

Funding Requirements and Avenues for Three Leading Energy Companies

Analysing the Clean Energy Plans and Capital Requirements of NTPC, Adani Green Energy and Tata Power

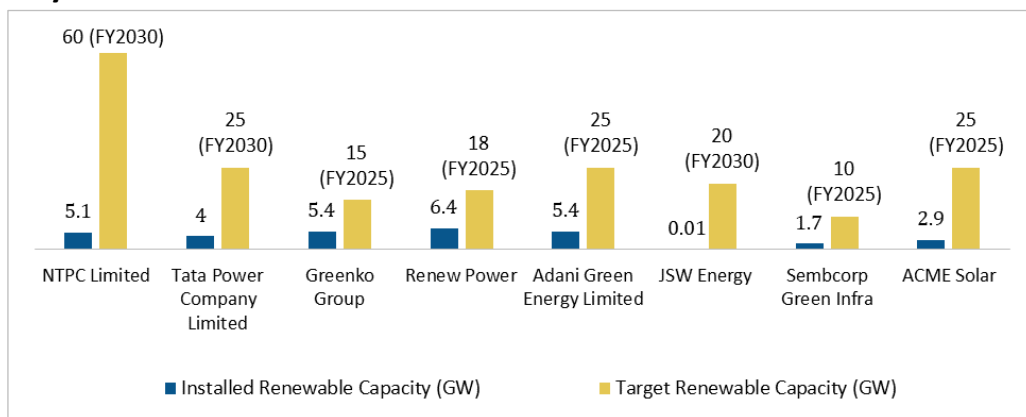
Executive Summary

India today operates the third largest electricity grid in the world, showing the progress already made on the key electrification-of-everything strategy articulated by the International Energy Agency (IEA).¹ Cost-effective and reliable sources of energy will be a mainstay as the country leapfrogs into its next period of growth.

Globally the overarching theme in energy markets is the emergence of renewable energy as the dominant source in the coming decades. India has also embarked upon an ambitious clean energy drive with pledges to install 450 gigawatts (GW) of renewable energy capacity by the end of this decade to enhance energy independence.

Private capital has been a major contributor to the growth of renewables around the world. As per IRENA, the private sector remained the main provider of capital for renewables globally, accounting for 86% of investments in the sector between 2013 and 2018.² In India too, the largest business houses have come on board to be part of the growth journey, with Reliance Industries a key new emerging sector leader.

**Figure 1: Current Renewable Capacity and Targets of Major Sector
Players³**



Source: Company reports, IEEFA analysis.

¹ BP. BP Statistical Review of World Energy. July 2021.

² IRENA. Global Landscape of Renewable Energy Finance 2020. FY 2020.

³ Installed renewable capacity includes wind, solar and hydro assets.

The above table gives the renewable energy targets of some of the major players operating within the industry. These have set the stage to open the floodgates of capital finding its way into the sector, but it is the ability to cost-effectively secure an ever-growing pool of capital from optimum sources that will decide whether these commitments by industry players can be realised at least cost.

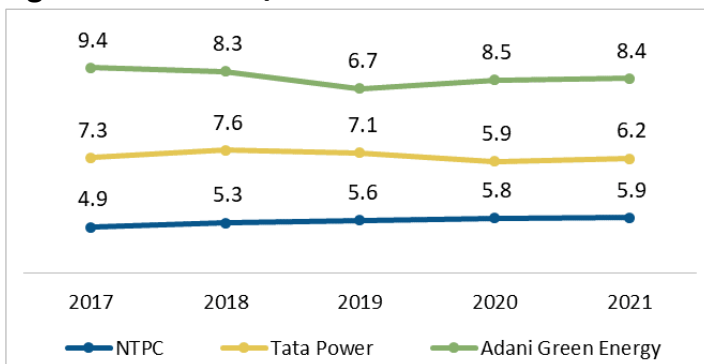
When the sector was still at a nascent stage, financing through recourse against the developers' balance sheet was prevalent. The vast majority of players provided security in tangible form through corporate guarantees or intangible form through cost overrun support for under-construction projects. With a sufficient demonstrable history of operations and the sector going mainstream, a variety of financing options have opened up for the incumbent players to tap into. This has helped in securing capital, but it has been accompanied by increasingly intense competition within the sector, with rock bottom tariffs being fetched in auctions across the country. Accordingly, a large proportion of India's renewable energy capacity will be added by the largest players already operating in the industry, given the capital-intensive nature of the business, which requires access to massive amounts of funds at competitive terms.

The traditional financing structure and sources used to fund capacity expansion in the sector, primarily thermal assets, need to be augmented by other sources such as bond market issuances, asset monetisation and capital recycling initiatives.

