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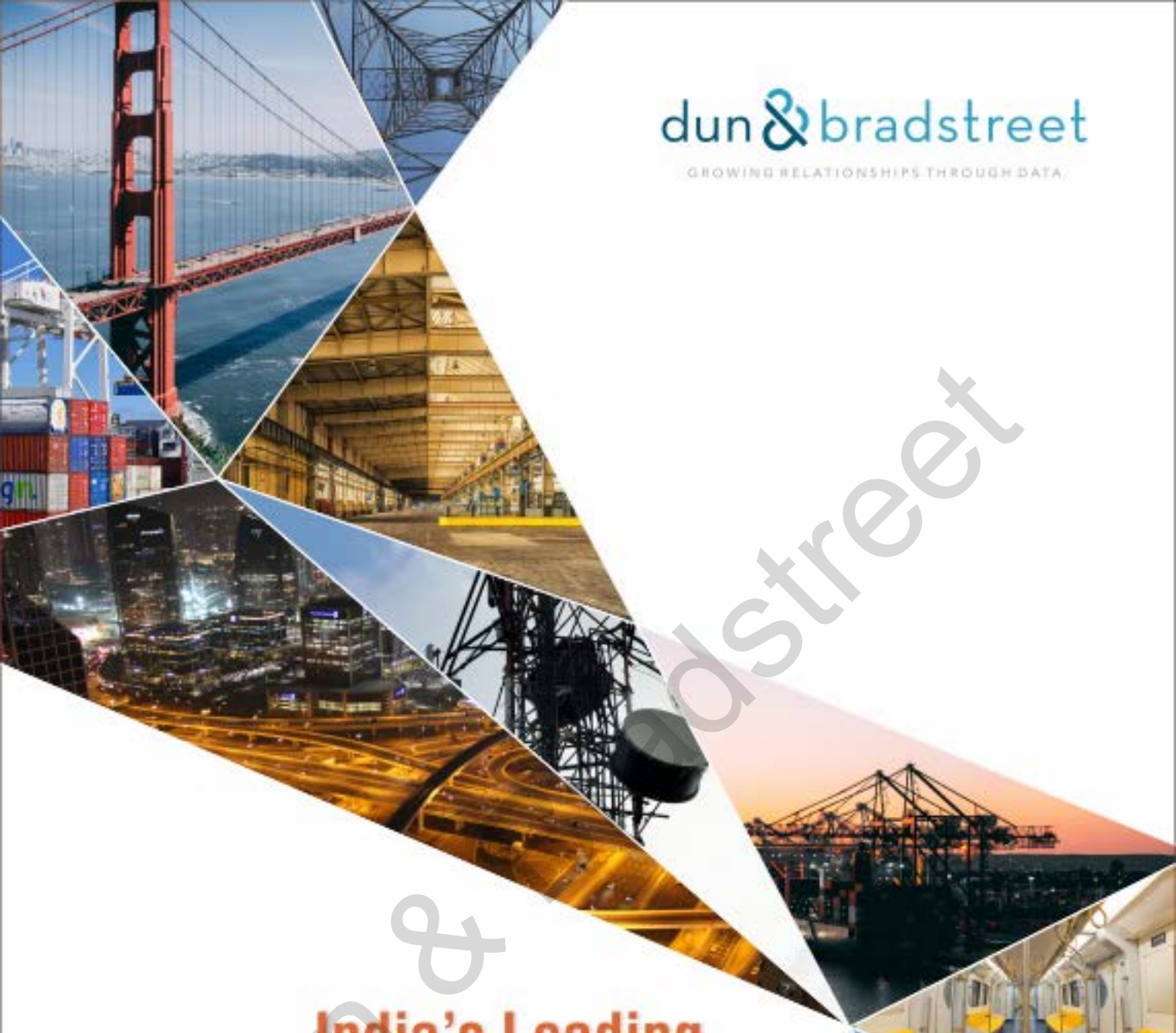

India's Leading Infrastructure Companies 2019

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India's Leading Infrastructure Companies 2019

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Preface

Manish Sinha
Managing Director – India
Dun & Bradstreet

Dun & Bradstreet India is pleased to announce the 12th edition of its publication '**India's Leading Infrastructure Companies**'. The publication provides an insight on India's Infrastructure sector; specifically analyses on Construction, Ports, Power, Oil & Gas and Telecom.

A study of infrastructure covers three themes: long term forecasts, urbanization, and investments. Firstly, all conversations around infrastructure tend to be long-term. From the infrastructure perspective, a frequently quoted year of reference is 2050. It is an interesting data point: by 2050, the Indian economy (in PPP terms) will be equal to the combined current size of the economies of USA and China put together. No other major economy is set to witness a growth of this magnitude.

Secondly, as economies grow and become richer, they also become more urban. If we were to map the level of urbanisation and per capita gross domestic product (GDP) of countries, we will find that the richer countries such as USA, Germany and Japan are more urbanised. Not surprisingly, India along with other developing countries are also less urban. The contribution of urban areas to India's GDP is expected to grow from around 60% in 2020 to around 85% by 2050. This increase in urban GDP will be accompanied by an increase in urban population. Nearly 400 mn people are likely to be added to the cities in the next 30 years, whereas the previous 400 mn took almost 60 years. So, the cities are going to become more crowded and at a much faster rate, thus creating a pressing need for developing urban infrastructure.

Thirdly, more infrastructure essentially means more investments. India's actual infrastructure investment stood at around US$ 105 bn in 2018: this was approximately half of the required level of US$ 201 bn. The cumulative infrastructure investment requirement by 2030 will be 30 times of the actual infrastructure investment in 2018. The multiplier will be 60 times by 2040 and 100 times by 2050.

From a user's perspective, these trends mean a significant evolution of core infrastructure. Unpaved roads will become paved roads, then highways, and then smart highways. The power sector will witness a change from coal-based plants to solar plants and later to more effective and environmentally friendly sources. We will see similar changes in all aspects of core infrastructure, from railways to communication. In this context, NextGen Infrastructure will have a key role to play in improving the quality of life and productivity across cities.

I hope you enjoy reading '**India's Leading Infrastructure Companies 2019**' and I look forward to receiving your suggestions.

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Foreword

Pankaj Khanna
Head – Learning & Economic Insights Group
Dun & Bradstreet India

Dun & Bradstreet India is pleased to bring to you the 12th edition of its premier publication '**India's Leading Infrastructure Companies 2019**'. For more than a decade, the publication has served as a reliable resource of information on the Indian infrastructure sector and its leading companies. In addition to profiling of leading companies of the infrastructure sector, the publication also provides valuable information on the trends in the various sub-segments of this important sector.

India is currently going through rapid transformation, in terms of reforms as well as infrastructure development. The infrastructure landscape has changed significantly in the past few years, for various reasons. There is renewed thrust on development, with the government focusing not only on new constructions, but also on reviving previously stalled/shelved projects. The sector is also witnessing the emergence and adoption of new technologies in infrastructure, which are adding value, helping reduce cost and time overruns, enhancing efficiencies, and even giving rise to futuristic infrastructure. Accordingly, we are witnessing the emergence of technology providers and service providers for smart infrastructure in the infrastructure ecosystem. Furthermore, rapid urbanization is expected to remain a major driver of increased infrastructure spending for years to come.

The Government is making efforts to steer the economy towards becoming a US$ 5 trillion economy. It is also working on its vision of a New India by 2022, the year that would mark 75 years of India's independence. Accordingly, the NITI Aayog drafted a strategy document titled 'Strategy for New India@75', to lay a roadmap to achieve this objective. It is not surprising that infrastructure has been listed as one of the four critical components of this strategy. Sustainable Development is also a critical component of India's growth vision, with India having signed the declaration on the 2030 Agenda for Sustainable Development; under this Agenda, there are 17 Sustainable Development Goals, including Infrastructure, Climate Action, Water Management and Sanitation, Sustainable Cities & Communities and Affordable & Clean Energy, among others. In line with this, the publication will also have a section on the topic **Infra@75: Building Modern & Sustainable Infrastructure**. This section will largely focus on areas such as next-generation infrastructure (modern transportation, innovative construction methods and use of innovative materials, etc.), energy self-sufficiency, smart solutions and telecommunications and water security.

We are confident that '**India's Leading Infrastructure Companies 2019**' will serve as a well-researched compendium on the Indian infrastructure sector. We thank you for your continued support and look forward to receiving your feedback and suggestions.

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Executive Summary

Naina R Acharya
Leader - Learning & Economic Insights Group
Dun & Bradstreet India

Dun & Bradstreet is proud to present the publication '**India's Leading Infrastructure Companies 2019**'. The publication, now in its 12th year, highlights the role of infrastructure in the Indian economy by featuring and analysing the performance of the leading companies in the sector. The publication covers key infrastructure segments such as construction, oil & gas, ports, power, telecom and logistics infrastructure.

The publication profiles the leading companies of the Indian infrastructure sector that have reported annual total income of ₹ 1,000 mn and above on a standalone basis during FY19. The current edition profiles 101 companies across key infrastructure segments, of which 43 companies belong to the construction segment (including development of airports & seaports, industrial units, roads, and railways), 22 in the power segment, 17 in the oil & gas segment, seven in the ports segment, nine in the telecom segment and three in the logistics segment.

Following are some of the key highlights covered in this publication:

- The Ministry of Road Transport & Highways termed FY19 as the 'Year of Construction'. During the year, a record-breaking 10,855 km of National Highways were built, as against 9,829 km built in FY18. The pace of road construction increased to around 30 km per day in FY19 from 22.5 km per day in the preceding year.
- In FY19, the passenger traffic handled by Indian Railways stood at 8,354 mn, which was marginally higher than the traffic of 8,286 mn recorded in the previous year. On the other hand, the revenue earning freight traffic stood at ₹ 1,223.3 MT, 5.5% higher than a year ago.
- During FY19, the passenger traffic handled by Indian airports grew by 11.6% vis-à-vis the previous year to 344.7 mn. Domestic passenger traffic grew by a healthy 13.1% to 275.2 mn during the year.
- During FY18, all ports in India (major and minor) collectively handled total cargo traffic of about 1,208.5 MT, which translates into an increase of 6.6% over FY17. Going ahead, however, the cargo traffic at major ports grew by a modest 2.9% to 699 MT in FY19.
- As of 30 September 2019, India's installed power generation capacity stood at 363.4 GW; the private sector accounts for 47% of the total installed capacity.

We are confident that '**India's Leading Infrastructure Companies 2019**' will provide the right platform for the profiled companies that are playing a key role in transforming the infrastructure sector. We will look forward to receiving your feedback for enhancing the publication.

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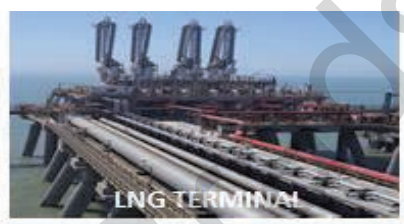

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Methodology

For the purpose of the publication '**India's Leading Infrastructure Companies 2019**', the term Infrastructure has been defined to include key segments, viz., construction, oil & gas, ports, power, telecom and logistics infrastructure. The construction segment includes construction of facilities such as roads & highways, railways, power projects, ports and airports, industrial plants, etc. Logistics infrastructure includes multimodal logistics parks comprising inland container depots (ICDs), cold chain facilities and warehousing facilities.

In order to ensure participation for the publication and the awards, emails, letters and social networking were leveraged to reach out to companies forming part of Dun & Bradstreet India's in-house database and to companies registered with respective regulatory bodies and industry associations. However, companies that have not responded with FY19 standalone financial statements, and/or whose required financial information was not available in public domain, have not been included. Companies that have explicitly declined participation have also been left out.

Eligibility Criteria

As a basic selection criterion, companies with a standalone total income of ₹ 1,000 mn and above in FY19 have been featured in this publication. The publication includes companies with substantial presence in the Infrastructure sector as defined for the purpose of this publication. We have also considered additional exclusion criteria of the corporate governance record and financial health (*) to arrive at the final list of companies to be featured in the publication.

** Macroeconomic conditions in India, in the past few years have impacted the financial health of many Indian companies. There have been instances wherein companies faced difficulties in servicing their debt and have been subject to bankruptcy proceedings at the National Company Law Tribunal (NCLT) or have adopted different debt restructuring mechanisms. In such cases (where information is public), an additional criteria set has been applied to include and exclude companies from the publication.*

Source of Information

The information contained in this book is sourced and compiled from company websites and information available in the public domain such as annual reports, draft red herring prospectus, industry bodies and associations, Government of India websites such as Reserve Bank of India, Securities and Exchange Board of India, Economic Survey, Central Statistical Organisation, National Highways Authority of India, Planning Commission, Telecom Regulatory Authority of India, Department of Telecommunications, etc. The information has been further verified and authenticated to ensure its accuracy. To ensure that all the information contained in this publication is verified and authenticated, companies that have not responded with financials statements, and/or their information is not available in public domain at the time of compiling this publication are excluded. The various financial computations are based on Dun & Bradstreet's methodology and have been explicitly explained in the 'Definitions and Calculations' section.

A standardized format has been used for reporting the information about the companies. The editorial team would appreciate feedback from readers in terms of updates regarding any changes in their companies, as and when they occur. Each company featured in the publication has been allotted a unique identification number (D-U-N-S® - Data Universal Numbering System). This will help readers locate and obtain full-fledged information reports on these companies from the Dun & Bradstreet database.

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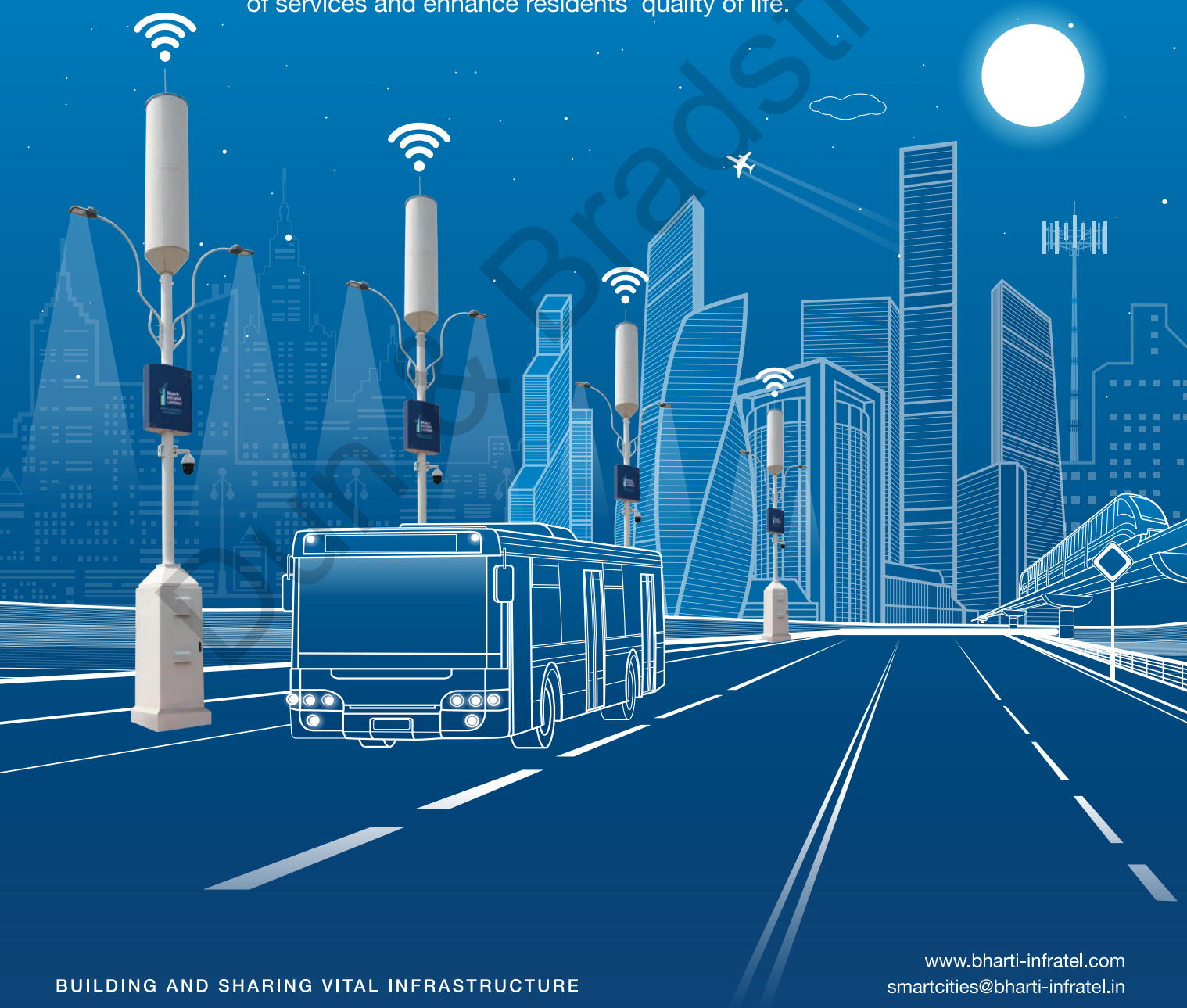

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Definitions & Calculations

This section defines financial terms and ratio for FY19 and FY18, used in this publication.

Ratios

Particulars	Definition
Total Income	Total revenue including other income as reported in the company's standalone financial statements
Net Profit	Profit after tax as reported in the company's standalone financial statements.
Total Assets	Non-Current Assets + Current Assets (excluding accumulated losses and deferred expenses) as reported in the company's standalone financial statements
Net Profit Margin (NPM) (%)	(Net Profit/Total Income)* 100
Return on Assets	(PAT/Average Total Assets) * 100
Debt-to-Equity (times)	(Total Debts) /Shareholder's Fund
Shareholder's Fund	Equity Share Capital + Preference Share Capital+ Reserves and Surplus – Accumulated Losses – Deferred expenses
Total Debt	Short Term Debt + Long Term Debt
Average Total Assets	(Opening Total Assets + Closing Total Assets)/2

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OVERVIEW OF THE INDIAN INFRASTRUCTURE SECTOR

Overview of the Indian Infrastructure Sector

Infrastructure is a key driver for any economy, especially for a huge and developing economy like India. Since infrastructure plays huge role in propelling India's overall development, it is a subject of a great deal of focus by the Government. The sector covers roads, highways & bridges, railways, airports, ports, logistics, telecom and urban infrastructure development.

The Government of India is taking every possible initiative to boost the infrastructure sector. For instance, the Government gave a massive push to infrastructure by allocating ₹ 4,560 bn towards the sector. It would not be wrong to say that the Government has given a renewed thrust to infrastructure development, both in terms of investment in new infrastructure, as well as in terms of reviving previously shelved/stalled projects. The sector is also attracting significant interest from international investors; according to the Department of Industrial Policy and Promotion (DIPP), FDI received in Construction Development (townships, housing, built up infrastructure and construction development projects) from April 2000 to March 2019 stood at US$ 25 bn. However, given the fact that India has a rapidly growing population and is undergoing rapid urbanisation, there is a high degree of stress on the existing infrastructure. It is estimated that India requires investment in infrastructure to the tune of ₹ 50 trillion by the year 2022 in order to sustain its growth.

Given this backdrop, this chapter will dwell on the current status of India's infrastructure and its various sub-segments. It will discuss challenges faced, will explore strategies employed thus far and will deliberate on possible solutions to these challenges.

Roads & Highways

Present scenario

Roads & highways play a significant role in terms of facilitating the movement of goods & passengers as well as contributing to the national economy. Road transportation in India accounts for about 3.14 per cent of the GVA and 69% & 90% of the country wide freight and passenger traffic, respectively.

India has a road network of approximately 5.9 mn km, which is the second largest in the world. This comprises National Highways, Expressways, State Highways, Major District Roads, Other District Roads and Village Roads among others. The length of the India's national highways/expressways network stands at a 132,500 km (accounting for 2.2% of India's total road network) and state highways stands at 156,694 km (2.7% of the country's total road network). The total road length of the country increased monumentally from 0.4 mn km in 1951 to 5.9 mn km in 2017, increasing at a CAGR of 4.2%.

Top 6 states details of NH in India

Name of State	Total Length as on 31 March 2019 (in km)	Total Length as on 31 December 2017 (in km)
Maharashtra	17,756.6	16,238.5
Uttar Pradesh	11,736.8	9,016.9
Rajasthan	10,341.8	8,971.5
Madhya Pradesh	8,772.3	8,052.7
Karnataka	7,334.8	6,991.1
Andhra Pradesh	6,913.5	6,383.2

Source: MoRTH

The Ministry of Road Transport & Highways (Ministry) has been constantly focusing on expanding the highway infrastructure throughout the country. The Ministry took a decision to complete the ongoing projects that were awarded upto FY16 and achieved the highest ever construction of 10,855 km of National Highways during FY19, as against 9,829 km achieved during FY18. Accordingly, the Ministry of Road Transport & Highways termed FY19 as the Year of Construction. Road projects exceeding 52,000 km in length, with an approximate value of more than ₹ 0.6 mn were under progress. The pace of road construction during FY19 was about 30 km per day as compared to 12 km per day in FY15.

Road development during 2014 -15 to 2018-19

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Award of NHs/ Road projects	7,972	10,098	15,948	17,055	5,470
Construction of NHs/ Roads	4,410	6,061	8,231	9,829	10,824
Road construction per day	12	17	23	27	30

Source: MoRTH

On the rural front, under the Pradhan Mantri Gram Sadak Yojana (PMGSY), the target of connecting the eligible and feasible habitations was advanced from the year 2022 to 2019, to accelerate the speed of achieving universal connectivity of eligible habitations. Moreover, weather connectivity was provided to more than 97% of such habitations. This was achieved by maintaining a high pace of road construction of 130 to 135 km per day for a period of 1,000 days. A total of 30,000 km of PMGSY roads were built using Green Technology, Waste Plastic and Cold Mix Technology, thereby helping reduce carbon footprint and promoting sustainable development. As per the Economic Survey 2018-19, approximately 190,000 km of rural roads were constructed under PMGSY since 2014.

Some of the major projects under implementation:

Project Name	Project Details	Additional Information
Delhi-Meerut Expressway	▪ To improve connectivity between Delhi and Meerut and beyond this, with Uttar Pradesh and Uttarakhand ▪ The Expressway is being constructed in 4 packages	Total investment – ₹ 49.8 bn Total length - 82 km, of which the first 27.74 km will be 14-laned & remaining will be 6-lane expressway
Delhi – Vadodara Expressway	▪ Greenfield alignment between Delhi – Vadodara through Sohna, Dausa, Jaora, Ratlam & Godhra ▪ Expected to reduce the travel distance between Delhi – Vadodara by 140 km	Total length - 840 km
Vadodara-Mumbai Expressway	▪ Greenfield alignment between Vadodara – Mumbai Kim, Talasari, Vasai and Thane has been finalized ▪ Awarded work for a stretch of 124 km for Vadodara-Kim sector and bids invited for 151 km between Kim and Talasari	Total length – 360 km
Bangalore-Chennai Expressway	▪ DPR is under progress ▪ Green-field alignment of the proposed expressway is running in between two stretches ▪ Two existing roads connecting Bangalore-Chennai, one is via Hoskote (Bangalore)-AP then to Chennai & second is via Electronic City (Bangalore) Hosur (Tamil Nadu) and then to Chennai	Total length – 260 km
Bridge over Ganga in Phaphamau in Allahabad	▪ Approval has been given for a project for construction of 6- lane bridge across river Ganga on NH-96 at Phaphamau in Allahabad ▪ Bridge is expected resolve the traffic congestion on existing old 2-lane Phaphamau bridge on NH-96 at Allahabad ▪ Project completion expected by December 2021	Total investment – 19.5 bn Total length – 9.9 km

Source: MoRTH

Some of the major programmes, projects & structures under implementation in the sector as on 31 March 2019 were:

- **Bharatmala Pariyojana** - In 2017, an umbrella programme was approved for the construction/up-gradation of National Highways of 34,800 kms length for a period of five years (FY18 to FY22) at an estimated cost of ₹ 5,350 bn.
- **Setu Bharatam** - Under this programme, out of 174 ROBs/RUBs to be constructed, 91 have been sanctioned with an estimated cost of ₹ 71 bn. Out of 91 sanctioned, 59 ROBs/RUBs have been awarded and are in various stages of progress.
- **Chardham Mahamarg Vikas Pariyojana** – The said EPC project involves development of 889 km of roads in Uttarakhand with configuration of two-lane with paved shoulders at an estimated cost of about ₹ 120 bn. The project is expected to be completed by March 2020.
- **Highways Projects in the North-East** - Projects worth ₹ 1,900 bn have been sanctioned for the construction of roads for over 12,000 km in the North East region.
- **Logistics Parks** - A network of 35 Multimodal Logistics Parks was identified for development in the Phase–1 of Bharatmala Pariyojana. The availability of the land parcels for development of Multimodal Logistics Parks was confirmed at seven locations and DPRs was initiated in all the nodes.

Major projects were completed in FY19:

Name of project	Description of project	Additional Information
Eastern Peripheral Expressway (EPE) – Western Peripheral Expressway (WPE)	The two projects of Peripheral Expressways around Delhi, comprising 135 km EPE and 135 km WPE connecting NH-1 and NH-2 from Western and Eastern side of Delhi were completed & inaugurated in May 2018 and November 2018 respectively.	The two expressways were conceptualised with the twin objectives of decongesting and de-polluting the national capital by diverting the traffic. This project generated employment opportunities of about 50 lakh man-days
Varanasi Airport Road and Ring Road	In November 2018, inauguration of the 16.55 km, ₹ 7.6 bn Varanasi Ring Road Phase-I and 17.25 km, ₹ 8.1 bn Babatpur-Varanasi road on NH-56	Reduced the travel time from Varanasi to the airport Relief to the people of Varanasi and tourists with a more convenient access to Sarnath, a site for Buddhist pilgrimage.

Source: MoRTH

The Ministry of Road Transport & Highways launched major initiatives to upgrade and strengthen National Highways through various phases of the National Highways Development project (NHDP). For the period 1 January 2018 up until 31 March 2019, a length of 8,741 km of National Highways was constructed under non-NHDP scheme and a length of 18,385 km was awarded.

Status of various programmes under NHDP up to 31 March 2019

NHDP Phases	Projects	Total length in km	Length completed from 1 January 2018 - 31 March 2019 (in km)	Length completed upto 31 March 2019 (in km)
NHDP - I, NHDP - II, NHDP - III, NHDP - IV	Bharatmala Pariyojana - GQ, Port connectivity & Upgradation with 2/4/6-laning / Development of North South-East West Corridor	46,278	3,447	33,808
NHDP - V	6-laning of GQ and High density corridor	6,500	621	3,264
NHDP - VI	Expressways	1,000	176	176
NHDP - VII	Ring Roads, Bypasses and flyovers and other structures	700 km of ring roads/ bypass & flyovers etc	91	115
SARDP-NE	Phase A & Arunachal Package	6,418	586	3,029
LWE	Including Vijayawada Ranchi Route	6,014	760	5,279
EAP	WB + JICA + ADB	1,985	261	1,018

Source: MoRTH

Some of the steps/policy initiatives taken by the Ministry of Road Transport & Highways to revive stalled projects in the last five years include:

- 100% equity divestment two years post COD – Enabling private developers to take out their entire equity and exit all operational BOT projects two years from start of operations (COD) irrespective of the date of award
- Premium deferment in stressed projects - Permitting rescheduling of premium committed by concessionaires during bid stage for awarded projects
- Rationalized compensation to concessionaires for languishing NH projects in BOT mode for delays not attributable to concessionaires
- One-time fund infusion - Enabling revival and physical completion of languishing BOT projects that have achieved at least 50% physical progress, through one-time fund infusion by NHAI, subject to adequate due diligence

Support from the National Highways & Infrastructure Development Corporation (NHIDCL)

NHIDCL has been focusing on the development of National highways and other infrastructure in the north-east and strategic areas of India sharing international borders. As on 31 March 2019, NHIDCL is in the process of developing 291 projects for the development of approximately 13,630 km length of NHs, Bharatmala & In-principle NHs to be executed at an outlay of more than ₹ 2,016 bn.

Projects planned for award in FY20 by NHIDCL

State	Total Nos	Length (in Km)	Cost (in bn)
Arunachal Pradesh	1	8	6.9
Assam	3	81	61.9
Manipur	7	424	71
Meghalaya	6	553	90.8
Mizoram	3	189	28.3
Nagaland	2	161	26
Uttarakhand	2	233	35
West Bengal	1	6	0.9
Total	25	1,655	320.8

Source: MoRTH

Focus on research and development during 2018-19

The Ministry of Road Transport & Highways constantly undertakes research and development in order to update the specifications for road & bridge works, to effectively implement projects and recommend new techniques for highway planning, design, construction and maintenance. During FY19, an outlay of ₹ 408.8 mn was set aside by the Ministry for research and development of the road infrastructure in India. Some of the sanctioned schemes for the development of roads & bridges were as follows:

- ₹ 6.3 mn was set aside for the research scheme to study the corrosion of various reinforcement bar materials/structural steel including anti-corrosion coatings, concrete treated with surface coating under different environment exposer condition
- ₹ 3.6 mn was earmarked for research scheme for estimation of Modulus of Resilience by volumetric/ performance properties of Asphalt Mixes

Policy Support

The Union Budget 2018-19 proposed the following:

- An estimated cost of ₹ 802 bn is envisaged under the PMGSY –III to upgrade 125,000 km of road length over the next five years to enhance connectivity between villages and rural markets
- A comprehensive restructuring of National Highway Programme is expected to be conducted to ensure that the National Highway Grid of desirable length and capacity is created using financeable model
- Second phase of Bharatmala will be launched to develop the state road networks
- Increase in Special Additional Excise Duty and road and infrastructure cess each by ₹ 1 per litre on petrol and diesel

Other measures/policies to facilitate the development of the sector include:

- An amount of ₹ 5 bn was set aside for the state roads under Inter State Connectivity and Economic Importance (ISC&EI) and 34 proposals involving cost of ₹ 4.4 bn was sanctioned for improvements during 2018-19
- Under green initiatives, the Ministry has notified emission standards for Construction Equipment Vehicles and Tractors. In October 2018, an advisory was issued to all the states by the Ministry wherein all the PUC vendors were directed to comply with the guidelines and facilitate electronic uploading of emissions test data to VAHAN database

- BhoomiRashi - the portal of the Ministry allowing complete digital and paper-less processing of land acquisition related notification resulting in transparent, efficient and error-free handling of land acquisition for expansion and/or development of a National Highways
- eDisha - an Enterprise Resource Planning project to facilitate the flow of real time information across departments inorder to deliver data-driven decisions & performances
- Initiatives such as Revision in Maximum Speed of vehicles, Notification regarding Registration Mark of Battery Operated Vehicles were introduced
- 100% FDI allowed under automatic route

The Way Forward

Apart from contributing towards the national economy, roadways also play a vital role in promoting socio-economic development across various regions of the country and neighboring countries. The International Cooperation Division of the Ministry has been actively engaged in various bilateral and regional level activities for cooperation with neighboring countries. The capacity of roadways and highways in terms of handling traffic has to be in tandem with the industrial growth. As such, development of infrastructure is of utmost priority for the government. The significant investments in the roads & highways sector will also give an impetus to its growth and development.

