions (excluding the auction of 2021) for up to four years with NPV protected at the interest rate stipulated in the respective auctions.
17. Option to the TSPs to pay the principal and the interest amount arising due to the said moratorium/ deferment of payment by way of equity.

Petroleum, Crude and Natural gas

8.68 Crude oil and condensate production during the year 2020-21 was 30.49 million metric tonnes (MMT), lower than the production level of 32.17 MMT in 2019-20 and 94.3 percent of the target of 32.32 MMT for 2020-21 (figure 39). India depends on imports to meet more than 80 per cent of its requirements.

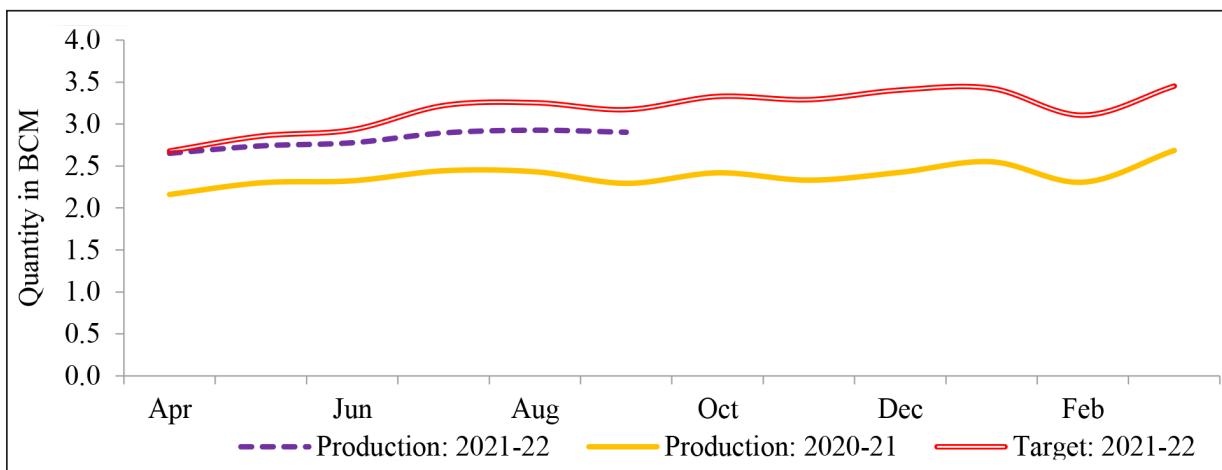
Figure 39: Production of Crude oil



Source: M/o PNG

8.69 Natural Gas production during the year 2020-21 was 28.67 billion cubic meters (BCM) as against production of 31.18 BCM in 2019-20 and 85.4 percent against the target of 33.57 BCM for 2020-21. The reasons for lower domestic oil and gas production in 2020-21 include, inter-alia, declining production from old and marginal fields, unplanned shutdown and operational losses from few producing wells (figure 40).