A comparison of the capital structure changes of three of the largest listed players, Tata Power Company Limited, NTPC Limited and Adani Green Energy Limited (AGEL), each with increasingly ambitious green energy plans, illustrates how the leaders have funded capacity expansion in the past and what major trends will be at play in the future. On the one hand, NTPC presents an example of a government-owned utility transitioning to green energy. AGEL, on the other hand, is a privately owned pure play renewable energy company which is rapidly ramping up its capacity. Between them is Tata Power, an established private utility pivoting to renewables.

Leverage, Already at Elevated Levels, Is Set To Increase Further as Renewable Capacity Ramps Up

Figure 2: Net Debt/EBITDA Ratio for the Three Companies

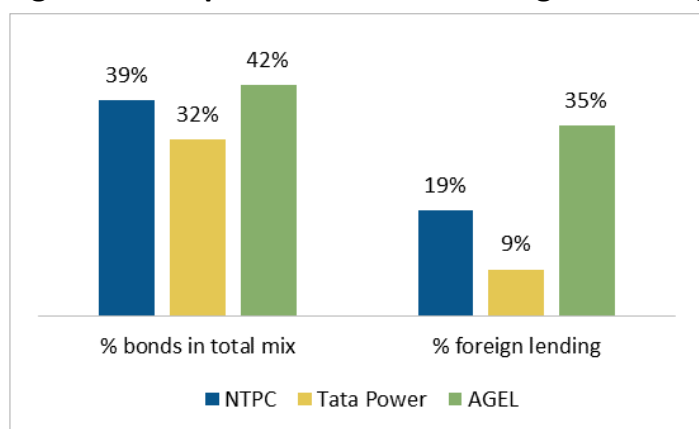


Source: Company reports, IEEFA analysis.

NTPC, with a superior leverage position to the other two companies (having decades-old, depreciated assets that have repaid their older project debt), has increased debt levels to augment the historic investments in thermal assets. AGEL has the highest gearing, given the company is in a rapid growth stage and the vintage of majority assets is much less compared to the other two. A common global financing structure to fund renewable energy projects is using 70-80% debt capital. For all three companies, leverage needs to be managed at sustainable levels so as not to impair their ability to continue to raise debt on competitive terms.

Offshore Bonds Are Proving an Essential Newer Source of Capital, Providing Tenured Debt at Competitive Rates

Figure 3: Comparison of Bond Lending and Foreign Lending (FY 2021)

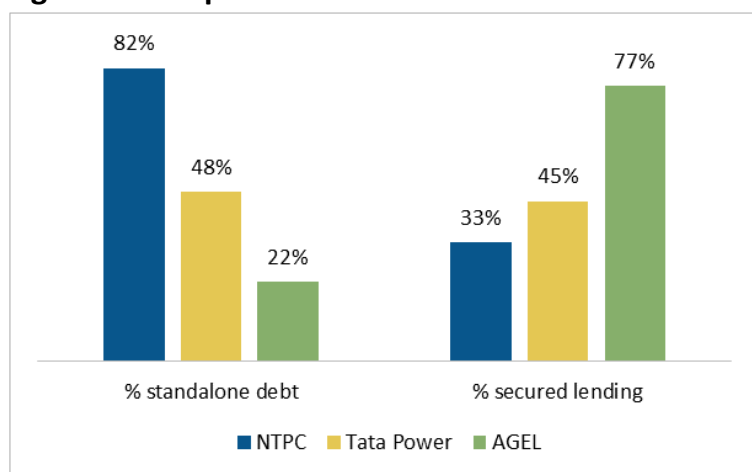


Source: Company reports, IEEFA analysis.

Bond instruments are well suited for funding RE projects as they provide long term capital at competitive rates, raised from a diverse set of investors. Further, with multi-decade low interest rates in the developed world and growing inclination towards ESG factors, global investor appetite for Indian RE assets is growing. NTPC has the benefit of Government of India parentage, which helps tap into a diverse set of investors. AGEL has capitalised exceptionally well on its green profile, evident from its highest percentage of bonds in the total mix and high proportion of foreign lending. Tata Power, to its credit, has been able to pare down debt but lacks foreign debt on its books. We note the company has raised several offshore bonds in the past, so with its strong green energy investment plans, Tata Power is likely to pivot to tapping the foreign bond market.

