



Power Sector of India

Challenges and Future

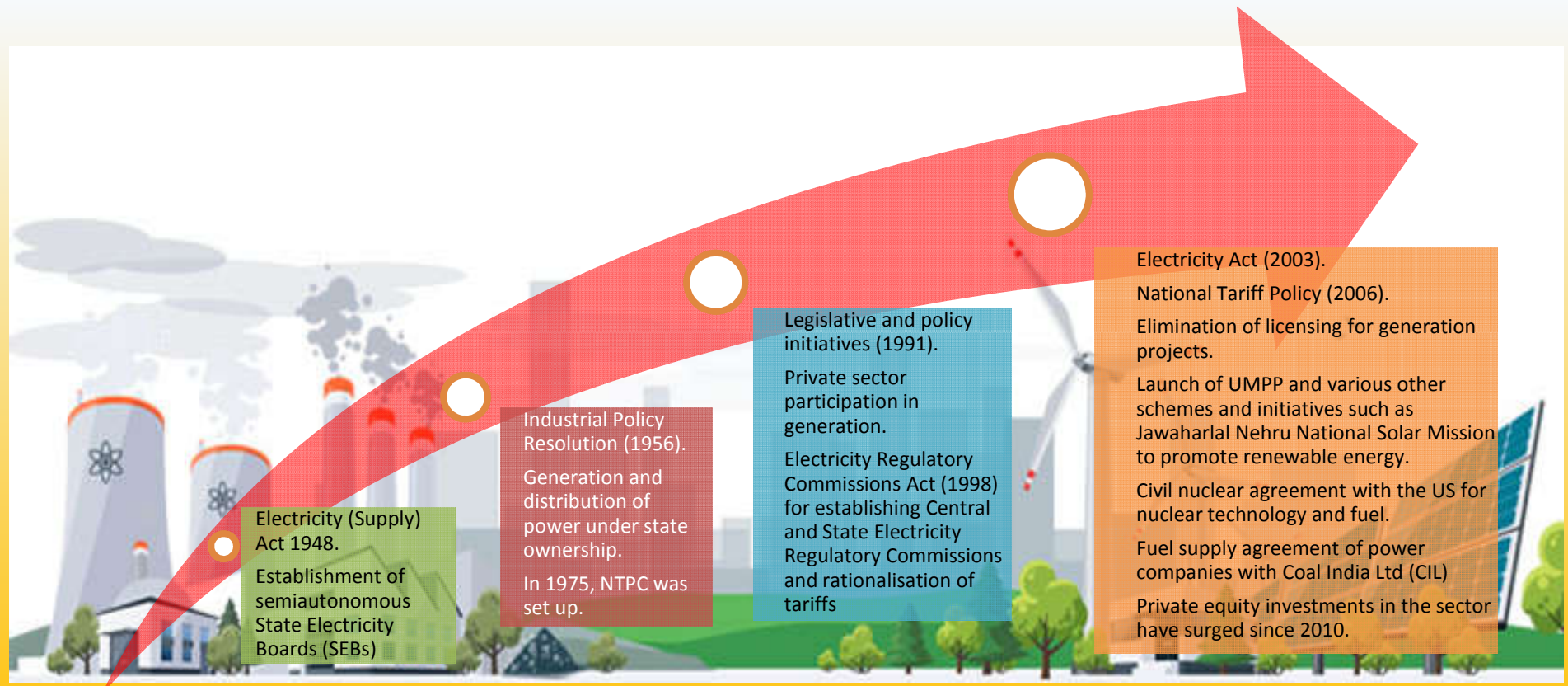
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- Power Sector is one of the key sectors contributing significantly to the growth of our country's economy.
- The existence and development of adequate infrastructure is essential for sustained growth of the Indian economy.
- India's power sector is one of the most diversified in the world.
- Sources of power generation can be categorized under two sources:
 - **Conventional Sources** such as coal, lignite, natural gas, oil, hydro and nuclear power
 - **Non-Conventional Sources** such as wind, solar, and agricultural and domestic waste.



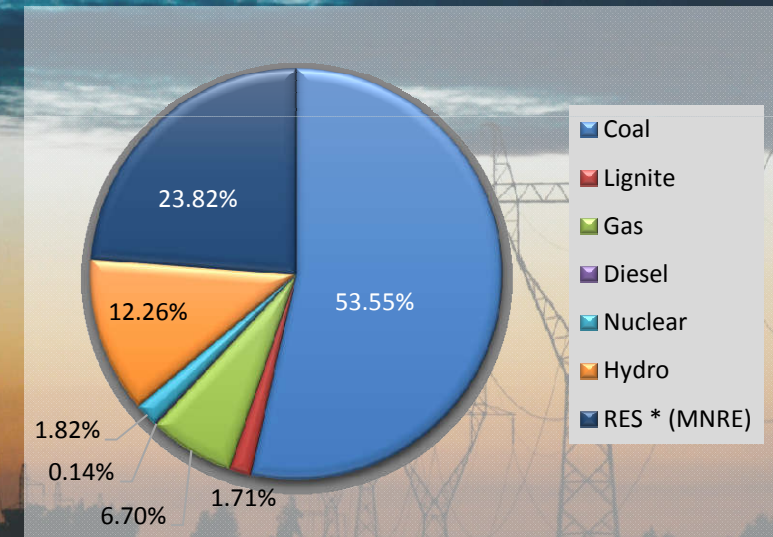
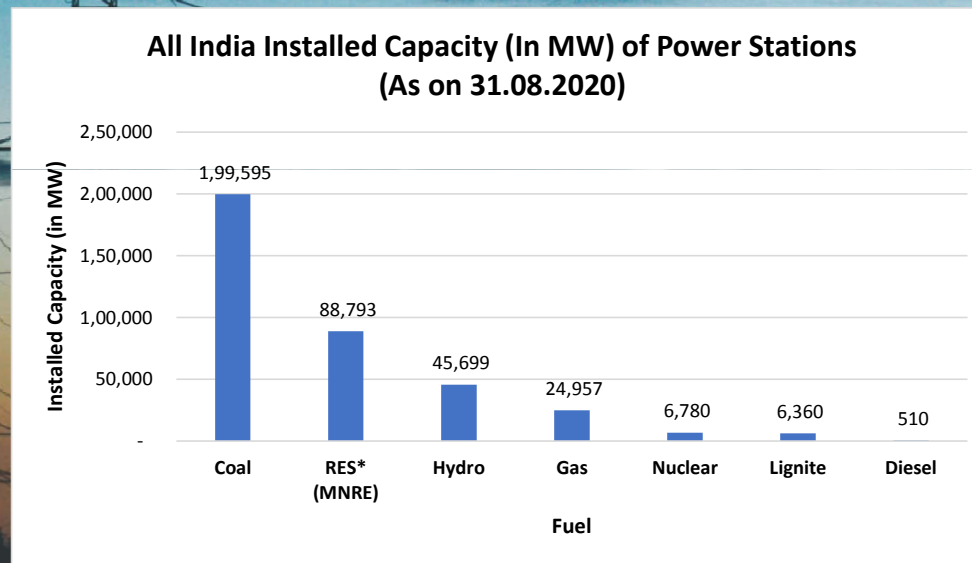




The Installed generating capacity of the Indian Power Industry as on 31st August 2020, was about 372.70 GW.

