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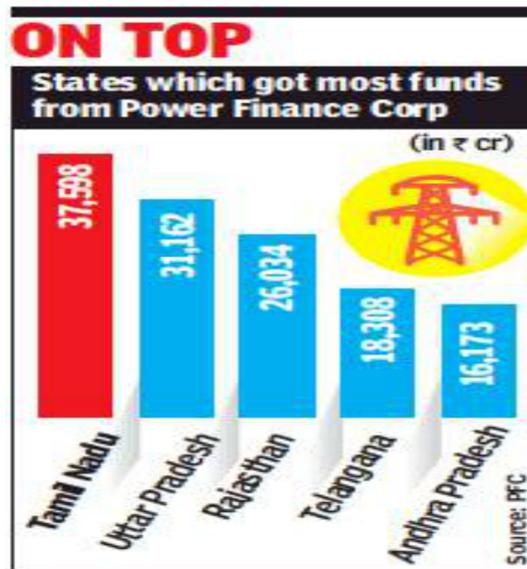
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Tangedco gets maximum funding from Power Finance Corporation

Times of India : March 26, 2018

The Tamil Nadu power utility, Tangedco, tops the list of debtors of Power Finance Corporation since April 2014. Of the total Rs 1.77lakh crore released as loan to 22 states by the corporation, Tangedco secured 21% of the amount towards loans — that is Rs 37,598crore. It is also the period during which the losses of Tangedco began to reduce and the credit worthiness of the discom increased.

The PFC has financed three thermal units for the North Chennai Thermal Power Station and Ennore Thermal Power. Of these, one unit has been commissioned and other two are likely to become operational later in the year. The total loan taken from the PFC for the three thermal units is Rs 14,724crore.



A Tangedco source said the discom has been availing loans from PFC because of the ease with which it could access it. "PFC and Rural Electrification Corporation are specialised agencies for financing power plants, both thermal and hydro. They have various parameters for giving loans to discoms," said a senior Tangedco official.

The parameters include the financial status of the discom and repaying capacity. "Taking loans from these specialised agencies means we get more time to repay, that is a longer repayment period. The interest is time-based. We can get loans from both the agencies at 11% per annum," said the official.

Tangedco's financial status improved in the last few years due to lowering of its losses after several measures were taken. They include use of more wind power which cost less, stoppage of coal imports and installation of digital meters. Of the total debt, the state government took over a major portion of it under the Uday scheme. "But for our improved

financial health, we would not have been able to get loans from any agency to fund our own power units," he said.

PFC has also financed two hydro units in Tamil Nadu. "The financing agency provided Rs 75crore loans for two units of one MW each at Periyar-Vaigai and two units of 1.5MW capacity each at the same place with Rs 57crore loan," the official said.

Tangedco has also received the maximum funding from PFC due to its dependence on thermal units, unlike other states. "Our main stay is thermal and we will have to increase our capacity for meeting future demand. Other states have avenues to tap power from hydro sources. But, our state is poor on hydro," said the official.

Lanco finance crisis leaves project undone, TN in fix

Times of India : March 27, 2018

Tamil Nadu Electricity Board (TNEB) has cancelled the contract given to LancoInfratech Ltd for setting up a 660MW thermal unit in Ennore. The work order was issued to Lanco in 2014 by former chief minister J Jayalalithaa after the company won the bid. The project was to be commissioned in January this year. The project was stuck because of Lanco's financial problems. Since August last year, Lanco's insolvency case is pending with the National Company Law Tribunal (NCLT).

TANGEDCO CANCELS CONTRACT

> Work order issued to Lanco in 2014 after the company won the bid

> Only 20% work done in nearly 4 years

> Lanco's insolvency case is pending with National Company Law Tribunal (NCLT) since August last year

> The project was to have been commissioned in January this year

> Tangedco has now cancelled



contract with Lanco for 660MW project

> Once a new contractor is identified through a re-tender, it would take 3 more years for the project to be completed

"The board has cancelled the contract worth Rs 3,960cr as the company is in a financial mess and the work has not progressed beyond 20%. About 85% of the foundation, construction of power house building and seawater intake pump house have been completed," a senior Tangedco official told TOI.

Once a new contractor is identified through a re-tender, it would take three more years for the project to be completed.