Securing Non-Recourse Debt at the Project Level Will Support Rapid Capacity Expansion

Figure 4: Comparison of Standalone Debt and Secured Debt (FY 2021)

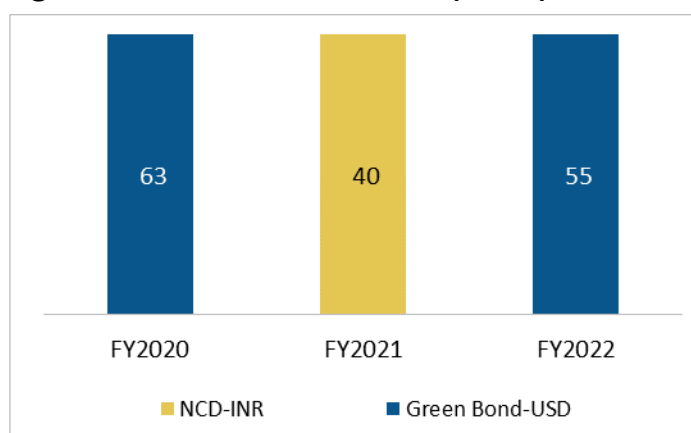


Source: Company reports, IEEFA analysis.

Debt provided for renewable assets in the past has been through recourse against the parent's balance sheet. This impairs future debt taking capacity and puts downward pressure on credit ratings, which may lead to higher cost of debt. The ability to secure debt on the project level will provide headroom to expand balance sheet size at the parent/ standalone level. AGEL has raised the majority of its debt at the special purpose vehicle (SPV) level. NTPC, on the flipside, has more than 80% of its debt raised on a standalone basis and unsecured in nature; the funding is provided to subsidiaries for their capex requirements.

Capital Recycling and Debt Refinancing Will Be an Important Element of Financing Strategy

Figure 5: AGEL Bond Issuances (Rs bn)



Source: AGEL annual reports 2020 & 2021, AGEL press release, Refinitiv.

A large part of debt raised by these companies is through term loans from banks and financial institutions domestically. These term loans, mainly used during construction phase, are usually raised at higher rates, given the execution risk involved. Hence refinancing at lower rates and longer tenures is imperative for companies. Further, the ability to recycle capital selectively from assets where the companies think they have created most value will lead to unlocking of funds for under-construction projects. All three companies engage in debt refinancing but only AGEL succeeded in monetising its operational assets through selling stakes in certain projects to Total SE.

Ringfencing Renewable Assets and Transparent Sustainability-Led Disclosures Will Provide Better Access to Global Investors

Figure 6: Share Price Performance of AGEL and Adani Enterprises⁴



Source: Google finance.

Globally, a flood of capital is vying for renewable energy assets as the pool of ESG led investors grows rapidly. India has the potential to attract a large part of this capital, though flows have not been sizeable due to concerns which include “greenwashing” and overhang of legacy thermal assets on the books of major players such as NTPC and Tata Power. Spinning off renewable assets into a renewable subsidiary or a ringfenced restricted group can help unlock much better value and help tap into the ESG investor pool. Further, adoption of globally recognized ESG frameworks and principles will also help as it reduces costs incurred by investors as they search for sustainable investments, making it easier for them to compare various financial products. AGEL, having demerged from Adani Enterprises in 2018, has since then outperformed the parent massively. NTPC and Tata Power have revealed plans to list their renewable energy subsidiaries, which should lead to rerating of the renewable business and help raise capital more efficiently, leveraging both the growing global interest in zero emissions infrastructure assets and the growing

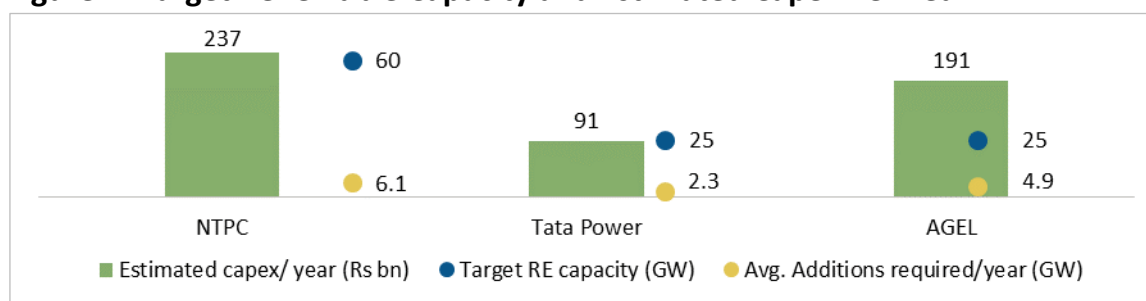
⁴ As of 19 October 2021.

aversion to thermal power asset risks.

Capacity Expansion Plans and Capital Required by the Three Companies

Capacity expansion plans of Tata Power, AGEL and NTPC will require major financing drives to keep on track to renewable energy goals.

Figure 7: Target Renewable Capacity and Estimated Capex Per Year⁵



Source: Company reports, IEEFA analysis.

The country's renewable energy financing landscape has transformed in the past decade as the sector went mainstream. Even as the sector has become financially attractive for investors and lenders, major financing gaps remain to be plugged. The table below lists some of the factors that have led to a better financing environment for the sector and some major bottlenecks it faced.

