Tim Buckley, Director Energy Finance Studies
May 2020

Institute for Energy Economics and Financial Analysis
IEEFA.org

Who Would Still Fund a New Coal Power Plant in India?

Stranded Asset Risks Continue to Rise as Solar Deflation Continues

Executive Summary

Renewable energy delivered more than two thirds or 9.39 gigawatts (GW) of India's new generating capacity additions in the fiscal year 2019/20.

In contrast, new thermal power plants delivered 4.3GW during 2019/20, net another 2.5GW removed due to end-of-life plant closures. While up from the decade low of just 3.5GW installed in 2018/19, this still marks a near 80% reduction in the rate of thermal power installs delivered in the four years to 2015/16, which at that time was 20GW annually.

The Government of India's National Electricity Plan of 2018 (NEP2018) called for an additional 70GW or more of new coal-fired power plants by 2026/27, and the closure of another 39GW.[1]

The NEP2018 was transformational in its thinking at the time. However, there is now a growing disconnect between the Plan for new thermal power and subdued demand growth, the significant cost disparity and need for flexible peaking capacity, versus the reality of diminishing new coal plant additions over the last five years.

This begs the question: who is still willing to finance the US$70bn of new investment implied, particularly as new builds must at least have basic pollution controls installed?

More than half of the new coal-fired power plant capacity additions in 2019/20 were equity financed by energy conglomerate NTPC, while the majority of debt financing for recently proposed Indian coal plants has been sourced from the non-banking financial institution Power Finance Corporation (PFC) which primarily funds power projects in India. Is this a case of doing one's civic duty despite the economic costs involved?

[1] The NEP2018 called for 93GW of new coal to be added by 2026/27 and 46GW of end-of-life coal plant closures. Three years into the plan, 21GW of new coal plants have been added and 7GW have been closed.

While both NTPC and PFC are controlled by the government of India, they are also stock exchange listed entities. Like their international peers, their ongoing share price underperformance suggests a strategic change in direction is needed.

Continuing to invest in inflexible coal power equates to an investment in current or soon-to-be stranded assets, which is proving to be a wealth destructive exercise.

Continuing to invest in inflexible coal power equates to an investment in current or soon-to-be stranded assets.

The pandemic and national lockdown has once again highlighted India's entirely unrealistic modelling assumptions of coal-fired power plants which assumes running at 70-80% capacity utilisation rates, double the actual rates seen in April 2020.

In stark contrast, Indian and international capital is focussed on new, more sustainable and cheaper domestic power opportunities. The US$2bn, 2GW solar tender awarded earlier this month at a US$ record low of US$33 per megawatt hour (MWh, or Rs2.55/kWh) provides clear evidence of this.

The move last week by global private equity giant KKR to invest in renewable infrastructure projects provides a second confirmation of global capital's growing interest in India.

In this note, we explore these trends in more detail.

State of India's Electricity Grid 2019/20

India's total installed capacity during 2019/20 rose 4% nationally to 370.1GW (see Figure 1).

Figure 1: India's Installed Electricity Capacity Additions in 2019/20 (GW)

Fuel Source	Mar 2019	March 2020	Change (GW)
Renewables	77.6	87.0	**9.39**
Large Hydro	45.4	45.7	**0.30**
Nuclear	6.8	6.8	**0.00**
Thermal	226.3	230.6	**4.32**
Total Ongrid Capacity	**356.1**	**370.1**	**14.01**

Source: CEA, MNRE, IEEFA calculations

Within that, India installed 9.39GW of new on-grid renewable energy capacity, plus some 2GW of behind-the-meter rooftop solar and 0.3GW of large hydro power. By comparison, India installed 4.32GW of net new thermal power capacity. In sum, more than two-thirds of total new power capacity installs were renewable energy.

While renewable energy installs are well-down relative to the Government's ambitious target of 36GW annually through to 2030, required to reach the 450GW total, the fact that renewable energy installs nearly doubled the traditional thermal power capacity installs is an indication of the new direction India's power sector is moving towards.

NTPC commissioned 3.44GW of new thermal power capacity in 2019/20, half of all (gross) additions across India. State government power utilities in Gujarat, Orissa, Rajasthan and Tamil Nadu accounted for the balance.