Railways

With a history that is more than 165 years old, the Indian Railways (IR) is a public utility service that has played a critical role in India's growth and development. Run under the Ministry of Railways, the IR is the third largest rail network in the world after the USA and China, with a length of 68,442 km at the end of FY18. It is the world's largest government-owned railway network. It is also the fourth largest freight carrier and the largest passenger carrier in the world. As a matter of fact, it is the most commonly used and cost effective long distance means of transport system, especially for the low and middle income population of the country. In that sense, it would not be wrong to say that the Indian Railway system has integrated the lives of 1.3 bn Indians.

The origins of railway systems in India can be traced back to the early 1800s. The Red Hill Railway which ran from Red Hills to the Chintadripet Bridge in Madras (1837) was the first train to run in India. The first passenger train in 1853 covered a 34 km stretch between Bori Bunder (Mumbai) and Thane with about 400 people in 14 carriages.

Current Status

Indian Railways – Key Statistics

Parameters	2017-18	2016-17	% change
Route km	68,442	67,368	1.6
Broad gauge (km)	63,491	61,680	2.9
Metre gauge (km)	3,200	3,479	(8.0)
Narrow gauge (km)	1,751	2,209	(20.7)
Running track km	94,735	93,902	0.9
Total track km (all gauges)	123,236	121,407	1.5
Electrified route km	29,376	25,367	15.8
Rolling stock (units)			
Wagons	2,79,308	2,77,992	0.5
Locomotives	11,764	11,461	2.6
Coaches	71,825	70,984	1.2
Passenger traffic (mn)	8,286	8,116	2.1
Freight traffic (MT)	1,159.6	1,106.1	4.8
Total revenue earning (₹ bn)	1,787.2	1,652.9	8.1
passenger (₹ bn)	486.4	462.8	5.1
freight (₹ bn)	1,135.2	1,020.3	11.3
Railway Stations (nos.)	7,318	7,309	0.1

Source: Ministry of Railways

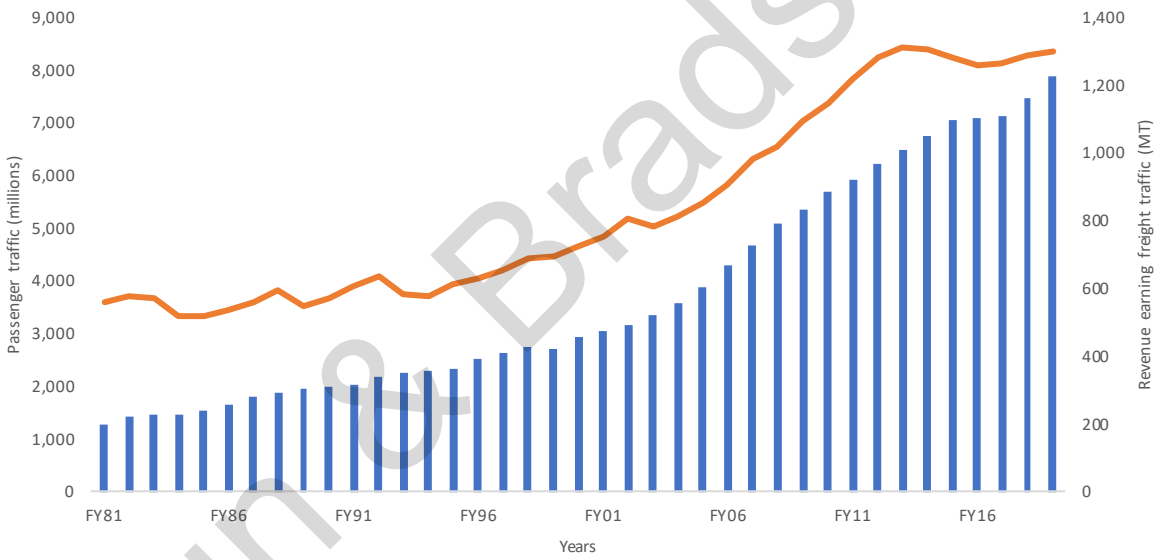
IR's Passenger Traffic Grows by Modest 2.1% in FY18

In FY18, the passenger traffic of the IR grew by a modest 2.1% as compared to the preceding year to 8,286 mn. Over the same period, the IR's revenue earning freight traffic grew by a faster 4.8% to 1,159.6 MT.

During the year, passenger earnings constituted 27.2% of the gross earnings, of which 82.7% was from express long distance traffic. On the other hand, freight earnings continues to be the major revenue earning segment for the IR, accounting for as much as 65.5% of gross earnings in FY18. Bulk freight like coal, ores, iron & steel, cement, foodgrains, fertilizers, POL products, limestone, dolomite, stones other than marble, salt and sugar contributed to more than 90% of the total goods earnings during the year.

Moving further, data suggests that the passenger traffic of the IR has increased marginally to 8,354 mn in FY19. On the other hand, the revenue earning freight traffic grew by another 5.5% to 1,223.3 MT.

Year-wise trends in IR's traffic



Source: Ministry of Railways

IR's Net Spends Upwards of ₹ 1 Trillion in FY18

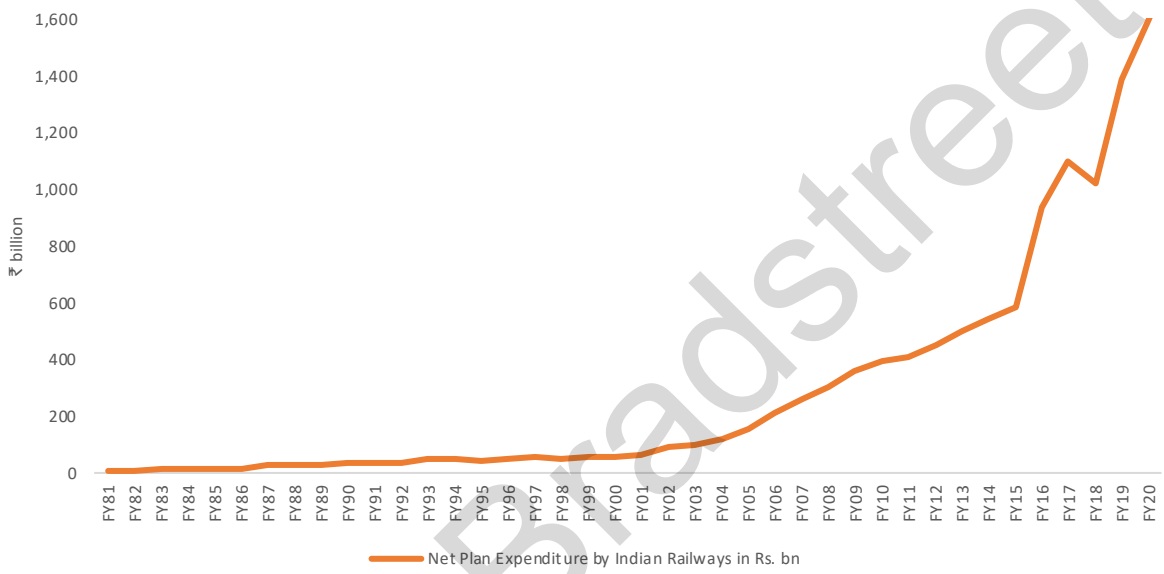
During FY18, the IR's net plan expenditure stood at ₹ 1.02 trillion. This was on the back of a ₹ 1.1 bn spend in FY17. Going further, the IR is estimated to have spent ₹ 1.38 bn in FY19 and another ₹ 1.6 bn in FY20.

A more detailed analysis of the expenditure heads on a decadal basis shows an uptick in investments in the railways since the early 1990s, which went on to grow manifold in the mid-2000s. Project Unigauge was launched in the early 90s as n effort to convert all rail gauges in India from metre and narrow gauge to broad gauge, and thereby increase speeds and load-bearing capacities of the railways. As at the end

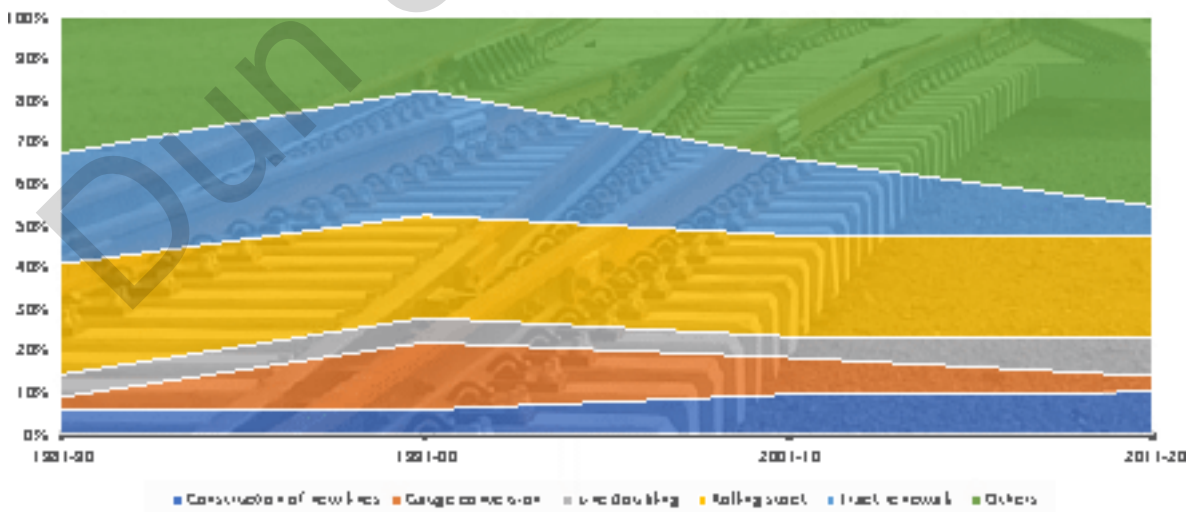
of FY18, nearly 93% of the existing 68,442 route km length of the IR had already been running on Broad Gauge.

Furthermore, the Indian Government had also begun aggressively pushing for investment in terms of construction of new lines, line doubling, renewals of tracks and rolling stock in the mid-2000s. These investments have been sustained since then.

Indian Railways Year-Wise Net Plan Expenditure – 1981-2020 (₹ bn)



Source: Ministry of Railways, Dun & Bradstreet Research



Source: Ministry of Railways, Dun & Bradstreet Research

Key developments

Union Budget

- The Union Budget 2019-20 has allocated ₹ 940.7 bn towards the Ministry of Railways
- The Budget has allocated ₹ 22 bn for gauge conversion, ₹ 7 bn for doubling of tracks, ₹ 61.1 bn towards rolling stock and ₹ 17.5 bn towards signalling and telecom.
- The Government has also proposed investing ₹ 50 trillion in railway infrastructure between 2018-30.

Dedicated Freight Corridor

- The Dedicated Freight Corridor Corporation of India Ltd (DFCCIL) is building the Eastern Freight Corridor (Ludhiana to Dankuni – 1,856 km) and the Western Freight Corridor (Dadri to Jawaharlal Nehru Port – 1,504 km) at a cost of ₹ 81 bn

High-speed and semi high-speed trains

- IR seeks to build seven high-speed rail corridors across the country at a cost of US$ 17 mn.
- IR has collaborated with the Government of Japan for the construction of a high speed passenger train corridor between Ahmedabad and Mumbai; it is expected to get completed by 2023.
- The IR is seeking cost-effective options to increase speeds on various routes to 160-200 km per hour from the existing 110-130 km per hour.
- India is focussing on manufacturing and exporting bullet train coaches to bring down the cost of Shinkansen trains
- The Vande Bharat Express is a semi high-speed train service that will run between Delhi and Varanasi; the service uses semi high-speed intercity electric multiple units (EMUs) designed and built by Integral Coach Factory, Chennai, under the Make in India initiative. The Vande Bharat Express train between Delhi and Katra was flagged off in October 2019.
- Train 20 high speed next generation sleeper class train will replace Rajdhani Express and will be rolled out by 2020.

Passenger safety

- There has been a vast improvement in passenger safety over the past few years. The number of deaths has declined by 81% from 152 in FY14 to 29 in FY19 (till January).

Policy Support

- The Government is mulling over a National Rail Plan to enable the integration of its rail network with other modes of transport, for a multi-modal transportation network
- A new Metro Rail Policy is likely to be announced with a focus on innovative models of implementation and financing, standardization and indigenisation of hardware and software.

The Way Forward

Although railways has historically been the backbone of the country's transport network, it has witnessed lack of adequate investment and development. The infrastructure is overstretched with more than 60% of routes being more than 100% utilized. On a positive note, however, IR plans to undertake 22,825 km of new line and 12,215 km of line doubling. Furthermore, about 3,360 km of the Dedicated Freight Corridor is expected to be commissioned by 2020. There are eight proposed high speed rail projects in the pipeline for the next 15-20 years, entailing an aggregate investment of more than ₹ 13 trillion.

About ₹ 1.1 trillion worth of investment opportunities in station and commercial development around stations is anticipated under IR's station redevelopment programme. In fact, the Ministry of Railways is targeting 100% rail electrification over the next 10 years; moreover, it seeks to achieve this through renewable energy. In this direction, IR has already set ambitious targets of setting up 1,000 MW and 200 MW of solar and wind power respectively by 2020.

Overall, the railways sector in India is poised to become one of the major drivers for economic growth in the country. Going forward, IR's network expansion and decongestion plans will not only lead to improved capacities to handle passenger and freight traffic but will also create huge opportunities for construction companies and support sectors.

Ports

With a coastline spanning about 7,517 km across 13 maritime states and union territories, India is amongst the largest maritime countries in the world. According to the Ministry of Shipping, Indian ports handle nearly 90% of India's external trade by volume and 70% by value. India presently has 13 major ports (12 government-controlled and one private) and more than 200 non-major ports.

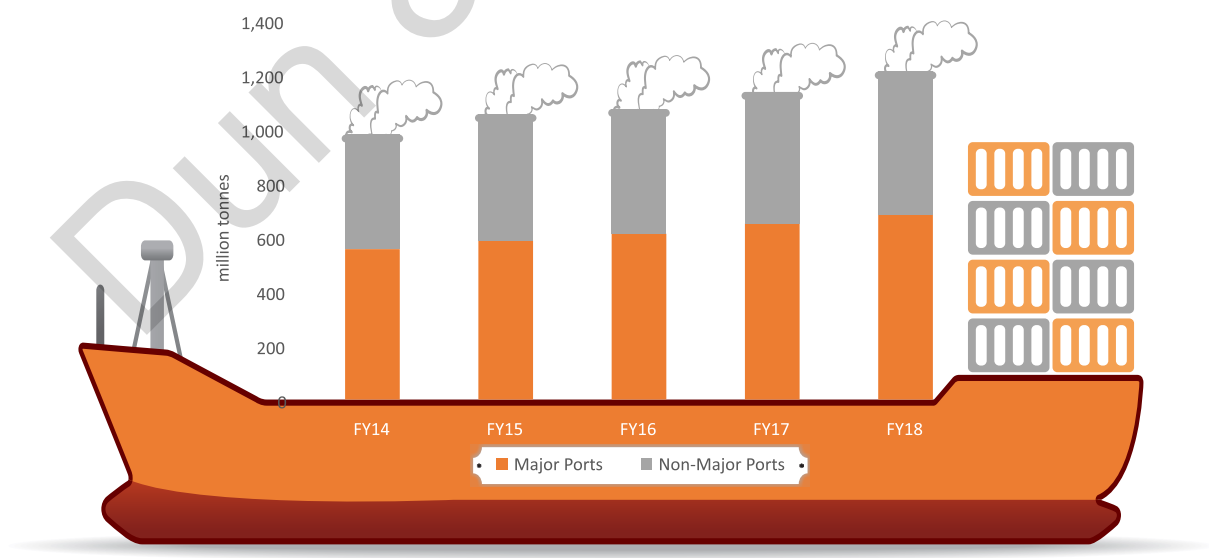
The 13 major ports play a critical role in India's maritime transport. In terms of number of ports and traffic handled, the major ports are almost equally split between the west coast (Kandla, Mumbai, JNPT, Mormugao, New Mangalore and Cochin) and east coast (Kolkata, Haldia, Paradip, Visakhapatnam, Kamarajar, Chennai and VO Chidambaranar Port Trust, Tuticorin). These 13 major ports collectively account for more than half of the total cargo traffic handled at all Indian ports.

Cargo Traffic at Indian Ports Grows by 6.6% in FY18

During FY18, the cargo traffic handled collectively by major and non-major ports in India stood at around 1,208.5 MT. This translates into a growth of 6.6% y-o-y. The 13 major ports collectively reported a 4.8% y-o-y growth in cargo handled during the year to 679.4 MT. On the other hand, the cargo traffic at non-major ports grew by a faster 9% to 529.1 MT.

Going ahead, the cargo traffic at major ports increased by a modest 2.9% to 699 MT in FY19.

Cargo handled at Indian Ports



Source: Ministry of Shipping

Share of Minor Ports in Overall Cargo Traffic on the Rise

In terms of a five-year timespan, the cargo traffic at all ports taken together grew a CAGR of 5.3% per annum. The traffic at major ports grew by a CAGR of 4.5% per annum during this period. On the other hand, the traffic at non-major ports grew by a faster 6.4% per annum.

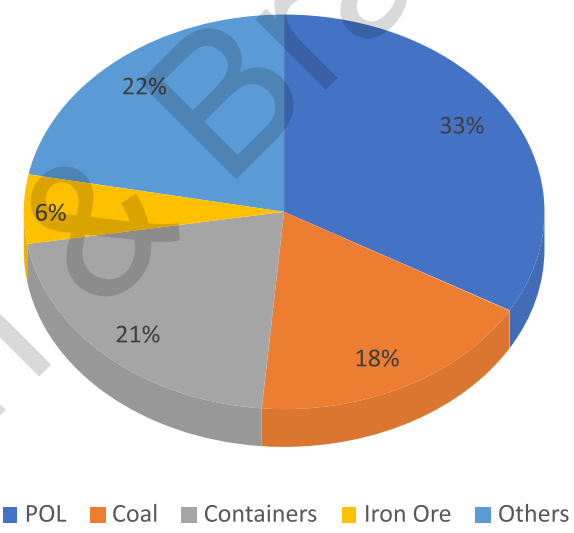
Over the years, the share of non-major ports in overall cargo traffic has expanded significantly. It increased from 18.9% in FY2000 to a much higher 43.8% in FY2018.

POL and Coal Continue to Account for Major Share of Traffic

There are five major commodity groups, namely coal, petroleum, oil & lubricants (POL), iron ore, fertilizers and containers, that collectively account for more than 80% of the traffic at Indian ports – both major as well as non-major.

An analysis of the commodity-based composition of the cargo traffic at major ports shows POL as the single largest commodity handled by the ports, accounting for 33.2% of traffic in FY19. Containerised cargos accounted for 20.8% of the traffic during the year. This was followed by coal (18%) and iron ore (5.9%). While coal and POL have been showing steady growth, there has been fluctuation in the traffic of containers and fertilizers over the past few years. In contrast, there has been a steep rise in iron ore traffic.

Commodity-based Composition of Cargo Traffic at Major Ports (FY19)



Source: Ministry of Shipping

Performance Indicators for Major Ports

Capacity Utilisation

As per data furnished by the Ministry of Shipping, the cargo handling capacity of major ports increased from 1,065.8 MT in FY17 to 1,451.2 MT in FY18, and further to 1,477.2 MT as of Dec-18. Projects have been identified in order to enhance the capacity to more than 3,500 MMTPA by the year 2025, in order to cater to projected traffic levels of 2,500 MT by that time.

The port-wise capacity and traffic handled during FY18 can be seen in the table below: -

Name of the Port	Capacity	Traffic	Capacity Utilization (%)
Kolkata	31.6	17.4	55.1
Haldia	51.0	40.5	79.4
Paradip	239.0	102.0	42.7
Visakhapatnam	131.1	63.5	48.5
Kamarajar	84.0	30.4	36.2
Chennai	134.0	51.9	38.7
V.O. Chidambaranar	94.8	36.6	38.6
Cochin	74.5	29.1	39.1
New Mangalore	98.0	42.1	42.9
Mormugao	63.0	26.9	42.7
JNPT	118.0	66.0	55.9
Mumbai	79.0	62.9	79.6
Kandla	253.2	110.1	43.5
Total	1,451.2	679.5	46.8

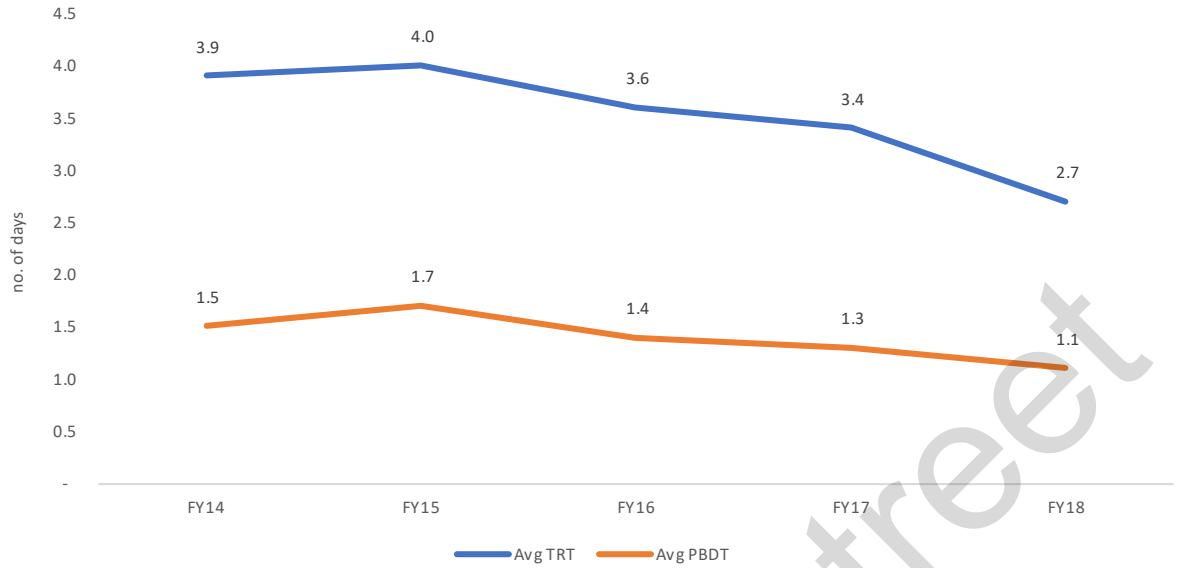
Source: Ministry of Shipping

Efficiency

As per the Ministry of Shipping, major ports have shown an improvement in their operational efficiency, especially in terms of turnaround time (TRT). The average turnaround time improved from 8.1 days in 1990-91 to 64.43 hours (2.7 days) in FY18. As a matter of fact, it further improved to 59.93 hours as of Dec-2018. The improvement in efficiency can be attributed to initiatives taken by the government such as improving connectivity and logistics, automating ports and augmenting existing infrastructure facilities.

The average overall pre berthing detention time (PBDT) for all major ports has shown steady decline during the five-year period starting from FY13 to FY18, except in FY15 when it increased to 1.7 days from 1.5 days in FY14. However, PBDT declined again to 1.4 days in FY16. Thereafter, it declined even further to 1.3 days in FY17 and eventually to 1.1 days in FY18.

Improvement in Key Efficiency Indicators at Major Ports



Source: Ministry of Shipping

Recent Developments under the Sagarmala Programme

The Sagarmala Programme is the flagship programme of the Ministry of Shipping for port-led development in the country by harnessing India's 7,500 km long coastline, more than 14,500 km of potentially navigable waterways and strategic location on key international maritime trade routes. The programme is an endeavour to reduce logistics cost for EXIM and domestic trade, at minimal investment.

Under the programme, more than 574 projects, entailing an investment of an estimated ₹ 6 trillion have been identified for implementation between 2015 and 2035. As of Sep-19, about 121 projects (₹ 302.3 bn) have already been completed, while another 201 projects (₹ 3.1 trillion) are under implementation. These projects are being implemented by relevant Central Government Ministries, State Governments, Ports and other agencies, primarily through the private or PPP mode.

Summary of Projects under Sagarmala (as of September 2019)

Particulars	Total		Completed		Under Implementation	
	No. of Projects	Project Cost (₹ bn.)	No. of Projects	Project Cost (₹ bn.)	No. of Projects	Project Cost (₹ bn.)
Port Modernisation	236	1,183.5	68	225.5	70	369.9
Port Connectivity	235	2,355.3	35	58.0	94	1,193.6
Port-Led Industrialization	35	2,402.3	2	5.1	17	1,517.4
Coastal Community Development	68	73.7	16	13.6	20	9.4
Total	574	6,014.8	121	302.3	201	3,090.5

Source: Ministry of Shipping

Projects under Implementation & Development (as of September 2019)

Particulars	Total Projects		Projects by Ministry of Shipping	
	No. of Projects	Project Cost (₹ bn.)	No. of Projects	Project Cost (₹ bn.)
Completed	121	302.3	85	179.9
Under Implementation (including under tendering process	235	3,136.2	86	678.6
Under Development	137	1,029.7	69	736.6
Total Completed/Under Implementation/Under Development	493	4,468.2	240	1,595.1

Source: Ministry of Shipping

A roadmap has been created to enhance the cargo carrying capacity at Indian ports to more than 3,000 MMTPA to cater to the projected traffic of 2,500 MMTPA by the year 2025. For all the 12 government-controlled major ports, master plans have been finalized, out of which 108 port capacity expansion projects entailing a cost of ₹ 678 bn have already been identified for implementation over the next 20 years. Out of these 108 projects, 22 have so far been completed at a cost of ₹ 152.4 bn and another 37 (₹ 142.8 bn) have been taken up for implementation.

Under Project Unnati, about 116 initiatives have been identified to enhance the operational efficiency at ports. Of these, 93 have so far been implemented to add more than 80 MMTPA capacity.

Port Connectivity

More than 235 connectivity projects, entailing an investment of ₹ 2.4 trillion have been identified under the Sagarmala programme. Some of the types of connectivity projects considered are: -

- National waterways prioritized for development in the first phase
- Connectivity to Dedicated freight corridors
- Last mile rail and road connectivity projects
- Major rail connectivity projects
- Freight friendly Expressway projects connecting the major ports
- Development of Multi-Modal Logistics Parks
- POL Pipelines

With respect to port connectivity, the Indian Port Rail Corporation Limited (IPRCL) has taken up 32 projects at a cost of ₹ 182.5 bn. Out of these, eight projects have been completed and seven are under implementation. Another 23 rail connectivity projects (₹ 248.8 bn) are being taken up by the Ministry of Railways and five projects (₹ 35.9 bn) are taken up either by Non–Government Rail (NGR) or by JVs, while another 10 are being taken up by ports. Out these 38 rail projects, 10 have already been implemented, while 16 are under implementation.

About 112 road connectivity projects have been identified under the Sagarmala programme. Out of these total 112 road connectivity projects, 60 projects are proposed to be implemented under the Bharatmala scheme. There will be implemented by the MoRTH, NHAI, State PWDs and Port Trusts. Six of these projects have been completed and 23 are under implementation.

Port-Linked Industrialization

For promoting port-led industrialization, 14 Coastal Economic Zones (CEZs) have been proposed, covering all Maritime States and Union Territories. The development of CEZ requires involvement of multiple agencies from the Central Ministries and State Governments. The institutional framework for development of CEZs would be similar to the institutional framework adopted by DMICDC for development of industrial corridors and industrial nodes.

Since the Sagarmala Programme seeks to reduce logistics cost and time for the movement of EXIM and domestic cargo, it is necessary to develop industrial capacities near these ports. Accordingly, 38 potential port-linked industrial clusters haven been identified under the Sagarmala programme across multiple sectors such as Energy, Materials, Discrete Manufacturing and Maritime.

Based on availability of land, the Ministry of Shipping seeks to develop an SEZ at JNPT, Smart Industrial Port City (SIPC) at Paradip and Kandla, and Coastal Employment Units (CEUs) at V.O. Chidambaranar Port Trust and KPL.

The projects identified under the Sagarmala Programme will mobilize more than ₹ 8.8 trillion towards infrastructure investment, will double the share of domestic waterways (inland & coastal) in the modal mix, will generate logistic cost savings of ₹ 350-400 bn per annum, will boost merchandize exports by US$ 110 bn and will enable creation of 10 mn new jobs, including 40 Lac direct jobs, over the next decade.