Figure 8: Renewable Energy Financing Landscape

	Facilitating Factors	Bottlenecks
1)	Demonstrated feasibility of RE technology	Limited sources of non-recourse debt
2)	Clean-up of bank balance sheets	Lack of non-bank debt sources
3)	Government policy initiatives	Shallow corporate bond market
4)	Rise of ESG led financing and climate advocacy	High premium required by offshore investors
5)	Advent of new financing instruments	Lack of domestic institutional financing
6)	Entry of large conglomerates	Poor sustainability disclosures

Source: IEEFA analysis.

Despite great efforts to establish the credibility of RE sector, domestic sources of lending remain limited and will need to be augmented by other capital avenues. Offshore investments, both debt and equity, can play an important role in helping Indian companies secure low-cost financing. As per IEA, although emerging markets

⁵ Projected capital expenditure considers cost for solar PV additions.

and developing economies account for about 40% of energy investments and emissions reductions under IEA climate-driven scenarios in the future, they currently hold only 10% of global financial wealth.⁶

Funding Avenues Available for Renewable Energy Players

Bond Market Issuances: Bond instruments are ideally suited to fund renewable assets. Among them, green bonds are one of the most widely used with global issuances of US\$442.2bn in 2021 (till October) alone.⁷ Green bonds have seen yields falling as investor interest in these instruments increases. Another instrument used extensively by global utilities to raise capital for their green energy initiatives is sustainability-linked bonds. Their issuance increased nearly four-fold, year-on-year, in the first six months of 2021 to US\$160bn.⁸

Pooled Investment Vehicles such as infrastructure investment trusts (InvIT's) allow companies to monetize operational cash generating assets by pooling multiple assets under a single entity. India's insurance regulator IRDAI and pension fund regulator PFRDA have recently enabled insurance companies and pension funds to invest in debt securities issued by InvITs which provides access to a large pool of domestic patient capital.

Loans from Offshore Lenders: A viable alternative to raising term loans domestically is to tap foreign lenders willing to take exposure to renewable energy. Bank of America,⁹ JBIC,¹⁰ HSBC, Barclays and Deutsche Bank are some examples of global financial institutions growing their sustainable books to achieve their net-zero pledges or being persuaded to lend to climate-aligned sectors by growing shareholder activism. This also helps leverage the multi-decade low interest rates in the developed world.

Equity Investments by a public listing through a spin-off IPO or SPAC route is another avenue to monetize assets and unlock value, while joint ventures with strategic investors such as global oil and gas majors can help recycle capital selectively from assets where the companies think they have an opportunity to unlock highest value. An association with these majors also helps gain global investor reach. Further, institutional investors such as private equity, sovereign wealth funds (SWFs), global pensions and infrastructure funds provide avenues to privately place equity and raise long term capital.¹¹ Domestic institutional Investors such as pension funds and insurance companies are a latent investor class that can help mobilize large capital if tapped through a focused approach.

⁶ IEA. [Financing Clean Energy Transitions in Emerging and Developing Economies](#). June 2021.

⁷ Refinitiv. [The Green Bond Guide](#). As of 19 October 2021.

⁸ Jdsupra. [The rise and rise of ESG-linked debt issuance](#). September 2021.

⁹ Bank of America. [Bank of America Increases Environmental Business Initiative Target to \\$1 Trillion by 2030](#). April 2021.

¹⁰ JBIC. [JBIC's Environmental Operations: Global action for Reconciling Economic growth and Environmental preservation \("GREEN"\)](#). Extracted October 2021.

¹¹ IEEFA. [IEEFA: Global capital mobilising for India's \\$500bn renewable energy infrastructure opportunity](#). February 2021.

Multilateral Development Banks (MDBs) have provided a total of US\$66bn towards green funding in 2020.¹² India has seen several MDBs committing capital for its renewable energy projects in the past. These institutions do not seek to maximize investment returns, which allows them to invest in high-risk countries and sectors. MBDs have been providing an increasing amount of climate change mitigation finance at low return thresholds in developing economies.

¹² Mercom India. [Climate Financing by Multilateral Development Banks Reaches \\$66 Billion in 2020](#). July 2020.