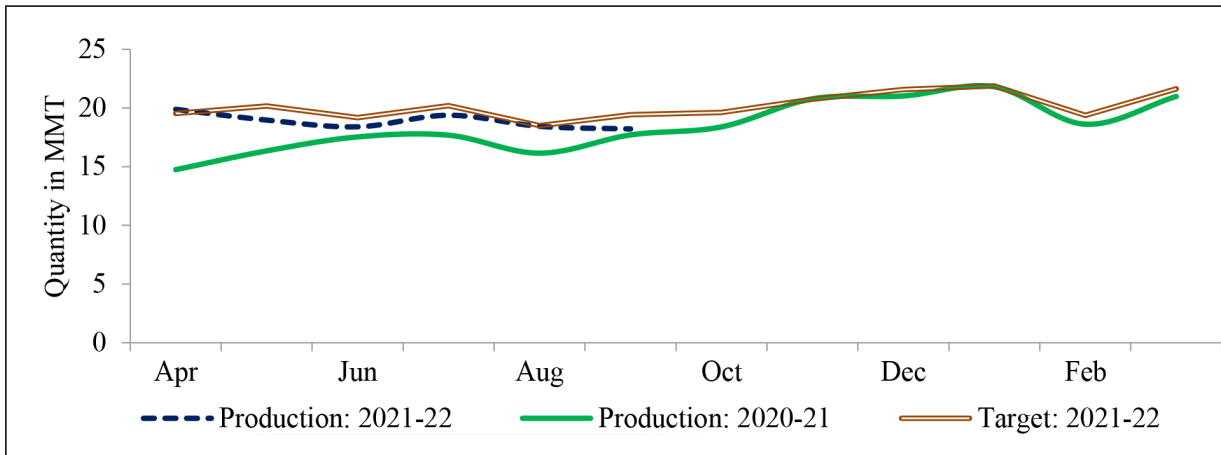
Figure 40: Production of natural gas



Source: M/o PNG

8.70 Crude Oil Processed during the year 2020-21 was 221.77 MMT as against 254.39 MMT in 2019-20, showing achievement of 88.1 percent of the target of 251.66 MMT for 2020-21 (figure 41). The shortfall in crude oil processing was mainly due to lower demand of petroleum products due to COVID-19 during 2020-21.

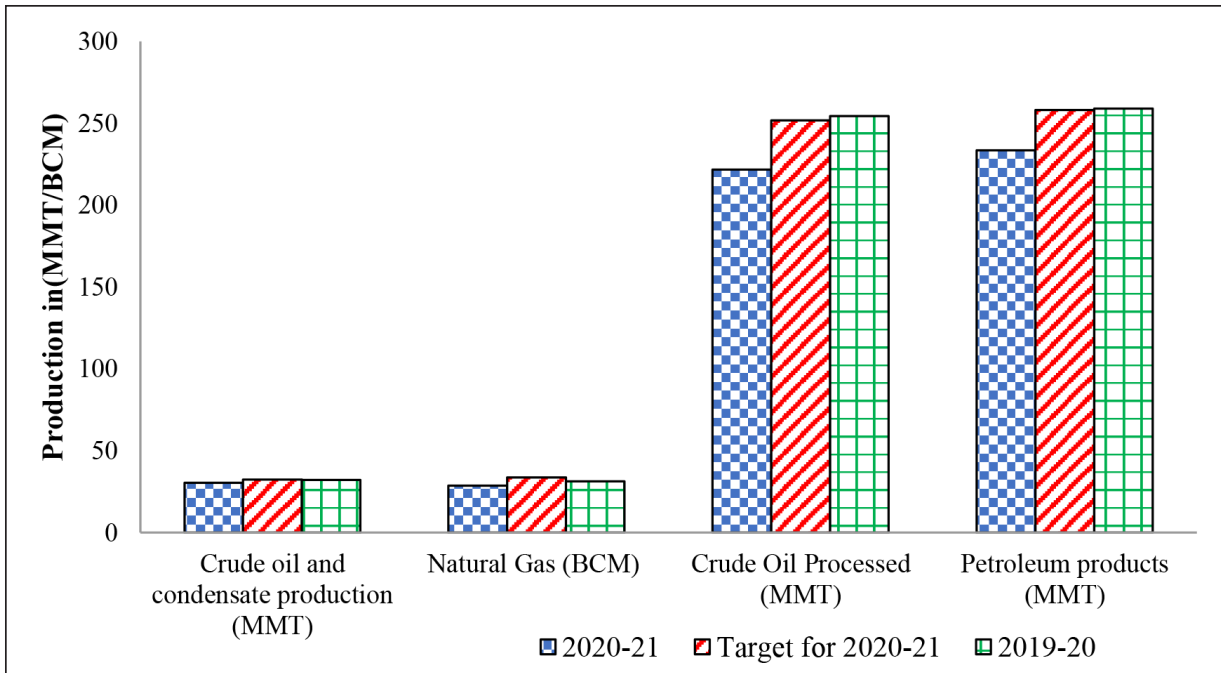
Figure 41: Production of Crude Processed oil



Source: M/o PNG

8.71 The production of petroleum products was 233.51 MMT in 2020-21 as against 258.18 MMT in 2019-20, showing achievement of 90.2 percent of the target of 259.02 MMT for 2020-21. During the year 2020-21, the consumption of petroleum products in India was 194.30 MMT, lower by 9.3 percent as compared to consumption of 214.13 MMT during 2019-20. (figure 42).