Private Sector Participation

- The adoption of the Model Concession Agreement (MCA) for PPP in the ports sector gave a boost to private participation in port-related infrastructural development. During FY18, about 15 PPP projects entailing an investment of ₹ 205.3 bn and involving capacity addition of 218 MTPA were under implementation. Another 41 PPP projects entailing an investment of ₹ 208.2 bn and involving capacity addition of 368 MTPA were already under operation.
- During FY19, 25 projects pertaining to major ports were awarded, involving an investment of ₹ 21.6 bn and additional capacity of 10.7 MTPA.
- In FY19, 32 projects having an investment of ₹ 85 bn were completed, enhancing the capacity by 62.9 MTPA.

The Way Forward

With increasing investment in port infrastructure and rising cargo traffic, the outlook for the Indian ports sector seems healthy. Capacity addition at ports is expected to increase by at least 300 MT over the next 3 years. Under the Sagarmala Programme, the government has envisioned a total of 574 projects for modernisation of ports, port connectivity, port-led industrialization, and coastal community

development involving an aggregate investment of more than ₹ 6 trillion by the year 2035. Ministry of Shipping has set a target capacity of over 3,130 MMT by 2020, which would be largely driven by participation from the private sector. Non-major ports are expected to account for more than 50 per cent of this capacity. India's cargo traffic handled by ports is expected to reach 1,695 million metric tonnes by 2021-22, according to a report of the National Transport Development Policy Committee. Small port industrial cities and industrial clusters are also proposed to be developed at some select ports. These measures are expected to boost India's port infrastructure very rapidly in the coming years and help the economy derive optimum dividend from its maritime capabilities.

Aviation

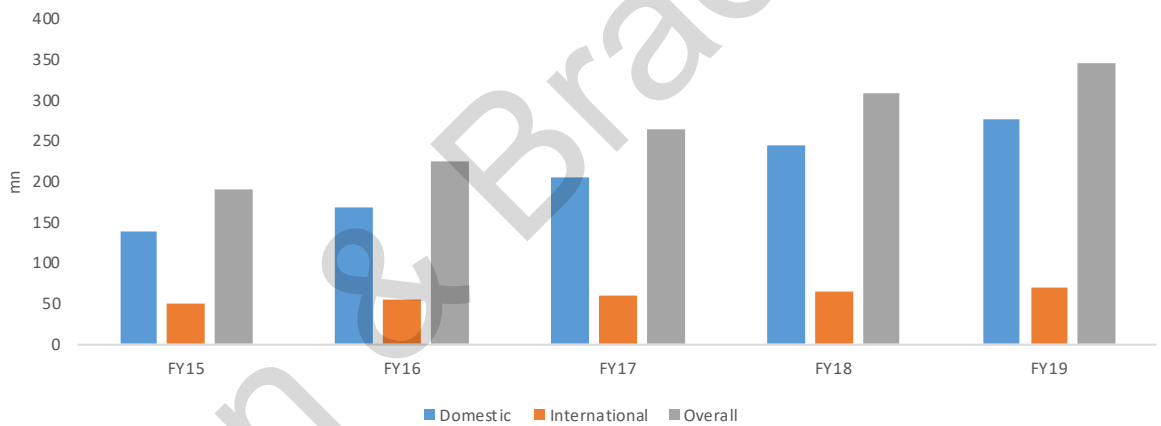
Present scenario

According to the IATA Traffic Study, India ranks seventh in the aviation market globally. India is the world's third largest domestic aviation market. The Airports Authority of India (AAI) owns and maintains 129 airports across India and offers air navigation services for over 2.8 mn sq nautical miles of air space.

In FY19, India's domestic air traffic passenger surpassed the 250 mn mark. However, in spite of growth opportunities in the sector, India's aviation industry has been largely untapped, considering air transportation is an expensive proposition for a vast majority of the country's population.

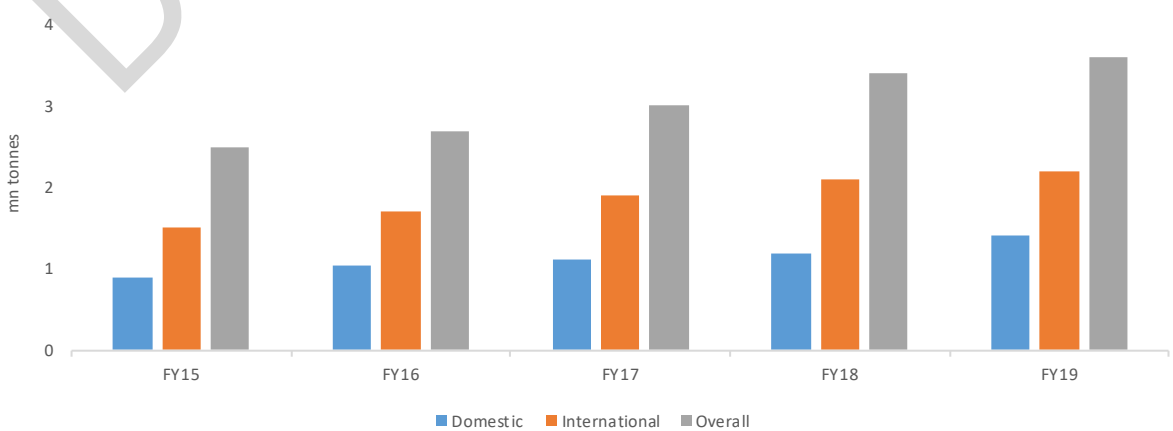
Air passenger traffic at all Indian airports

Trends in air passenger traffic



Source: Airports Authority of India (AAI)

Growth in freight traffic

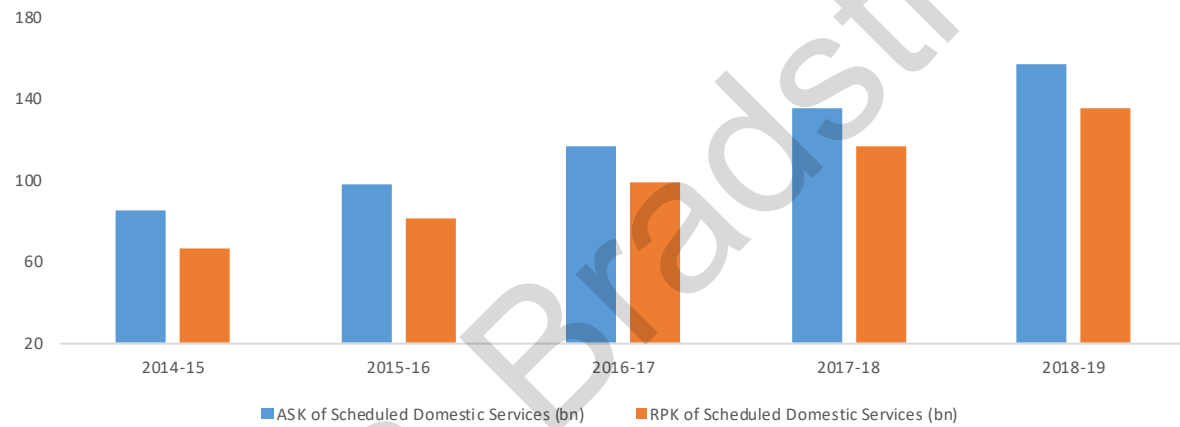


At 344.7 mn, India's air passenger traffic reflected a growth of 11.6% y-o-y during FY19. The growth was largely on account of domestic passenger traffic which reported a double digit growth of 13.1% from the previous fiscal. In fact, domestic traffic formed 80% of the total passenger traffic in FY19. On the other hand, international passenger traffic grew by 6.1% y-o-y to 69.5 mn during the year.

Demand & Supply Trends - Available Seat Kilometre (ASK) v/s Revenue Passenger Kilometre (RPK)

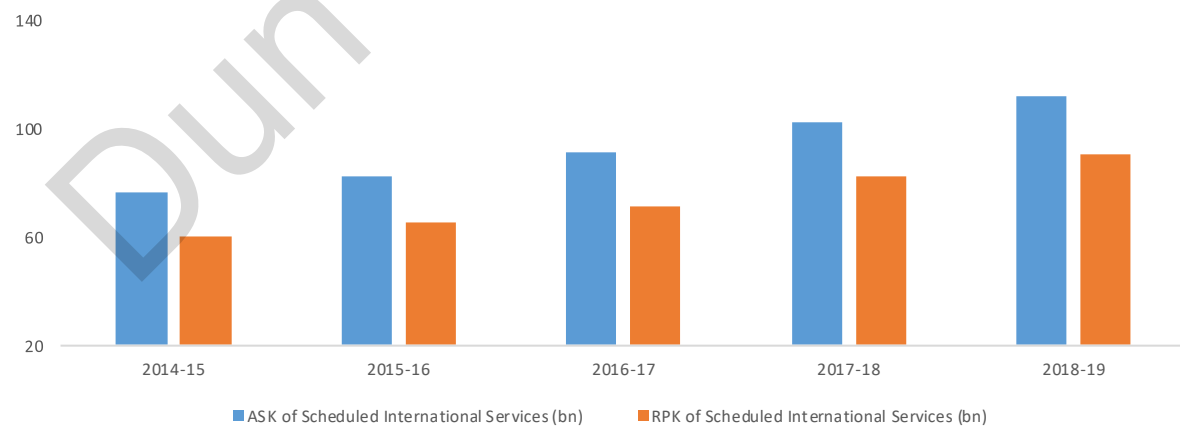
The revenue passenger kilometre (RPK) in India increased by around 20% for more than 50 consecutive months up to December 2018; this was the fastest increase reported across the globe. This created a positive impact for India's economy. To meet the surging demand and providing air connectivity to remote regions, new Greenfield airports are being developed. At the end of FY19, a total of 107 airports provided scheduled airline operations.

ASK v/s RPK of scheduled domestic services (in ₹ bn)



Source: DGCA, 2019

ASK v/s RPK of scheduled international services (in ₹ bn)



Source: DGCA, 2019

Top 5 airports in India by passenger traffic volume (international + domestic) (in mn)				Top 5 airports in India by freight traffic volume (international + domestic) (in MT)			
City	FY19	FY18	% growth	City	FY19	FY18	% growth
Delhi	69.2	65.7	5.4	Delhi	1,042,948	963,032	8.3
Mumbai	48.9	48.5	0.7	Mumbai	963,460	906,321	6.3
Bengaluru	33.3	26.9	23.8	Chennai	411,613	417,787	-1.5
Chennai	22.5	20.4	10.7	Bengaluru	386,849	348,403	11
Kolkata	21.9	19.9	10	Kolkata	155,232	163,323	-5

Source: AAI

During FY19, total freight traffic in India rose by 6% y-o-y to 3.6 mn tonnes. International freight traffic, accounting for 62% of the total freight, grew by 2.6% in FY19. On the other hand, domestic cargo traffic rose by a healthy 12.1% y-o-y to 1.4 mn tonnes during the year.

During FY19, the total aircraft movement recorded an increase of 12% on a yearly basis to 2.6 mn. The rise was on account of growth in domestic aircraft movements which witnessed a rise of 14.1% y-o-y to 2.2 mn in FY19. International aircraft movements grew by 3.4% y-o-y to 0.5 mn during the same period.

Over the years, AAI has been constantly focusing on modernizing & developing airside & terminal side infrastructure, air navigation services and improvising services at airports to deliver a better travel experience to passengers.

Some of the recent developments & contributions of AAI towards the aviation sector are as follows:

- In March 2019, AAI signed MoU with state government of UP for taking over the infrastructural development and operationalisation of the existing non-operational airport at Kushinagar, (spread over an area of 589 acres) to enhance air connectivity in the region
- Planned to approximately invest ₹ 200 bn towards upgrading the existing airport infrastructure as part of Project DISHA, the largest airport transformation program undertaken in India to enhance operational efficiency and overall travel experience of the travellers
- Established Airport Operations Control Centre (AOCC), a prime centre for all airport operations, with associated Airport Operations Data Base at top 10 airports with main data centre at Chennai for monitoring all the operations and collaborative decision with participation of all stakeholders. Further, the installation of AOCC is being carried out at two more major airports of AAI at Goa and Lucknow
- Process of setting up a Civil Aviation Research Organization (CARO) at Begumpet Airport, Hyderabad catering to ANS and Airport/ Engineering research
- Installation of sophisticated Air Traffic Flow Management (ATFM) which is expected to optimize airport operations by reducing aircraft fuel burn. The ATFM is a country-wide system focussed on managing air traffic with the implementation of Phase-I in six metro airports, in conjunction with Flow Management Positions established at 22 other airports. The phase-II will be rolled for other capacity constrained airports after completion of phase- 1

- Process of procuring additional passenger processing systems comprising of 160 Common User Terminal Equipment, 200 Common User Self Service kiosks, 1,000 scanners for checkin-counters, corresponding Counter Information Display Systems. These systems are expected to ease the congestion in terminal buildings and enable efficient and secure passenger processing
- Awarded works at Agartala, Calicut, Port Blair towards construction of new state-of-the-art integrated terminals. Has also been in the process to approve the works for upgradation and expansion of capacity at Chennai, Lucknow and Guwahati Airports, at an estimated outlay of ₹ 24.6 bn, ₹ 13.8 bn and ₹ 12.3 mn, respectively

Apart from the above, the state government of Andhra Pradesh is planning to develop Greenfield airports in six cities - Nizamabad, Nellore, Kurnool, Ramagundam, Tadepalligudem and Kothagudem under the PPP model.

Policy support

Union budget 2018-19

- Outlay of ₹ 45 bn has been proposed for the aviation sector in FY20 as against ₹ 97 bn (RE) in FY19
- On the lines of the successful model of One Nation - One Grid, the government has proposed to make available a blueprint in 2019-20 for developing gas grids, water grids, i-ways and regional airports
- The Government would examine suggestions of further opening of FDI in aviation
- It was proposed that the Government would not only reinitiate the process of strategic disinvestment of Air India, but would offer more CPSEs for strategic participation by the private sector

Some of the other notable measures by the government:

- Allowed 100 per cent FDI under automatic route in airports; ground handling services subject to sectoral regulations & security clearance. Further, 100% FDI under automatic route is allowed in scheduled air transport service, regional air transport service & domestic scheduled passenger airlines, however, FDI over 49% would require government approval
- Under the capacity expansion programme of NABH Nirman (NextGen Airports for Bharat), the government has proposed to increase the capacity of airports by 4 to 5 times to handle a billion passenger trips per year over the next 10 to 15 years
- Under New Greenfield Airport Policy, granted approval for Noida International Airport (Jewar), Mopa (Goa), Purandar Airport (Pune), Bhogapuram Airport (Visakhapatnam), Dholera Airport (Ahmedabad), Hirasar Airport (Rajkot). Approval granted for an estimated outlay of ₹ 500 bn towards development of New Greenfield Airports
- Apart from the 2016 National Civil Aviation Policy, the government has devised measures towards the development of air cargo business in the country. In January 2019, the first National Air Cargo Policy's outline was released at the Global Aviation Summit. The policy aims to achieve fundamental re-engineering of the value-chain for domestic and export-import air freight in order to reach the target of handling 10 million tonnes by 2026-27. It also focusses on offering cargo transportation by air at an affordable cost thereby connecting every village to the national and global supply chains. The policy further targets air cargo and logistics to be the most efficient and cost & time effective in the next ten years

- Decision to lease out six brownfield airports of AAI in Public-Private Partnership on Operation, Maintenance and Development model (in Guwahati, Lucknow, Jaipur, Ahmedabad, Mangalore and Thiruvananthapuram). This move is expected to enhance service quality at these airports besides bringing enhanced revenue to AAI.

UDAN Scheme

Ude Desh ka Aam Naagrik (UDAN), Scheme provides air connectivity to smaller cities, thereby enabling the common citizens of India to avail air travel. This scheme is aimed at bridging the rural-urban divide of the country. Under the scheme, a total of 719 routes were awarded in three rounds of bidding for regional connectivity. Of these, 182 routes were operational. The routes are widely spread geographically offering connectivity across India, ensuring balanced regional growth thereby making air travel convenient and affordable. Presently, connectivity has been provided to more than 22 States/UTs. Once all routes are operationalized, more than 10 mn Regional Connectivity Scheme (RCS) - UDAN seats will be provided on an annual basis with 21 States having more than three operational airports each.

Regional Connectivity Scheme (RCS-UDAN)

Scheme	RCS Routes awarded	No. of RCS Airports & Heliports	RCS routes operationalized
UDAN -1	128	43	72
UDAN - 2	312	30 Airports + 31 Heliports	84
UDAN - 3	279	42 Airports + 10 Waterdromes	26
UDAN (Total)	719	115 Airports + 31 Heliports + 10 Waterdromes	182

Source: Ministry of Civil Aviation

Prior to UDAN, seven states had more than three operational airports each. With an aim to operationalize 100 airports by the year 2026-27, the scheme has offered connectivity to 23 unserved airports. UDAN (International) Scheme was launched recently, under which Guwahati Airport will be connected to Bangkok and Dhaka.

The Way Forward

India's civil aviation has garnered a healthy growth rate of approximately 18% in the last three years. According to IATA Traffic Study, India, is expected to stand third in the aviation market globally by 2023-24, overtaking UK, Japan, Spain & Germany.

The combined efforts of the government and private sector to expand capacity through policy push and investment have helped unlock value of air travel for small-town India. As India making its mark in the domestic aviation sector, it is an apt time for the country with government's support (regulatory department) to enter into aircraft financing and leasing activities from Indian shores. This move is expected to be vital for the development of the aviation industry, generating employment and creating business opportunities available in India's financial SEZs, namely, International Financial Services Centre (IFSC) .

Additionally, annual import of Maintenance Repair & Overhaul (MRO) services by airlines in India is approximately ₹ 97 bn. With airlines' fleet growing annually by 100, the size of domestic and imported Indian airline MRO is expected to grow annually to ₹ 216 bn in the next five years and to ₹ 360 bn once the fleet size reaches 2,000 aircraft.

With most of India's largest airports expected to exceed their design capacity within a decade, the government's focus has shifted towards ensuring adequate airport infrastructure development. AAI has undertaken an ambitious target of ₹ 41 bn towards capital expenditure on airport infrastructure development during 2018-19. Additionally, AAI has been working constantly towards upgrading airport capacity, developing new greenfield airports, expanding existing brownfield airports and undertaking new initiatives to meet the future requirements of the sector.

Logistics

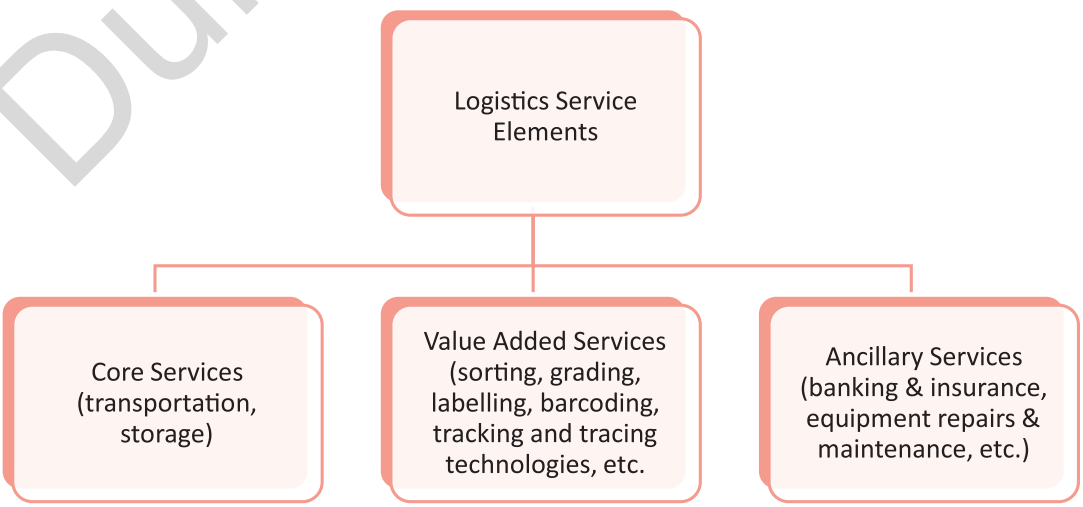
Logistics and warehousing play a very critical role in any economy, by connecting manufacturers and suppliers to consumers. It includes various activities such as transportation, storage/warehousing, inventory management, material handling, packaging, etc.

The Indian logistics sector is currently valued at around US$ 160 bn; however, it is expected to grow to US$ 215 bn over the next couple of years and further to US$ 500 bn by the year 2025. The sector at present employs more than 22 mn people, and is expected to provide employment to about 40 mn people over the next couple of years.

In 2017, the logistics sector was granted infrastructure status in India. This status helped the industry avail of the following benefits: -

- Infrastructure lending at easier terms with enhanced limits.
- Access to larger amounts of funds as External Commercial Borrowings (ECB).
- Access to longer tenor funds from insurance companies and pension funds.
- Eligibility to borrow from India Infrastructure Financing Company Limited (IIFCL).

In FY18, the logistics cost in India stood at 14% of the GDP. This is significantly higher than the logistics cost-to-GDP ratio of 8-10% that is seen in developed economies. This can largely be attributed to the absence of efficient intermodal and multimodal transport systems. However, the government aims to reduce the logistics cost to less than 10% by the year 2022. This is being done through initiatives such as the introduction of a structured Logistics Policy, which will help create a strong infrastructure platform and will help make the sector more integrated, seamless, efficient, cost-effective and technology-driven.



The Indian logistics sector is characterised by the presence of a large number of unorganized players, which renders the industry highly fragmented. As a matter of fact, organized players account for merely 10% of the total market share in the sector.

The consumer base of the sector encompasses a wide range of industries including retail, automobile, telecom, pharmaceuticals and heavy industries. Accordingly, the industry has been increasingly attracting investments in the last decade. The Government has undertaken initiatives towards a policy which will place major emphasis on development of logistic related infrastructure such as logistics parks, dedicated freight corridors, free trade warehousing zones (FTWZs) and container freight stations (CFSs). Investment in the logistics sector as a whole is expected to reach US$ 500 bn annually by the year 2025. The warehousing sector itself is likely to get investments amounting to ₹ 500 bn by the end of 2020.

India's Performance on Logistics Performance Indices

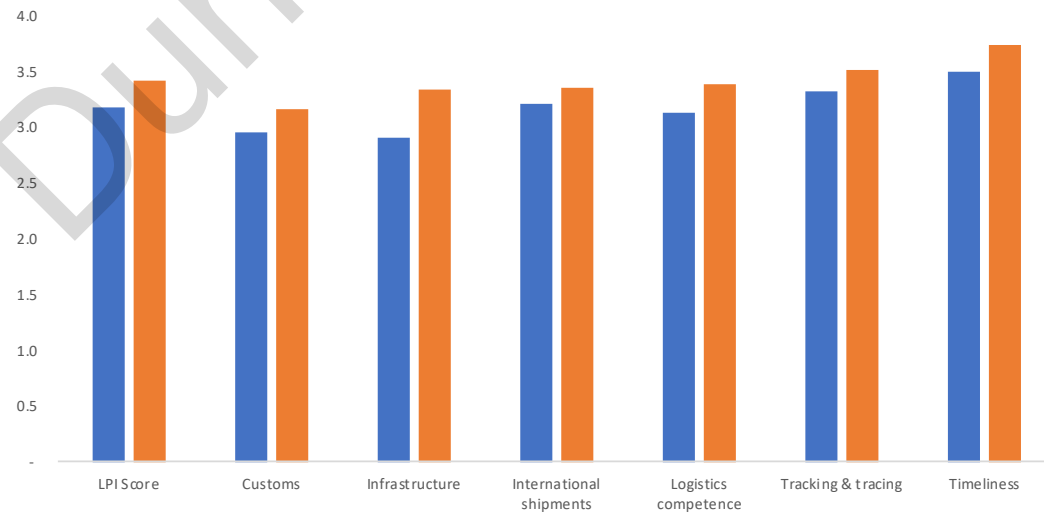
The Logistics Performance Index (LPI), published by the World Bank Group serves as a global benchmarking reference for featuring logistic performance across countries

The LPI score represents a weighted average of a country's scores on six key dimensions: -

- Efficiency of the clearance process (i.e. speed, simplicity and predictability of formalities) by border control agencies, including customs.
- Quality of trade and transport-related infrastructure (ports, railroads, roads, etc.)
- Ease of arranging competitively-priced shipments
- Competence of logistics services
- Ability to track and trace consignments
- Timeliness in terms of reaching destination within scheduled/expected delivery time

In 2018, India ranked 44th among 167 countries. However, India's rank has slipped from 35th in the preceding rankings in 2016. The index suggests that India's ranking has deteriorated on all parameters.

Logistics Performance Index – India's Scores (2018 vs 2016)



Source: World Bank Group

On the other hand, India's ranks second in the Agility Emerging Markets Logistics Index, with only China ahead of it. As a matter of fact, the other 48 emerging markets covered in the index stand a fair distance behind India and China in this ranking.

The Index is a broad gauge of competitiveness, ranking 50 countries by factors that make them attractive to logistics providers, freight forwarders, shipping lines, air cargo carriers and distributors. The index is based on equal weightages given to domestic logistics opportunities, international logistics opportunities and business fundamentals. India's high score in this index is on the basis of the size of its domestic and international logistics markets, as well as the scale of growth expected over the medium term. Additionally, the country's e-commerce market is expected to grow from US$ 35 bn in 2018 to US$ 100 bn by 2022 and to create one million jobs.

Agility Emerging Markets Logistics Index – Top 10

Ranking	Country	Agility Emerging Markets Logistics Index 2019	Domestic Logistics Opportunities	International Logistics Opportunities	Business Fundamentals
1	China	8.87	8.82	9.70	7.12
2	India	7.39	8.09	7.20	6.35
3	UAE	6.16	5.56	5.48	8.89
4	Indonesia	6.09	6.32	5.94	5.94
5	Malaysia	6.00	5.23	5.64	8.39
6	Saudi Arabia	5.71	5.27	5.23	7.67
7	Mexico	5.67	5.34	6.23	5.13
8	Qatar	5.62	5.38	4.85	7.84
9	Turkey	5.56	5.27	5.85	5.49
10	Vietnam	5.48	4.88	6.12	5.31

Logistics Ease Across Different States (LEADS) 2019 – State Logistics Performance Index

In 2018, the Ministry of Commerce launched LEADS (Logistics Ease Across Different States), a state logistics performance index that seeks to assess the status of logistics efficiency in each state. The index evaluates states' logistics ease with respect to both, domestic as well as international trade.

The ranking is based on the following parameters:-

- Availability of logistics infrastructure
- Quality of logistics infrastructure
- Quality of logistics services provided by service providers
- Ease of arranging logistics at competitive rates
- Timeliness of cargo delivery
- Ease of track and trace
- Safety/Security of cargo movement
- State facilitation and coordination
- Efficiency of regulatory processes

Data published in LEADS 2019 reveals that Gujarat, with a score of 3.62 is the top performing state. The list follows with Punjab (3.46), Andhra Pradesh (3.42), Maharashtra (3.42) and Tamil Nadu (3.40).

Top 10 performing states	Index Score
Gujarat	3.62
Punjab	3.46
Andhra Pradesh	3.42
Maharashtra	3.42
Tamil Nadu	3.40
Haryana	3.37
Karnataka	3.37
Telangana	3.22
Madhya Pradesh	3.21
Odisha	3.18

Source: Ministry of Commerce

Policy Support

- The newly set up Logistics Division in the Ministry of Commerce and Industry has launched a draft National Logistics Policy that seeks to provide a favourable environment for logistics. It is also in the process of designing and rolling out a national logistics action plan to foster cost-effective and seamless movement of goods across India. The policy sets a vision to drive economic growth and trade competitiveness of the country through an integrated, seamless, efficient, reliable, and cost-effective logistics network.
- The Government is making an effort to ease the implementation of the Goods and Services Tax (GST), by gradually working towards providing a uniform tax on the supply of goods and services; interventions seem to have helped reduce transit times of freight vehicles, ease documentation complexities, and enable consolidation of warehouses to optimise inventory costs.
- Programmes such as Bharatmala, Sagarmala, and Dedicated Freight Corridors (DFCs) signal the Government's efforts to leverage infrastructure for robust economic growth. A key element of these recent programmes or initiatives has been the focus on integration across the supply chain to ensure a seamless movement of freight. Some of the significant initiatives in this direction are the planned development of 35 Multi Modal Logistics Parks (MMLPs) under Bharatmala Pariyojana, a number of port connectivity projects under Sagarmala, renewed focus on national waterways with inland terminals, and a number of industrial and dedicated freight corridors being planned across the country.
- The draft National Logistics Policy focuses on skill enhancement by seeking to double the employment in the logistics sector by generating additional 10-15 million jobs.
- There has been a rise in adoption of technology by both public and private sector agencies in logistics, to enable seamless exchange of information, informed decision-making through data analytics, and cost competitiveness in services and operations. Several start-ups are trying to capitalise on the potential in logistics sector by using advanced technologies such as fleet visualisation, geocoding, route deviation engines, and internet of things (IoT) to improve operational efficiencies.