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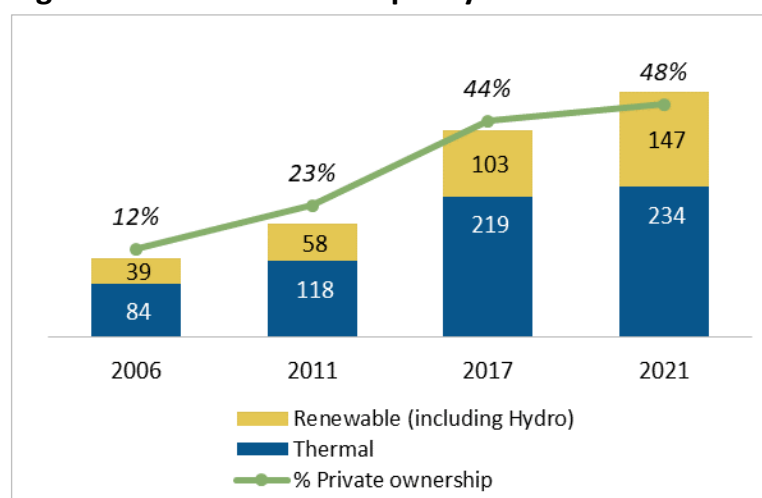
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India's Shift to Clean Energy Supported by Ambitious Plans by Industry Players

India is the world's fourth largest energy consumer¹³ and among the fastest growing large economies. Still, the country's per capita energy consumption is among the lowest in the world at 0.99 MWh a head as against 13.02 MWh for the United States of America and 5.15 MWh for China in 2020.¹⁴ With strong economic growth and an electrification-of-everything strategy driving the expected increase in per capita power consumption, the country will need additional sources of energy to fuel its economy, with the IEA projecting that India's energy demand will increase by 35% from 2019 to 2030.¹⁵

Figure 9: India Installed Capacity



Source: CEA, IEEFA analysis.

The nation's electricity needs have historically been met primarily through thermal power, chiefly state owned. In 2006, ~88% of total installed capacity in the country was owned by public utilities and the share of renewable energy (RE) was 31%, the majority contributed by hydro energy. Over the past 15 years, private ownership of generation assets has increased consistently, with a rising share of non-hydro renewable energy sources. In August 2021, private

India has embarked upon one of the world's most ambitious clean energy drives, with a target to install 450GW of renewable energy by 2030.

¹³ Economic Times. [India to overtake EU as world's third largest energy consumer by 2030](#): IEA. February 2021.

¹⁴ IEA. [IEA Atlas of Energy](#). Extracted 29 September 2021.

¹⁵ IEA. [India Energy Outlook 2021](#). February 2021.

ownership of generation assets stood at 48%, and 68% of RE assets were owned privately.

The rising share of renewables is supported by the government’s clean energy plans. India has embarked upon one of the world’s most ambitious clean energy drives, with a target to install 450GW of renewable energy by 2030. Public and private sectors alike have stepped up their plans to capitalize on the prospects of the industry. The below table presents a summary of current and future capacity installation plans of the major Indian power producers.

Figure 10: Installed and Pipeline Generation Capacity of Major Players

No.	Company	Total Capacity (GW)	Renewable Capacity (GW) ¹⁶	Current Pipeline (GW) ¹⁷	Target Renewable Capacity (GW)
1	NTPC Limited	66.9	5.1	17.1	60 (2030)
2	Tata Power Company Limited	12.8	4.0	1.3	25 (2030)
3	Greenko Group	7.2	5.4	1.8	15 (NA)
4	Renew Power	6.4	6.4	3.8	18 (2025)
5	Adani Green Energy Limited	5.4	5.4	14.0	25 (2025)
6	JSW Energy	4.6	0.01	2.5	20 (2030)
7	Sembcorp Green Infra	4.4	1.7	0.4	10 (2025)
8	Torrent Power	3.9	0.8	0.9	NA
9	ACME Solar	2.9	2.9	2.6	25 (2025)
10	Azure Power	2.1	2.1	4.9	NA
Total		115.6	28.3	54.6	198.2

Source: Company reports, IEEFA analysis.

A large proportion of India’s new renewable energy capacity is expected to be added by the largest players already operating in the industry, given the capital-intensive nature of the business, which requires access to massive amounts of funds at competitive terms. Companies in the above table have a strong parentage, which helps them raise the required capital – even so, the sheer size of their plans and the competitive nature of the industry make the task of raising capital more demanding. IEEFA expects Reliance Industries is poised to join this list of Indian renewable energy leaders, if the recent announcements are any guide.¹⁸ Capital management plans will be needed to continually arrange funds from the most cost-effective sources of debt, infrastructure, and equity capital, domestically and internationally, while also exploiting new instruments as they become available.

Globally the shift to renewable energy infrastructure has been predominantly led by private capital, mostly contributed by project developers. India has also seen similar

¹⁶ Includes wind, solar and hydro.

¹⁷ Includes thermal and renewable pipeline capacity.

¹⁸ Economic Times. [Mukesh Ambani buys two firms in a day, brings REC Group and Pallonji’s Sterling into Reliance’s fold.](#) October 11 2021.

trends, with sponsors providing both the debt and equity side of capital, through balance sheet financing. The funding scenario has been changing over the years with a multitude of sources, both domestic and foreign, available for the incumbent players to tap,¹⁹ but the competitive intensity of the business is also increasing. India's growing access to global capital provides the benefit of OECD interest rates, which are at near six-decade lows, resulting in very competitive markets for patient capital and a succession of ever-lower renewable energy tariffs, to the growing benefit of all of India.