Figure 42: Production of Petroleum, crude and natural gas



Source: M/o PNG

8.72 The Government has introduced several measures to bring transparency by ensuring that projected requirements of the industry are duly uploaded, reduce transaction costs through investment in building infrastructure required for this sector and extend benefits to the weaker sections. The "Lakshya Bharat Portal" launched in September, 2021 requires all oil and gas organizations to upload details of various items procured by them including the future

requirements. The portal is planned to mature into a central information pool for sourcing of capital goods and MRO (maintenance, repair and overhaul) of items of the oil and gas companies which in turn is expected to provide clear demand projections to enable the manufacturers to enhance their capacity and scope. This portal, which is accessible to all stakeholders is an important step towards AtmaNirbhar Bharat. The measures taken to enhance the investments on gas grid are encapsulated in Box 9.

8.73 The petroleum sector played a critical role throughout the COVID 19 lockdown period by maintaining fuel supplies across the country, without any interruption. The scheme of three free cylinders to Ujjwala beneficiaries provided much-needed relief to the poor households during Covid times. The second phase of the Pradhan Mantri Ujjwala Yojana, Ujjawala 2.0, was launched on 10th August, 2021 on pan India basis to provide additional one crore LPG connections along with free first refill and stove. As on 25.10.2021, while more than 1 crore applications have been received in this phase, a total of 54.01 lakh LPG connections have been released. Ujjwala 2.0 focuses on migrants and poor women from low LPG coverage areas.

Box 9: Measures taken to develop the national gas grid and city gas distribution network

National Gas Grid: With the aim to create nationwide gas grid, Petroleum and Natural Gas Regulatory Board (PNGRB) has authorized approximately 33,764 km natural gas pipeline network across the country, as on 31.03.2021. The National Gas Grid would connect all major demand and supply centres in India. This would ensure easy availability of natural gas across all regions and also potentially help to achieve uniform economic and social progress. As on 31 March 2021, 19,998 km of natural gas pipelines are operational and 15,369 km are under various stages of construction.

Pradhan Mantri Urja Ganga (2016): In order to develop the national gas grid, the Government has taken a decision to provide a capital grant of Rs.5176 crore (i.e., 40percent of the estimated capital cost of Rs.12,940 Cr) for development of a 2655 Km long Jagdishpur-Haldia -Bokaro-Dhamra Gas Pipeline (JHBDPL) project. It will pass through 50 districts in the State of Uttar Pradesh, Bihar, Jharkhand, Odisha & West Bengal

North East Gas Grid (2020): Government has approved the North East Gas Grid project of Indradhanush Gas Grid Limited (IGGL) with Viability Gap Funding (VGF) / Capital Grant at 60percent (Rs.5,559 crore) of the estimated cost of Rs.9,265 crore. The 1,656 km long North East Gas Grid will connect eight North-Eastern states.

City Gas Distribution Network (CGD): PNGRB has authorized 232 geographical areas (GAs) for development of CGD network across the country covering more than 400 districts in 27 States/UTs which covers around 71percent of India's population and 53 percent of area. As on 31.07.2021, a total of approx. 79.47 lakh PNG Domestic connections and 3323 CNG stations have been commissioned in the country.