Towards the end of the financial year in March 2020, Unit-7 (660MW) of the Suratgarh Super Thermal Power Station (STPS) was commissioned by Rajasthan Rajya Vidyut Utpadan Nigam Ltd, the electricity generation company of the government of Rajasthan. Unit-2 (660MW) of the Khargone Super Thermal Power Station in Madhya Pradesh was also commissioned by NTPC.

At the same time however, 910MW of thermal power capacity across nine end-of-life, subscale coal-fired power units in four plants in Tamil Nadu, Haryana and Jharkhand closed during the month of March 2020.

In all, total thermal power closures over 2019/20 were 2.48GW. This is the highest rate of thermal power closure that India has ever seen, to-date at least.

This is the highest rate of thermal power closure that India has ever seen, to-date at least.

2019/20: The Year in Review

Renewable energy reached 87GW of capacity or 23.5% of total power capacity in the fiscal year 2019/20, and provided 10.2% of total power generation (or 21.6% when including hydro-electricity).

Figure 2: India's Electricity Capacity and Generation (2019/20)

	---- Capacity ----		-- Generation --		Capacity	Increase
	GW	%	TWh	%	Utilisation	GW yoy
Coal-fired	205.2	55.4%	986.9	71.3%	55.5%	4.4
Gas-fired	24.9	6.7%	49.0	3.5%	22.4%	0.0
Diesel-fired	0.5	0.1%	0.1	0.0%	2.0%	-0.1
Large Hydro	45.7	12.3%	157.9	11.4%	39.6%	0.3
Nuclear	6.8	1.8%	42.8	3.1%	72.1%	0.0
Renewables	87.0	23.5%	141.7	10.2%	19.7%	9.4
Bhutan (Import)	n.a	n.a	4.9	0.4%	n.a.	
Total	**370.1**	**100%**	**1,383.3**	**100.0%**		**14.0**
Captive power	51.4					
Total	**421.5**					

Source: CEA, IEEFA Estimates

Coal-fired power generation remained the dominant source of electricity in India during 2019/20. It provided 71.3% of total generation (down from 75.1% two years ago) in a market where total power generation grew by just 0.3% year-on-year, well below the 6% average growth rate seen in the past decade.

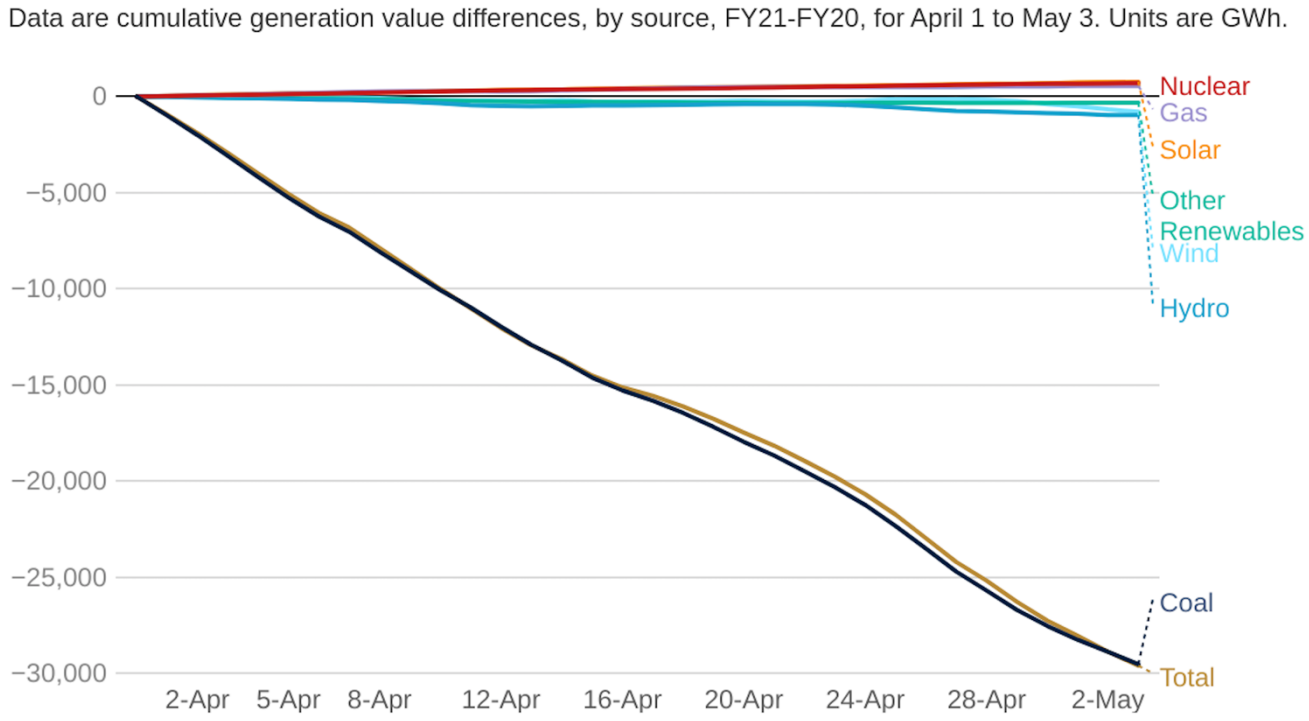
The National Lockdown Has Seen Total Electricity Demand Drop 24% year on year in April 2020