**Reliance Industries
is poised to join this list
of Indian renewable
energy leaders, if the
recent announcements
are any guide.**

The next section analyses the capital structure transformation of three of the largest listed players, Tata Power Company Limited, NTPC Limited and Adani Green Energy Limited, which each have increasingly ambitious green energy plans, to gauge and learn from how these companies funded their capacity addition plans in the past, both conventional and renewable. NTPC is an example of a government owned utility transitioning to green energy, AGEL is a privately owned pure play renewable energy company with plans to rapidly ramp up its capacity and Tata Power is an established private utility pivoting to renewables.

Tata Power: Capital Structure Analysis

Tata Power is among the largest vertically integrated utility companies operating in India. It has a combined installed power generation capacity of 12.8GW, of which 4GW is renewables. On the renewables side, Tata Power has a solar engineering, procurement, and construction (EPC) business, through which it services internal and external clients and has a presence in rooftop solar, solar pumps and solar cell and module manufacturing. It recently forayed into installation of public electric vehicle (EV) charging infrastructure. In addition, the company also has a substantial transmission and distribution portfolio and a legacy coal mining and trading business in Indonesia, vertically integrated with its imported coal power plants in India.²⁰

Tata Power was one of the first Indian majors to pivot towards renewable energy with plans to phase out coal-based capacity and, more recently, an ambitious target to expand its clean and green portfolio to 80% by FY2030.²¹ The below charts analyse the company's capital structure and leverage profile over the past five years.

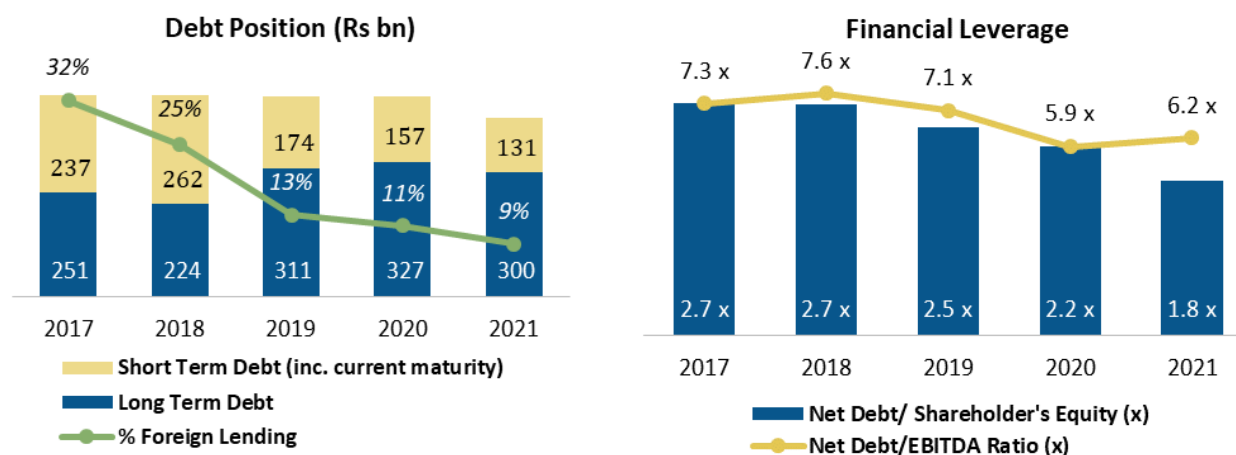
¹⁹ IEEFA. [IEEFA: Global capital mobilising for India's \\$500bn renewable energy infrastructure opportunity](#). February 2021.

²⁰ Tata Power. Tata Power annual report 2021.

²¹ Mercom India. [No New Coal-Fired Projects for Tata Power as it Aims for Carbon Neutrality by 2050](#). July 2021.

Debt Levels Decreased Marginally With an Improved Leverage Position and Lower Reliance on Bank Loans and Foreign Capital