Electricity

8.74 India has witnessed a significant transformation from being an acutely power deficit country to a situation of demand being fully met. India has also made remarkable strides to

ensure universal access to electricity for every household. The total installed power capacity and captive power plant (industries having demand of 1MW and above) was 459.15 GW on 31.03.2021 as compared to 446.35 GW on 31.03.2020 registering a growth of 2.87 percent. Installed capacity in utilities was 382.15 GW on 31.03.2021 as compared to 370.11 GW as on 31.03.2020 – increasing by 3.25 percent. Thermal sources of energy make the largest – 61.42 percent share of total installed capacity in utilities followed by renewable energy resource (RES) with 24.7 percent and hydro by 12.09 percent. Details of all India installed capacity mode wise and source wise is given in table 6.

8.75 The total electricity generated including that from captive plants during the year 2020-21 was 15.73 lakh GWh as compared to 16.23 lakh GWh during the year 2019-20, of which 13.73 lakh GWh was generated by utilities and 2 lakh GWh in captive plants. Between 2020-21 and 2019-20, maximum rise in electricity generation was recorded in diesel based thermal energy for utilities and RES for captive plants. Overall, due to pandemic led disruptions in economic activity, electricity generation was lower in the year 2020-21 which is now expected to increase with the recovery of the economy. Details of mode wise source wise electricity generation are given in table 7. Figure 44 gives composition of total installed capacity and electricity generation for the year 2020-21.

Renewable energy – Solar, Wind, Biomass and small hydro energy

8.76 India has witnessed the fastest rate of growth in renewable energy capacity addition among all large economies, during the last 7.5 years with renewable energy capacity growing by 2.9 times and solar energy expanding by over 18 times. Renewable energy (excluding large hydro) constitutes over 24.71 percent of the country's installed power capacity and around 10.7 percent of the electrical energy generation for year 2020-21. As of 31 October 2021, India's total renewable energy installed capacity (excluding hydro power above 25 MW) has reached over 103.05 GW. During the last 7.5 years, if large hydro is included, the share of renewable energy in electric installed capacity is estimated to be about 38.27 percent (as of October 2021) and its share in electric energy generation is estimated to be about 26.96 percent (for the month of August 2021). The difference in the share of renewable energy in installed capacity and electricity generation is because of the variability in the sunshine hours or extent of wind which in turn will determine the utilization of the installed capacity.

8.77 In order to facilitate renewable power evacuation and reshaping the grid for future requirements, the Green Energy Corridor (GEC) projects have been initiated. The GEC Project aims at synchronizing electricity produced from renewable sources, such as solar and wind, with conventional power stations in the grid. The first component of the scheme, Inter-state GEC with target capacity of 3200 circuit kilometer (ckm) transmission lines and 17,000 MVA capacity sub-stations, was completed in March 2020. The second component - Intra-state GEC with a target capacity of 9700 ckm transmission lines and 22,600 MVA capacity sub-stations is expected to be completed by June 2022 (BOX 10 on Transition to clean energy).

Table 6: All India Installed Capacity Mode-Wise

| Year | Thermal | | | | | | | Total (2+3+7+8) |
|---|---------|--------|--------|-------|-----------------------------|---------|-------|--------------------|
| in GW | Hydro | Steam | Diesel | Gas | Total Thermal (3+4+5) | Nuclear | RES | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| (1) Utilities | | | | | | | | |
| 2019-20 | 45.70 | 205.13 | 0.51 | 24.96 | 230.60 | 6.78 | 87.03 | 370.11 |
| 2020-21 | 46.21 | 209.30 | 0.51 | 24.92 | 234.73 | 6.78 | 94.43 | 382.15 |
| % change | 1.12 | 2.03 | 0.00 | -0.13 | 1.79 | 0.00 | 8.51 | 3.25 |
| (2) Non-Utilities (Industries having demand of 1 MW & above) | | | | | | | | |
| 2019-20 | 0.13 | 51.54 | 12.77 | 7.32 | 71.63 | 0.00 | 4.48 | 76.24 |
| 2020-21@ | 0.13 | 52.06 | 12.90 | 7.39 | 72.35 | 0.00 | 4.52 | 77.00 |
| % change | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0 | 1.00 | 1.00 |
| (3) Installed Capacity : (1+2) | | | | | | | | |
| 2019-20 | 45.83 | 256.68 | 13.28 | 32.27 | 302.23 | 6.78 | 91.50 | 446.35 |
| 2020-21 | 46.34 | 261.35 | 13.41 | 32.31 | 307.08 | 6.78 | 98.95 | 459.15 |
| % change | 1.12 | 1.82 | 0.96 | 0.13 | 1.60 | 0.00 | 8.14 | 2.87 |