The Thermal energy which includes Coal, Lignite, Gas and Diesel contributes around 62.10 % whereas, Nuclear and Hydro power contributes around 1.82 % and 12.26 % respectively.

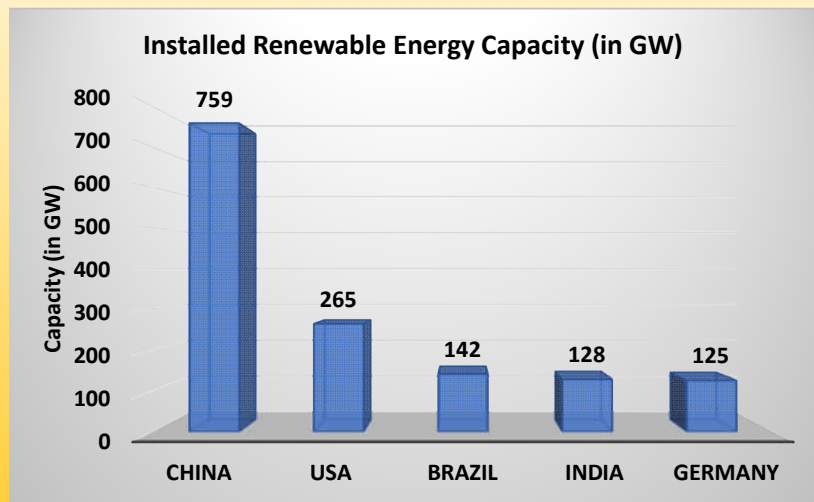
The Renewable Energy Sources (RES) contributes around 23.82 % (Source CEA)



*RES- Renewable Energy Sources which includes Small Hydro Project (≤ 25 MW), Biomass Power, Urban & Industrial Waste Power, Solar and Wind Energy installed capacity as on 31.08.2020

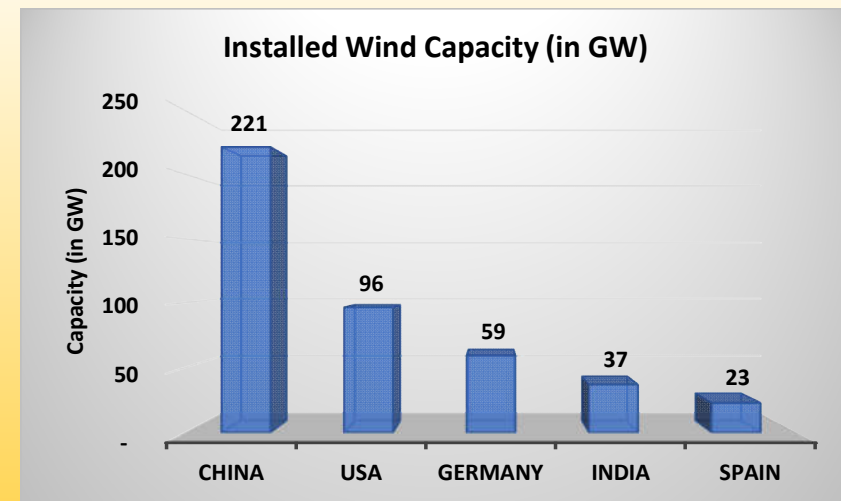


India Ranks 4th in the Installed Renewable Energy Capacity (in GW) in the world.



Source: CEA

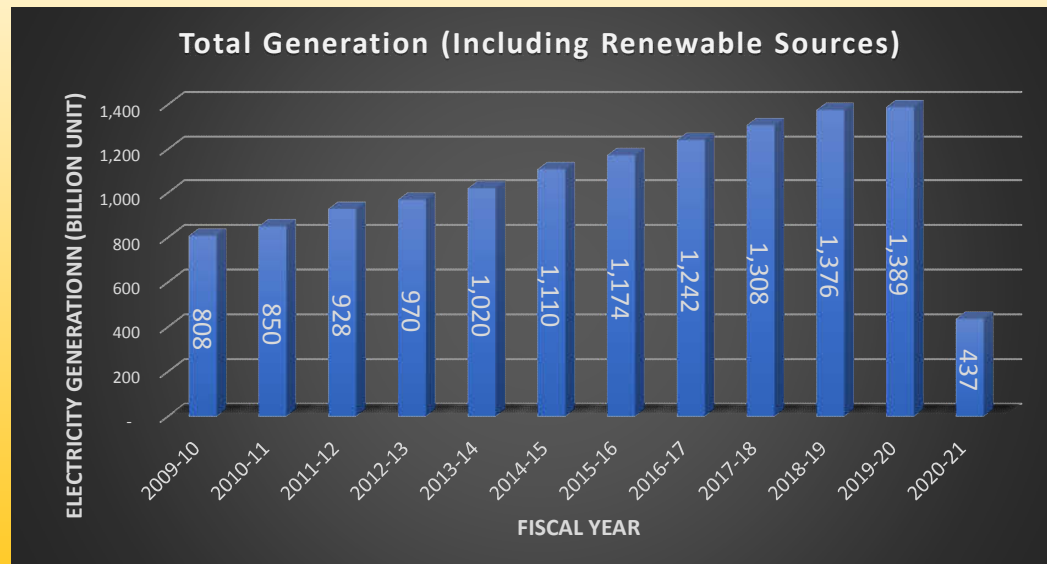
Source: CEA



India has the 4th largest installed wind power capacity in the world.

Current Installed Capacity

The electricity generation target of conventional sources for the year 2020-21 was fixed at 1,330 BU comprising of 1,138.53 BU thermal; 140.35 BU hydro; 43.88 nuclear; and 7.230 BU import from Bhutan.