Telecommunication

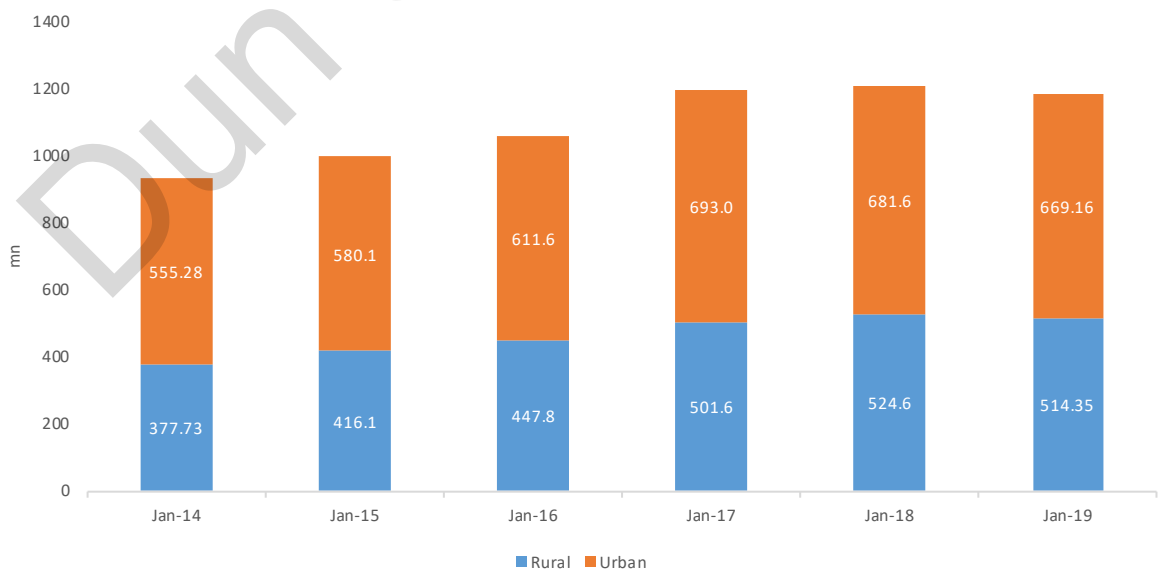
India has become the world's second largest telecommunication market with total subscription at 1.2 bn as of March 2019. Of this, about 514.2 mn connections were from rural areas and 669.1 mn connections from urban areas. Growth in the telecommunication sector in India has remained positive and strong over the last few years on account of strong consumer demand and the government's supportive policies.

Mobile phones as a means of communication have been playing a vital role in the Digital India initiative, the government's vision to transform India into a digitally empowered society and knowledge economy. India's digital profile is one of the fastest growing in the world with mobile data consumption being the highest. With more than 200 million Indians accessing mobile banking and digital payments, it is estimated that India's digital economy has the potential to touch US$ 1 trillion by the year 2025.

Current scenario

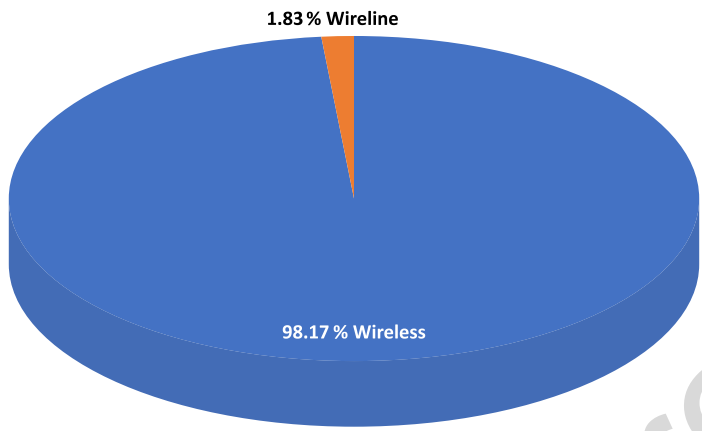
The Indian telecom subscriber base jumped from 0.9 mn as of March 2014 to 1.2 bn as of March 2019, which translates into a CAGR of approximately 5%. During the same period, the wireless subscriber base witnessed a healthy growth, reflecting a CAGR of 5.1% to 1.16 bn as on March 2019. On the other hand, the wireline subscriber base recorded a decline from 28.5 mn as on March 2014 to 21.7 mn as on March 2019. At 1.05 bn, the private sector dominated the overall connections with a share of 88.7% at the end of March 2019, while the share of public sector was 11.3% with 133.5 mn connections.

Increase in telecom subscribers



Source: TRAI

Wireless & Wireline Subscribers (as on March 2019)



Source: TRAI

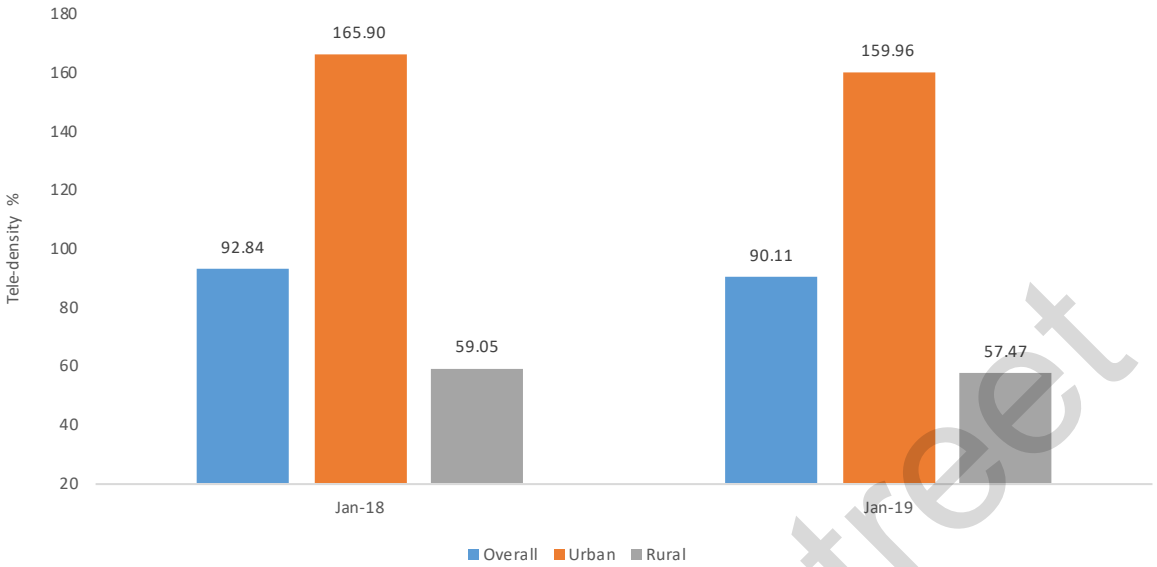
Telecom penetration in India has grown at a fast pace over the past few years. The overall tele-density in India recorded a substantial growth in the period of five years with tele-density improving from 75.2 as on March 2014 to 90.11 as on March 2019, garnered by an improvement in the tele-density of wireless subscribers. Tele-density for wireless subscribers rose to 88.5 as on March 2019 from 72.94 as on March 2014.

Top 6 states in terms of overall Tele-density – as on 31st March 2019

State	Tele-density
Delhi	238.58
Himachal Pradesh	146.39
Kerala	126.15
Punjab	125.35
Tamil Nadu	117.05
Karnataka	110.04
All- India	90.11

Source: TRAI

Overall Tele-density as on March 2018 and as on March 2019



The total number of internet subscribers has witnessed approximately more than two-fold increase in the last five years from 251.6 mn as on March 2014 to 636.73 mn as on March 2019. The internet subscriber base reported a healthy y-o-y growth of 29% in FY19. The growth in total internet subscribers was on account of wireless internet subscribers, which grew by 30% on a yearly basis. Number of wired internet subscribers rose by 2.7% during the year. Monthly ARPU for wireless service declined by 6.12% on yearly basis to ₹ 71.39 for the quarter ended March 2019.

In the recent past, the mobile industry recorded a significant growth on account of affordable tariffs, wider availability, Mobile Number Portability (MNP), expanding 3G & 4G coverage, evolving consumption patterns along with favorable & regulatory environment. Additionally, 5G technologies are expected to approximately contribute USD 2.2 trillion to the global economy over the next 15 years, with key sectors such as manufacturing, utilities and professional/ financial services benefiting from the new technology.

For India, 5G is expected to provide an opportunity for the industry to reach out to global markets and citizens to avail several benefits such as medical support, education, entertainment, enhanced digital payments among others. As such, the government constituted High Level 5G India 2020 Forum to focus on the vision for 5G in India and submitted its report on 'Making India 5G Ready' in August 2018. Accordingly, committees were constituted for action, based on the recommendations of the forum.

Recent developments

- In October 2019, Bharti Airtel announced the launch of its Startup Accelerator Program to support growth of early stage Indian tech startups. With this, the company aims to support the creation of a vibrant start-up ecosystem that contributes towards Digital India
- In October 2019, Bharti Airtel was chosen as the strategic Network Solution partner by Faridabad Smart City Limited to transform the NCR satellite town of Faridabad (in Haryana) into a smart city

- Reliance Jio in partnership with Samsung Networks, built the world's largest green-field and all IP based 4G LTE network, which supports more than 340 million LTE subscribers as of August 2019
- In July 2019, Bharti Airtel reported to have designed and implemented State Wide Area Network (SWAN) for the state government of UP as part of GoI's e-governance initiative. This integrated solution comprising of 885 PoPs with MPLS bandwidth is expected to connect state, district, block and tehsil headquarters across the state of UP
- In May 2019, Vodafone Idea Limited announced signing of a multi-million-dollar five-year agreement with IBM to deliver an enhanced customer experience to its connected consumers and businesses in India. Additionally, this engagement is expected to contribute to Vodafone Idea's merger synergy objectives by reducing its IT related costs
- In August 2018, Reliance Communications Limited announced the launch of Reliance IP Centrex, India's first hosted Enterprise IP telephony solution powered by the futuristic IP Multimedia Subsystem network core. Reliance IP Centrex is expected to offer high-quality, feature-rich voice telephony to individual users at the workplace
- In 2017, Phased Manufacturing Programme (PMP) was announced to promote manufacturing of mobile handsets in India

Policy support

Union Budget 2018-19

- Outlay of ₹ 273.4 bn has been proposed in FY20 as against ₹ 215.8 bn (RE) in FY19
- In FY20, an outlay of ₹ 83.5 bn has been proposed under the scheme of compensation to service providers for creation and augmentation of telecom infrastructure as against ₹ 50 bn (RE) in FY19
- Bharat-Net", an internet connectivity programme to connect local bodies in every panchayat in the country, will be speeded up with assistance from Universal Service Obligation Fund (USOF) and under a Public Private Partnership arrangement
- Custom duty on lithium ion cell and charger/adapter of cellular mobile phone was reduced to nil
- Custom duty on Optical Fibres, optical fibre bundles and cables increased to 15% from 10% while custom duty on raw materials used in manufacture of Preform of Silica has been reduced to nil

Other key measures

- In FY18, TRAI issued amendments and regulations in lieu to the changing policy and regulatory requirements of the telecommunication sector. Some of which are the Telecommunication Interconnection Regulations, 2018; the Telecommunication Interconnection Usage Charges (Fourteenth Amendment) Regulations, 2018; Telecommunication Mobile Number Portability Per Port Transaction Charge and Dipping Charge (Amendment) Regulations, 2018 among others
- In 2018, TRAI passed the Telecommunication Tariff Order (63rd amendment), focusing on 'Regulatory Principles of Tariff Assessment' ensuring transparency, non-discrimination and non-predation in telecommunication services
- In October 2018, the Telecom Commission was re-designated as the 'Digital Communications Commission' to ensure effective implementation & monitoring of the newly announced National Digital Communications Policy – 2018 along with dealing with various aspects of the telecom sector

The Way Forward

Telecom infrastructure has emerged to be a main driver of the socio-economic growth and development of the country. The introduction of the government's 2018 National Digital Communications Policy aims to attract investments worth USD 100 bn and create 4 mn jobs in the digital communication sector by 2022. The policy also focuses on expanding IoT ecosystem to 5 bn connected devices, thereby propelling India to be in the top 50 nations in the ICT Development Index of ITU from 134 in 2017. The government policies, reforms and measures taken towards ease of doing business, as well as the bright growth prospects of the telecom sector is expected to enable India to play a leading role in emerging global information society.

Power

Power (conventional energy & renewable energy)

With the rapid urbanisation, the demand for power in India has witnessed significant increase over the years. In recent years, the conducive policy environment and investment in power infrastructure, has helped the country to meet this growing demand. Currently, India ranks third largest in the world in terms of power generation. The country fulfils majority of its energy needs from thermal sources. However, subsequent to the Paris accord on environment, India has started promoting renewable energy sector.

Current status

Capacity installation and generation performance

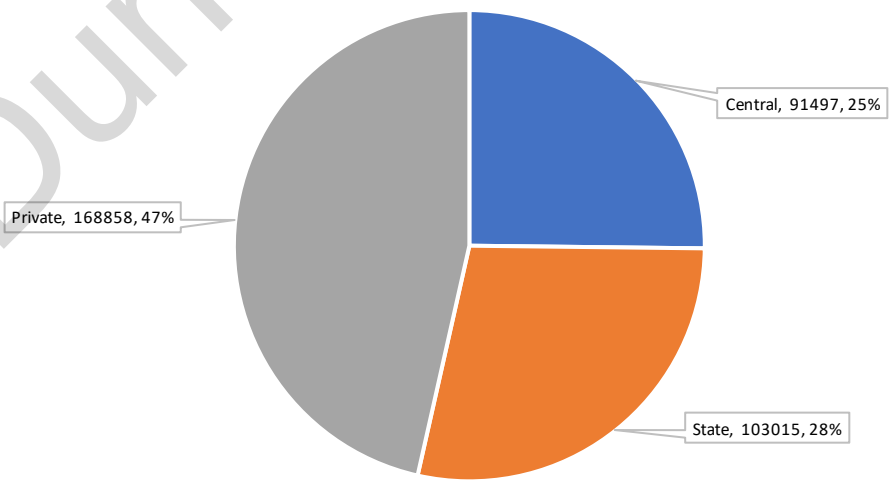
As of September 30, 2019, the total installed capacity of power was 363,370 MW. The sector-wise classification of installed capacity reveals that private sector accounts for the highest share of 47% of total installed capacity. There has been significant increase in the share of private sector since delicensing of power sector in 2003.

Indian Power Sector – Key Highlights

- 3rd largest producer and also the 3rd largest consumer of power in the world
- 100% FDI permitted in the areas of power generation (from all resources except nuclear power), transmission, distribution and power trading under the automatic route
- 49% FDI permitted in Power Exchanges registered under the Central Electricity Regulatory Commission Regulations, 2010 under automatic route
- US$ 1.1 bn FDI in power sector during FY19 as compared to US$ 1.6 bn in FY18.

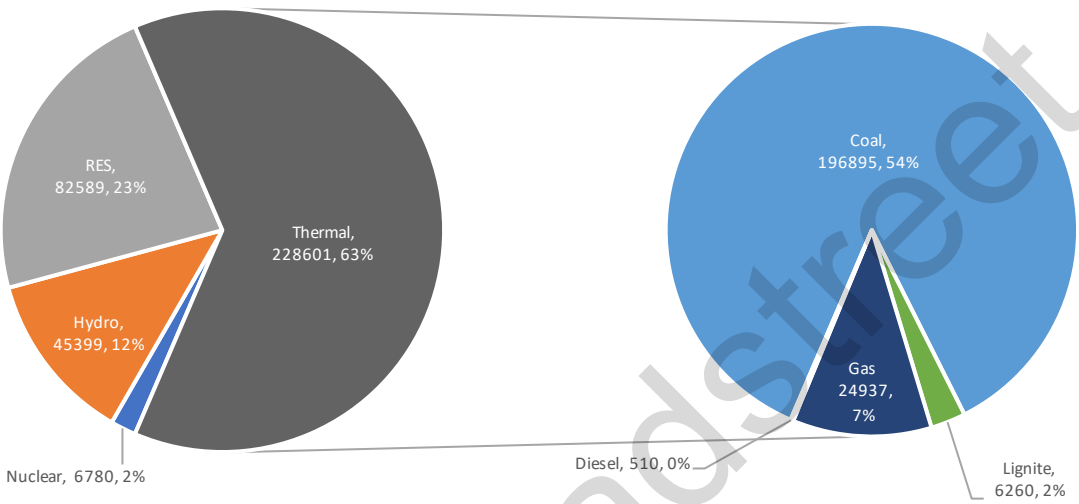
Source: Make in India, Invest India and Department for Promotion of Industry & Internal Trade

Private sector holds the largest share in total installed capacity



Total installed capacity in MW as of September 30, 2019
Source: Central Electricity Authority

In terms of sources, while conventional source of energy accounts for 77% of the total installed capacity, the share of renewable energy sources (RES) has increased from mere 12% five years before to 23% in FY20 (as of September 30, 2019).



RES: Renewable Energy Sources
Total installed capacity in MW as of September 30, 2019
Source: Central Electricity Authority

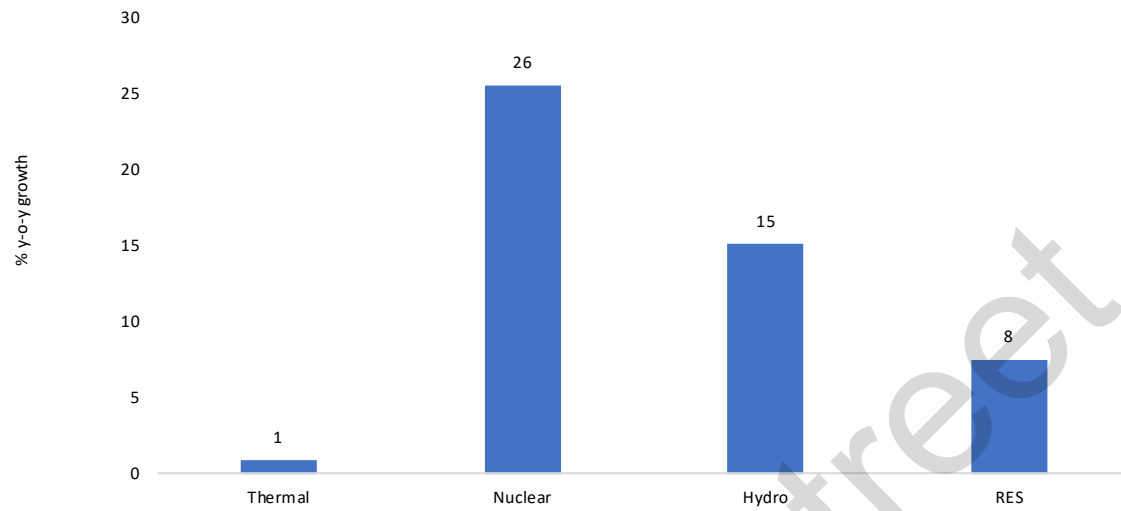
Generating capacity addition during FY20 (MW)

	Apr-Sep FY19	Apr-Sep FY20
Thermal	69.755	3345
Hydro	140	0
Nuclear	0	0
All India	209.755	3345

Source: Central Electricity Authority

The electricity generation target through conventional sources has been fixed at 1,330 Billion Units (BU) for FY20, a growth of around 6.5% over the actual generation of 1,249.3 BU for FY19. As of September 30, 2019, around 50% of the target has been achieved by generating energy of 658.55 BU. On y-o-y basis, electricity generation has reported an increase of 3.6% during Apr-Sep 2019 owing to significant increase in power generation from hydro and nuclear sources. On the other hand, growth in power generation through thermal plants has remained dismal during Apr-Sep 2019 despite significant addition in their installed capacity during the same period.

Growth in power generation during Apr-Sep FY20

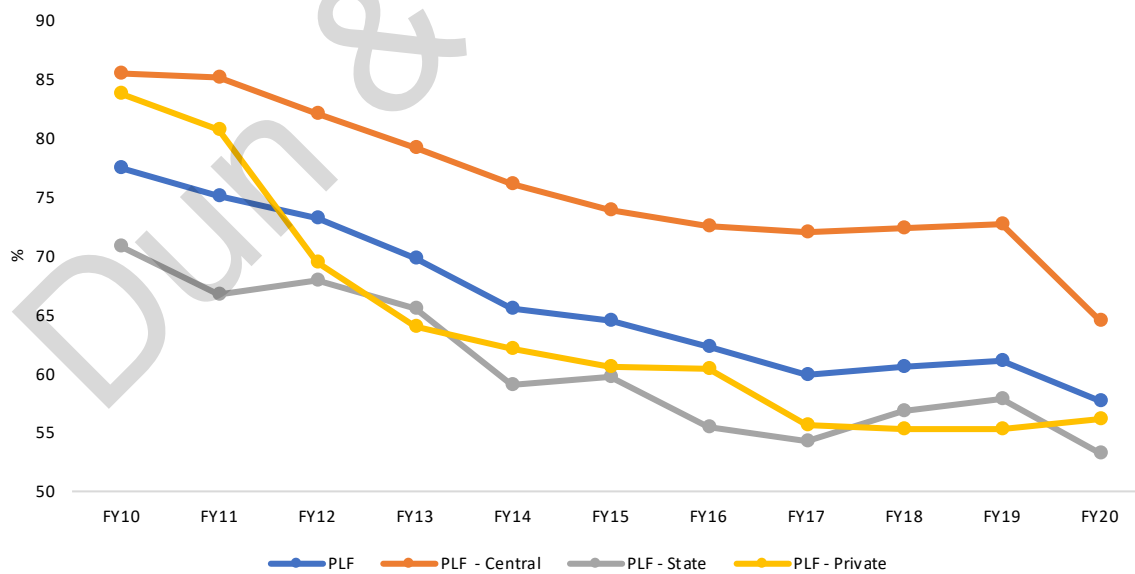


Source: Central Electricity Authority

Plant Load Factor

The utilisation of installed capacity as indicated by Plant Load Factor (PLF) has shown steady deterioration over a decade. PLF stood at a decade low of 57.7% in FY20 (upto September 2019), indicating that thermal power plants have been lying idle. While all the sectors witnessed deterioration in their PLF over a decade, the decline in PLF of private sector was the largest (28%) amongst others. PLF of private sector plunged to 56.2% in FY20 (upto September 2019) from 83.9% in FY10.

Substnatial deterioration in PLF over a decade



Note: for FY20 data upto September 30, 2019
Source: Ministry of Power

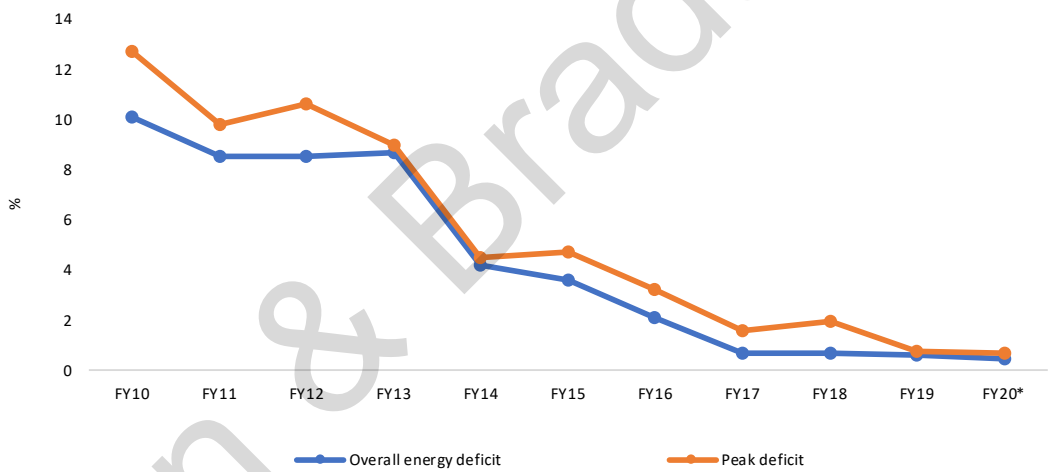
The overall deterioration in PLF can be attributed to the factors like:

- Increment in power demand lagging the capacity addition;
- Capacity addition in thermal power segment despite scarcity of coal & gas that led additional capacity to remain idle;
- Lack of Power Purchase Agreements (PPAs) by state-owned power distribution companies (DISCOMs) due to financial stress;
- Major push to the renewable energy sector through the government support measures in recent years has led to decline in their tariffs, affecting demand for thermal power.

Power Supply Position

With increase in installed capacities, the power supply position in the country has witnessed constant improvement over a decade. This is revealed from the sharp fall in overall energy deficit and peak deficit to 0.5% and 0.7% respectively in FY19 (upto September 30, 2019) as compared to 10.1% and 12.7 respectively in FY10. However, amongst states, Jammu & Kashmir (20%) and North Eastern States like Assam (10.8%) and Nagaland (9.3%) witnessed higher peak deficit during Apr-Sep 2019.

Steady improvement in power supply over the years



** for FY20 data upto September 30, 2019*
Source: Ministry of Power

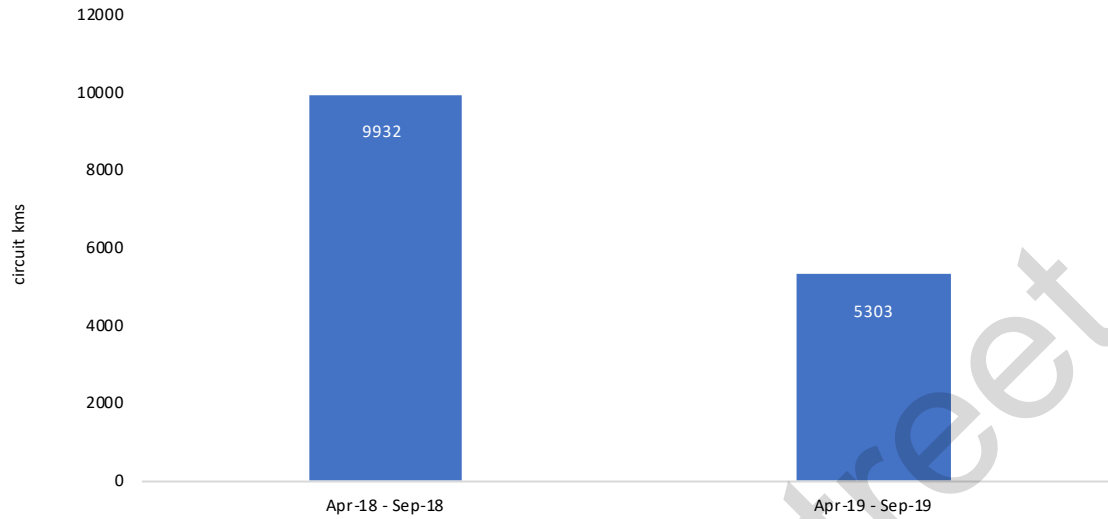
Transmission & distribution system

Transmission system helps in evacuating power from generating stations and its delivery to the load centres. For FY20, the target of 10,824 circuit kms has been set for laying of transmission lines, out of which 5,303 circuit kms of transmission lines have been completed as of September 30, 2019. The addition to the transmission lines is expected to ease grid congestion and eliminate supply constraints, which in turn will benefit the power sector.

Household electrification status as on March 31, 2019, under Saubhagya Scheme	
Households electrified	214.5 mn (99.99% of total)
Households to be electrified	18,734
Villages fully electrified	0.6 mn (99.92% of total)
Electrification under progress villages	519 (0.08%)

Source: Pradhan Mantri Saubhagya Scheme portal

Transmission lines added during Apr-Sep period of FY19 and FY20



Source: Ministry of Power

India's power distribution sector consists of Power Distribution Companies (DISCOMs) which are engaged in supply of power to retail consumers. There are around 65 DISCOMs listed on the government's PRAAPTI portal.

Key trends in conventional power sector

Weak financial health of DISCOMs

The financial health of DISCOMs has remained under stress in the recent period primarily due to outstanding dues from government departments, high power purchase & establishment costs, low revenue collection from remotely located customers, inadequate tariff hikes (due to inadequate hike in tariffs for agricultural & residential consumers) and slow subsidy disbursement from states. Besides, rise in sales via open access (i.e. generating companies serving retail customers directly) in last two years that resulted in demand uncertainty, has adversely impacted DISCOMs' revenue.

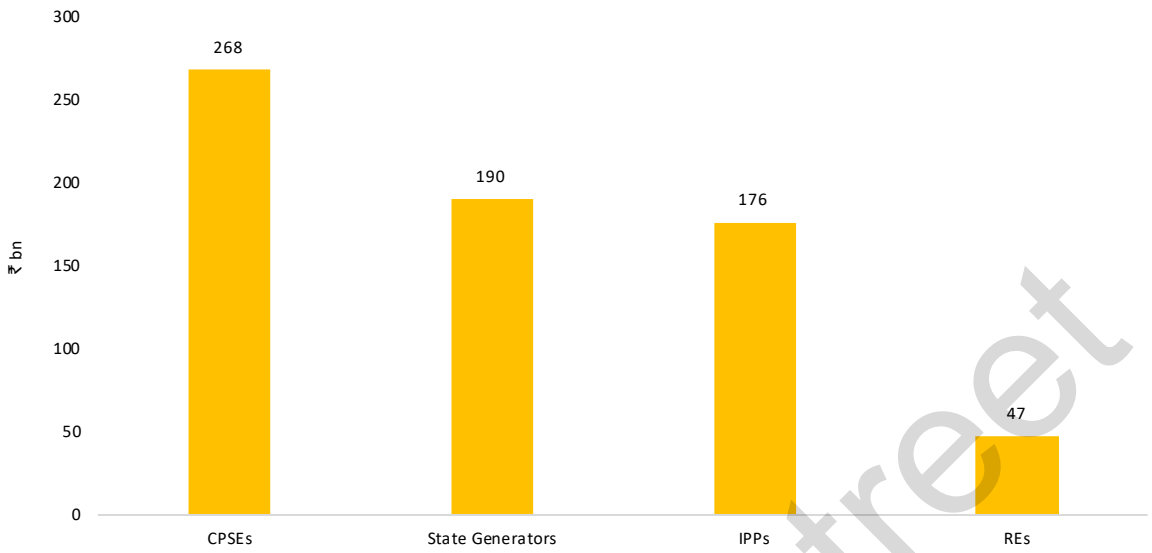
Delay in payment of dues to power utilities by DISCOMs

Given the weak financial conditions of the DISCOMs, they are not only able to make Power Purchase Agreements with power generating utilities but also have delayed payment of dues to power utilities.