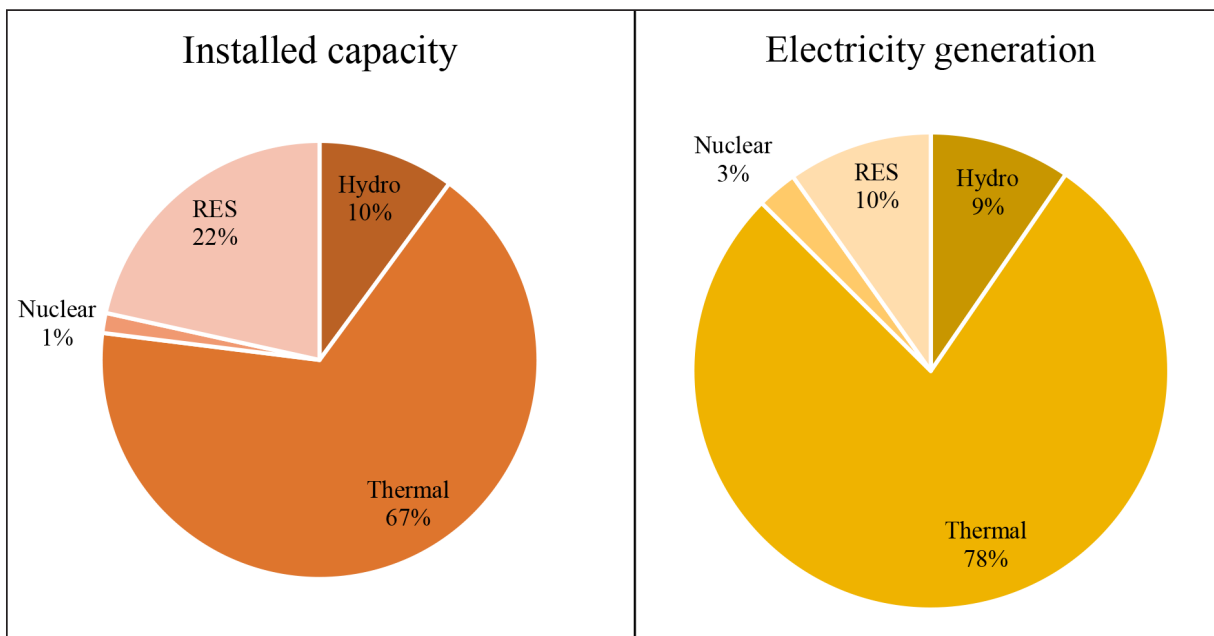
Source: Survey Calculations based on data from Central Electricity Authority. @ Estimated