Source: CEA

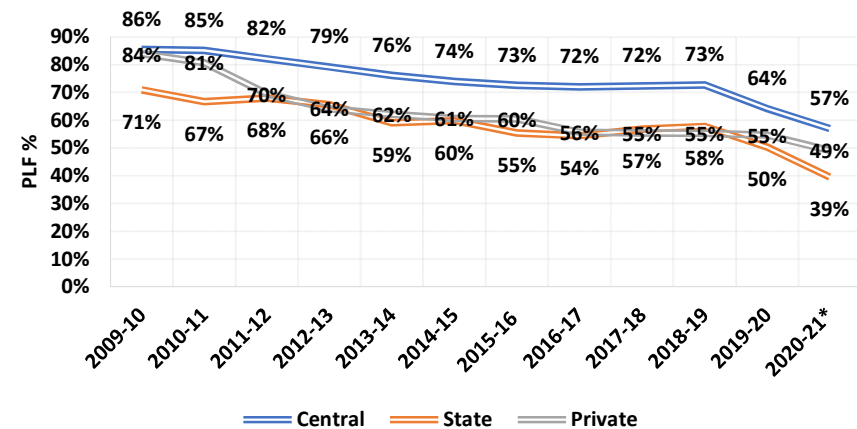


The Plant Load Factor is commonly considered as a measure of a power plant's capacity utilization. The Central Electricity Regulatory Commission defines Plant Load Factor as a percentage of energy sent out by the power plant corresponding to installed capacity in that period.

The fall in the PLF percentage over the years is attributes to the following.

- Lack of fuel Supply Agreement to provide steady and affordable domestic coal.
- Over build thermal capacity resulting in lower PLF's.
- High cost of import coal.
- Lack of long-term Power Purchase Agreement.
- Growth in Renewable Energy Sources.

SECTOR-WISE PLF (COAL & LIGNITE BASED)

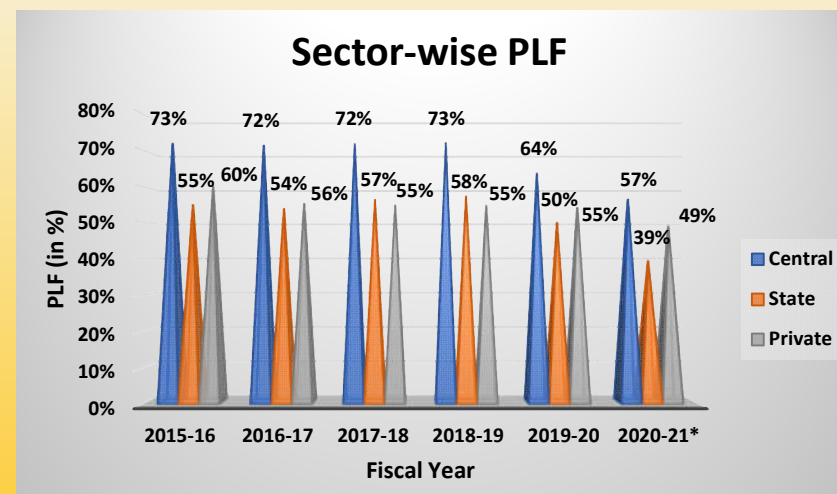
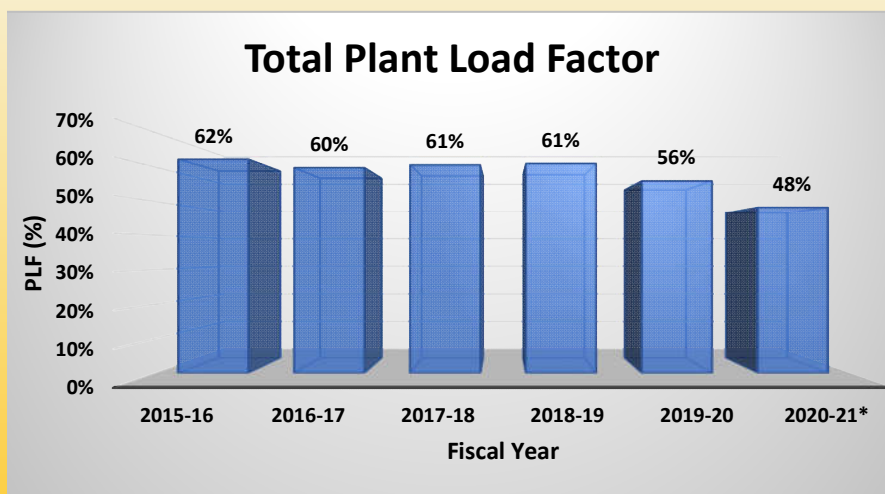


* Up to August 2020

Source: CEA

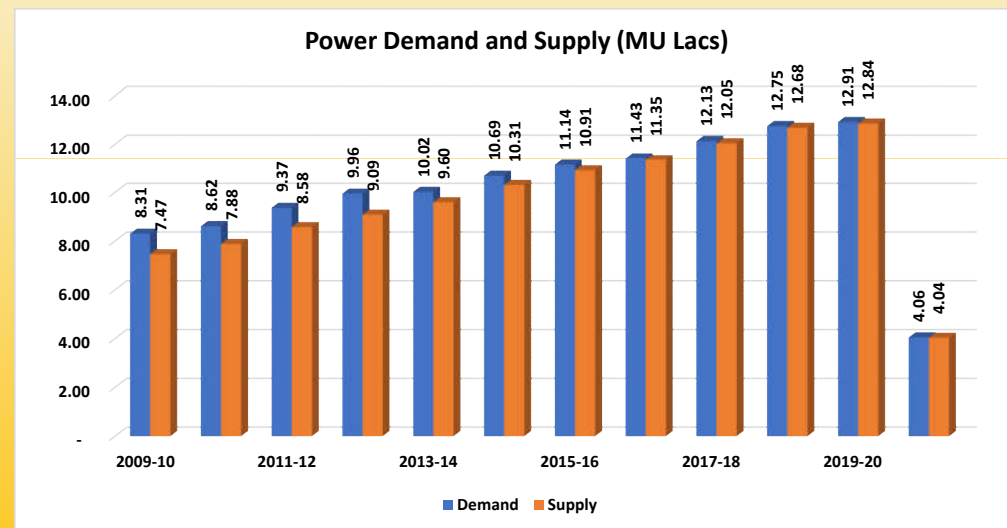


The Total and Sector-wise PLF in the country (Coal & Lignite based) from 2015-16 to 2020-21



*Upto July 2020 (Provisional), Source : CEA

Power shortages have become a recurrent feature in the country. India is currently facing a peculiar problem of demand-supply gap in power. The power scenario in India continues to be grim even as the country gears up to expand its power supply to bridge the large demand- supply gap.