Unlike other thermal units which got stuck in court cases, Ennore expansion project was allotted to Lanco soon after the bids were opened for the project. "The company was given the EPC contract and we received loan from Power Finance Corporation to fund the thermal unit," said the official.



Other thermal projects like Ennore special economic zone (SEZ) and North Thermal 800MW unit are also likely to be delayed by at least two more years.

"Unlike 2012-13, when the state was dependent on new thermal units for managing power shortage, the situation is better now. In the next one month, we will have wind power generation and that will take care of power supply till September. But if demand increases beyond 15,500MW, we would need all these new projects to generate power," said the official.

TN power regulator for curbs on wind power banking as discom losses mount

Business Standard : March 26, 2018

Banking was adopted years ago by TN to promote clean energy, but with the State becoming energy surplus, govt-owned discom TANGEDCO has begun bearing losses

Captive wind power generators including the mills in Tamil Nadu are likely to face restrictions on banking their excess production with the discoms, as the power regulator has proposed limiting generation to no more than the annual average consumption.

Of the 7,900 Mw of wind power capacity in Tamil Nadu, which is the largest in the nation, almost 70 per cent or around 5,500 Mw is under captive generation.

The banking of excess power generated by wind power producers was a measure the government adopted years ago to promote clean energy, but with the State becoming energy surplus, the government-owned discom TANGEDCO says it is bearing losses due to the additional cost in banking. The Tamil Nadu Electricity Regulatory Commission (TNERC) is now considering a new tariff order for wind energy, based on this submission by TANGEDCO.

"Banking has always remained a bone of contention between the licensee and wind energy generators (WEGs)," TNERC observed in its new consultative paper.

In the consultative processes undertaken by the Commission before the issue of every tariff order, the distribution licensee has always requested for the removal of the facility of banking provided to WEGs. Wind energy generators, on the other hand, have raised concerns about the investments they have already made in banking provision and cited principles of promissory estoppel.

TANGEDCO has often stated that banking is detrimental to its finances and has caused heavy losses due to power purchase cost in the non-wind season and additional expenditure in the form of integration cost in the process of accommodating wind energy by backing down and surrendering power. The WEGs have been contending that banking is necessary and should be continued, and that there is no financial loss to TANGEDCO. They have also approached various legal forums against the orders on banking.

"The rise in captive installations is a cause for concern with respect to the facility of banking of energy," TNERC observed. "The Commission proposes that the captive wind power plants shall restrict the installed capacity such that there is no excess generation beyond the annual average consumption, say taken for two or three years."

The Commission also draws comparisons with other renewable energy-rich States such as Andhra Pradesh, Gujarat, Maharashtra, Rajasthan and Karnataka. It says they have all placed much larger restrictions on banking of wind energy than Tamil Nadu.

TNERC has suggested various options, including doing away with the facility of banking, but with deemed purchase of excess generation, or banking facility with a restriction on timing



from one month to 12 months, with various riders and charges. It also recommends removal of banking of energy for third party power purchases.

Last sparks in non-solar RECs as regulated prices stifle market

Business Standard : March 27, 2018

CERC cut prices to historic low in March 2017 to match prevailing tariffs; There are 1,200 projects under REC mechanism with total capacity of 5,383 Mw

The market for Renewable Energy Certificates (RECs), which has been witnessing downturn for the past three years, could be staring at an end soon. While the trading of solar RECs has been stalled for a year now, non-solar ones would last be traded on March 28 because the regulated price band rendered the market unviable. Close to 3.9 million non-solar RECs will be traded this week and if all are sold, it will mark the end of the trading. The industries dependent on these certificates for meeting their renewable power obligations are worried about the implications if the RECs market ceases to exist. There are around 1,200 projects under REC mechanism with a total capacity of 5,383 Mw. The trouble began in March 2017, when Central Electricity Regulatory Commission (CERC) reduced the REC prices to a historic low to match prevailing tariffs. The floor price of solar REC was reduced to Re 1/unit and forbearance price to Rs 2.4/unit. It was earlier Rs 3.5/unit and Rs 5.8/unit, respectively. For the non-solar (wind power and others), the floor price was reduced to Re 1/unit and forbearance at Rs 3/unit. It was earlier in the range of Rs 1.5-3.5/unit. The order was challenged by REC generating companies in the Supreme Court and in Appellate Tribunal of Electricity (APTEL).