The COVID-19 pandemic and national lockdown is proving extremely problematic for coal-fired power generation, both for existing plants and those that are proposed but yet to get financing.

In the first 33 days of the 2020/21 fiscal year, coal-fired power generation was down almost 30,000 gigawatt hours (GWh) (see Figure 3). This means that coal-fired power generation has worn 100% of the power demand loss, compared to its 71% share of total generation.

Coal-fired power generation has worn more than 100% of the power demand loss.

Figure 3: India's Electricity Generation by Fuel Type (April 2020)



Source: POSOCO Daily Reports, Charles Worringham for Indiapowerreview.com

This is a very clear lesson in the implications of the merit order effect (in India, this is phrased as renewables having "must run" status), where the low marginal cost sources of supply get priority (once built, renewables have a near zero marginal cost of generation), and the high marginal cost producer loses out (in this case, coal).

Whereas a decade ago coal-fired power plants were modelled as running at on average 70-80% capacity in a year, during 2019/20 the average coal-fired power plant ran just 55.5% of the time (Figure 2). In fact, during the month of April 2020 the average Indian coal-fired power plant operated at just 40% capacity utilisation.[2] Coal-fired power plants unable to operate at the expected utilisation rate are operationally less efficient and also have to amortise their fixed costs over a lower level of production, giving a higher than average cost of production.

Financiers and promoters of coal-fired power plants clearly have to factor this in as another key financial risk giving rise to stranded assets in the thermal power sector.

Even During a Lockdown, Global Capital Will Still Finance Deflationary Solar

In contrast to the, at best, dour thermal power electricity market trends, a landmark 2GW solar tender was awarded by NHPC of India in April 2020.

Priced at a near record low of Rs2.55/kWh fixed flat for 25 years, it equates to an Indian record low of US$33/MWh (at the current Rp76 per US$). In addition to raising US$2bn of new infrastructure investment at the start of the worse pandemic in modern history, the funding profile of the winning parties – SB Energy, O2 Power, Eden Renewables, Axis Energy and Avaada – is also telling:

- SB Energy won 600MW of the tender, bringing global capital to India via its parent company, SoftBank of Japan;
- New entrant O2 Power, a startup with US$500m of equity backing from the leading private equity firm EQT Infrastructure of Sweden and the Temasek sovereign wealth fund of Singapore, won 380MW;
- Eden Renewables, backed by EDF and Total of France, won 300MW;
- India's Axis Energy, which has developed renewable energy projects it has subsequently on-sold to the giant infrastructure investor Brookfield Asset Management of Canada, won 400MW; and
- India's Avaada Energy won 380MW, showing how specialist Indian renewable operators continue to commit significant new capital to this emerging sector. Avaada was founded by Vineet and Sindoor Mittal who had previously founded Welspun Energy before selling it's 1.1GW renewables portfolio to Tata Power, India's largest integrated private power company.

[2] IEEFA notes capacity utilisation is lower than the plant load factor (PLF) regularly cited in India (the PLF ignores downtime related to coal supply disruption).