*Upto July 2020 (Provisional)

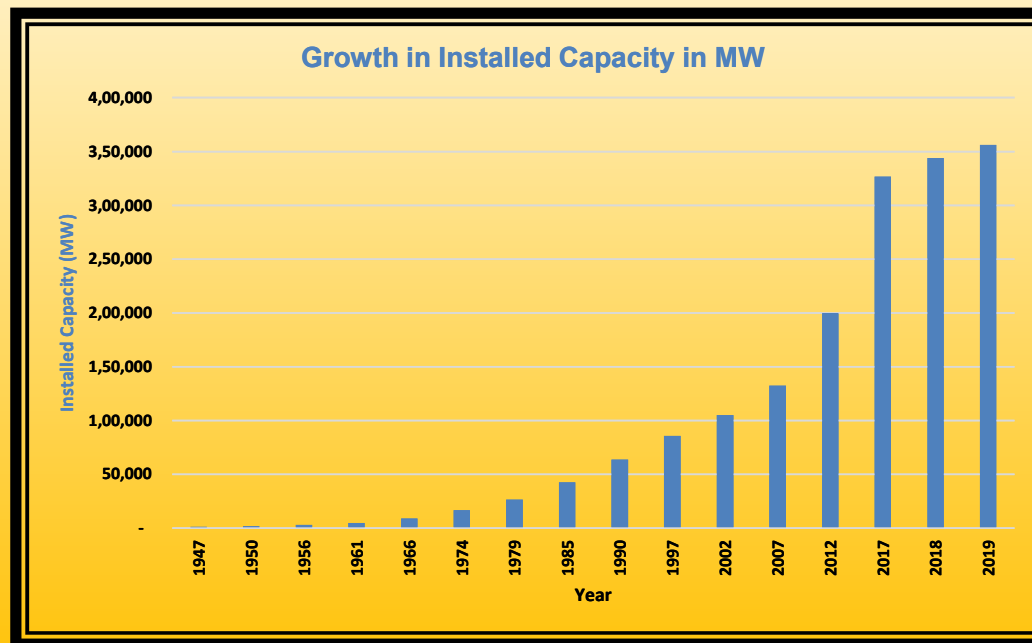
Source : CEA

Where the country stands ?

- India is the 3rd largest producer and 2nd largest consumer of electricity in the world.
- 4th largest installed wind power capacity in the world having total installed wind power capacity of 37.27 GW as of August 2020.
- India is the world's fifth-largest energy economy
- India ranks 13th place in generating electricity from Nuclear power plant.



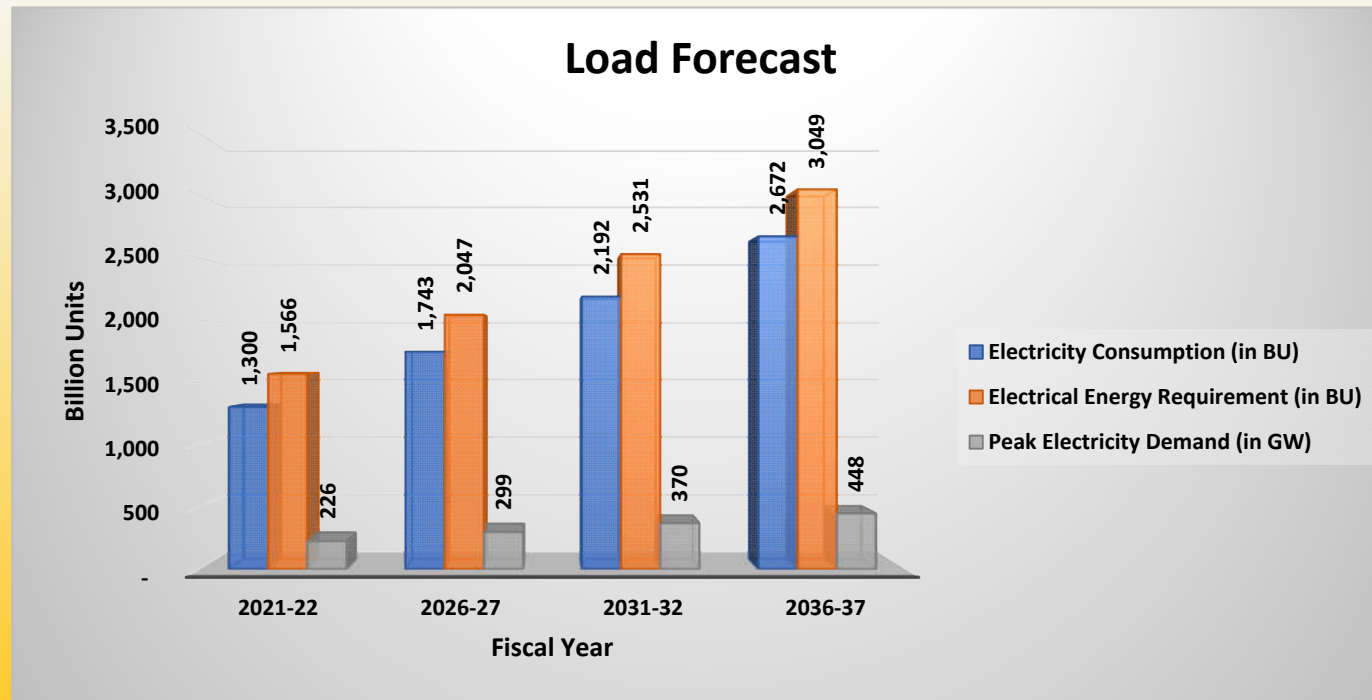
When India got its Independence in 1947, the total installed capacity was 1363 MW. The planned and structured growth of Power Sector in India started immediately after Independence with the enactment of the erstwhile Electricity (Supply) Act 1948.



- In coming years when we will be having abundance of clean energy from renewables, quality of energy will also take equal importance.
- India's aggregate transmission and commercial (AT&C) losses were nearly 21.35% in 2017-18. This compares unfavorably to the total AT&C loss in the electricity sector of the United States, which was only 9.43% out of 4,113 billion kWh electricity supplied during the year 2013.
- The Indian government has set a target of reducing losses to 14.10% by 2022.
- In coming decade transportation sector in India and in world will also see a big transformation.
- Soon fossil fuel based vehicles will be matter of history and battery-operated vehicles will take important place in our daily lives.
- Hybrid equipment and vehicle working on combination of solar energy and battery operation or DME shall be in demand.
- Methanol can be thought of cleaner alternative to coal for power generation, China has already taken this concept and working on it.

In continuing efforts to safeguard the environment and reduce emissions from power sector, India has made the following commitments in Conference of the Parties 21 (Paris):

- India intends to reduce the emissions intensity of its GDP by 33 to 35% by 2030 from 2005 level.
- To achieve about 40 percent cumulative electric power installed capacity from non-fossil fuel based energy resources by 2030 with the help of transfer of technology and low cost international finance.
- Introducing new, more efficient and cleaner technologies in thermal power generation.
- To reduce emissions from Thermal Power Stations, Ministry of Environment, Forest and Climate Change (MoEF & CC) has also issued new environmental norms in December 2015 regarding Suspended Particulate Matter (SPM), SO_x, NO_x, Mercury.
- Norms for specific water consumption by Thermal Power Stations have also been notified to conserve water.



Source: CEA

Stress is a condition in which a firm or an individual cannot generate revenue or income because it is unable to meet or cannot pay its financial obligations due to High Fixed Cost, Illiquid Assets and Revenues sensitivity to economic downturns.

There are two kinds of **stress**: -

Acute stress results from situations that are new and have never been faced before.