Figure 11: Tata Power Debt Position (Rs bn) and Financial Leverage



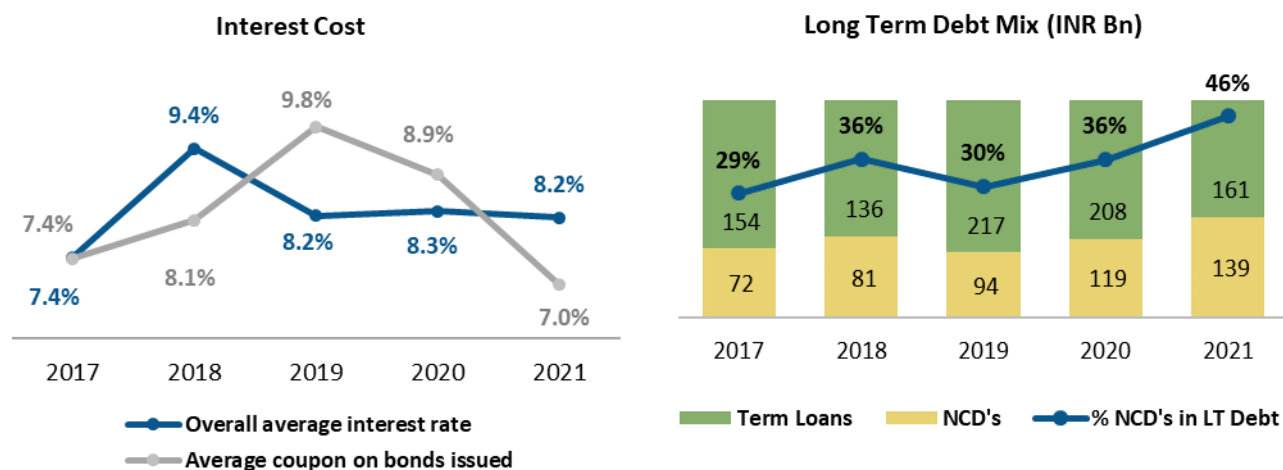
Since 2017, the company materially lengthened the debt maturity which has primarily come from domestic sources while share of foreign lending has decreased.

Leverage, while still high, decreased due to debt repayments and an equity raise of Rs 30 bn from promoters in FY2021. Coverage ratio improved due to non-core asset sales and higher operating profit.

Source: Tata Power annual reports, 2018-21.

Shift in Debt Mix in Favour of Non-Convertible Debentures (NCDs) While Average Interest Cost Remains Range-Bound

Figure 12: Tata Power Interest Cost and Long-Term Debt Mix



Average interest cost remained range-bound over the last 3 years, while average coupon paid on bond issues declined.

Use of non-convertible debentures (NCDs) increased compared to term loans, with all outstanding NCDs being rupee denominated.

Source: Tata Power annual reports, 2018-21, Refinitiv.

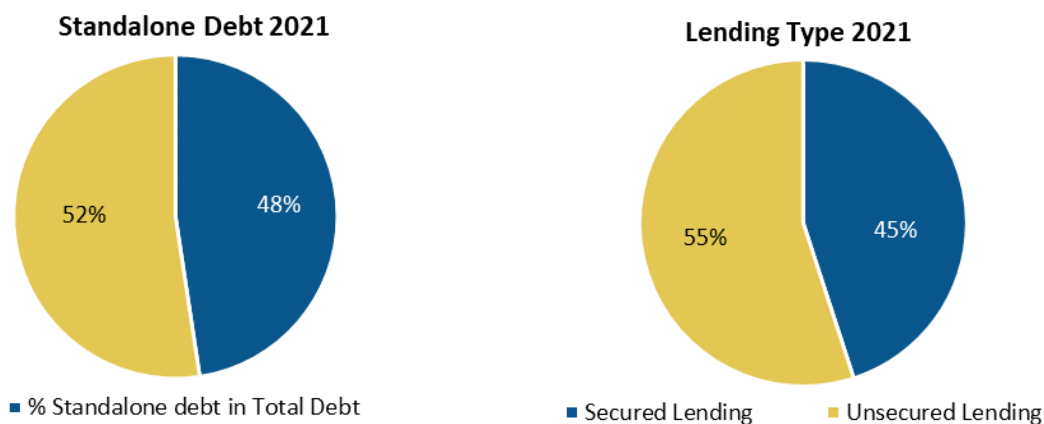
Bond Issues Have Been on the Rise at Both the Company and Subsidiary Level

Tata Power has issued several non-convertible debentures (NCDs) over the past five years with the majority being at the parent level. At subsidiary level, most issuances are by its loss-making subsidiary, Coastal Gujarat Power Ltd (CGPL), where debt has been substantially reduced in the past two years through proceeds from an equity raise from Tata Sons Ltd and divestment proceeds from Tata Power's non-core asset sales. CGPL in June 2021 raised Rs5.7bn worth of NCDs²² at a coupon of 5.7%, which was lower than many similar NCDs issued in the market lately, likely due to its improved leverage position and reduction in operating losses (plus the corporate guarantee given by Tata Power). The parent company has provided corporate guarantee for Rs143bn of subsidiary debt as of FY2021. The renewable business also has NCDs outstanding but hasn't relied on this source of debt lately, with the last issuance being in 2019.