Table 7: All India Gross Electricity Generation Mode-Wise

| Year | Thermal | | | | | | | Total (2+6+7+8) |
|---|---------|-------|----------|-------|------------------------------|---------|------|--------------------|
| (Lakhs GWh) | Hydro | Steam | Diesel | Gas | Total Thermal) (3+4+5) | Nuclear | RES | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| (1) Utilities Gross Electrical Energy Generation | | | | | | | | |
| 2019-20 | 1.56 | 9.94 | 0.00199 | 0.48 | 10.43 | 0.46 | 1.38 | 13.83 |
| 2020-21 | 1.50 | 9.81 | 0.00216* | 0.51 | 10.33 | 0.43 | 1.47 | 13.73 |
| % change | -3.5 | -1.3 | 9.0 | 5.2 | -1.0 | -7.4 | 6.4 | -0.7 |
| (2) Non-Utilities Gross Electrical Energy Generation (Industries having capacity 1 MW & Above) | | | | | | | | |
| 2019-20 | 0.00 | 2.06 | 0.02 | 0.25 | 2.33 | 0.00 | 0.06 | 2.40 |
| 2020-21 @ | 0.00 | 1.69 | 0.02 | 0.21 | 1.92 | 0.00 | 0.07 | 2.00 |
| % change | 0.7 | -17.7 | 4.3 | -16.5 | -17.4 | 0.0 | 15.2 | -16.5 |
| (3) Total Gross Electrical Energy Generation (1+2) | | | | | | | | |
| 2019-20 | 1.56 | 12.00 | 0.02 | 0.74 | 12.76 | 0.46 | 1.45 | 16.23 |
| 2020-21 | 1.51 | 11.51 | 0.02 | 0.72 | 12.25 | 0.43 | 1.55 | 15.73 |
| % change | -3.5 | -4.1 | 4.8 | -2.3 | -4.0 | -7.4 | 6.8 | -3.1 |

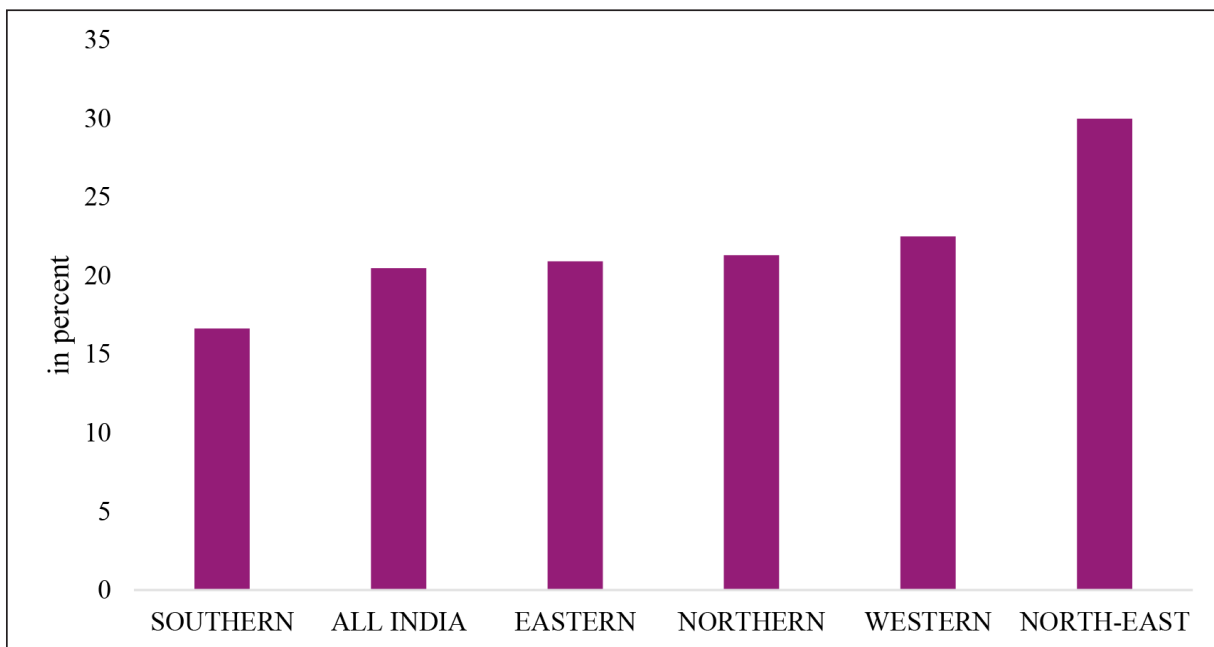
Source: Survey Calculations based on data from Central Electricity Authority. *-provisional, @ Estimated

Figure 44: Source of Installed Capacity and electricity generation 2020-21



Source: Survey Calculations based on data from Central Electricity Authority. Includes both Utilities and captive plants. Thermal includes gas, steam and diesel.