Chronic stress results from the repeated exposure to a particular situation This kind if stress is the most detrimental

Chronic Stress

Balance sheet

- Decline in working capital as the payables in the account grow at a faster rate than inventory and the receivables ($CL > CA$)
- Higher interest repayments as there exists higher risk of defaulting.
- Higher debt to equity ratio ($D/E > 1$)
- If $ICR < 1$ then companies' payment credibility is questionable and implies that company cannot cover its interest with the earnings in the current period.

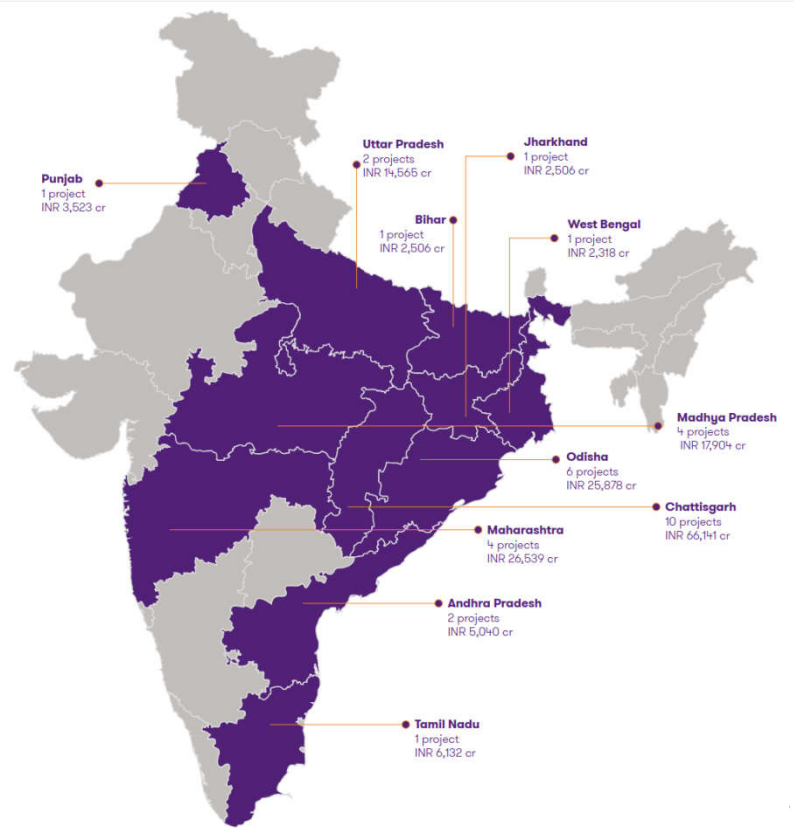
Acute Stress

Liquidity

- Lack of marketability of an investment that can't be bought or sold quickly.
- Cannot meet short term debt obligations.
- Lack of convertibility of assets into cash.

Cash Flows

- Negative cash flows over a sustained period of time



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Overview of Stressed Assets

Total number of projects	34
Total stressed capacity (in MW)	40,130
Commissioned capacity (in MW)	24,405
Under construction capacity (in MW)	15,725
PPAs tied up (in MW)	18,516
PPAs not tied up (in MW)	21,614

Reasons for Stress in the sector



Supply of
Fuel



High Real
Interest Rates



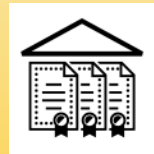
Health of
DISCOMS



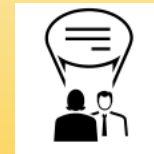
Technological
Risks



Economic
Turndown



Fixed Cost
Debt



Irrational
Exuberance



Frauds



Regulatory
Roadblocks



Market
Factors



Operational Inflexibility
of the Plants

Why the Power Sector is in so much Stress?

- Inadequate supply of fuel (coal and gas)
- Inability of the promoters to complete the large complex power projects within the stipulated costs and timelines.
- Absence of creditable off-take under long-term/medium-term PPAs (negligible power procurement by DISCOMs).
- Muted power demand especially from industrial and manufacturing sector.
- Aggressive initial tariff bid by project companies without an adequate mechanism to understand the associated risks.
- Summary cancellation of all the 214 coal blocks, which were allocated by the Inter-Ministerial Group from 1993 onwards and by the Supreme Court in September 2014, has put approximately 24,000 MW of captive coal-based thermal capacity under stress.
- Delayed payments by DISCOMs coupled with litigations in tariff approvals by regulators.
- Regulatory delays in procurement of regulatory clearances and contractual disputes.
- Currently, the stress is concentrated in private thermal generation and distribution sector.
- It has led to spill over and distress in Public Sector Banks and NBFCs



Renewable Power

Govt. Policies:

- World's largest renewable Integration plan: - 175 GW renewable Capacity to be added by 2022 (Solar 100 GW, Wind 60 GW, SHP- 5GW, Bio.- 10 GW)

• Other Reforms:

- National Energy storage mission
- Green Energy Corridor
- E-mobility

Electrification

Govt. Policies:

- Pradhan Mantri Sahaj Bijli Har Ghar Yojana – Saubhagya
- Integrated Power development Scheme (IPDS) for urban areas
- Distributed Decentralized Generation (DDG) for remote areas
- National Smart Grid mission.





Other

Govt. Policies:

- UDAY scheme – Launched to improve the financial condition of Distribution company.
- FDI – Automatic approval of 100% foreign equity is permitted in generation, transmission, and distribution sectors
- DDUGJY – To enable rural electrification to un-electrified parts of the country through development of infrastructure relating to distribution of electricity

• Other Reforms:

- Creation of a power sector development fund to bailout stressed projects
- Coal linkage rationalization
- Liberally allowing coal swaps from inefficient plants to efficient plants and from plants situated away from mines to pithead plants to minimize cost of coal transportation.
- Proposed amendments in the Electricity Act.



GOVERNMENT OF INDIA
MINISTRY OF POWER

National Electricity Fund (NEF)

The objectives of scheme are:

- To promote investment in the distribution sector.
- Provide interest subsidy on loans disbursed to the Distribution Companies (both in public and private sector, to improve the distribution network for areas not covered by RGGVY and RAPDRP project areas.
- The preconditions for eligibility are linked to certain reform measures taken by the States and the amount of interest subsidy is linked to the progress achieved in reforms linked parameters.

Website: <https://powermin.nic.in/en/content/national-electricity-fund>

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Integrated Power Development Scheme

A Priority Programme of Govt. of India

Integrated Power Development Scheme (IPDS)

Approved on 20-11-2014 with a total outlay of Rs. 32,612 Cr. which includes a budgetary support of Rs. 25,354 Cr. from Govt. of India.

The objectives of scheme are:

- Strengthening of sub transmission and distribution networks in the urban areas.
- Metering of distribution transformers feeders consumers in the urban area.
- IT enablement of distribution sector and strengthening of distribution network.