The range of players in the solar bid clearly shows that while India's renewable energy targets are exceptionally ambitious, when backed by the right legal and policy frameworks, capital from both global and Indian domestic leaders is available at an exceptionally competitive price.

Capital from both global and Indian domestic leaders is available at an exceptionally competitive price.

In contrast, a new non-minemouth or import coal-fired power plant in India would require a starting tariff of Rs4-5/kWh (rising over time with inflation).

In April 2020, global private equity leader KKR also entered the Indian renewable infrastructure sector, acquiring 317MW of solar from Shapoorji Pallonji Solar Holdings. This builds on its US$400m investment last year to take control of India Grid Trust, the infrastructure investment trust of Sterlite Power Transmission, and also its investment of US$510m to acquire a 60% stake in Ramky Enviro Engineers Limited, an environmental waste management business. IEEFA has also been watching for BlackStone's first move into Indian renewables.

The question remains: Why would any debt or equity capital providers fund a high emission, highly polluting new coal-fired power plant at double the cost of deflationary renewables?

The Buyer and Funder of Last Resort?

For all the competitive advantages of having the sovereign backing of the Government of India, and the economies of scale of running a 54GW power generation portfolio across India, and an excellent operating performance that sees its coal-fired power plants run at 10-20% higher capacity utilisation rates than the national average, NTPC has the competitive disadvantage of having to provide the national service of supplying the expected power growth needs of India.

Where private firms have stopped investing good money after bad, NTPC has continued to build some 3GW annually of new coal-fired power plants, even as it embraces the new technology opportunities of low cost, sustainable renewable energy in addition to opportunities in electrification (in terms of fast chargers and hydrogen buses).

NTPC's continued investment in coal comes at a significant cost to investors, with shares (red) down 25% over the last five years, against a rise of 18% across the Indian equity market (blue) in the same timeframe (see Figure 4).

Figure 4: India's Electricity Generation by Fuel Type (April 2020)

Source: Yahoo Finance

Likewise, whereas foreign investors and most Indian private banks have learnt their lesson from repeatedly investing in stranded assets in the thermal power sector, the government controlled Power Finance Corporation (PFC) continues to commit to the financing of expensive new coal-fired power plants where no others will. PFC has been named as the sole US$1.5bn financier of Adani's import coal-fired power plant at Godda, and for THDC India's ligation-prone coal proposal at Khurja. PFC shares (black) are down 32% in the last five years.

Given the very low cost of domestic renewable energy infrastructure, rather than building yet more inflexible, high cost, high emission coal-fired power plants, it is logical for NTPC instead to be lobbying for a time-of-day or peaking power price signal sufficient to underwrite investments in technologies that complement the intermittency of renewable energy.

With decade low prices for gas (albeit these prices cannot be locked in), investing in peaking gas capacity might be one path forward. We note however that the U.S. utility leader NextEra Energy has just shelved plans for two gas powered plants it had slated for a 2025 commissioning due to the likelihood of them being technologically challenged by low cost renewables firmed by battery storage.

Conclusion

Once India has mastered the coronavirus pandemic, it will be time to look to a green investment-led stimulus to kickstart the Indian economy. IEEFA would note the right policies and structures are largely already in place, and private capital is entirely ready to invest.

The announcement of yet another record low 1.5GW solar tender in Abu Dhabi in April 2020 at a brilliantly low US$13.50/MWh (15% below the price of the winning tender seen only in January 2020) is a reminder of the ongoing deflationary nature of renewable energy infrastructure.

The call is for the Government of India to lead the way on an innovative and sustainable economic recovery that builds India's resilience and energy security, whilst also introducing energy price deflation that can kickstart India's international competitiveness of key export industries to best leverage the exchange rate weakness.

About IEEFA

The Institute for Energy Economics and Financial Analysis conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

About the Author

Tim Buckley

Tim Buckley, IEEFA's director of energy finance research, Australasia, has over 30 years of financial market experience covering the Australian, Asian and global equity markets from both a buy and sell side perspective. Tim was a top-rated Equity Research Analyst and has covered most sectors of the Australian economy. Tim was a Managing Director, Head of Equity Research at Citigroup for 17 years, as well as co-Managing Director of Arkx Investment Management P/L, a global listed clean energy investment firm that was jointly owned by management and Westpac Banking Group.