Outstanding amount of DISCOM to power utilities (data as of September 2019)	
No. of DISCOMs	65
No. of overdue invoices	7183
Outstanding amount at month-end	₹ 818.4 bn
Overdue outstanding amount at month-end	₹ 643.9 bn

Source: PRAAPTI

Overdue o/s amount of power utilities (excluding disputed amount)



IPP: Individual Power Producer; o/s: outstanding
Data upto September 2019
Source: PRAAPTI

In view of the financial stress in DISCOMs, the government launched UDAY (Ujwal DISCOM Assurance Yojana) in 2015 for financial and operational turnaround of DISCOMs. Currently 32 states and union territories have participated in UDAY. The performance of UDAY is as given below:

Parameter	Performance	Target (FY20)
Total AT&C loss	21.58%	15%
ACS – ARR Gap (₹/unit) (data for 21 states)	₹ 0.39/unit	₹ 0.unit
Bonds issued (data for 16 states)	₹ 2.3 trillion	
Bonds to be issued	₹ 2.7 trillion	

AT&C: Aggregate Technical & Commercial; ACS: Average Cost of Supply; ARR: Average Realisable Revenue
Partial Q1 FY20 data for 22 states
Source: UDAY

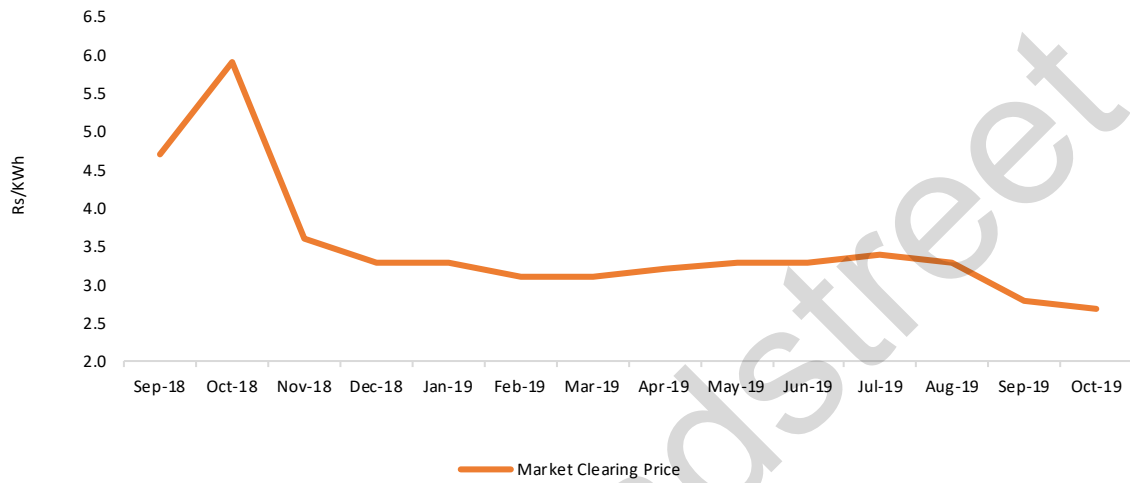
The issue of bad loans continues to linger in the thermal power sector

The power sector in India has been dealing with indebtedness as 34 coal-based thermal power projects with stressed capacity of 40.13 GW have been categorised as financially stressed. The key reasons behind the inability of power plants to service their debts have been non-availability of regular fuel supply arrangements, delayed payments by DISCOMs to generating companies, demand-supply mismatch in the power sector and inability of promoters of power plants to infuse equity & working capital as well as regulatory issues. The delayed payments by DISCOMs has adversely impacted the generating companies in terms of working capital and ability to service debt and has risked power projects being turned into NPAs. Despite various measures taken by the government, the resolution of stressed assets particularly in thermal power segment has remained low. Nonetheless, the revised circular by the RBI that relaxed compulsory referral to the bankruptcy court in June 2019, has provided some respite to the power utilities.

Fall in spot power price

The spot power price has softened during 2019 due to reduction in international coal prices, improvement in fuel supplies and weak demand for power. The average spot power price fell to a two-year low of ₹ 2.71/kWh in October 2019 as against ₹ 5.94 in October 2018.

Softening of spot power price during 2019



Source: Indian Energy Exchange

Policy Support for conventional power sector

- PRAKASH (Power Rail Koyla Availability through Supply Harmony) portal was launched in October 2019 in order to bring better coordination for coal supplies among all stakeholders including Ministry of Power, Ministry of Coal, Coal India Ltd, Indian Railways and power utilities. The portal is expected to help in monitoring entire coal supply chain for power plants such as coal stock at mines, coal rakes planned, coal quantity in transit and coal availability at power utilities. The portal will not only ensure adequate coal supplies to power utilities but will also result in optimum utilization of coal at thermal power plants.
- In June 2019, the implementation of Payment Security Mechanism mainly in the form of Letter of Credit (LC) was made mandatory for purchase of power by DISCOMs.
- In March 2019, measures to promote hydro power sector were approved. Details of which are as follows: a) Large hydropower projects to be declared as 'Renewable Energy' source as against the earlier practice of categorizing hydropower projects less than 25 MW as RE projects; b) Hydropower projects to be made as a separate entity within non-solar Renewable Purchase Obligation; Tariff rationalization measures like providing flexibility to the developers to determine tariff by back loading of tariff after increasing project life to 40 years, increasing debt repayment period to 18 years and introducing escalating tariff of 2%; Budgetary support for funding flood moderation component of hydropower projects on case to case basis; and Budgetary support for funding cost of enabling infrastructure like roads and bridges on case to case basis as per actual, limited to ₹ 150 mn per MW for upto 200 MW projects and ₹ 100 mn per MW for above 200 MW projects.

- In FY19, the Ministry of Power decided to make all meters smart prepaid in three years from April 1, 2019. This is expected to result in reduction in AT&C losses, in turn improving earnings of DISCOMs.
- In July 2019, the government approved ₹ 16 bn for pre-investment activities and various clearances for 2,880 MW capacity Dibang Multipurpose Project in Arunachal Pradesh. The project is expected to produce 11223 MU of energy on completion. The total value of benefit to the state from free power (12% free power from the project) and contribution to LADF is estimated to be ₹ 267.85 bn over the project life of 40 years.
- In March 2019, the approval was given for two thermal and two hydro power projects worth over ₹ 310 bn located at Buxar in Bihar & Khurja in UP (both thermal power projects) and Kishtwar in J&K and Sirwani in Sikkim (both hydro power projects).
- In February 2019, ₹ 12.36 bn investment for transmission component of Arun-3 Hydro Electric Project (Nepal portion) we approved. The project is expected to provide surplus power to India.
- Central Electricity Authority is preparing a Distribution Planning Manual for guiding DISCOMs for future planning.

Union Budget 2019-20 Proposals

- The government proposed to work with state governments to remove barriers like cross subsidy charges, undesirable duties on open access sales or captive generation for industrial and other bulk power consumers.
- Reduction in customs duty to nil on fuels like all forms of uranium ores and concentrates for nuclear power plants.
- The customs duty reduced to nil on all goods required for setting up of nuclear power plant under project imports – MahiBanswara Atomic Power project, Kaiga Atomic Power project, Gorakhpur Atomic Power project and Chutka Atomic Power project.

Renewable Energy Sector

Renewable energy sector (RES) has gained traction in India subsequent to the Paris Agreement on Environment. As per the commitment made to the Paris accord, the government targets to achieve 40% of cumulative power generating capacity from RES by 2030. Thus, as part of nationally determined contribution to fulfil the commitment made by the country to the agreement, the government has initiated National Renewable Energy Mission (NREM) which comprises of setting up 175 GW of RE capacities by 2022. As part of NREM, the government has identified transmission schemes for around 66.5 GW of RE generation, comprising around 28 GW under phase-I and around 38.5 GW under phase-II. As of October 2019, the cumulative installed RE capacity stood at 84.72 GW, which is little less than 50% of the target.

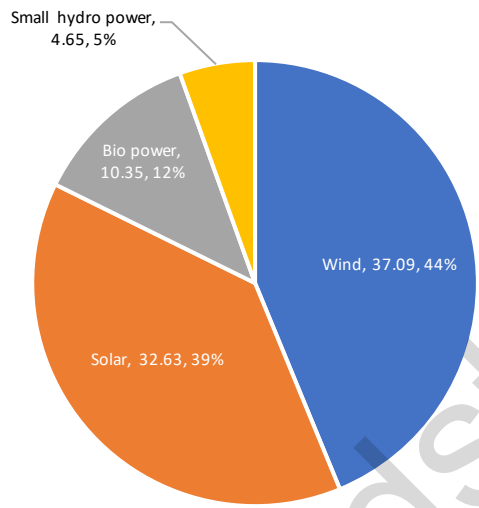
Indian RE Sector – Key Highlights

- 5th largest installed capacity of RE in the world
- 4th largest installed capacity of wind power in the world
- 5th largest installed capacity of solar power in the world
- 100% FDI permitted in RE sector through automatic route
- The world's largest ground-based solar power plant is located in Kamuthi (Tamil Nadu)
- The world's largest rooftop solar power plant is located in Beas (Punjab)

Source: Invest India, Make in India

Within RES, wind power dominates the segment with the largest share of 44%, followed by solar energy with a share of 39%. During Apr-19 to Oct-19, 5.12 GW of RE generating capacity has been added as against the target of 12.21 GW set for FY20 i.e. an achievement of 42% of the target.

The cumulative RE installed capacity as of October 2019 (GW)



Source: Ministry of New & Renewable Energy

Key trends in renewable energy sector

Solar sector - major contributor to the new capacity addition in the RE segment

Solar power that accounts for over two-thirds of the new capacity addition has become major contributor to the new capacity addition in the RE segment. The sector added 3,537 MW capacity during Apr-Oct 2019, which comprised of 3,033 MW in ground-mounted, 483 MW in rooftop and 21 MW in SPV systems. The substantial addition in solar capacity can be attributed to the various government measures to step up investment in the segment as well as sharp decline in cost of building large-scale solar projects. According to an International Renewable Energy Agency survey set up cost of solar projects in India fell by almost 80% between 2010 and 2018.

Slowdown in the pace of addition in generation capacities of RE

Although the government is giving major push to RE sector through a slew of support measures, the pace of addition in generation capacities has witnessed some slowdown in FY20 due to depreciating rupee (as solar modules are sourced from China), cancellation of some renewable project tenders and government-mandated tariff caps in reverse auctions.

Policy support for renewable energy sector

- In July 2019, the GoI approved the proposal for early regulatory approval by Central Electricity Regulatory Commission (CERC) for transmission schemes identified for 66.5 GW National Renewable Energy Mission (NREM) projects. This will help to complete transmission and generation activities of renewable energy (RE) projects in matching time-frame, in turn enabling the government to

achieve the target set for RE capacities. The transmission schemes for aforementioned 66.5 MW NREM project will be accorded the status of 'Projects of National Importance'. The government has also issued few directions to the Central Electricity Regulatory Commission (CERC) in respect of these projects, which are as given below:

a) To accord regulatory approval for the transmission system associated with 12.5 GW of RE capacity in Phase-I for which CTU has already applied to CERC for regulatory approval, while for balance 15.5 GW under phase-I and 38.5 GW under phase-II regulatory approval to be given promptly on submission of the application by CTU.

b) Prior requirement of Long Term Access (LTA) applications and associated bank guarantees, to be deferred for the interim period till the RE project is awarded to successful bidder.

- In November 2019, the government waived of inter-state transmission charges and losses on transmission of the electricity generated from solar and wind.
- In June 2019, a dispute resolution committee was formed to resolve unforeseen disputes between solar/ wind companies and SECI/ NTPC.

Ocean energy

- In August 2019, the government approved the proposal to declare ocean energy as renewable energy. The energy produced using various forms of ocean energy such as tidal, wave and ocean thermal energy conversion shall be considered as renewable energy and shall be eligible for meeting the non-solar Renewable Purchase Obligations.

Solar

- In October 2019, the government clarified that semi-processed solar PV cells (Blue Wafer Cells) if imported and used as raw material for the manufacturing of solar PV cells, then such solar PV cells will not qualify as domestically manufactured solar PV cells for programmes implemented by the Ministry of New and Renewable Energy.
- In February 2019, the phase II of Grid Connected Rooftop Solar Programme was approved for achieving the cumulative capacity of 40,000 MW from rooftop solar projects by 2022. The programme will be implemented with the central allocation of ₹ 118.14 bn.
- In order to get a comprehensive overview of measures adopted by states to encourage rooftop solar deployment, State Rooftop Solar Attractiveness Index (SARAL) was launched in August 2019. SARAL index is based on five key aspects namely i) robustness of policy framework; ii) implementation of environment; iii) investment climate; iv) consumer experience and v) business ecosystem.
- In February 2019, the government provided approval for the setting up of 12,000 MW grid-connected solar photovoltaic (PV) power projects by the government producers with viability gap funding support of ₹ 85.8 bn.
- In February 2019, Kisan Urja Suraksha evam Utthaan Mahabhiyan (KUSUM) was launched which includes three components namely a) 10,000 MW of decentralised ground mounted grid connected renewable power plants; b) installation of 1.7 mn standalone solar powered agriculture pumps; c) solarisation of 1 mn grid-connected solar powered agriculture pumps. The scheme intends to add a solar capacity of 25,750 MW by 2022 and the financial support provided under the scheme stands at ₹ 344.22 bn.

- National Institute of Solar Energy partnered with United Nations Industrial Development Organisation (UNIDO) to carry skill development programme for technical manpower engaged in the solar thermal energy sector.

Wind

- In July 2019, the government made amendment to the standard bidding guidelines for wind power projects. These include i) extension of the timeline for land acquisition for wind power projects from seven months to 18 months; ii) the window for revision of declared Capacity Utilization Factor (CUF) of projects increased to three years; iii) the penalty on shortfall in energy corresponding to the minimum CUF fixed at 50% of the PPA tariff; iv) the procurer may purchase the generation, at full PPA tariff in case of early part commissioning; v) commissioning schedule of wind power project defined as 18 months from the date of execution of the PPA or PSE, whoever is later.

Biomass

- The Union Budget for 2019-20 proposed to support private entrepreneurship in agriculture allied activities like generating RE.

The Way Forward

The Indian power Sector is currently passing through a distressed phase due to stressed assets especially in the thermal power segment. The government has announced a slew of measures to address financial stress in the power sector. Yet much of it has remained unresolved, suggesting that there is no easy fix to this problem. Further, the lack of progress in reducing AT&C loss levels in line with the targets agreed under UDAY has led to lower-than-expected reduction in losses for DISCOMs. However, the initiative like converting all meters to smart prepaid is expected to reduce AT&C losses, thereby improving earnings for DISCOMs. In case of transmission and distribution network, state governments have been asked to ensure metering of feeders and distribution transformers. Further, March 2020 deadline set by the government to complete all Integrated Power Development Scheme work will help in providing seamless power supply. In order to initiate sustainable revival of the power sector, a major reform agenda is required. The government has also hinted at announcing a package of power sector tariff and structural reforms in the near future in the Union Budget for 2019-20.

In case of RE segment, the government will continue to play a major role in driving growth of RE segment in near future. The project proposals like building of 30 GW of RE capacity along a desert on its western border spread across the states of Gujarat and Rajasthan and 25 GW solar projects combined with storage capacity in Ladakh are expected propel fresh investment in the solar power. Besides solar, the government is expected to tap wind power from three ports namely Tuticorin, Kandla and Paradip. In case of biomass energy, research is undertaken to develop novel approaches to convert agriculture residue to biomass energy. India is targeting production of 75 GW of hydropower by 2030, up from 45 GW currently as the government aims to achieve the target of 175 GW of RE capacity. Moreover, the recent government measures of increasing debt repayment period to 18 years for hydro power projects are expected to boost investment in the segment.

It has to be noted that RE generating capacity is given major boost at a time when capacity utilisation at thermal power plants is at decade low level. Hence, the focus should be on balancing RE-thermal mix to avoid huge idle capacities of either in future.

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INFRA@75

BUILDING MODERN & SUSTAINABLE INFRASTRUCTURE

Infra@75: Building Modern & Sustainable Infrastructure

The Government is making efforts to steer the economy towards becoming a US$ 5 trillion economy achieving the aspiration of a New India by 2022, the year marking 75 years of India's independence. The Niti Aayog has drafted a strategy document titled '**Strategy for New India@75**' as a roadmap to help achieve this objective. It is no surprise that infrastructure has been listed as one of the four critical components of this strategy. Needless to say, India's objective of sustaining high growth is heavily dependent on infrastructure.

The government has displayed a strong resolve for a renewed thrust on infrastructure development, not only by way of new constructions, but also by reviving previously stalled/shelved projects. Rapid urbanization is also a major driver of increased spending on infrastructure.

Sustainable Development is another critical component of India's growth vision, with India having signed the declaration on the 2030 Agenda for Sustainable Development; under this Agenda, there are 17 Sustainable Development Goals, including Infrastructure, Climate Action, Water Management and Sanitation, Sustainable Cities & Communities and Affordable & Clean Energy, among others.

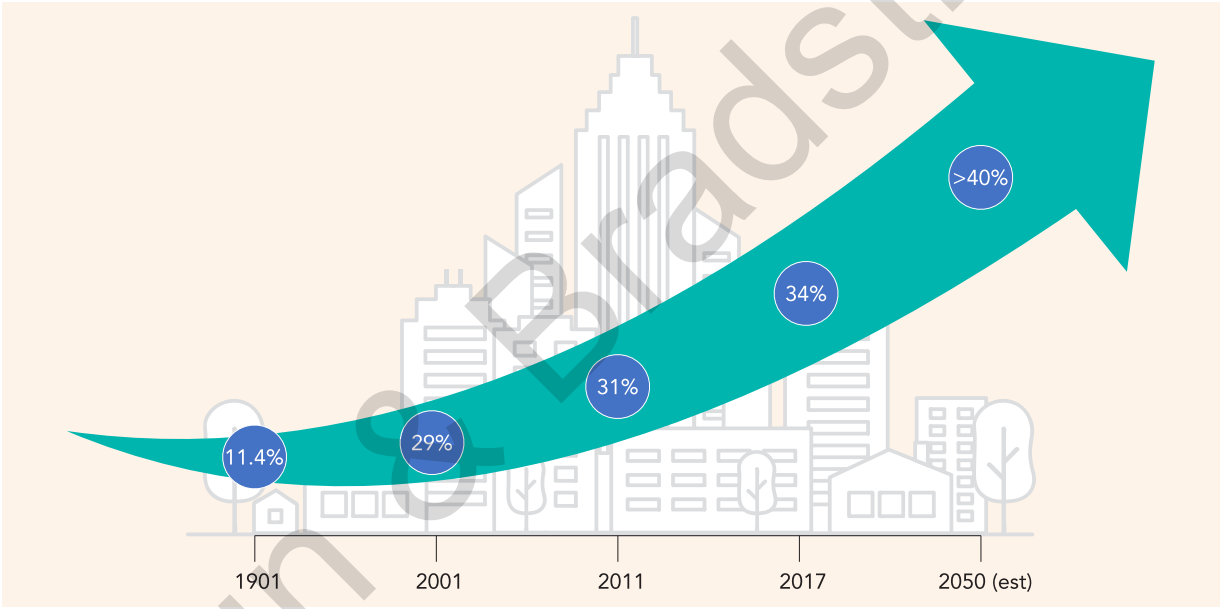
With this context, India needs to build '**Modern and Sustainable Infrastructure**'. Accordingly, the focus areas ought to be a) next-generation infrastructure (modern transportation, innovative construction methods, and use of innovative materials, etc.), b) energy self-sufficiency, c) connectivity through smart solutions and telecommunications and d) water security.

Next-Generation Infrastructure

Despite being the third largest economy in the world in terms of GDP measured in terms of purchasing power parity, India still remains a developing economy with low per capita income. For an emerging economy like India, the level and pace of infrastructure development significantly influences its growth.

India has been undergoing rapid urbanisation over the years. According to the 1901 census, about 11.4% of the country's population resided in urban areas. This increased to almost 29% in the 2001 census and even further to 31% by 2011. As per the World Bank, this number increased to 34% by 2017. It is estimated that the population in urban areas will increase by another 400 mn people over the next 30 years; interestingly, it took 60 years to add the same number of people to India's urban population. This rapid increase in urbanisation has placed additional stress on the existing infrastructure in cities.

Rising urbanisation in India



Addressing this issue, the Government of India launched the Smart Cities mission, the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) which focuses on water supply, sewage networks and sustainable urban transport facilities and the Pradhan Mantri Awas Yojana housing scheme. Besides these, there is an urgent need to expedite the pace of infrastructure development and the access to infrastructure. This could be addressed through means such as developing new-age infrastructure, creation of new means of transportation, use of technology and new methods in construction, use of new materials, etc.

Some of the next-generation developments in infrastructure that are already being used in India, or are expected to be used in the near future are as follows:-

1) New-Age Transportation Systems

Private mode of transportation is the dominant mode of transportation in India. Heavy dependence on private transport has led to additional pressure on roads and open spaces due to movement of vehicles and parking. Needless to say, there needs to be an expansion in the traffic-bearing capacities of the existing transport infrastructure. However, it also makes sense to enhance the efficiency and quality of public transport and related infrastructure, to make it more popular among the masses. The development of metro rail systems, for instance can help in reducing the burden on the road network within cities. Bullet trains are also going to be used in the near future. Inland Waterways are also being developed. However, public transport needs to be both, affordable as well as reliable in order to become popular.

2) New-Age Technology for Construction

- **Use of Building Information Modelling (BIM)**

  Building Information Modelling (BIM) systems have been gaining popularity among professionals in architecture, engineering and construction. It goes beyond 2D and 3D modelling in terms of helping in planning, designing, constructing and managing structures. BIM works on the base of an intelligent model with intelligent objects, with relationships defined between objects and data. If an element changes, the entire model is able to adjust to the change. The software can keep the entire design consistent and coordinated. Although the technology is expensive, it offers benefits like fewer errors, less rework, greater collaboration, and design data that can ultimately be used to support operations, maintenance, and asset management.

- **Modern infrastructure machinery**

  Construction companies are now extensively using modern construction equipment and machinery like lifting bars, advanced cranes, trailers, launching girders, equipment for production and transportation of concrete, equipment for foundation construction, equipment for placing and finishing concrete, etc. Likewise, the use of other advanced infrastructure-related equipment like advanced jet-pump based dredging equipment, tunnel-digging machinery, unmanned oil rigs and offshore oil platforms, robotic drilling systems, and roofbolters and shuttle cares should be explored.

- **Robotic systems for civil construction**

  Robotic systems can be used for precise inspection and maintenance of civil infrastructure. To reach higher locations, these robots will require adhesion as well as locomotion mechanisms. Robotic systems can also be used for cleaning and maintenance of structures. For example, in recent times, robotic equipment are being used to clean solar panels in solar power projects. Likewise, drones are now being used not only to monitor sections of projects, but also for installation/construction purposes.

3) New-Age Construction Methods

- **Aluminium Formwork System/Aluminium Shuttering**

  The Aluminium Formwork System is a construction system for forming cast in place with respect to concrete structures of buildings. Although it increases the overall cost of construction, it helps reduce construction time. It is unique because it forms all the concrete in a structure (walls, floor slabs, columns, stairs, beams, windows, etc., exactly in accordance with the architect's design. It also eliminates the need for plastering. It eliminates the need for brick work in the case of walls.

- **Pre-fabricated construction**

  Pre-fabricated construction involves putting together a variety of components of a structure at another site and subsequently moving them to the construction site for final assembly. Although it is generally considered as a low-end and mass-produced mode of construction, it actually requires meticulous planning, detailing and precision. It results in faster and cheaper construction, primarily because the components are fabricated using 3D modelling and are made in controlled factory settings. Another advantage is that they can be designed to include mechanical, electrical and plumbing connections, thereby reducing the labour time that would otherwise be required to install the same at a later stage. It is environment-friendly, since construction debris and waste can be reduced to a great extent; it leads to less health risks for workers and engineers.

- **Lift slab construction**

  This is a construction method that involves placing several slabs one over the other and lifting them up after casting, using jacks. The structure is built at the ground level using a separating medium in between. Though this patented technology was designed in 1950s, it is still in the experiment stage in India. The casting for this form is done in-situ, hence, the construction process is faster as major part of the work is done at the ground level without having the need to transport material, thereby saving money and manpower.

- **Cavity wall construction**

  This form of construction is used to build structures in hot weather regions. It provides good insulation against heat and can be used in air-conditioned buildings and other commercial constructions. It involves leaving a measured air cavity within the wall between masonry leaves. The leaves are tied with brick, concrete wall or metal tiers.

4) New-Age Construction Materials

- **Use of Ferro-Cement**

  Ferro-cement is a form of reinforced mortar. It consists of a layer of cement applied over layers of iron-based metals like wires and metal mesh. This helps structures become crack, fire, and earthquake-resistant. The material is ideal for lightweight construction and is an affordable alternative for traditional methods. The maintenance costs associated with such structures are also found to be lower vis-à-vis pure steel constructions.

- **Use of advanced forms of concrete**

  The construction sector is increasingly making use of advanced forms of concrete. RCC, fair-faced concrete and self-healing concrete are some examples.

RCC is concrete that is strengthened by use of fibre, steel plates and bars. The load-bearing capacity of RCC is much higher than normal concrete. It can withstand more compression, with the tensile strength of steel. The presence of steel helps reduce the thermal expansion and contraction of structures. RCC mixed with lime and water helps make structures corrosion-resistant as well.

Fair-faced concrete is a concrete surface which, on completion of the forming process, requires no further (concrete) treatment other than curing. Not only does it have load-bearing properties and unequalled cost/performance ratio, it also offers versatility in design and variety in finishes.

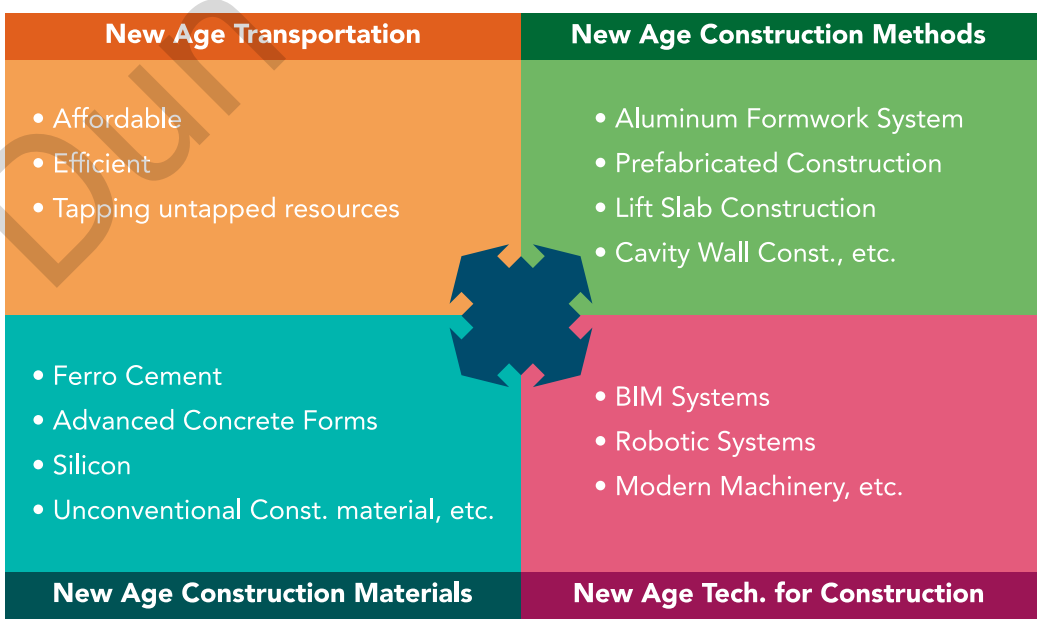
Self-healing concrete is also being used, especially in road works, since it offers protection against corrosion. Self-cleaning concrete is also being used to make structures that require lower maintenance.

- **Use of Silicon**

Modern construction techniques are also making use of silicon-based structures. In Korea, for instance, a large number of structures have been constructed using silicon-coated fabric roofs, which are translucent and light, let in natural light and also have acoustic properties. Silicon is also used in the form of sealants, adhesives and coatings, among other materials to enhance the durability of structures. As building material, silicon is highly durable and can resist decay and corrosion due to severe weather conditions, moisture or sunlight. Silicon can also be used to create suspended structures. Silicon sealants help increase the flexibility and stress-absorption capabilities of structures, especially in earthquake-prone areas. It also improves energy efficiency by preventing humidity and keeping temperatures regulated.

- **Use of unconventional material for construction of roads & highways**

Indian roads are vulnerable to extreme changes in weather conditions, such as heat and rain. As a result, the bitumen which is used as a binder for construction of roads loses its adhesive character, resulting in cracks and potholes. Modified bitumen, which combines natural asphalt and waste materials like rubber, plastic polymer, etc., can be used to strengthen roads. The use of waste can help in more efficient disposal of waste as well.



Energy Security

Energy security is defined as the uninterrupted availability of energy resources, at an affordable price. Energy security, both in the short term as well as long term, are matters of high importance for any economy. Short term energy security refers to the ability to respond to sudden changes in supply and demand; long term security pertains to a long term strategy to address economic development and environmental objectives.

Energy security is a major focus area in India's objective to become a global economic power. However, coal, oil and natural gas are the most important sources of primary energy in India, and the country has inadequate domestic supplies of all of these. India's energy consumption is expected to rise by 4-5% per year for the next 25-30 years. India, therefore, is forced to increase its imports every year in order to cater to the rising demand.