Website: [IPDS : Integrated Power Development Scheme](#)

DEENDAYAL UPADHYAYA GRAM JYOTI YOJANA

(Scheme of Govt. of India for Rural Electrification)

Deendayal Upadhyaya Gram Jyoti Yojana

Scheme approved on 20-11-2014 with a total outlay of Rs. 44,033 Cr. which includes a budgetary support of Rs. 33,453 Cr. from Govt. of India.

The objectives of scheme are:

- Separation of agriculture and non agriculture feeders.
- Strengthening of sub transmission and distribution networks in the rural areas
- Metering of distribution transformers feeders consumers in the rural area
- Rural Electrification.

Website: <http://www.ddugjy.gov.in/>



The objectives of scheme are:

- (UDAY) is the financial turnaround and revival package for electricity distribution companies of India (initiated by the Govt. of India with the intent to find a permanent solution to the financial situation of power distribution.
- Allows state governments, which own the DISCOMs, to take over 75% of their debt as of September 30 2015 and pay back lenders by selling bonds DISCOMs are expected to issue bonds for the remaining 25 percent of their debt.

Website: <https://powermin.gov.in/en>

Insolvency is a term for when an Individual or Company can no longer meet their financial obligations to lenders as debts become due.

Those in a state of insolvency are said to be **Insolvent**.

It was introduced by the Minister of Finance, Mr. Arun Jaitley, in Lok Sabha on December 21, 2015.

Insolvency is a state of Financial Distress in which a person or business is unable to pay their debts.

Insolvency in a company can arise from various situations that lead to poor cash flow.

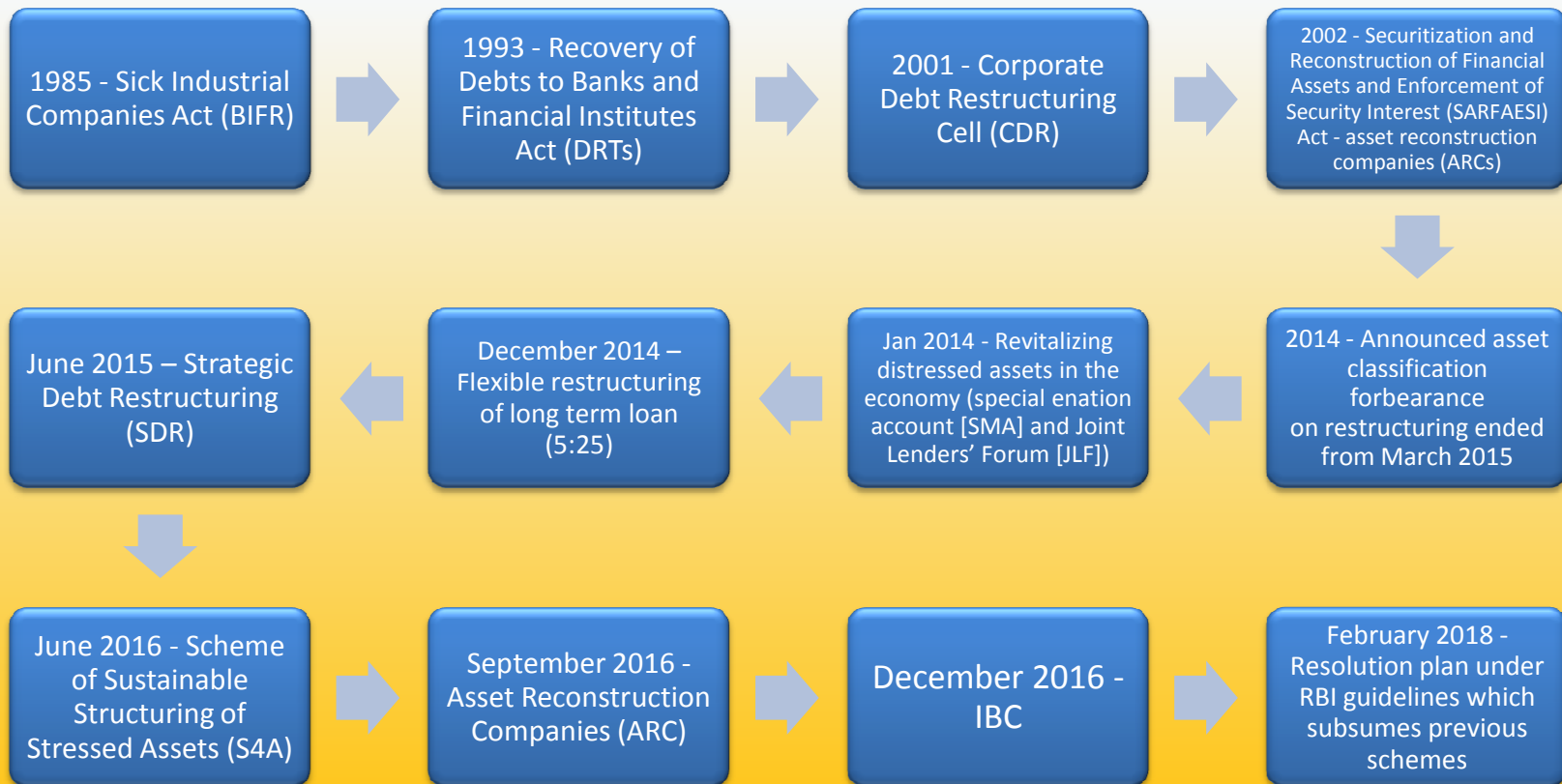
When faced with insolvency, a business or individual can contact creditors directly and restructure debts to pay them off.



- IBC is one of the most important legislative reforms of recent times (next only to the Goods and Services Tax [GST]), as it is expected to resolve the prevailing NPA crisis in the banking sector, the resultant logjam in the availability of credit and the consequential impact on GDP growth.
- IBC consolidated and amended various laws related to insolvency resolution of companies, limited liability entities, partnerships and individuals, which were contained in various enactments into a single legislation by an enactment of the parliament.
- IBC received praises from multilateral institutions like the World Bank and IMF, and was considered one of the major reasons of India's sudden jump in the ease of doing business index.
- RBI came up with an initial list of 12 companies in June 2017 and followed up with another 26 companies in Aug 2017, which cumulatively accounted for about 50% of total NPAs. As at the end of September 2018, 1,198 corporates were undergoing insolvency resolution process.