NON-SOLAR REC TRADING

	No. of buys (million)	% growth YoY in past 4 months
Nov '17	2.2	50
Dec '17	5.2	124
Jan '18	1.2	116
Feb '18	2.3	174

REC: Renewable energy certificate
Source: REC Registry

The petitioners had submitted that lowering the prices would never clear the unsold stock of close to 10 million RECs. The generators asked the APTEL to suggest means to clear the existing stock of RECs which would be hampered by the new price regime. The Supreme Court, in a separate case, however, allowed the trading of non-solar RECs with the earlier prices. APTEL is yet to give a decision in the matter which has led to backlog of RECs. The non-solar ones where the trading was allowed in the last four months saw good trading. In the past four months, the non-solar RECs traded were 1.2 to 5.2 million. The last tranche of 3.9 million will be trading next week, which would be cleared in one go, said a market expert. "There was an overall improvement in the renewable purchase obligation (RPO) which led to turnaround in the non-solar RECs. After more than five years, demand of RECs exceeded supply. However, due to huge backlog, RECs were sold at the

floor price," said a trader. Against a demand of 14 million RECs, there were 4.8 million non-solar RECs. With no clarity on solar RECs and non-solar ones too going off market, purchasers and sellers of these certificates, like distribution companies, thermal power producers, open access consumers, would have to look at alternate mechanism to meet RPO. Sector experts said thermal captive industry of 65 Gw would need close to 20 million RECs while open access consumers would need 7.5 million RECs annually. There is also 272 Gw of thermal power capacity which needs to meet RPO. "The existing 32 Gw of wind power capacity cannot meet requirement of REC demand of 337 Gw. There will be immense



shortfall in the coming years," said a renewable power expert. He added the demand from these consumers would continue as they do not have access to power procured by SECI.

Now, India is the third largest electricity producer ahead of Russia, Japan

Business Standard : March 26, 2018

The power sector has a 100% FDI permit, which boosted FDI inflows in the sector

India's electricity production grew 34% over seven years to 2017, and the country now produces more energy than Japan and Russia, which had 27% and 8.77% more electricity generation capacity installed, respectively, than India seven years ago.

India produced 1,160.10 billion units (BU) of electricity—one BU is enough to power 10 million households (one household using average of about 3 units per day) for a month—in financial year (FY) 2017. Electricity production stood at 1,003.525 BU between April 2017-January 2018, according to a February 2018 report by India Brand Equity Foundation (IBEF), a trust established by the commerce ministry.

With a production of 1,423 BU in FY 2016, India was the third largest producer and the third largest consumer of electricity in the world, behind China (6,015 BU) and the United States (4,327 BU).

With an annual growth rate of 22.6% capacity addition over a decade to FY 2017, renewables beat other power sources—thermal, hydro and nuclear. Renewables, however, made up only 18.79% of India's energy, up 68.65% since 2007. About 65% of installed capacity continues to be thermal.

As of January 2018, India has installed power capacity of 334.4 gigawatt (GW), making it the fifth largest installed capacity in the world after European Union, China, United States and Japan.

The government is targeting capacity addition of around 100 GW—the current power production of United Kingdom—by 2022, as per the IBEF report.

Electricity generation grew at 7% annually

India achieved a 34.48% growth in electricity production by producing 1,160.10 BU in 2017 compared to 771.60 BU in 2010—meaning that in these seven years, electricity production in India grew at a compound annual growth rate (CAGR) of 7.03%.

Generation capacity grew at 10% annually

Of 334.5 GW installed capacity as of January 2018—up 60% from 132.30 GW in 2007—thermal installed capacity was 219.81 GW. Hydro and renewable energy installed capacity totaled 44.96 GW and 62.85 GW, respectively, said the report.

The CAGR in installed capacity over a decade to 2017 was 10.57% for thermal power, 22.06% for renewable energy—the fastest among all sources of power—2.51% for hydro power and 5.68% for nuclear power.

Growing demand, higher investments will drive future growth

Growing population and increasing penetration of electricity connections, along with increasing per-capita usage would provide further impetus to the power sector, said the report.