Oil & Gas

India's High Dependency on Oil Imports

India is the world's third largest consumer of oil. The increase in demand for oil stems from the rising demand for auto fuel and LPG. However, India is forced to meet 80% of its oil needs through imports. This high degree of dependence on imported oil is a reason for India's highly vulnerable energy security. Moreover, the rising fuel subsidies to make fuel affordable for the masses is a major reason for the economy's current account deficit (CAD). India's economic fortunes, therefore, are closely linked with global crude prices.

NELP and HELP's Failure to Attract International Investment

The New Exploration Licensing Policy (NELP) was formulated by the Government of India in 1997-98 to boost domestic production of hydrocarbons. It sought to provide a level playing field to both Public and Private sector companies in exploration and production with Directorate General of Hydrocarbons (DGH) as the nodal agency for its implementation. NELP also sought to attract more investment in oil exploration and production by inviting not just Indian private companies, but also foreign companies to help in supplementing the efforts of public sector oil & gas companies. Under NELP, blocks were awarded to Indian, private and foreign companies through International Competitive Bidding process.

In March 2016, the Government introduced the Hydrocarbon Exploration Licensing Policy (HELP) to replace the existing NELP. The new policy promised simpler rules, tax breaks, pricing and marketing freedom, as a strategy to help double oil & gas output by the year 2022-23 and help reduce the oil import bill by 10% by the year 2022. HELP was to work on a revenue-sharing model as against the profit-sharing model of the erstwhile NELP.

However, neither NELP nor HELP succeeded in attracting significant interest, especially among large international energy corporations. Therefore, India will need to make major investments to acquire hydrocarbon reserves abroad.

Electricity

Heavy Dependence on Thermal Power & Coal

India is the world's second largest producer of coal, producing one-tenth of the world's coal. However, India is also the second largest importer of coal. Despite various economies across the globe making a commitment towards reducing carbon emissions and towards shifting focus to renewable energy, coal continues to be the largest source of electricity in the world. Closer home, thermal power plants, which run on coal, account for more than 70% of India's electricity needs. Accordingly, two-thirds of India's coal consumption goes towards electricity generation. To add another perspective to India's energy needs for the future, more than 300 mn Indians do not yet have access to electricity.

The Indian Government is showing great resolve in harnessing renewable resources towards generating power. In fact, the Government has set itself a target of enhancing its renewable energy capacity from 78 GW to 175 GW by the year 2022, of which 100 GW is expected to come from solar power alone. As per the BP Energy Outlook 2019, the share of coal in India's primary energy consumption is expected to decline from nearly 60% in 2017 to around 48% by the year 2040. However, this would still be nearly half of India's energy mix.

While the power sector uses non-coking or thermal coal, coking coal is used by steel manufacturers for iron ore smelting. About 87% of India's proven coal reserves (approx. 150 bn tonnes) is non-coking coal. Nonetheless, the demand for coal far exceeds domestic supply.

India - Energy Facts

- 80% of India's oil needs is met through imports
- Thermal power plants cater to ~70% of India's electricity needs
- Energy consumption is expected to rise by 4-5% p. a. over the next 25-30 years

Power Generation Sector Under Stress

The thermal power sector, especially private companies, has been facing a few problems since the past few years. The problems stem from lack of assured fuel supply and agreements to sell the power generated. As a result, such companies have witnessed piling up of debt and stress on their financials.

One of the major reasons for the stress of the thermal power sector was the Supreme Court's decision in 2014 to cancel more than 200 coal blocks allocated since 1993. In 2015, a bill was passed to award these blocks through auctions and allotments. So far, 85 of these coal mines have been allocated to the private sector. Since then, then government ended the monopoly of Coal India with respect to coal mining, in an attempt to provide a level playing field and to foster competitiveness. Accordingly, private sector power companies could also bid for coal mines.

Some Possible Solutions to India's Energy Security Problems

- India needs to rapidly expand its renewable energy capacities. It needs to find better ways to harness its ample potential with respect to solar and wind energy, and also come up with better technologies to help store solar and wind energy and make them cost-effective.
- Other non-conventional energy resources should be explored and researched in order to make them economical and accessible. Some examples are tidal energy, geothermal energy, etc.
- India needs to be able to better leverage its diplomatic ties in order to enter into energy security partnerships with foreign countries. It currently sources most of its oil needs from the Middle East. Iran also used to be a source of oil, but that dependence had to be reduced in order to maintain good relations with USA. In order to counter such risks, India needs to find more resources within its shores or needs to create newer partnerships. India is already building relationships in its extended neighbourhood with Myanmar, Vietnam, Central Asian countries like Kazakhstan and other Gulf countries.
- The Indo-US nuclear deal has helped India gain access to valuable technology and nuclear fuel. India has also started engaging with China, Kazakhstan and Australia for nuclear power.
- India needs to find a solution to the stalling of the Iran-Pakistan-India gas pipeline and the Turkmenistan-Afghanistan-Pakistan-India gas pipeline for assured supply of natural gas.
- In order to ensure energy security at the ground level, efforts need to be made not only to bring electricity to all households, but also to ensure 24x7 electricity supply to all households.
- The Pradhan Mantri Ujjwala Yojana is a mission to provide LPG connections to women of below poverty line households. The programme could be supported by setting up biomass palletisation units and distribution of biomass challahs.
- The National Mission for Enhanced Energy Efficiency (NMEEE) is one of the eight national missions under the National Action Plan on Climate Change. It aims to strengthen the market for energy efficiency through implementation of innovative business models in the energy efficiency sector. It should be deployed to bring about energy efficiencies across several industries.
- Auto fuel quality should be upgraded to BS-VI norms and launched by 2020. This will certainly enhance vehicle fuel efficiency.
- HELP should be made more attractive with respect to investment and returns for investors.
- The India Energy Security Scenarios, 2047 (IESS) has been developed as an energy scenario building tool. The tool aims to explore a rage of potential future energy scenarios across energy supply sectors and energy demand sectors. The model allows users to interact and make energy choices and explore a range of outcomes. The tool was designed to engage various stakeholders such as policy makers, academicians, private sector in the country's energy planning and to facilitate informed debates at different levels. It enables policy makers and parliamentarians make a more secure and sustainable energy future for India and allows a comprehensive policy discourse on India's future energy planning.
- For Hydro power projects, efforts are needed to expedite progress with respect to under construction projects through satisfactory rehabilitation and resettlement initiatives.

- India has already built strategic petroleum reserves in order to meet supply shocks due to emergencies like wars, natural disasters, etc. Three strategic petroleum reserves have already been constructed in huge underground rock caverns at Visakhapatnam, Mangaluru and Padur. These facilities have a capacity of 5.3 million tonnes and can make up for 10 days of India crude oil requirements. Plans are in the pipeline to construct another 6.5 million tonnes of storage at Padur and Chandikhol for 22 days supply.

Digital Empowerment

India is the second most populous country in the world. It is also the second largest telecommunication market in the world in terms of number of telephone subscribers (both landline and wireless) at around 1.2 bn subscribers. At more than 451 mn active internet users, it also has the second largest internet user base in the world after China. However, the internet penetration in India is around 33-36%. India also ranks an unimpressive 47th out of 100 countries on the Inclusive Internet Index, commissioned by Facebook and conducted by The Economist Intelligence Unit. Although India stands first among Asian nations in affordability and third in readiness, poor availability, poor usage and network quality, especially mobile speed and latency, result in a low score overall.

In the current age of information and digital technology, there is a deep correlation between economic prosperity and access to ICT services. Accordingly, if any has to get any close to its target of becoming a US$ 5 trillion economy, it needs to work towards ensuring that its population is better connected.

Government's Push for Digital Empowerment

The Government's Digital India programme has helped boost corporate governance, digital payments and has even boosted convergence of various telecommunication services such as telephony, media & entertainment and data services. The convergence of ICT services is expected to usher in significant development in various areas such as fintech/digital finance, e-commerce, logistics, healthcare, media & entertainment.

The **Digital India** programme was launched in July 2015 with the aim of transforming India into a digitally empowered society and knowledge economy. It sought to bring about delivery of Government services and public accountability electronically.

The Nine Pillars of the Digital India Programme are: -

- **Broadband Highways** – This covers Broadband for All Rural, Broadband for All Urban and National Information Infrastructure. The Broadband for Rural project, also known as **BharatNet** (previously known as National Optic Fiber Network) sought to connect 250,000 gram panchayats via the optical fiber network. As of Nov 15, 2019, more than 3.83 lakh km of OFC have been laid, spanning across 1.41 lakh Gram Panchayats.

  The Broadband for All Urban project would mandate leveraging Virtual Network Operators for service delivery and communication infrastructure in new urban developments and buildings. Finally, the National Information Infrastructure would integrate networks like SWAN, NKN and NOFN along with cloud enabled National and State Data Centres, with DeitY as the nodal department.

- **Universal Access to Mobile Connectivity** – This initiative seeks to enhance network penetration and to fill gaps in connectivity across the country. More than 42,000 villages are to be covered.
- **Public Internet Access Programme** – This initiative seeks to provide access to internet-based government and business services at public centres, namely Common Service Centres (access points for delivery of essential public utility services, social welfare schemes, healthcare, financial, education and agriculture services) and post offices as multi-service centres. To improve reach, the number of common service centres will be increased from 135,000 to 250,000 (one in each Gram Panchayat). Further, around 150,000 post-offices would be converted to multi-service centres.
- **E-Governance** – This is an initiative to bring about a technological transformation across ministries and departments. The guiding principles for this initiative are form simplification, enabling an online application and form tracking process, use of online repositories and integration of services and platforms for integrated and interoperable service delivery to citizens and businesses.
- **E-Kranti** – This program covers 41 mission mode projects for e-governance. It covers technology for education, healthcare, farmers, security (emergency services & disaster management), financial inclusion, justice, planning and cyber security, among others.
- **Information for All** – This initiative pertains to creating an open data platform and hosting information & documents online for open and easy access to information for citizens. It also covers use of social media and web based platforms to engage with citizens and keep them informed. MyGov.in has already been launched as a medium to exchange ideas/ suggestions and will facilitate 2-way communication between citizens and government.
- **Electronics Manufacturing** – This initiative seeks to manufacture electronics within India and to eventually phase out imports thereof.
- **IT for Jobs** – This program seeks to train one crore students from smaller towns and villages for IT sector jobs. It also seeks to set up BPOs in North-Eastern states to facilitate ICT-enabled growth. Furthermore, 3 lakh service delivery agents would be trained as part of skill development to run viable businesses delivering IT services and 5 lakh rural workforce would be trained by the Telecom Service Providers (TSPs) to cater to their own needs.
- **Early Harvest Programmes** – This covers other routine aspects/matters of government offices and departments, such as IT platform for messaging, e-greetings, biometric attendance, Wi-Fi connections in universities, emails, e-books in schools, weather information and alerts, lost & found, etc.

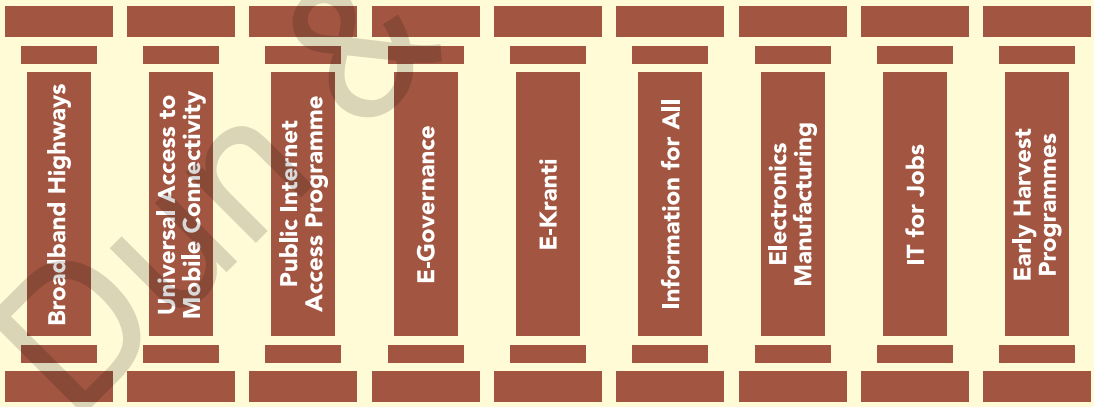
Leveraging the Internet of Things (IoT)

Another aspect of digital communication that is significantly changing the landscape is the Internet of Things (IoT). A lot of developments are already taking place since the advent of the IoT. Not only people, but even machines, devices and homes are getting connected to the internet. IoT is being deployed to create a 'smart economy' in which administration and delivery of services is intelligently managed.

The various areas where IoT is being applied are as follows:-

- **Smart Cities** – A smart city is a term used to describe a city that incorporates ICT to enhance the quality and performance of urban services such as lighting, energy, transportation and utilities, in a way that reduces consumption of resources, wastage and overall costs. Under the Government of India's Smart Cities Mission, 100 smart cities are to be developed across the country under the direction of the Ministry of Urban Development. These smart cities will make use of IoT to monitor and control aspects like street lighting, traffic management, parking, WiFi internet access in public areas, surveillance systems, and solid waste management, among others.
- **Smart Health** – IoT will be used in wearable devices to monitor vital parameters like pulse, respiration, heart rates and body temperature, not just in health centres, but on a real-time basis. It could also be used in the form of sensors to help monitor and track people with mental disorders.
- **Smart Workplaces** – IoT can also be used to create digitally connected workplaces to connect employees with their workstations and fellow employees, even when they are on the move.
- **Smart Water Solutions** – Smart sensors and devices can help monitor water levels in water bodies and quality of water at public places. It can also be used to detect any leakages, wastage of water.
- **Smart Agriculture** – Smart solutions can be used in precision farming to monitor things like earth density, moisture levels in the soil, temperature, pest alerts, etc.
- **Smart Supply Chain** – IoT sensors can be used to manage logistics chains pertaining to food grains to ensure timely refilling and to reduce wastage of food supplies.

Nine Pillars of the Digital India Programme



Water Security

India is home to about 17% of the world's population. However, it has only 4% of the world's freshwater resources. As per the NITI Aayog, nearly 820 million people in 12 major river basins across the country face high to extreme water stress. Of these, 495 million alone belong to the Ganga river basin, which generates nearly 40% of the country's GDP.

It is estimated that every year, at least two lakh people die due to inadequate water, sanitation and hygiene. Furthermore, the country generates huge quantities of waste water annually, which leads to contamination of groundwater. There is gross mismanagement of waste water, and lack of liquid waste management, which contribute to a large section of the population also suffering from water-borne diseases.

Recognising the issue, the NITI Aayog had first come out with the Composite Water Management Index in 2018, as a useful tool to assess and recommend measures to improve the performance in terms of efficient management of water resources. The index provides useful information for the states and also for the concerned central ministries/departments enabling them to formulate and implement suitable strategies for better management of water resources. The index also ranks states across nine themes (it covers 25 states and two union territories), which include source augmentation and restoration of water bodies, source augmentation (groundwater), major and medium irrigation, watershed management, participatory irrigation practices, sustainable on-farm water use practices, rural drinking water, urban water supply and sanitation, and policy and governance.

In August 2019, the NITI Aayog released the 2019 edition of the CWMI Report, i.e. CWMI Index 2019. The report showed that states across the country were indeed making progress in water management; however, it also pointed out that the overall performance is still not enough to tackle India's increasing water challenges. The report showed that although 80% states had improved their water management scores in recent years, 16 states still scored less than 50 points (out of 100) on the index and fell in the low-performing category. The low-performing states include Uttar Pradesh, Bihar, Jharkhand, Odisha, Delhi, Rajasthan, Nagaland and Meghalaya, which collectively account for around 48% of the population, 40% of the agricultural produce, and 35% of economic output of India. It also pointed out that food security was also at risk because of the poor water management in the country. None of the top 10 agricultural producers in India, except Gujarat and Madhya Pradesh, scored more than 60 points on the CWMI, which was a worrying fact given that almost half of the Index scores were directly linked to water management in agriculture.

More than 12% of India's population currently finds itself inching closer to a 'Day Zero' scenario with respect to groundwater levels. To compound the problem, it is estimated that by 2030, the demand for water in the country will be twice the available supply. This would lead to scarcity for millions of people and the possibility of an estimated 6% loss in GDP.

Government's Water Management Strategy

In May 2019, the Government of India formed a new ministry named **Ministry of Jal Shakti**. The ministry was formed by merging two ministries – Ministry of Water Resources, River Development & Ganga Rejuvenation and Ministry of Drinking Water and Sanitation. The ministry aimed at tackling water issues with a holistic and integrated approach and had the target of providing piped water connections to every household in India by 2024.

Some of the programs and missions currently being implemented by the Ministry are as under: -

1) **National Water Mission (NWM)**

NWM is one of the eight missions launched under the National Action Plan on Climate Change (NAPCC) for combating the threat of global warming. Under the mission, the National Water Policy would be revisited in consultation with States to ensure basin level management strategies to deal with variability in rainfall and river flows due to climate change. The objectives of the mission are to promote conservation of water, minimise wastage and ensure equitable distribution across the country and within states through integrated water resources management.

Goals of the National Water Mission: -

- Comprehensive water database in public domain and assessment of the impact of climate change on water resources.
- Promotion of citizen and state actions for water conservation, augmentation and preservation.
- Focused attention to vulnerable areas including over-exploited areas.
- Increasing water use efficiency by 20%.
- Promotion of basin level integrated water resources management.

Major provisions under the National Water policy are:

- Establishing a standardized national information system with a network of data banks and databases.
- Guidelines for the safety of storage dams and other water-related structures.
- Regulate exploitation of groundwater.
- Setting water allocation priorities in the following order: Drinking water, Irrigation, Hydropower, Navigation, Industrial and other uses.
- Rationalisation of water rates for surface water and ground water with due regard to the interests of small and marginal farmers.
- Participation of farmers and voluntary agencies, water quality, water zoning, conservation of water, flood and drought management, erosion, etc.

2) **National Rural Drinking Water Programme (NRDWP)**

The National Rural Drinking Water Programme is a centrally sponsored scheme aimed at providing adequate and safe drinking water to the rural population of the country. NRDWP focuses on creating and sustaining rural drinking water infrastructure in the country. Launched in 2009, it underwent modifications in 2012 and again in 2017 to make it competitive, outcome-based and to incentivize states for keeping the completed schemes functional.

Financial Performance under NRDWP

During FY18, Budget Estimates (BE) allocation towards NRDWP was ₹ 60.5 bn. Subsequent to revised estimate, a total of ₹ 70.5 bn was provided. Of this, ₹ 70.37 bn was released to States i.e. utilized at the national level including the Ministry level expenditure. During FY19, allocation under NRDWP was for ₹ 70 bn at BE stage which was revised to ₹ 55 bn at RE stage.

Physical Performance under NRDWP

As of 31 March 2019, the physical performance under NRDWP was as under: -

Fully Covered		Partially Covered		Quality Affected		Total	
Target	Coverage	Target	Coverage	Target	Coverage	Target	Coverage
18,294	32,460	52,805	30,964	8,468	4,378	79,567	67,802

3) Swachh Bharat Mission (SBM)

The Swachh Bharat Mission was launched on 2nd October 2014 to accelerate efforts to achieve universal sanitation coverage, improve cleanliness and eliminate open defecation in India by 2nd October 2019. The programme is considered India's biggest drive to improve sanitation, hygiene and cleanliness. It also aims to improve cleanliness in the villages through Solid and Liquid Waste Management (SLWM) projects.

Since the launch of SBM (Gramin), significant improvement has happened in the rural sanitation coverage. The rural sanitation coverage on 2nd October, 2014 was 38.7%. As of 31 March 2019, the coverage stands at 99.04%.

Year	IHHL (BPL)	IHHL (APL)	IHHL (Total)	Community Sanitary Complex
FY18	14,776,864	15,505,800	30,282,664	3,897
FY19	10,752,568	11,896,522	22,649,090	12,665

**IHHL – Individual Household Latrine, APL – Above Poverty Line, BPL (Below Poverty Line)*

The Way Forward

- There is a need for giving focus on not just creating infrastructure for water supply, but also on improving water use efficiency, reducing leakages, recharging/restoring local waterbodies as well as rationalising tariffs and ownership by various stakeholders.
- There should be more work done towards rainwater harvesting. At presently, only 8% of India's annual rainfall is estimated to be harvested, which is among the lowest in the world.
- About 80% of the water that reaches households, leaves as waste and pollutes the waterbodies and environment. There is a huge potential in reusing and recycling this treated wastewater.
- Citizens and communities also need to play a role in this initiative, to help it succeed at the ground level.

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Website: www.dilipbuildcon.com

Experts' View

CDE Asia Limited

Manish Bhartia
Promoter & MD

Please provide a brief background about CDE Asia and its growth story thus far.

CDE Asia, subsidiary of CDE Global (UK), is a leading inventor and manufacturer of recycling technologies, serving over 24 countries in the Indian subcontinent and South-East Asia. It has been awarded the prestigious DSIR certification as an approved R&D centre. Recently, the company received an investment of US$ 14.5 million from IIFL-AMC to help its growth plan.

CDE Asia provides pathbreaking solutions for combating growing shortages in natural sands, recovering value from low-grade minerals or rejects through beneficiation and solving the age-old problem of industrial waste disposal, by offering novel recycling techniques to recover useful construction materials. The company has been credited with developing patented and innovative products that have redefined the construction, mining and waste management industries.

What are some of the company's most groundbreaking technologies in recent years?

We continue our fight to restore and reclaim sand and aggregates through our patented path-breaking wet processing technologies and have championed the cause of countering natural sand shortage with inventive technology. Combo, an inspired product from the CDE stable, converts crushed rock fines into high-quality Manufactured Sand that are a perfect and superior substitute to natural riverine sand. Another of CDE products, namely, ReUrban recycles Construction & Demolition Waste into reusable and beneficiated sand, hence meaningfully contributing to the cause of Smart Cities.

How has the company been championing sustainability?

Our purpose is to champion sustainability in a new world of resource. We have aligned ourselves with SDGs (Sustainable Development Goals) defined by UN. Being a socially and environmentally responsible organisation, we have worked extensively towards creating sustainable solutions that are creating a positive impact on our planet by extending the lifespan of natural resources.

Our technology is helping businesses in their sustainability mission and creating more value. Some of our focus areas are:

- Extracting sand from overburden (OB) of coal mines
- Extracting sand from dredging waste
- Recycling excavation waste from tunneling projects
- Reclaiming contaminated land through land remediation projects
- Replacing natural sand with manufactured sand
- Recycling urban construction & demolition waste

We are supportive and are confident of achieving our set targets for ushering in an inclusive, responsible and smart future, as envisioned by the United Nations.

What is your outlook for the next 4-5 years?

The outlook for our products and company is very positive across Asia and we have aimed to grow at a rate of 30% on a YoY basis. By the beginning of 2020, our regional office for SE Asia located in Indonesia will be operational. This will help us improve our penetration and exports to the region.

As a world leader in the industry, we will continue to challenge assumptions and bring new and exciting products to the global market, which will help us all achieve a cleaner, quieter, safer and more efficient future in partnership with our customers.

HOWE
Benchmarking Infrastructure

Howe Engineering Projects (India) Private Limited

U V Phani Kumar
Chief Executive Officer

Kindly share with us HOWE's journey since inception in the Indian context.

HOWE was established in 1966, with a vision to excel in the infrastructure industry. With time, it has evolved into an EPC service provider, offering a wide array of services to multi-conglomerates under one roof, ranging from consulting to project management to commissioning of infrastructure projects.

In the last five decades, we have significantly contributed towards developing green & brown field projects. We are specialised in the development of ports & terminals, coal & ore handling plants, roads, railways & inland waterway projects, oil & gas projects and agriculture projects, among many others.

Our esteemed client list includes government and private port operators, NHAI, RVNL, FCI, IWAI, etc.

Our prime focus is delivery of projects within the three points of scope triangle of Time, Quality and Cost, with a sense of ownership.

HOWE has acquired and gathered inherent strengths developed over decades in all the disciplines that are required for setting up large scale port and infrastructure projects. The top-line, networth and order book have grown multifold in recent years.

What are some of the biggest opportunities and challenges with respect to India's infrastructure?

India's hyper growth has led to an emphasis on bridging the infrastructure gap. Accordingly, there is increased investment in various sectors such as Ports, Telecom, Datacentre, Aviation, Road & Railway, Oil & Gas, Cross Country Pipeline and renewable energy, among others. Further, the recent move by government with respect to reduction in corporate tax will help attract FDI in infrastructure.

However, infrastructure development has not been smooth in recent years, with a significant shortfall in planned investments, funding constraints, shortage of skilled manpower, land acquisition issues, delay in award of projects, stalling of projects, etc.

What is your outlook for the next 3-5 years?

With the Government pursuing a $5 trillion economy, higher investments are expected. We are ready to be a part of this growth story, which will boost the infrastructure sector.

Our ability to execute projects from concept to commissioning and to execute projects with traditional and hybrid contracting models will be capitalized in the new era of infrastructure by carving out solutions for business requirements. Our EPC division, which is executing transhipment hub in India and LPG Cross country pipeline, will continue to be our major contributor.

Apart from India, infrastructure and port sector of other Asian countries like Bangladesh, Myanmar, Maldives and Indonesia are also expected to be a source of growth for us in the coming years.

How is HOWE different as compared to its peers?

We provide end-to-end services under one roof, with expertise across various sectors such as ports, airports, waterways, rail & roads, agriculture, MHS, LNG, LPG and Cross Country Pipeline projects, etc.

Our diversified business portfolio and highly technical and skilled manpower have played a key role in our growth. HOWE holds expertise in managing projects in a cost-effective and time-bound manner. We provide innovative technical solutions and contracting models/strategies to ensure project success.

Kirby Building Systems & Structures India Private Limited

D Raju
Managing Director

What does Kirby offer in terms of its product & services portfolio, and areas of application?

Kirby Building Systems is one of the world's largest producers of quality steel buildings and has been operational since 1976. The company pioneered the Pre-Engineered Steel Buildings (PEB) technology in India in the year 1999 and has been the market leader in the Indian PEB industry. Kirby India is into Design, Fabrication, Supply and Installation of PEB/Steel Structures and has been evolving over the last 20+ years. The company has also created many benchmarks for the industry in the earlier years and has established standard set of practices to be followed for any type of steel building to be setup right from pre-sales, engineering, fabrication, supply, installation and after sales service.

Kirby India specializes in completing many projects for diverse applications such as Factories, Warehouses, Showrooms, Offices, Supermarkets, Shopping Malls, Shipyards, Metro Rails, Aircraft Hangars, Sports Stadiums, High Rise Buildings, Steel Plants, Cement Plants, Heavy Industrial Structures, etc., spread across various industry segments.

What are some of the advantages of PEB systems?

PEB is one of the first choices when it comes to sustainable and eco-friendly construction. These buildings are also referred to as green buildings as steel is a recyclable material. Kirby India is in the forefront of this innovation and is leading the revolution of green construction across industrial infrastructure through its PEB technology, as it involves dry construction, saving of natural resources, etc. Some of the other advantages are economical, factory-controlled quality, flexibility in expansion, larger clear span, earthquake-resistance, etc.

Steel is the preferred material for prefab construction as the steel used is more than 70% recyclable. These buildings are cost-effective, energy-efficient and provide better quality environment as they are cooler in hot conditions due to the favorable roofing material, suitable insulation and natural ventilation. Further, use of skylights and solar panels mounted on rooftops of industrial buildings also meet daylight and captive power requirements, thereby reducing emission levels.

What is your outlook for the next 4-5 years?

Kirby India has grown manifold over the last few years by executing simple box like buildings to very complex industrial buildings to high rise structures. The company is now adapting new innovative methods across design, fabrication & construction which has widened its scope of operations to diversify into newer growth areas.

Kirby India also provides Industrial Racking Solutions and has diversified into Structural Steel applications such as High Rise Structures and developed a new product to cater to this rapidly growing segment through composite construction or steel construction. The company has already executed many high rise buildings and is currently executing G+20 & G+17 commercial office buildings. This will definitely lead to an increase in demand for steel structures for high rises in the coming years and Kirby India, being a leader, will continue to achieve excellence and create new benchmarks for the industry as a whole.