Debt Resolution Mechanism in India since 1985



Insolvency and Power Sector

- The country's power sector has been one of the highly stressed sectors in recent times, with loans worth approximately Rs. 1,00,000 crore having earned bad loans. Further, as per the recent estimates, around 66,000 MW capacity is facing various degrees of financial stress, including 54,800 MW of coal-based power, 6,830 MW of gas-based power and 4,570 MW of hydropower, with the lenders having an exposure of around Rs. 3,00,000 crore to these assets, which is alarming, to say the least. According to the RBI, the total outstanding loans of scheduled commercial banks to the power sector, including renewables, stood at Rs. 5,65,000 crore as of March 2018.
- RBI on 12 February 2018 released a circular, where it mandated that loan accounts above INR 2,000 crore, that remained unresolved for more than 180 days (the period ended on 27 August 2018) be brought under the IBC and taken to the NCLT for resolution. The Allahabad High Court in a challenge refused to stay the RBI circular and accordingly, lenders in most of the stressed power accounts have filed recovery proceedings against these assets in NCLT.
- It may be mentioned that there is no universal solution for these ailing power assets and a mixed multi-pronged strategy needs to be adopted instead of a straight jacketed approach. This has to be done as there are not enough takers for all of these stressed assets and any unthoughtful action may result in huge credit recovery losses for the banks/FIs.

Requirements for valuation of any Company which is into power generation;

- Project Start Date, Development period, Construction Days, Prior Delays, Proposed Commercial Operation Date
- Mechanical Equipment and Land Cost, Technical Due Diligence, Upfront Insurance Payment etc.
- Current Capacity of the plant needs to be studied.
- Trend for cost of energy generation and Other O&M expenses needs to be studied.
- Coal linkages with Coal India Limited, Coal (MTPA) available, tenure of Power Purchase Agreements.
- Station Heat Rate & Plant Load Factor (PLF) to be analyzed, to check the trend of capacity utilization of the plant.
- PPAs tied up with the plant, No. of PPAs, PPAs Tariff, any escalation clause, tenure of PPAs.
- Pending Regulatory/Environment clearances to be kept track of, that can deeply impact the value of the plant.



PPGCL's Prayagraj Thermal Power Plant

Commissioning: - The power plant's three supercritical units were commissioned during 2016 and 2017.

Asset: - 1,980 MW Prayagraj Thermal Power Plant at Tehsil Bara, District Allahabad, UP. The power plant's three supercritical units were commissioned during 2016 and 2017.

PPA: - PPGCL entered into a 25-year PPA with the five distribution utilities of Uttar Pradesh for sale of 90% of the power generated from the commercial operation date (COD), with the balance of power being sold by PPGCL on a merchant market/bilateral basis. The PPA has provision for pass-through of variable costs as per actuals.

Overrun in Construction: - The original project cost was estimated at Rs. 10,780 Cr. The project however was delayed by 33 months on account of delays in land transfer by UPPCL, delays in equity infusion by promoter, Increases in foreign exchange rate variations, the assumed rate of interest, and the cost of equipment and labour as per contra Additional interest costs accumulated during construction due to the construction time overrun, etc. The revised project costs now stand at Rs. 15,537 Cr.

Debt & Equity: - PPGCL had an outstanding debt of Rs. 11,493 Cr. (74% of total outlays) and equity infusion of Rs. 4,043 Cr. (26%).

Buyer: - Renascent Power, Subsidiary of Resurgent Power

Date of Transaction: - Announced on 28th August 2018 & Completed on 4th December 2019.

Transaction Rate: - Rs. 3.03 Cr. per MW

Lanco's Amarkantak Thermal Power Plant

Commissioning: - At the start of the last decade, Lanco commissioned Units 1 & 2 of the Amarkantak coal-fired power plant in Chhattisgarh, giving total operational capacity of 600 MW.

Assets: - Amarkantak coal-fired power plant of 600 MW capacity in Chhattisgarh (2 units of 300MW each, with one unit idle in 2013/14 due to coal supply and regulatory issues), with plans to build the Amarkantak 3 & 4 units of a combined 1,320MW of new capacity

PPA: - In FY 2013-14, the 300 MW Unit 2 idled due to the suspension of its coal linkage after the PPA to the Haryana discom (HPGCL) was terminated for non-compliance with certain covenants. Litigation was entered into, but the merchant tariff available remained below the marginal cost of operation, so the unit was left idle. The PPA for Unit 2 was terminated in January 2015.

Overrun in Construction: - The power plant is reported to be 85% built, putting it at least two years behind schedule and 20-30% over budget. A combination of delays in land acquisition, poor geology, and earthquakes (a common, predictable issue with Indian hydro projects) resulted in substantial cost and time overruns, such that the company cancelled the PPA in September 2014.

Debt & Equity: - The plant had an outstanding debt of Rs. 8,782 Cr. and equity of Rs. 1,533 Cr. Total borrowings reached Rs. 36,705 Cr. by March 2014, representing financial leverage of 25 times the book value of ordinary equity of just Rs. 1,458 Cr.

Buyer: - Adani Group and Vedanta are conducting due diligence to acquire Lanco's Amarkantak power plant in Chhattisgarh

RattanIndia's Nasik Sinnar Thermal Power Plant

Asset: - RattanIndia Power Limited has 2 coal-based thermal power projects at Amravati and Nasik in Maharashtra (2,700 MW each)

Phase 1: - Amravati Thermal Power Project with total capacity of 1350 MW, comprising of 5 units each of 270 MW. All 5 Units of Phase 1 have been commissioned in 2017.

Phase 2: - Nasik Thermal Power Project is being setup by Sinnar Thermal Power Ltd. with total capacity of 1350 MW

Commissioning: - All 5 Units of Phase 1 have been commissioned. Phase 2 is yet not commissioned.

PPA: - The plant has a long term PPA for 950 MW with Maharashtra State Utilities. The plant has also received a letter of intent from Maharashtra State Electricity Distribution Company Limited (MSEDCL) for a PPA supplying 507 MW for 25 years.

Defaults: - The primary reason for the lack of operation is the lack of a PPA for rest of its capacity. The plant is unable to run as the railway siding from the main railway line, needed to transport coal and other raw materials to the plant, is not ready. RattanIndia Power Ltd. have defaulted to the tune of Rs. 2 lakh million for the two thermal power plants at Nashik and Amravati in Maharashtra.

Debt & Equity: - It has an outstanding debt of Rs. 7,107 Cr. and an equity infusion of Rs. 2,454 Cr.

Buyer: - Rs. 4,050 Cr. debt was taken over by new investors, including Goldman Sachs and Varde Partners (15% equity each).

Date of Transaction: - Announced on 11th January 2019 & Completed on 31st December 2019

Transaction Rate: - Rs. 3.03 Cr. per MW

GMR Chhattisgarh Energy Limited (GCEL)

Asset: - 1,050 MW (3 × 350) domestic coal based power plant at Kamalanga Village, Odisha.

Commissioning: - COD for Unit 1 was achieved in March 2013
COD for Unit 2 was achieved in November 2013
COD for Unit 3 was achieved in March 2014

PPA: - About 85% of the power plant's capacity supplies electricity to Odisha, Haryana and Bihar under long-term power purchase agreements.