Power consumption is estimated to increase from 1,160.1 BU in 2016 to 1,894.7 BU in 2022, as per the report.



Increasing investment remained one of the driving factors of power sector growth in the country.

Power sector has a 100% foreign direct investment (FDI) permit, which boosted FDI inflows in the sector.

Total FDI inflows in the power sector reached \$12.97 billion (Rs 83,713 crore) during April 2000 to December 2017, accounting for 3.52% of FDI inflows in India, the report said.

Meeting India's electricity needs

The Hindu : March 23, 2018

Till the central grid becomes reliable, a solar- and wind-powered microgrid is the way to light up remote areas

One often comes across news about variable renewable energy sources like solar photovoltaic and wind having reached 'grid parity'. What is the concept of grid parity? Electricity grid is a very complex system. It involves long-distance transmission of electricity at high voltage, step-up and step-down transformers, and a distribution network at load centres. Various electricity generators and consumers are connected to it.

Complex network

Grid parity can be seen in two different ways: generator-end grid parity and consumer-end grid parity. Generator-end grid parity is limited to the plant boundary and does not include the cost of the grid system. To ensure that electricity is always available to consumers on a reliable basis, a grid manager has to contract enough electric supply from generators available on demand at all times. In India, the peak demand occurs in the evening, when solar is not available and wind may or may not be blowing. Therefore, the capacity of generators capable of despatching electricity on demand, i.e. despatchable sources, connected to the grid should be more than the peak load.

It has to be more because some generators will be under long-term maintenance and some will not be available for the short term due to technical faults. The cost of the grid system is, therefore, more than the cost of towers, wires, and transformers. It also includes capital and operating cost of storage capacity when provided for and capacity charge paid by the grid manager to meet the peak load. When a grid manager is not able to pay adequate capacity charge, the result is load shedding.

However, priority feed-in accorded to solar and wind forces the despatchable generators to lower electricity generation despite their capability to continue operation at full capacity. Thus, while capital investment has to be made in despatchable generators to meet the peak demand, they are not given the opportunity to work on a 24x7 basis by the prevailing policy framework. Despatchable generators have to suffer loss of generation because of intermittency of solar and wind, and this is an aberration for a capital-scarce country like India. The result is stranded assets.

To compensate for intermittency of solar and wind, despatchable generators have to ramp up generation or back down, and the frequent change in generation level causes wear and tear of machines and increases maintenance costs. All costs are ultimately paid by the consumers or as subsidy by the government — that is, tax payers.

To analyse consumer-end grid parity, one will have to add system costs to the plant-level costs, and when so examined, solar and wind are far from achieving grid parity. Therefore, a factually correct statement is that 'solar and wind have reached generator-end grid parity and more research and development is needed before they achieve consumer-end grid parity.' Such an articulation provides a correct picture to the policymakers.

The cost factor

Energy economists use the concept of levelled cost of electricity generation to compare various electricity generation options, but limit calculations to the plant-level costs. This doesn't capture differences in grid-level costs of different technologies. In view of increasing penetration of solar and wind, it is desirable to replace the concept of plant-level levelled cost with system-level levelled costs.

Appropriate ways to deploy solar and wind can be decided by recognising their three characteristics — zero fuelling cost, low capacity factors and intermittency. Solar and wind are eminently suitable for isolated deployment such as for powering irrigation pumps. An irrigation pump directly connected to a solar panel can be useful for a farmer as he doesn't have to depend on the grid. In this application, intermittency of solar is of no consequence.

In India, there are still communities that have no access to the central electricity grid, or the supply from the central grid is unreliable. A microgrid getting electricity supply from solar and wind, and connected to consumers in an isolated remote community, is helpful in providing electricity for lighting, in charging mobile phones, and small livelihood applications. A storage battery is an integral part of such an isolated microgrid and this increases the cost of electricity. Experience from such installations indicates that consumers are willing to pay for it in return for reliable electric supply. Consumers connected to a community managed microgrid can meet their minimum needs. Until the reliability of the central grid can be assured, solar- and wind-powered microgrid is the way forward for rural and remote communities.