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India's Leading Infrastructure Companies 2019

Sr No	Company Name	Sector
1	Adani Gas Limited	Oil & Gas
2	Adani Green Energy Limited	Construction
3	Adani Hazira Port Private Limited	Ports
4	Adani Kandla Bulk Terminal Private Limited	Ports
5	Adani Logistics Limited	Logistics
6	Adani Petronet (Dahej) Port Private Limited	Ports
7	Adani Ports and Special Economic Zone Limited	Ports
8	Adani Power Limited	Power
9	Afcons Infrastructure Limited	Construction
10	ARSS Infrastructure Projects Limited	Construction
11	Ashoka Buildcon Limited	Construction
12	BGR Energy Systems Limited	Construction
13	Bharat Petroleum Corporation Limited	Oil & Gas
14	Bharti Airtel Limited	Telecom
15	Bharti Infratel Limited	Telecom
16	BSES Yamuna Power Limited	Power
17	CESC Limited	Power
18	Chennai Petroleum Corporation Limited	Oil & Gas
19	The Dhamra Port Company Limited	Ports
20	Dilip Buildcon Limited	Construction
21	Dredging Corporation of India Limited	Construction

Sr No	Company Name	Sector
22	Engineers India Limited	Construction
23	Everest Industries Limited	Construction
24	Future Supply Chain Solutions Limited	Logistics
25	GAIL (India) Limited	Oil & Gas
26	Gateway Distriparks Limited	Logistics
27	Gayatri Projects Limited	Construction
28	GMR Infrastructure Limited	Construction
29	GPT Infraprojects Limited	Construction
30	Gujarat Gas Limited	Oil & Gas
31	Gujarat Industries Power Company Limited	Power
32	Gujarat Pipavav Port Limited	Ports
33	Gujarat State Petronet Limited	Oil & Gas
34	H.G. Infra Engineering Limited	Construction
35	Hathway Cable and Datacom Limited	Telecom
36	HFCL Limited	Telecom
37	Hindustan Construction Company Limited	Construction
38	Hindustan Petroleum Corporation Limited	Oil & Gas
39	Howe Engineering Projects (India) Private Limited	Construction
40	India Power Corporation Limited	Power
41	The Indian Hume Pipe Company Limited	Construction
42	Indian Oil Corporation Limited	Oil & Gas
43	Indraprastha Gas Limited	Oil & Gas
44	IRB Infrastructure Developers Limited	Construction
45	Ircon International Limited	Construction
46	ITD Cementation India Limited	Construction
47	J. Kumar Infraprojects Limited	Construction
48	JMC Projects (India) Limited	Construction

Sr No	Company Name	Sector
49	JSW Energy Limited	Power
50	JSW Hydro Energy Limited	Power
51	Kalpataru Power Transmission Limited	Construction
52	Kamarajar Port Limited	Ports
53	KEC International Limited	Construction
54	KNR Constructions Limited	Construction
55	Konkan Railway Corporation Limited	Construction
56	L&T Hydrocarbon Engineering Limited	Oil & Gas
57	L&T Infrastructure Development Projects Limited	Construction
58	Larsen & Toubro Limited	Construction
59	Maithon Power Limited	Power
60	Man Infraconstruction Limited	Construction
61	Mangalore Refinery and Petrochemicals Limited	Oil & Gas
62	Modern Road Makers Private Limited	Construction
63	Montecarlo Limited	Construction
64	Nabha Power Limited	Power
65	Nava Bharat Ventures Limited	Power
66	NBCC (India) Limited	Construction
67	NCC Limited	Construction
68	NHPC Limited	Power
69	NLC India Limited	Power
70	NTPC Limited	Power
71	Nuclear Power Corporation of India Limited	Power
72	Numaligarh Refinery Limited	Oil & Gas
73	Oil and Natural Gas Corporation Limited	Oil & Gas
74	Oil India Limited	Oil & Gas
75	ONGC Videsh Limited	Oil & Gas

Sr No	Company Name	Sector
76	Patel Infrastructure Limited	Construction
77	Petronet LNG Limited	Oil & Gas
78	PNC Infratech Limited	Construction
79	Power Grid Corporation of India Limited	Power
80	Power Mech Projects Limited	Power
81	Rail Vikas Nigam Limited	Construction
82	RailTel Corporation of India Limited	Telecom
83	Reliance Industries Limited	Oil & Gas
84	Reliance Jio Infocomm Limited	Telecom
85	ReNew Power Limited	Power
86	Sadbhav Engineering Limited	Construction
87	Simplex Infrastructures Limited	Construction
88	SJVN Limited	Power
89	SPML Infra Limited	Construction
90	Sterling and Wilson Solar Limited	Power
91	Tata Communications Limited	Telecom
92	The Tata Power Company Limited	Power
93	Tata Power Renewable Energy Limited	Power
94	Tata Power Solar Systems Limited	Construction
95	Tata Projects Limited	Construction
96	Techno Electric & Engineering Company Limited	Construction
97	Torrent Power Limited	Power
98	VA Tech Wabag Limited	Construction
99	Vindhya Telelinks Limited	Telecom
100	Vodafone Idea Limited	Telecom
101	Welspun Enterprises Limited	Construction

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India's Leading Infrastructure Companies 2019

Sr No	Company Name	Total Income (₹ mn)
1	Indian Oil Corporation Limited	6,090,522.8
2	Reliance Industries Limited	3,943,230.0
3	Bharat Petroleum Corporation Limited	3,406,061.3
4	Hindustan Petroleum Corporation Limited	2,985,642.5
5	Oil and Natural Gas Corporation Limited	1,171,735.6
6	NTPC Limited	921,795.6
7	Larsen & Toubro Limited	897,567.0
8	GAIL (India) Limited	766,715.7
9	Mangalore Refinery and Petrochemicals Limited	724,703.8
10	Chennai Petroleum Corporation Limited	522,599.5
11	Bharti Airtel Limited	498,587.0
12	Petronet LNG Limited	388,457.2
13	Reliance Jio Infocomm Limited	388,440.0
14	Vodafone Idea Limited	379,321.0
15	Power Grid Corporation of India Limited	356,180.7
16	Numaligarh Refinery Limited	186,346.4
17	Oil India Limited	151,700.0
18	Tata Projects Limited	132,898.5
19	Torrent Power Limited	132,390.7

Sr No	Company Name	Total Income (₹ mn)
20	L&T Hydrocarbon Engineering Limited	129,628.0
21	ONGC Videsh Limited	125,936.1
22	NCC Limited	121,980.1
23	Nuclear Power Corporation of India Limited	117,530.0
24	Rail Vikas Nigam Limited	103,327.0
25	KEC International Limited	101,559.2
26	Dilip Buildcon Limited	91,646.1
27	NHPC Limited	90,859.6
28	The Tata Power Company Limited	84,491.8
29	Sterling and Wilson Solar Limited	83,658.5
30	Gujarat Gas Limited	80,737.6
31	NLC India Limited	80,592.7
32	Bharti Infratel Limited	80,493.0
33	Afcons Infrastructure Limited	79,352.9
34	CESC Limited	79,185.8
35	Adani Ports and Special Economic Zone Limited	76,792.8
36	NBCC (India) Limited	74,322.3
37	Kalpataru Power Transmission Limited	71,663.2
38	Indraprastha Gas Limited	65,080.2
39	Simplex Infrastructures Limited	61,533.7
40	BSES Yamuna Power Limited	59,629.4
41	Tata Communications Limited	54,813.6
42	JSW Energy Limited	54,811.1
43	Ircon International Limited	46,795.4

Sr No	Company Name	Total Income (₹ mn)
44	Hindustan Construction Company Limited	44,591.3
45	HFCL Limited	44,142.1
46	Modern Road Makers Private Limited	40,310.7
47	Nabha Power Limited	39,720.2
48	Ashoka Buildcon Limited	39,363.4
49	Sadbhav Engineering Limited	36,495.4
50	IRB Infrastructure Developers Limited	36,234.8
51	Gayatri Projects Limited	34,710.6
52	Adani Power Limited	34,698.7
53	JMC Projects (India) Limited	32,776.4
54	BGR Energy Systems Limited	32,300.2
55	Tata Power Solar Systems Limited	31,978.8
56	PNC Infratech Limited	31,399.1
57	SJVN Limited	29,089.9
58	Konkan Railway Corporation Limited	28,986.8
59	Maithon Power Limited	28,411.0
60	J. Kumar Infraprojects Limited	28,152.1
61	Engineers India Limited	26,694.2
62	Montecarlo Limited	24,697.3
63	KNR Constructions Limited	22,006.4
64	Vindhya Telelinks Limited	21,086.9
65	H.G. Infra Engineering Limited	20,213.5
66	Gujarat State Petronet Limited	19,366.2
67	Adani Gas Limited	19,101.7

Sr No	Company Name	Total Income (₹ mn)
68	ITD Cementation India Limited	18,448.8
69	Welspun Enterprises Limited	17,940.4
70	Power Mech Projects Limited	17,509.3
71	VA Tech Wabag Limited	17,505.0
72	The Indian Hume Pipe Company Limited	16,570.4
73	Gujarat Industries Power Company Limited	15,242.7
74	SPML Infra Limited	14,932.6
75	Nava Bharat Ventures Limited	14,377.8
76	Everest Industries Limited	14,106.0
77	Howe Engineering Projects (India) Private Limited	13,382.3
78	JSW Hydro Energy Limited	12,757.4
79	Patel Infrastructure Limited	12,671.6
80	Adani Hazira Port Private Limited	11,620.0
81	The Dhamra Port Company Limited	11,600.4
82	GMR Infrastructure Limited	11,489.0
83	Future Supply Chain Solutions Limited	11,183.8
84	Techno Electric & Engineering Company Limited	10,478.1
85	RailTel Corporation of India Limited	10,171.0
86	ReNew Power Limited	8,544.0
87	Tata Power Renewable Energy Limited	8,019.9
88	Gujarat Pipavav Port Limited	7,472.2
89	Kamarajar Port Limited	7,171.7
90	Dredging Corporation of India Limited	6,985.2
91	Adani Green Energy Limited	6,207.7

Sr No	Company Name	Total Income (₹ mn)
92	Adani Logistics Limited	5,971.9
93	Hathway Cable and Datacom Limited	5,824.9
94	India Power Corporation Limited	5,486.6
95	GPT Infraprojects Limited	5,416.4
96	ARSS Infrastructure Projects Limited	4,852.7
97	Gateway Distriparks Limited	4,413.0
98	Adani Petronet (Dahej) Port Private Limited	4,312.3
99	L&T Infrastructure Development Projects Limited	3,071.4
100	Man Infraconstruction Limited	2,739.8
101	Adani Kandla Bulk Terminal Private Limited	1,244.6

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India's Leading Infrastructure Companies 2019

Sr No	Company Name	Net Profit (₹ mn)
1	Reliance Industries Limited	351,630.0
2	Oil and Natural Gas Corporation Limited	267,157.9
3	Indian Oil Corporation Limited	168,941.5
4	NTPC Limited	117,498.9
5	Power Grid Corporation of India Limited	99,385.5
6	Bharat Petroleum Corporation Limited	71,320.2
7	Larsen & Toubro Limited	66,777.0
8	Hindustan Petroleum Corporation Limited	60,286.6
9	GAIL (India) Limited	60,256.7
10	Reliance Jio Infocomm Limited	29,640.0
11	Nuclear Power Corporation of India Limited	28,190.0
12	Bharti Infratel Limited	27,790.0
13	Adani Ports and Special Economic Zone Limited	26,377.2
14	NHPC Limited	26,305.5
15	Oil India Limited	25,901.4
16	Petronet LNG Limited	21,554.3
17	Numaligarh Refinery Limited	19,681.0
18	The Tata Power Company Limited	17,085.8
19	SJVN Limited	13,642.9

Sr No	Company Name	Net Profit (₹ mn)
20	ONGC Videsh Limited	13,267.8
21	NLC India Limited	12,669.7
22	CESC Limited	9,370.5
23	Torrent Power Limited	8,892.4
24	Gujarat State Petronet Limited	7,946.7
25	Indraprastha Gas Limited	7,866.7
26	Dilip Buildcon Limited	7,649.4
27	Rail Vikas Nigam Limited	6,065.9
28	NCC Limited	5,639.1
29	L&T Hydrocarbon Engineering Limited	5,547.4
30	KEC International Limited	4,976.9
31	Adani Hazira Port Private Limited	4,698.3
32	Ircon International Limited	4,446.8
33	Gujarat Gas Limited	4,170.3
34	Kalpataru Power Transmission Limited	4,013.0
35	NBCC (India) Limited	3,841.1
36	Engineers India Limited	3,700.7
37	Kamarajar Port Limited	3,403.5
38	Mangalore Refinery and Petrochemicals Limited	3,319.6
39	IRB Infrastructure Developers Limited	3,287.7
40	PNC Infratech Limited	3,249.1
41	Modern Road Makers Private Limited	3,237.6
42	Ashoka Buildcon Limited	2,861.6
43	Maithon Power Limited	2,729.0

Sr No	Company Name	Net Profit (₹ mn)
44	KNR Constructions Limited	2,632.7
45	JSW Energy Limited	2,514.5
46	Tata Projects Limited	2,399.0
47	Adani Gas Limited	2,287.1
48	Adani Petronet (Dahej) Port Private Limited	2,119.0
49	Gayatri Projects Limited	2,107.7
50	Hathway Cable and Datacom Limited	2,106.0
51	Gujarat Pipavav Port Limited	2,056.3
52	Sterling and Wilson Solar Limited	1,961.5
53	Sadbhav Engineering Limited	1,868.5
54	HFCL Limited	1,840.3
55	Techno Electric & Engineering Company Limited	1,815.9
56	J. Kumar Infraprojects Limited	1,770.7
57	Gujarat Industries Power Company Limited	1,764.0
58	BSES Yamuna Power Limited	1,717.3
59	Vindhya Telelinks Limited	1,686.6
60	Nava Bharat Ventures Limited	1,661.9
61	Welspun Enterprises Limited	1,536.9
62	Montecarlo Limited	1,457.5
63	JMC Projects (India) Limited	1,421.3
64	Afcons Infrastructure Limited	1,250.5
65	H.G. Infra Engineering Limited	1,235.7
66	Simplex Infrastructures Limited	1,225.6
67	The Dhamra Port Company Limited	1,137.4

Sr No	Company Name	Net Profit (₹ mn)
68	RailTel Corporation of India Limited	1,098.0
69	Man Infraconstruction Limited	1,085.2
70	VA Tech Wabag Limited	1,024.0
71	Konkan Railway Corporation Limited	1,018.7
72	Nabha Power Limited	964.2
73	Power Mech Projects Limited	957.4
74	L&T Infrastructure Development Projects Limited	926.4
75	Tata Power Renewable Energy Limited	925.3
76	Tata Power Solar Systems Limited	904.4
77	Gateway Distriparks Limited	881.6
78	The Indian Hume Pipe Company Limited	863.1
79	JSW Hydro Energy Limited	794.1
80	ITD Cementation India Limited	655.0
81	Future Supply Chain Solutions Limited	651.6
82	Everest Industries Limited	642.0
83	Patel Infrastructure Limited	507.0
84	SPML Infra Limited	496.2
85	Dredging Corporation of India Limited	445.9
86	Adani Logistics Limited	326.4
87	BGR Energy Systems Limited	290.5
88	Howe Engineering Projects (India) Private Limited	257.4
89	India Power Corporation Limited	187.0
90	GPT Infraprojects Limited	83.9
91	ReNew Power Limited	54.0

Sr No	Company Name	Net Profit (₹ mn)
92	ARSS Infrastructure Projects Limited	(112.1)
93	Adani Green Energy Limited	(349.8)
94	Adani Kandla Bulk Terminal Private Limited	(798.2)
95	Chennai Petroleum Corporation Limited	(2,133.6)
96	Adani Power Limited	(2,252.3)
97	Tata Communications Limited	(4,423.2)
98	GMR Infrastructure Limited	(10,343.1)
99	Bharti Airtel Limited	(18,290.0)
100	Hindustan Construction Company Limited	(19,617.5)
101	Vodafone Idea Limited	(140,560.0)

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India's Leading Infrastructure Companies 2019

Sr No	Company Name	Total Assets (₹ mn)
1	Reliance Industries Limited	7,757,450.0
2	Indian Oil Corporation Limited	3,157,077.2
3	Oil and Natural Gas Corporation Limited	3,022,348.1
4	NTPC Limited	2,908,777.7
5	Power Grid Corporation of India Limited	2,464,730.0
6	Vodafone Idea Limited	2,330,531.0
7	Bharti Airtel Limited	2,226,855.0
8	Reliance Jio Infocomm Limited	1,957,800.0
9	Larsen & Toubro Limited	1,257,256.9
10	Bharat Petroleum Corporation Limited	1,156,272.5
11	Hindustan Petroleum Corporation Limited	1,037,508.5
12	ONGC Videsh Limited	856,157.7
13	Nuclear Power Corporation of India Limited	846,370.0
14	GAIL (India) Limited	643,786.1
15	NHPC Limited	596,093.7
16	Oil India Limited	474,653.0
17	Adani Ports and Special Economic Zone Limited	474,244.2
18	The Tata Power Company Limited	381,345.8
19	NLC India Limited	346,823.4

Sr No	Company Name	Total Assets (₹ mn)
20	Adani Power Limited	289,280.4
21	Mangalore Refinery and Petrochemicals Limited	271,912.6
22	CESC Limited	260,889.0
23	Torrent Power Limited	238,246.6
24	GMR Infrastructure Limited	223,899.4
25	Bharti Infratel Limited	180,839.0
26	ReNew Power Limited	157,313.0
27	JSW Energy Limited	155,102.1
28	Chennai Petroleum Corporation Limited	152,517.0
29	Petronet LNG Limited	150,848.3
30	SJVN Limited	149,206.5
31	NCC Limited	131,586.0
32	Tata Projects Limited	131,396.4
33	Ircon International Limited	129,694.4
34	Tata Communications Limited	126,139.6
35	L&T Hydrocarbon Engineering Limited	118,764.1
36	Rail Vikas Nigam Limited	114,031.7
37	Nabha Power Limited	112,688.2
38	BSES Yamuna Power Limited	111,595.3
39	KEC International Limited	111,002.3
40	Tata Power Renewable Energy Limited	109,738.9
41	Dilip Buildcon Limited	109,066.5
42	Hindustan Construction Company Limited	102,277.3
43	IRB Infrastructure Developers Limited	97,823.1

Sr No	Company Name	Total Assets (₹ mn)
44	Afcons Infrastructure Limited	97,574.4
45	Simplex Infrastructures Limited	95,257.3
46	Gujarat State Petronet Limited	89,499.6
47	NBCC (India) Limited	82,994.1
48	Kalpataru Power Transmission Limited	82,518.7
49	JSW Hydro Energy Limited	82,469.4
50	Numaligarh Refinery Limited	75,002.1
51	The Dhamra Port Company Limited	73,668.3
52	Gujarat Gas Limited	71,274.7
53	BGR Energy Systems Limited	65,053.8
54	Konkan Railway Corporation Limited	61,142.6
55	Indraprastha Gas Limited	59,493.4
56	Gayatri Projects Limited	58,640.6
57	Hathway Cable and Datacom Limited	55,581.2
58	Adani Green Energy Limited	54,117.1
59	Ashoka Buildcon Limited	53,085.7
60	Maithon Power Limited	48,602.8
61	Engineers India Limited	46,844.9
62	Sadbhav Engineering Limited	45,977.2
63	Sterling and Wilson Solar Limited	45,751.9
64	Modern Road Makers Private Limited	43,808.4
65	L&T Infrastructure Development Projects Limited	41,889.0
66	Howe Engineering Projects (India) Private Limited	40,842.8
67	Adani Hazira Port Private Limited	40,618.7

Sr No	Company Name	Total Assets (₹ mn)
68	JMC Projects (India) Limited	39,432.2
69	Gujarat Industries Power Company Limited	38,313.8
70	PNC Infratech Limited	37,155.6
71	J. Kumar Infraprojects Limited	34,973.6
72	Kamarajar Port Limited	34,267.4
73	Nava Bharat Ventures Limited	34,075.5
74	HFCL Limited	31,438.2
75	VA Tech Wabag Limited	28,094.0
76	SPML Infra Limited	27,215.3
77	Adani Logistics Limited	26,281.1
78	Vindhya Telelinks Limited	26,092.2
79	Welspun Enterprises Limited	25,978.0
80	Tata Power Solar Systems Limited	25,311.1
81	Dredging Corporation of India Limited	24,664.3
82	Gujarat Pipavav Port Limited	23,692.7
83	Montecarlo Limited	23,386.4
84	KNR Constructions Limited	22,703.2
85	RailTel Corporation of India Limited	21,555.5
86	Adani Gas Limited	20,576.4
87	ITD Cementation India Limited	20,213.1
88	Techno Electric & Engineering Company Limited	19,958.8
89	India Power Corporation Limited	19,130.9
90	ARSS Infrastructure Projects Limited	18,346.2
91	The Indian Hume Pipe Company Limited	17,895.2

Sr No	Company Name	Total Assets (₹ mn)
92	Power Mech Projects Limited	17,855.9
93	H.G. Infra Engineering Limited	15,680.9
94	Gateway Distriparks Limited	14,443.8
95	Patel Infrastructure Limited	13,326.9
96	Adani Petronet (Dahej) Port Private Limited	12,399.3
97	Future Supply Chain Solutions Limited	11,839.2
98	Adani Kandla Bulk Terminal Private Limited	9,448.4
99	Everest Industries Limited	8,987.4
100	Man Infraconstruction Limited	8,714.1
101	GPT Infraprojects Limited	6,382.9

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Construction

Adani Green Energy Limited

Adani House, Near Mithakhali Six Roads, Navrangpura, Ahmedabad - 380009, Gujarat
www.adanigreenenergy.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2015	Total Income	6,207.7	NPM	(5.6)
Dun & Bradstreet D-U-N-S® No	Net Profit	(349.8)	ROA	(0.2)
65-098-6164	Total Assets	54,117.1	Current Ratio	2.2

Afcons Infrastructure Limited

"Afcons House" 16, Shah Industrial Estate, Veera Desai Road, Andheri (West), Mumbai - 400053, Maharashtra
www.afcons.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1976	Total Income	79,352.9	NPM	1.6
Dun & Bradstreet D-U-N-S® No	Net Profit	1,250.5	ROA	0.4
65-007-7712	Total Assets	97,574.4	Current Ratio	1.2

ARSS Infrastructure Projects Limited

Plot-no-38, Sector-A, Zone-D, Mancheswar Industrial Estate, Bhubaneswar - 751010, Odisha
www.arssgroup.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2000	Total Income	4,852.7	NPM	(2.3)
Dun & Bradstreet D-U-N-S® No	Net Profit	(112.1)	ROA	(0.2)
65-005-7029	Total Assets	18,346.2	Current Ratio	0.2

Ashoka Buildcon Limited

S. No. 861, Ashoka House, Ashoka Marg, Nashik - 422011, Maharashtra
www.ashokabuildcon.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1993	Total Income	39,363.4	NPM	7.3
Dun & Bradstreet D-U-N-S® No	Net Profit	2,861.6	ROA	1.5
86-219-1301	Total Assets	53,085.7	Current Ratio	1.0

BGR Energy Systems Limited

A-5, Pannamgadu Industrial Estate, Ramapuram Post, District Nellore - 524401, AP
www.bgrcorp.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1985	Total Income	32,300.2	NPM	0.9
Dun & Bradstreet D-U-N-S® No	Net Profit	290.5	ROA	0.1
65-017-7900	Total Assets	65,053.8	Current Ratio	1.0

Dilip Buildcon Limited

Plot No. 5, Inside Govind Narayan Singh Gate, Chuna Bhatti, Bhopal - 462016, MP
www.dilipbuildcon.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2006	Total Income	91,646.1	NPM	8.3
Dun & Bradstreet D-U-N-S® No	Net Profit	7,649.4	ROA	1.9
67-580-3483	Total Assets	109,066.5	Current Ratio	1.3

Dredging Corporation of India Limited

Core 2, Scope Minar, Plot No 2A/2B, Laxminagar District Centre, Delhi - 110092, Delhi
www.dredge-india.nic.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1976	Total Income	6,985.2	NPM	6.4
Dun & Bradstreet D-U-N-S® No	Net Profit	445.9	ROA	0.4
65-005-8373	Total Assets	24,664.3	Current Ratio	2.0

Engineers India Limited

Engineers India Bhawan, 1, Bhikaji Cama Place, New Delhi - 110066, Delhi
www.engineersindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1965	Total Income	26,694.2	NPM	13.9
Dun & Bradstreet D-U-N-S® No	Net Profit	3,700.7	ROA	2.0
65-004-6956	Total Assets	46,844.9	Current Ratio	1.6

Everest Industries Limited

Gate No 152, Lakhmpur, Taluka Dindori, Nashik - 422202, Maharashtra
www.everestind.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1934	Total Income	14,106.0	NPM	4.6
Dun & Bradstreet D-U-N-S® No	Net Profit	642.0	ROA	1.9
91-845-3858	Total Assets	8,987.4	Current Ratio	1.3

Gayatri Projects Limited

B-1, TSR Towers, 6-3-1090, Raj Bhavan Road, Somajiguda, Hyderabad - 500082, Telangana
www.gayatri.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1989	Total Income	34,710.6	NPM	6.1
Dun & Bradstreet D-U-N-S® No	Net Profit	2,107.7	ROA	1.0
86-224-1734	Total Assets	58,640.6	Current Ratio	1.8

GMR Infrastructure Limited

Naman Centre, 7th Floor, Opp. Dena Bank, Plot No.C-31, G Block, BKC, Bandra (East), Mumbai - 400051, Maharashtra
www.gmrgroup.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1996	Total Income	11,489.0	NPM	(90.0)
Dun & Bradstreet D-U-N-S® No	Net Profit	(10,343.1)	ROA	(1.1)
91-500-2906	Total Assets	223,899.4	Current Ratio	0.4

GPT Infraprojects Limited

GPT Center, JC-25, Sector-III, Salt Lake, Kolkata - 700098, WB
www.gptinfra.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1980	Total Income	5,416.4	NPM	1.5
Dun & Bradstreet D-U-N-S® No	Net Profit	83.9	ROA	0.3
91-534-8602	Total Assets	6,382.9	Current Ratio	1.0

H.G. Infra Engineering Limited

14, Panchwati Colony, Ratanada, Jodhpur - 342001
www.hginfra.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2003	Total Income	20,213.5	NPM	6.1
Dun & Bradstreet D-U-N-S® No	Net Profit	1,235.7	ROA	2.0
86-364-9311	Total Assets	15,680.9	Current Ratio	1.3

Hindustan Construction Company Limited

Hincon House, LBS Marg, Vikhroli (West), Mumbai - 400083, Maharashtra
www.hccindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1926	Total Income	44,591.3	NPM	(44.0)
Dun & Bradstreet D-U-N-S® No	Net Profit	(19,617.5)	ROA	(4.6)
65-028-1066	Total Assets	102,277.3	Current Ratio	1.0

Howe Engineering Projects (India) Private Limited

E – 102, Sanskaar, Opp. Karnavati Club, Near Prahladnagar Garden, Satellite, Ahmedabad - 380015, Gujarat
www.howeindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2013	Total Income	13,382.3	NPM	1.9
Dun & Bradstreet D-U-N-S® No	Net Profit	257.4	ROA	0.2
87-411-8077	Total Assets	40,842.8	Current Ratio	1.0

The Indian Hume Pipe Company Limited

2nd Floor, Construction House, 5, Walchand Hirachand Road, Ballard Estate, Mumbai - 400001, Maharashtra
www.indianhumepipe.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1926	Total Income	16,570.4	NPM	5.2
Dun & Bradstreet D-U-N-S® No	Net Profit	863.1	ROA	1.3
65-017-6126	Total Assets	17,895.2	Current Ratio	1.3

IRB Infrastructure Developers Limited

11th Floor / 1101, Hiranandani Knowledge Park, Technology Street, Hill Side Avenue, Powai, Mumbai - 400076, Maharashtra
www.irb.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1998	Total Income	36,234.8	NPM	9.1
Dun & Bradstreet D-U-N-S® No	Net Profit	3,287.7	ROA	0.8
67-594-2902	Total Assets	97,823.1	Current Ratio	0.5

Ircon International Limited

Plot No. C - 4, District Centre Saket New Delhi - 110017, Delhi
www.ircon.org

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1976	Total Income	46,795.4	NPM	9.5
Dun & Bradstreet D-U-N-S® No	Net Profit	4,446.8	ROA	0.9
65-017-7595	Total Assets	129,694.4	Current Ratio	1.3

ITD Cementation India Limited

National Plastic Building, A-Subhash Road, Paranjape B Scheme, Vile Parle (E), Mumbai - 400057, Maharashtra
www.itdcem.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1978	Total Income	18,448.8	NPM	3.6
Dun & Bradstreet D-U-N-S® No	Net Profit	655.0	ROA	1.0
86-220-0128	Total Assets	20,213.1	Current Ratio	1.5

J. Kumar Infraprojects Limited

16-A, Andheri Industrial Estate, Veera Desai Road, Andheri , West, Mumbai - 400053, Maharashtra
www.jkumar.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1999	Total Income	28,152.1	NPM	6.3
Dun & Bradstreet D-U-N-S® No	Net Profit	1,770.7	ROA	1.3
85-951-2483	Total Assets	34,973.6	Current Ratio	1.4

JMC Projects (India) Limited

A-104, Shapath-4, Opp. Karnavati Club, S. G. Road, Ahmedabad - 380015, Gujarat
www.jmcprojects.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1986	Total Income	32,776.4	NPM	4.3
Dun & Bradstreet D-U-N-S® No	Net Profit	1,421.3	ROA	1.0
65-064-7803	Total Assets	39,432.2	Current Ratio	1.4

Kalpataru Power Transmission Limited

Plot No. 101, Part III, GIDC Estate, Sector 28, Gandhinagar - 382028, Gujarat
www.kalpatarupower.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1981	Total Income	71,663.2	NPM	5.6
Dun & Bradstreet D-U-N-S® No	Net Profit	4,013.0	ROA	1.3
86-223-4684	Total Assets	82,518.7	Current Ratio	1.4

KEC International Limited

RPG House, 463, Dr. Annie Besant Road, Worli, Mumbai - 400030, Maharashtra
www.kecrpg.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2005	Total Income	101,559.2	NPM	4.9
Dun & Bradstreet D-U-N-S® No	Net Profit	4,976.9	ROA	1.2
92-109-0051	Total Assets	111,002.3	Current Ratio	1.2

KNR Constructions Limited

C-125, Anand Niketan, New Delhi – 110021, Delhi
www.knrcl.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1995	Total Income	22,006.4	NPM	12.0
Dun & Bradstreet D-U-N-S® No	Net Profit	2,632.7	ROA	3.1
91-856-7082	Total Assets	22,703.2	Current Ratio	1.5

Konkan Railway Corporation Limited

Belapur Bhavan, Plot No 6,Sector 11, CBD Belapur, Navi Mumbai - 400614, Maharashtra
www.konkanrailway.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1990	Total Income	28,986.8	NPM	3.5
Dun & Bradstreet D-U-N-S® No	Net Profit	1,018.7	ROA	0.4
65-013-4646	Total Assets	61,142.6	Current Ratio	0.5