Figure 45: Energy loss in transformation, transmission and distribution and unaccounted for as a percentage of Net energy available for supply



Source: Central Electricity Authority

8.78 The energy losses in transformation, transmission and distribution during the year 2019-20 was at 20.46 percent for all India which was highest for the North east region - 29.98 percent (figure 45). In order to prevent such losses the government has mandated electricity distribution companies to undertake quarterly energy accounting through a certified energy manager which

will give detailed information about electricity consumption by different categories of consumers & the transmission and distribution losses in various areas and enable corrective actions.

Box 9: Transitioning to clean energy

The two main pillars for mitigation action to achieve net-zero carbon ambition are transition to clean and renewable sources of energy and storage of this energy. The World Bank in its report Minerals for Climate Action has in its report mentioned that this transition from conventional fossil fuel-based energy to clean energy as well as battery storage will be more mineral intensive. Minerals and metals like copper, aluminum, iron, manganese, nickel etc are critical for developing clean energy sources like solar PV, wind, nuclear while minerals like lithium and graphite are important for energy storage. Therefore, on the policy front, it is pertinent to prepare for this. In this regard, the following is essential –

- Pace at which shift from conventional fossil-fuel based sources is made. The pace will determine the extent and mix of investment in renewable sources of energy.
- With the developed countries as frontrunners of net-zero emission plans, it is important to avoid the risk of being a late comer. The inelastic supply of minerals is already increasing the prices of minerals which is likely to shoot up even further in the future.
- Encourage R&D to ensure effortless switch to renewable sources of energy. This may also include focus on developing technology that recycles, reuses and repurposes minerals.

The recent surge in prices of natural gas in Europe on account of higher energy demand coupled with cold spells across the region and slower winds to run wind turbines has resulted in lower electricity output. The energy crisis being experienced by Europe brings to the fore the need for having a diversified mix of sources of energy of which fossil fuels are an important part. Simultaneously focus should be laid on building storage for intermittent electricity generation from solar PV and wind farms to ensure on-demand energy supply.

CONCLUSION

8.79 Initiatives under Atma Nirbhar Bharat including introduction of structural and procedural reforms, record vaccinations, various PLI scheme designed to attract investments in sectors of core competency and cutting edge technology, Make-in-India programme to boost domestic manufacturing capacity, reduction of corporate tax rate, etc and steps to improve operational efficiency have helped the industrial sector to keep up its ante. The sector has started to recover steadily and according to the National Statistical Office, is expected to grow at 11.8 percent in 2021-22. The performance of the Index of Industrial Production while a little subdued at 1.4 per cent in November 2021 vis a vis the same month in the previous year must be viewed along with growth of 17.4 percent in April-November 2021 as compared to -15.3 percent in the corresponding period of last year. Most components of IIP have recovered to the pre-lockdown level.

8.80 The Government has charted out a comprehensive programme for industrial transformation. With emphasis on supply side measures, the reforms address long known bottlenecks of insufficient infrastructure, tardy business processes and labour market reforms. Introduction of the production linked incentive schemes intends to encourage the scaling up of industries that are strategic in nature or are technology intensive. The objective being to create the capacity to integrate with the global value chains. Several measures have been taken to reduce transaction costs especially for the small and medium enterprises as well as facilitate inflow of capital, technology and international best practices into the industries. The new CPSE policy provides a roadmap for disinvestment, opening up avenues for their further growth and improvement in efficiency while enabling the government to focus its resources on developmental needs of the country.

8.81 The recovery of the industrial sector, positive business expectations propelled by extensive reforms and improved consumer demand, suggests that further improvements in the industrial performance can be expected.