Hopefully, ongoing research in battery technologies will bring down the cost of electricity storage and improve safety of storage, thereby paving the way for a large deployment of solar and wind. One can expect the International Solar Alliance to direct technology development towards the needs of all developing countries. Another option for large-scale penetration of solar and wind is to install gas-based power plants which can be ramped up and down fast. This will be possible only if overland or undersea pipes can be commissioned to transport gas from Central Asia and Iran to India.

Nuclear, hydro options

But solar and wind cannot meet even a quarter of India's projected electricity requirements. A major share has to come from large hydro, nuclear and coal. Out of these three technologies, one has to prefer low-carbon technologies that is hydro and nuclear. Until electricity generation from hydro and nuclear picks up, coal has to continue to meet India's electricity requirements. Along with investment in solar and wind, the government must plan for increased investment in both hydro and nuclear.

Emission norms: How money is the fuel thermal plants lack

Financial Express : March 23, 2018

After the failure to meet the two-year deadline set in December, 2015 for compliance with new emission norms, power plants have been directed by the Central Pollution Control Board to meet the revised norms by 2022.

With the country under an obligation to meet its Paris commitments and renewables representing the future of the power sector, India's coal-based power plants —the backbone of power generation in the country — face the challenge of cutting down on their emissions by 2022 if they are to stay in business. After the failure to meet the two-year deadline set in December, 2015 for compliance with new emission norms, power plants have been directed by the Central Pollution Control Board to meet the revised norms by 2022. The revised plan envisages installation of flue gas de-sulphurisation (FGD) units for 1,61,402 MW generation capacity and upgrade of electrostatic precipitators for 64,525 MW capacity.



Finance is the biggest hurdle in this exercise, especially at private plants. Power Minister RK Singh said recently capital expenditure on such installation would be in the range of Rs 88-128 lakh per MW. As is known, the industry is not in the best of health, with plants facing low capacity utilisation due to less-than-expected growth in demand. Stressed assets in the sector comprising 34 private power plants have an outstanding debt of Rs 1.74 lakh crore. "With high exposure and a large number of projects on watch list, no bank is willing to lend more money to developers," Ashok Khurana, director general, Association of Power Producers, tells FE. "We have requested the power ministry to designate REC and PFC as nodal financing institutions for pollution control equipment," he adds.

While assessing the options before power plants, officials have noted that Central Electricity Regulatory Commission (CERC) regulations allow any capital expenditure (including installation of FGDs) to be categorised under "change in law", ensuring it could be passed on to consumers in the form of higher tariffs. As per projected figures, installation of emission-reducing equipment would necessitate a rise of Rs 0.62-0.93/unit in power tariffs — the average price at which discoms purchase power is Rs 3.5/unit. A sector representative who did not want to be identified points out that since power plants with lower generation costs get to sell their electricity first, producers that raise tariff on account of installation of FGD units would find it more difficult to sell power.

The private sector is also sceptical of the government providing the level of infrastructural support required to retrofit coal-based power plants within the specified timeline. "The clean-power agenda would require huge amounts of limestone, which is used in a big way by the cement industry. Has the government worked out any plan to raise pure limestone supply by about 95%?" asks a representative of the power industry on the condition of anonymity. Between April, 2014 and November, 2017, 6,769 MW capacity that was more than 25 years old was decommissioned. In a report, Motilal Oswal Securities has estimated that about 17,000 MW of power plants would have to be decommissioned for failure to meet the emission norms by the 2022 deadline. Kameswara Rao, partner, PwC, says states need to assess the situation, especially for older power plants, to ensure suitable capacity augmentation. "Older plants face issues of land availability and high variable costs, requiring them to consider more comprehensive steps such as a complete renovation or closure," he says.

The Motilal Oswal Securities report also said the move for clean power would open up a Rs 1.3-lakh-crore opportunity for emission-control equipment providers in the next three years. Companies such as BHEL, L&T, GE Power and Reliance Infrastructure are expected to benefit from it. RInfra recently emerged as the lowest bidder in a FGD project tendered by NTPC for its 1,500-MW Jhajjar power plant in Haryana. Similarly, Bharat Heavy Electricals has bagged a Rs 560-crore FGD order for NTPC's 980-MW Dadri power plant while GE Power has been awarded a Rs 309-cr contract by NTPC for its super thermal power project in Telangana.

Save Energy. Save Money. Save the Planet