L&T Infrastructure Development Projects Limited

TCTC Building, First Floor, Mount Poonamallee Road, Manapakkam, Chennai - 600089, TN
www.lntidpl.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2001	**Total Income**	3,071.4	**NPM**	30.2
Dun & Bradstreet D-U-N-S® No	**Net Profit**	926.4	**ROA**	0.5
91-858-5068	**Total Assets**	41,889.0	**Current Ratio**	0.5

Larsen & Toubro Limited

L&T House, Ballard Estate, Mumbai - 400001, Maharashtra
www.larsentoubro.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1946	**Total Income**	897,567.0	**NPM**	7.4
Dun & Bradstreet D-U-N-S® No	**Net Profit**	66,777.0	**ROA**	1.4
65-004-6436	**Total Assets**	1,257,256.9	**Current Ratio**	1.3

Man Infraconstruction Limited

12th Floor, Krushal Commercial Complex, G. M. Road, Chembur (W), Mumbai - 400089, Maharashtra
www.maninfra.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2002	**Total Income**	2,739.8	**NPM**	39.6
Dun & Bradstreet D-U-N-S® No	**Net Profit**	1,085.2	**ROA**	3.3
65-035-4728	**Total Assets**	8,714.1	**Current Ratio**	9.7

Modern Road Makers Private Limited

"1101, 11th Floor, Hiranandani Knowledge Park, Technology Street, Hill Side Avenue, Powai, Mumbai - 400076, Maharashtra
www.irb.co.in/home/our-spvs-subsidiaries

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1994	**Total Income**	40,310.7	**NPM**	8.0
Dun & Bradstreet D-U-N-S® No	**Net Profit**	3,237.6	**ROA**	1.9
65-032-4994	**Total Assets**	43,808.4	**Current Ratio**	1.3

Montecarlo Limited

706, 7th Floor, Shilp Building, Nr. Municipal Market, C.G.Road, Navrangpura, Ahmedabad - 380009, Gujarat
www.mclindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1995	**Total Income**	24,697.3	**NPM**	5.9
Dun & Bradstreet D-U-N-S® No	**Net Profit**	1,457.5	**ROA**	1.8
87-219-9931	**Total Assets**	23,386.4	**Current Ratio**	1.3

NBCC (India) Limited

NBCC Bhawan, Lodhi Road, New Delhi - 110003, Delhi
www.nbccindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1960	Total Income	74,322.3	NPM	5.2
Dun & Bradstreet D-U-N-S® No	Net Profit	3,841.1	ROA	1.2
65-007-7241	Total Assets	82,994.1	Current Ratio	1.1

NCC Limited

NCC House, Madhapur, Hyderabad - 500081, Telangana
www.ncclimited.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1990	Total Income	121,980.1	NPM	4.6
Dun & Bradstreet D-U-N-S® No	Net Profit	5,639.1	ROA	1.2
65-065-2100	Total Assets	131,586.0	Current Ratio	1.2

Patel Infrastructure Limited

Patel House, Beside Prakruti Resort, Chhani Road, Chhani, Vadodara - 391740, Gujarat
www.patelinfra.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2004	Total Income	12,671.6	NPM	4.0
Dun & Bradstreet D-U-N-S® No	Net Profit	507.0	ROA	1.1
67-653-4358	Total Assets	13,326.9	Current Ratio	1.1

PNC Infratech Limited

NBCC Plaza, Tower-II, 4th Floor, Pushp Vihar, Sector-V, Saket, New Delhi - 110017, Delhi
www.pncinfratech.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1999	Total Income	31,399.1	NPM	10.3
Dun & Bradstreet D-U-N-S® No	Net Profit	3,249.1	ROA	2.5
67-580-4284	Total Assets	37,155.6	Current Ratio	2.1

Rail Vikas Nigam Limited

Plot No. 25, First Floor, August Kranti Bhawan, Bhikaji Cama Place, R. K. Puram, New Delhi - 110066, Delhi
www.rvnl.org

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2003	Total Income	103,327.0	NPM	5.9
Dun & Bradstreet D-U-N-S® No	Net Profit	6,065.9	ROA	1.6
65-006-4863	Total Assets	114,031.7	Current Ratio	1.9

Sadbhav Engineering Limited

Sadbhav House, Opp. Law Garden Police Chowki, Ellisbridge, Ahmedabad - 380006, Gujarat
www.sadbhaveng.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1988	Total Income	36,495.4	NPM	5.1
Dun & Bradstreet D-U-N-S® No	Net Profit	1,868.5	ROA	1.0
91-665-8177	Total Assets	45,977.2	Current Ratio	1.7

Simplex Infrastructures Limited

Simplex House, 27, Shakespeare Sarani, Kolkata - 700017, WB
www.simplexinfra.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1924	Total Income	61,533.7	NPM	2.0
Dun & Bradstreet D-U-N-S® No	Net Profit	1,225.6	ROA	0.3
65-007-5534	Total Assets	95,257.3	Current Ratio	1.2

SPML Infra Limited

F-27/2, Okhla Industrial Area, Phase - II, New Delhi - 110020, Delhi
www.spml.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1983	Total Income	14,932.6	NPM	3.3
Dun & Bradstreet D-U-N-S® No	Net Profit	496.2	ROA	0.5
65-032-7919	Total Assets	27,215.3	Current Ratio	1.1

Tata Power Solar Systems Limited

78, Electronics City, Phase I, Hosur Road, Bengaluru - 560100, Karnataka
www.tatapowersolar.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1989	Total Income	31,978.8	NPM	2.8
Dun & Bradstreet D-U-N-S® No	Net Profit	904.4	ROA	1.0
65-007-6052	Total Assets	25,311.1	Current Ratio	1.2

Tata Projects Limited

Mithona Tower-I, 1-7-80 to 87, Prenderghast Road, Secunderabad - 500003, Telangana
www.tataprojects.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1979	Total Income	132,898.5	NPM	1.8
Dun & Bradstreet D-U-N-S® No	Net Profit	2,399.0	ROA	0.5
65-017-1978	Total Assets	131,396.4	Current Ratio	1.0

Techno Electric & Engineering Company Limited

C-218, Ground Floor (GR-1), Sector-63, Gautam Buddha Nagar, Noida - 201307, UP
www.techno.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1963	**Total Income**	10,478.1	**NPM**	17.3
Dun & Bradstreet D-U-N-S® No	**Net Profit**	1,815.9	**ROA**	2.3
87-167-1853	**Total Assets**	19,958.8	**Current Ratio**	3.2

VA Tech Wabag Limited

WABAG House, No.17, 200 Feet, Sunnambu Kolathur, Chennai - 600117, TN
www.wabag.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1995	**Total Income**	17,505.0	**NPM**	5.8
Dun & Bradstreet D-U-N-S® No	**Net Profit**	1,024.0	**ROA**	1.0
65-067-1902	**Total Assets**	28,094.0	**Current Ratio**	1.3

Welspun Enterprises Limited

Welspun City, Village Versamedi, Taluka Anjar, Dist Kutch - 370110, Gujarat
www.welspunenterprises.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1994	**Total Income**	17,940.4	**NPM**	8.6
Dun & Bradstreet D-U-N-S® No	**Net Profit**	1,536.9	**ROA**	1.7
65-059-9967	**Total Assets**	25,978.0	**Current Ratio**	1.7

Logistics

Adani Logistics Limited

Infrastructure House, Nr Mithakhali Circle, Navrangpura, Ahmedabad - 380009, Gujarat
www.adaniports.com/Logistics

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2005	Total Income	5,971.9	NPM	5.5
Dun & Bradstreet D-U-N-S® No	Net Profit	326.4	ROA	0.4
67-739-9892	Total Assets	26,281.1	Current Ratio	1.9

Future Supply Chain Solutions Limited

Knowledge House, Shyam Nagar, JVLR, Jogeshwari (East), Mumbai - 400060, Maharashtra
www.futuresupplychains.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2006	Total Income	11,183.8	NPM	5.8
Dun & Bradstreet D-U-N-S® No	Net Profit	651.6	ROA	1.6
86-335-7920	Total Assets	11,839.2	Current Ratio	1.5

Gateway Distriparks Limited

Sector-6, Dronagiri, Taluka-Uran, Raigad- District, Navi Mumbai - 400707, Maharashtra
www.gateway-distriparks.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1994	Total Income	4,413.0	NPM	20.0
Dun & Bradstreet D-U-N-S® No	Net Profit	881.6	ROA	1.9
86-245-8382	Total Assets	14,443.8	Current Ratio	1.3

Oil & Gas

Adani Gas Limited

Adani House, Near Mithakhali Six Roads, Navarangpura, Ahmedabad - 380009, Gujarat
www.adanigas.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2005	Total Income	19,101.7	NPM	12.0
Dun & Bradstreet D-U-N-S® No	Net Profit	2,287.1	ROA	2.3
85-904-2253	Total Assets	20,576.4	Current Ratio	3.0

Bharat Petroleum Corporation Limited

Bharat Bhavan, 4 & 6 Currimbhoy Road, Ballard Estate, Mumbai - 400001, Maharashtra
www.bharatpetroleum.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1952	Total Income	3,406,061.3	NPM	2.1
Dun & Bradstreet D-U-N-S® No	Net Profit	71,320.2	ROA	1.7
65-007-8793	Total Assets	1,156,272.5	Current Ratio	1.0

Chennai Petroleum Corporation Limited

No. 536, Anna Salai, Teynampet, Chennai - 600018, TN
www.cpcl.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1965	Total Income	522,599.5	NPM	(0.4)
Dun & Bradstreet D-U-N-S® No	Net Profit	(2,133.6)	ROA	(0.4)
65-005-1287	Total Assets	152,517.0	Current Ratio	0.7

GAIL (India) Limited

GAIL Bhawan, 16 Bhikaji Cama Place, R K Puram, New Delhi - 110066, Delhi
www.gailonline.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1984	Total Income	766,715.7	NPM	7.9
Dun & Bradstreet D-U-N-S® No	Net Profit	60,256.7	ROA	2.5
65-007-1269	Total Assets	643,786.1	Current Ratio	1.1

Gujarat Gas Limited

Gujarat Gas CNG Station, Sector 5/C, Gandhinagar - 382006, Gujarat
www.gujaratgas.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2012	Total Income	80,737.6	NPM	5.2
Dun & Bradstreet D-U-N-S® No	Net Profit	4,170.3	ROA	1.5
65-093-1087	Total Assets	71,274.7	Current Ratio	0.6

Gujarat State Petronet Limited

GSPC Bhavan, Behind Udyog Bhavan, Sector - 11, Gandhinagar - 382010, Gujarat
www.gspcgroup.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1998	**Total Income**	19,366.2	**NPM**	41.0
Dun & Bradstreet D-U-N-S® No	**Net Profit**	7,946.7	**ROA**	2.2
91-959-1065	**Total Assets**	89,499.6	**Current Ratio**	0.4

Hindustan Petroleum Corporation Limited

Petroleum House, 17, Jamshedji Tata Road, Churchgate, Mumbai - 400020, Maharashtra
www.hindustanpetroleum.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1952	**Total Income**	2,985,642.5	**NPM**	2.0
Dun & Bradstreet D-U-N-S® No	**Net Profit**	60,286.6	**ROA**	1.6
65-005-4943	**Total Assets**	1,037,508.5	**Current Ratio**	0.8

Indian Oil Corporation Limited

Indian Oil Bhavan, G-9, Ali Yavar Jung Marg, Bandra (E), Mumbai - 400051, Maharashtra
www.iocl.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1959	**Total Income**	6,090,522.8	**NPM**	2.8
Dun & Bradstreet D-U-N-S® No	**Net Profit**	168,941.5	**ROA**	1.4
65-004-9216	**Total Assets**	3,157,077.2	**Current Ratio**	0.8

Indraprastha Gas Limited

IGL Bhawan, Community Centre, Sector-9, R.K. Puram, New Delhi - 110022, Delhi
www.iglonline.net

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1998	**Total Income**	65,080.2	**NPM**	12.1
Dun & Bradstreet D-U-N-S® No	**Net Profit**	7,866.7	**ROA**	3.6
91-533-9985	**Total Assets**	59,493.4	**Current Ratio**	1.5

L&T Hydrocarbon Engineering Limited

L&T House, Ballard Estate, Mumbai - 400001, Maharashtra
www.lnthydrocarbon.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2009	**Total Income**	129,628.0	**NPM**	4.3
Dun & Bradstreet D-U-N-S® No	**Net Profit**	5,547.4	**ROA**	1.3
65-076-4348	**Total Assets**	118,764.1	**Current Ratio**	1.0

Mangalore Refinery and Petrochemicals Limited

Mudapadav, Kuthethoor, P.O. Via Katipalla, Mangaluru - 575030, Karnataka
www.mrpl.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1988	Total Income	724,703.8	NPM	0.5
Dun & Bradstreet D-U-N-S® No	Net Profit	3,319.6	ROA	0.3
65-017-8924	Total Assets	271,912.6	Current Ratio	0.8

Numaligarh Refinery Limited

22A, G. S. Road, Christianbasti, Guwahati - 781005, Assam
www.nrl.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1993	Total Income	186,346.4	NPM	10.6
Dun & Bradstreet D-U-N-S® No	Net Profit	19,681.0	ROA	6.6
65-068-4640	Total Assets	75,002.1	Current Ratio	2.3

Oil and Natural Gas Corporation Limited

Deendayal Urja Bhawan, 5, Nelson Mandela Marg, Vasant Kunj, New Delhi - 110070, Delhi
www.ongcindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1993	Total Income	1,171,735.6	NPM	22.8
Dun & Bradstreet D-U-N-S® No	Net Profit	267,157.9	ROA	2.3
65-006-5345	Total Assets	3,022,348.1	Current Ratio	0.6

Oil India Limited

P. O. Duliajan, Dibrugarh - 786602, Assam
www.oil-india.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1959	Total Income	151,700.0	NPM	17.1
Dun & Bradstreet D-U-N-S® No	Net Profit	25,901.4	ROA	1.4
65-004-9570	Total Assets	474,653.0	Current Ratio	1.4

ONGC Videsh Limited

Deendayal Urja Bhavan, Tower B, Plot No. 5A-5B, Nelson Mandela Marg, Vasant Kunj, New Delhi - 110070, Delhi
www.ongcvidesh.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1965	Total Income	125,936.1	NPM	10.5
Dun & Bradstreet D-U-N-S® No	Net Profit	13,267.8	ROA	0.4
65-068-4855	Total Assets	856,157.7	Current Ratio	0.6

Petronet LNG Limited

1st Floor, World Trade Center, Babar Road, Barakhamba Lane, New Delhi - 110001, Delhi
www.petronetlng.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1998	**Total Income**	388,457.2	**NPM**	5.5
Dun & Bradstreet D-U-N-S® No	**Net Profit**	21,554.3	**ROA**	3.5
86-220-4216	**Total Assets**	150,848.3	**Current Ratio**	2.4

Reliance Industries Limited

3rd floor, Maker Chambers - IV, 222, Nariman Point, Mumbai - 400021, Maharashtra
www.ril.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1973	**Total Income**	3,943,230.0	**NPM**	8.9
Dun & Bradstreet D-U-N-S® No	**Net Profit**	351,630.0	**ROA**	1.3
65-005-3135	**Total Assets**	7,757,450.0	**Current Ratio**	0.8

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Ports

Adani Hazira Port Private Limited

Adani House, Mithakhali Six Roads, Navarangpura, Ahmedabad - 380009, Gujarat
www.adaniports.com/hazira-port

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2009	Total Income	11,620.0	NPM	40.4
Dun & Bradstreet D-U-N-S® No	Net Profit	4,698.3	ROA	3.0
85-904-6410	Total Assets	40,618.7	Current Ratio	3.0

Adani Kandla Bulk Terminal Private Limited

Adani House, Mithakhali Six Roads, Navarangpura, Ahmedabad - 380009, Gujarat
www.adaniports.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2012	Total Income	1,244.6	NPM	(64.1)
Dun & Bradstreet D-U-N-S® No	Net Profit	(798.2)	ROA	(2.0)
86-024-0995	Total Assets	9,448.4	Current Ratio	0.5

Adani Petronet (Dahej) Port Private Limited

Adani House, Mithakhali Six Roads, Navarangpura, Ahmedabad - 380009, Gujarat
www.adaniports.com/dahej-port

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2003	Total Income	4,312.3	NPM	49.1
Dun & Bradstreet D-U-N-S® No	Net Profit	2,119.0	ROA	3.9
67-592-7927	Total Assets	12,399.3	Current Ratio	1.0

Adani Ports and Special Economic Zone Limited

Adani House, Near Mithakhali Six Roads, Navrangpura, Ahmedabad - 380009, Gujarat
www.adaniports.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1998	Total Income	76,792.8	NPM	34.3
Dun & Bradstreet D-U-N-S® No	Net Profit	26,377.2	ROA	1.5
86-218-2743	Total Assets	474,244.2	Current Ratio	1.5

The Dhamra Port Company Limited

HIG-20, BDA Colony, Jayadev Vihar, Bhubaneswar - 751013, Odisha
www.adaniports.com/dhamra-port

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1998	Total Income	11,600.4	NPM	9.8
Dun & Bradstreet D-U-N-S® No	Net Profit	1,137.4	ROA	0.4
91-713-6488	Total Assets	73,668.3	Current Ratio	0.5

Gujarat Pipavav Port Limited

Pipavav Port at Post, Rampara No. 2, Via Rajula Dist, Amreli - 365560, Gujarat
www.pipavav.com; www.apmterminals.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1992	**Total Income**	7,472.2	**NPM**	27.5
Dun & Bradstreet D-U-N-S® No	**Net Profit**	2,056.3	**ROA**	2.2
86-218-0606	**Total Assets**	23,692.7	**Current Ratio**	2.7

Kamarajar Port Limited

No 17, Jawahar Building, Rajaji Salai, Chennai - 600001, TN
www.ennoreport.gov.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1999	**Total Income**	7,171.7	**NPM**	47.5
Dun & Bradstreet D-U-N-S® No	**Net Profit**	3,403.5	**ROA**	2.6
91-583-3651	**Total Assets**	34,267.4	**Current Ratio**	0.4

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Power

Adani Power Limited

Shikhar, Mithakhali Six Roads, Navrangpura, Ahmedabad - 380009, Gujarat
www.adanipower.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1996	Total Income	34,698.7	NPM	(6.5)
Dun & Bradstreet D-U-N-S® No	Net Profit	(2,252.3)	ROA	(0.2)
65-038-5490	Total Assets	289,280.4	Current Ratio	0.05

BSES Yamuna Power Limited

Shakti Kiran Building, Karkardooma, Delhi - 110092
www.bsesdelhi.com/web/bypl

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2002	Total Income	59,629.4	NPM	2.9
Dun & Bradstreet D-U-N-S® No	Net Profit	1,717.3	ROA	0.4
91-853-7395	Total Assets	111,595.3	Current Ratio	0.1

CESC Limited

CESC House, Chowringhee Square, Kolkata - 700001, WB
www.cesc.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1978	Total Income	79,185.8	NPM	11.8
Dun & Bradstreet D-U-N-S® No	Net Profit	9,370.5	ROA	0.9
65-004-6741	Total Assets	260,889.0	Current Ratio	0.5

Gujarat Industries Power Company Limited

P.O. Petrochemicals, Vadodara - 391346, Gujarat
www.gipcl.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1985	Total Income	15,242.7	NPM	11.6
Dun & Bradstreet D-U-N-S® No	Net Profit	1,764.0	ROA	1.2
65-017-7488	Total Assets	38,313.8	Current Ratio	1.5

India Power Corporation Limited

Plot No. X1, 2&3, Block-EP, Sector-V, Salt Lake City, Kolkata - 700091, WB
www.indiapower.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1919	Total Income	5,486.6	NPM	3.4
Dun & Bradstreet D-U-N-S® No	Net Profit	187.0	ROA	0.2
91-843-9956	Total Assets	19,130.9	Current Ratio	1.3

JSW Energy Limited

JSW Centre, Bandra Kurla Complex, Bandra (E), Mumbai - 400051, Maharashtra
www.jsw.in/energy

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1994	Total Income	54,811.1	NPM	4.6
Dun & Bradstreet D-U-N-S® No	Net Profit	2,514.5	ROA	0.4
65-032-6929	Total Assets	155,102.1	Current Ratio	0.5

JSW Hydro Energy Limited

PO Tapri, Dist. Kinnaur - 172104, HP
www.jsw.in/energy

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2014	Total Income	12,757.4	NPM	6.2
Dun & Bradstreet D-U-N-S® No	Net Profit	794.1	ROA	0.2
87-373-3149	Total Assets	82,469.4	Current Ratio	0.6

Maithon Power Limited

Corporate Centre, 34 Sant Tukaram Road, Carnac Bunder, Mumbai - 400009, Maharashtra
www.tatapower.com/businesses/maithon/overview.aspx

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2000	Total Income	28,411.0	NPM	9.6
Dun & Bradstreet D-U-N-S® No	Net Profit	2,729.0	ROA	1.4
67-792-3139	Total Assets	48,602.8	Current Ratio	1.1

Nabha Power Limited

PO Box No. 28, Near Village Nalash, Rajpura - 140401, Punjab
www.lntpowerdevelopment.com/thermal-power-projects/nabha-power-ltd

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2007	Total Income	39,720.2	NPM	2.4
Dun & Bradstreet D-U-N-S® No	Net Profit	964.2	ROA	0.2
85-897-4474	Total Assets	112,688.2	Current Ratio	0.4

Nava Bharat Ventures Limited

6-3-1109/1, Nava Bharat Chambers, Rajbhavan Road, Hyderabad - 500082, Telangana
www.nbventures.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1972	Total Income	14,377.8	NPM	11.6
Dun & Bradstreet D-U-N-S® No	Net Profit	1,661.9	ROA	1.2
65-007-6128	Total Assets	34,075.5	Current Ratio	2.2

NHPC Limited

NHPC Office Complex, Sector - 33, Faridabad - 121003, Haryana
www.nhpcindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1975	Total Income	90,859.6	NPM	29.0
Dun & Bradstreet D-U-N-S® No	Net Profit	26,305.5	ROA	1.1
86-225-7412	Total Assets	596,093.7	Current Ratio	1.0

NLC India Limited

First Floor, No.8, Mayor Sathyamurthy Road, Chetpet, Chennai - 600031, TN
www.nlcindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1956	Total Income	80,592.7	NPM	15.7
Dun & Bradstreet D-U-N-S® No	Net Profit	12,669.7	ROA	0.9
65-005-2186	Total Assets	346,823.4	Current Ratio	1.1

NTPC Limited

NTPC Bhawan, SCOPE Complex, 7 Institutional Area, Lodi Road, New Delhi - 110003, Delhi
www.ntpc.co.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1975	Total Income	921,795.6	NPM	12.7
Dun & Bradstreet D-U-N-S® No	Net Profit	117,498.9	ROA	1.1
65-007-9049	Total Assets	2,908,777.7	Current Ratio	0.8

Nuclear Power Corporation of India Limited

16th Floor, Centre - I, World Trade Centre, Cuffe Parade, Colaba, Mumbai - 400005, Maharashtra
www.npcil.nic.in/index.aspx

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1987	Total Income	117,530.0	NPM	24.0
Dun & Bradstreet D-U-N-S® No	Net Profit	28,190.0	ROA	0.9
65-009-2695	Total Assets	846,370.0	Current Ratio	1.0

Power Grid Corporation of India Limited

B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi - 110016, Delhi
www.powergridindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1989	Total Income	356,180.7	NPM	27.9
Dun & Bradstreet D-U-N-S® No	Net Profit	99,385.5	ROA	1.1
65-014-6749	Total Assets	2,464,730.0	Current Ratio	0.6

Power Mech Projects Limited

Plot No 77, Jublee Enclave, Opp. Hitex, Madhapur, Hyderabad - 500081,Telangana
www.powermechprojects.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1999	Total Income	17,509.3	NPM	5.5
Dun & Bradstreet D-U-N-S® No	Net Profit	957.4	ROA	1.5
91-503-1320	Total Assets	17,855.9	Current Ratio	1.5

ReNew Power Limited

138, Ansal Chamber-II, Bikaji Cama Place, New Delhi - 110066, Delhi
www.renewpower.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2011	Total Income	8,544.0	NPM	0.6
Dun & Bradstreet D-U-N-S® No	Net Profit	54.0	ROA	0.01
65-080-6818	Total Assets	157,313.0	Current Ratio	1.9

SJVN Limited

SJVN, Corporate Office Complex, Shanan, Shimla - 171006, HP
www.sjvn.nic.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1988	Total Income	29,089.9	NPM	46.9
Dun & Bradstreet D-U-N-S® No	Net Profit	13,642.9	ROA	2.3
65-067-9319	Total Assets	149,206.5	Current Ratio	5.4

Sterling and Wilson Solar Limited

Universal Majestic, 9th Floor, P. L. Lokhande Marg, Chembur (West), Mumbai - 400043, Maharashtra
www.sterlingandwilson.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2017	Total Income	83,658.5	NPM	2.3
Dun & Bradstreet D-U-N-S® No	Net Profit	1,961.5	ROA	1.2
86-051-7137	Total Assets	45,751.9	Current Ratio	1.1

The Tata Power Company Limited

Bombay House, 24, Homi Mody Street, Mumbai - 400001, Maharashtra
www.tatapower.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1919	Total Income	84,491.8	NPM	20.2
Dun & Bradstreet D-U-N-S® No	Net Profit	17,085.8	ROA	1.1
65-004-7459	Total Assets	381,345.8	Current Ratio	0.3

Tata Power Renewable Energy Limited

Corporate Centre, A Block, 34 Sant Tukaram Road, Carnac Bunder, Mumbai - 400009, Maharashtra
www.tatapowerrenewables.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2007	**Total Income**	8,019.9	**NPM**	11.5
Dun & Bradstreet D-U-N-S® No	**Net Profit**	925.3	**ROA**	0.2
65-057-5702	**Total Assets**	109,738.9	**Current Ratio**	0.2

Torrent Power Limited

600, Samanvay, Tapovan, Ambawadi, Ahmedabad - 380015, Gujarat
www.torrentpower.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2004	**Total Income**	132,390.7	**NPM**	6.7
Dun & Bradstreet D-U-N-S® No	**Net Profit**	8,892.4	**ROA**	1.0
65-033-2237	**Total Assets**	238,246.6	**Current Ratio**	1.5

Telecom

Bharti Airtel Limited

Bharti Crescent, 1, Nelson Mandela Road, Vasant Kunj, Phase II, New Delhi - 110070, Delhi
www.airtel.in

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1995	Total Income	498,587.0	NPM	(3.7)
Dun & Bradstreet D-U-N-S® No	Net Profit	(18,290.0)	ROA	(0.2)
65-032-6481	Total Assets	2,226,855.0	Current Ratio	0.3

Bharti Infratel Limited

901, Park Centra, Sector 30, NH-8, Gurugram - 122001, Haryana
www.bharti-infratel.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2006	Total Income	80,493.0	NPM	34.5
Dun & Bradstreet D-U-N-S® No	Net Profit	27,790.0	ROA	3.6
91-541-2542	Total Assets	180,839.0	Current Ratio	2.4

Hathway Cable and Datacom Limited

Rahejas, 4th Floor, Corner of Main Avenue and V. P. Road, Santacruz (W), Mumbai - 400054, Maharashtra
www.hathway.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1959	Total Income	5,824.9	NPM	36.2
Dun & Bradstreet D-U-N-S® No	Net Profit	2,106.0	ROA	1.4
91-643-2297	Total Assets	55,581.2	Current Ratio	7.4

HFCL Limited

8, Electronics Complex, Chambaghat, Solan - 173213, HP
www.hfcl.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1987	Total Income	44,142.1	NPM	4.2
Dun & Bradstreet D-U-N-S® No	Net Profit	1,840.3	ROA	1.6
65-014-6517	Total Assets	31,438.2	Current Ratio	1.6

RailTel Corporation of India Limited

6th Floor, 3rd Block, Delhi Technology Park, Shastri Park, New Delhi, Delhi-110053, Delhi
www.railtelindia.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2000	Total Income	10,171.0	NPM	10.8
Dun & Bradstreet D-U-N-S® No	Net Profit	1,098.0	ROA	1.2
91-860-7115	Total Assets	21,555.5	Current Ratio	1.4

Reliance Jio Infocomm Limited

9th Floor, Maker Chambers IV, 222, Nariman Point, Mumbai - 400021, Maharashtra
www.jio.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
2007	Total Income	388,440.0	NPM	7.6
Dun & Bradstreet D-U-N-S® No	Net Profit	29,640.0	ROA	0.3
67-736-5063	Total Assets	1,957,800.0	Current Ratio	0.2

Tata Communications Limited

VSB, Mahatma Gandhi Road, Fort, Mumbai - 400001, Maharashtra
www.tatacommunications.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1986	Total Income	54,813.6	NPM	(8.1)
Dun & Bradstreet D-U-N-S® No	Net Profit	(4,423.2)	ROA	(0.9)
91-583-3524	Total Assets	126,139.6	Current Ratio	0.6

Vindhya Telelinks Limited

Udyog Vihar, P.O. Chorhata, Rewa - 486006, MP
www.vtlrewa.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1983	Total Income	21,086.9	NPM	8.0
Dun & Bradstreet D-U-N-S® No	Net Profit	1,686.6	ROA	2.0
86-222-4565	Total Assets	26,092.2	Current Ratio	1.5

Vodafone Idea Limited

Suman Tower, Plot no. 18, Sector 11, Gandhinagar, 382011, Gujarat
www.vodafoneidea.com

(As on Mar 31, 2019)

Year of Incorporation	Financial Parameters	Values (₹ In Million)	Ratios	%
1995	Total Income	379,321.0	NPM	(37.1)
Dun & Bradstreet D-U-N-S® No	Net Profit	(140,560.0)	ROA	(2.1)
86-223-5256	Total Assets	2,330,531.0	Current Ratio	0.4

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