Defaults: - GCEL plant had operated at 63% PLF only (9M FY 2020-21), from 73% in FY 2019-20. The plant operations were not viable for GCEL because the competitive rates, INR2.89/unit - INR3.39/unit, at which it sold power were insufficient to recover the costs incurred from operating the plant.

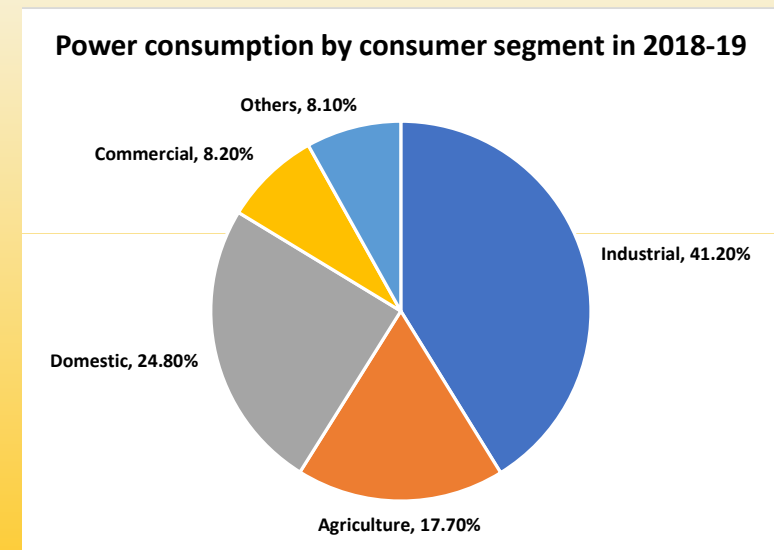
Debt & Equity: - It has an outstanding debt of Rs. 3,951 Cr. and an equity infusion of Rs. 2,250 Cr.

Buyer: - GSW Energy Ltd.

Date of Transaction: - Announced on 17th February 2020 (transaction put on hold due to COVID19)

Transaction Value: - Rs. 5,321 Cr.

- Power supply saw a decrease of approx. 30% during the nationwide lockdown due to COVID19.
- Segment wise Power Consumption in 2018-19 is shown in the pie chart. As the lockdown has severely reduced the industrial and commercial activities in the country, these segments would have seen a considerable decline in demand for electricity.
- The domestic demand may have seen an uptick as people were staying indoors.
- During the lockdown period, the coal stock with coal power plants has seen an increase.
- Coal India has to think over to divert the fuel supply to other sectors like cement on account of restrained demand of coal by the power sector.
- The benefits from SHAKTI and UDAY Schemes have fallen short of expectations.
- Due to the global pandemic, the stressed companies are less likely to get any buyers.



Source: CEA

- Power sector in the country will require meaningful structural changes, targeting an improvement in the operational efficiency, a reduction in cross subsidies and cost-reflective tariffs.
- The reduced demand has given a serious blow to the coal-based generation.
- Replacing ideal thermal energy into renewable energy is the need of the hour.
- The government is also pushing to replace the old thermal power plants with renewable energy.
- Coal India having surplus coal reserve which could be allocated to other sectors like cement.
- CRISIL's recent study on generation across 75 solar projects indicates that performance was better than the estimation
- Local policies and market reformation will be the biggest driver of energy transition in the coming times.





VALUATION

Business & Business Interests

- Business & Equity Valuation
- Valuation of Start-up / IPO / REIT / M&A, Leverage Buyout Valuation
- Valuation of ESOPs and Sweat Equity
- Valuation for Tax, Capital Gain, Transfer Pricing
- Valuation for Financial Reporting, Fairness Opinion, Purchase Price Allocation (PPA) for M&A
- Determination of Swap Ratio under Merger and Demerger
- Valuation of Inventory / Stocks and Debentures / Receivables
- Litigation and Dispute Support

Intangible Assets

- Valuation of Brands, Goodwill, Trademark, Copyright, Patents, Other Intangible Assets & Intellectual Property
- Valuation for Financial Reporting, Fairness Opinion, Purchase Price Allocation (PPA) for (M&A)
- Impairment Studies of Intangible Assets

Financial Instruments

- Valuation of Financial Securities, Instruments & Derivatives
- Valuation for M&A Transaction, under Insolvency & Bankruptcy Code

Immovable Assets (Real Estate)

- Valuation of Land, Building Residential / Commercial / Industrial Estates
- Valuation of Infrastructure Assets, Expressways / Toll Ways & Specialized Assets
- Valuation for Capital Gain Tax, Stamp Duty, Litigation & Dispute
- Impairment Studies for Financial Reporting, PPA, Cash Generating Units
- Mines, Mineral Advisory and Valuation
- Valuation under Insolvency & Bankruptcy Code (IBC)
- Movable Assets (Plant & Machinery)
- Valuation of Industrial Assets and Plant & Machinery
- Valuation of Infrastructure Assets & Specialized Assets, Power Plants
- Fairness Opinion, Purchase Price Allocation for M&A
- Impairment Studies for Financial Reporting, Cash Generating Units
- Valuation under Insolvency & Bankruptcy Code (IBC)

Transaction Advisory

- Buy side due diligence and closing due diligence
- Vendor due diligence and vendor assistance
- Sale Purchase agreement (SPA) and Business Transfer Agreement (BTA)
- Assistance in deal negotiation



RISK CONSULTING

Strategic & Risk Advisory Services

- Techno Economic Feasibility Studies
- Economic Viability & Financial Appraisal
- Business Plan Review

Technical Support Services

- Lender's & Investor's / Independent Engineer Services
- Technical Due Diligence, Technical Opinions
- Chartered Engineers Opinion & Certification
- Project Cost Investigations
- Project Appraisal & Monitoring

Agency for Specialized Monitoring (ASM)

- Term Loan Monitoring
- Working Capital Monitoring
- Cash Flow Monitoring

Financial & Treasury Risk Advisory

- Assessment Of Credit Risk, Market Risk & Interest Rate Risk
- Assets Quality Review & Stress Testing
- Assessment of Expected Credit Loss
- Assessment of Asset Liability Management & Liquidity Risk

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INVESTMENT BANKING

- M&A Advisory:
 - Sell Side, Buy Side
 - Domestic & Cross Border
- Partner, Joint Venture & Strategic Alliances
- Government Disinvestment & Privatization
- Fund Raising – Equity, Mezzanine, Structure Finance & Debt
- Distress Investment Banking – One – Time Settlement, Priority and Interim Funding, Rescue Financing and Buyouts

DISPUTE & LITIGATION SUPPORT

- Valuation Services
- Damages & Loss of Profit Assessment
- Independent Expert Testimony
- Anti – Trust & Competition Advisory
- Post – Acquisition Disputes, Joint Venture & Shareholder Disputes
- Civil & Construction Disputes, Real Estate Disputes
- Intellectual Property Rights Dispute

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