²² Business Standard. [Tata Power arm CGPL raises Rs 570 cr via non-convertible debentures](#). June 2021.

Majority Debt Unsecured in Nature With More Than Half Raised at Subsidiary Level

Figure 13: Tata Power Standalone Debt and Lending Type (2021)



Source: Tata Power annual report, 2021.

Tata Power's majority lending is unsecured in nature meaning that a large part of outstanding debt is not secured by charge on the assets of the company. This largely stems from the NCDs issued, 83% of which are unsecured. Term loans outstanding have largely been secured in the past five years, with 89% being secured in FY2021. More than half of the debt is raised at subsidiary level with the majority attributed to its legacy thermal assets.

In Summary

- Tata Power's capital structure has been deleveraged over the past five years as the company paid off its debt primarily related to CGPL. The ratio is still above 100% but this provides some headroom to expand the balance sheet if required in the future, particularly as the group expands into the renewable infrastructure sector – its 25-year power purchase agreement (PPA) profile secured against the government of India is low risk and absent commodity price volatility.
- A higher inclination towards bond instruments such as NCDs shows investor appetite for the company's issues and an ability in the future to tap the corporate bond market, which is deepening in the country. Moreover, given that most NCDs issued are unsecured in nature, it leaves room for the company to raise debt through the more traditional term loans, where banks would be more inclined to go for secured lending.
- A higher portion of short-term debt, compared to peers such as NTPC,

due to the counterparty risk arising from its PPAs with state distribution companies and leads to working capital mismatch.

- Lack of foreign debt on the books indicates the company is best able to raise debt at more favourable rates and terms from the domestic market and reflects the growing international debt market aversion to legacy thermal assets. We note the company has raised several offshore bonds in the past, primarily in the Eurobond market. With its green energy plans, Tata Power is likely to pivot to tapping the offshore bond market through instruments such as green bonds, which have more favourable rates than domestic market issues.
- The average coupon on bond issues has been on a downward trajectory yet the overall average interest rate has been range-bound, implying that loans raised both short and long term may be higher than average bond yields.
- The company's recent equity raising from its promoter group, Tata Sons, suggests strong links with the group holding company. It also provides added comfort for current and future lenders.

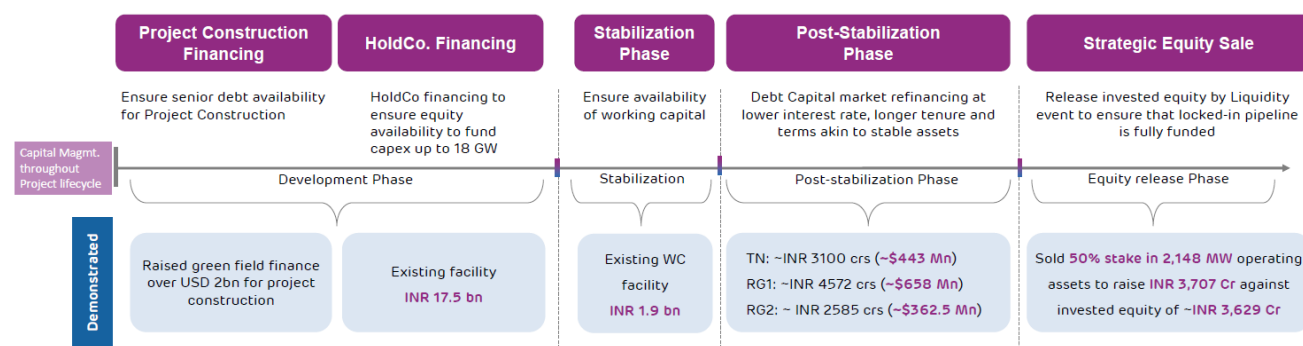
Adani Green Energy Limited

Adani Green Energy Limited (AGEL), part of the Adani group of companies, is among the largest pure play renewable energy companies in India. The company is engaged in development, ownership, operation and maintenance of utility-scale solar and wind farm projects in India. AGEL has an installed capacity of 5.4GW in solar and wind energy assets as well as a pipeline capacity of 14GW across the country at different stages of implementation.

AGEL's growth has been fuelled through a mix of organic and inorganic initiatives. As well as adding capacity through active participation in renewable auctions, the company has an aggressive acquisition strategy, through which it adds operational and under construction assets, most notable being the acquisition of SB Energy's renewable portfolio of 4.9GW for an enterprise value of approximately US\$3.5bn.²³

²³ Adani Green Energy Limited. [Adani Green Energy To Acquire SB Energy's 5GW India Renewable Power Portfolio For A Fully Completed EV Of USD 3.5 Billion - India's Largest Renewables M&A Transaction](#). May 2021.

Figure 14: Adani Green Financing Strategy



Source: Adani Green Energy Limited equity presentation, May 2020.

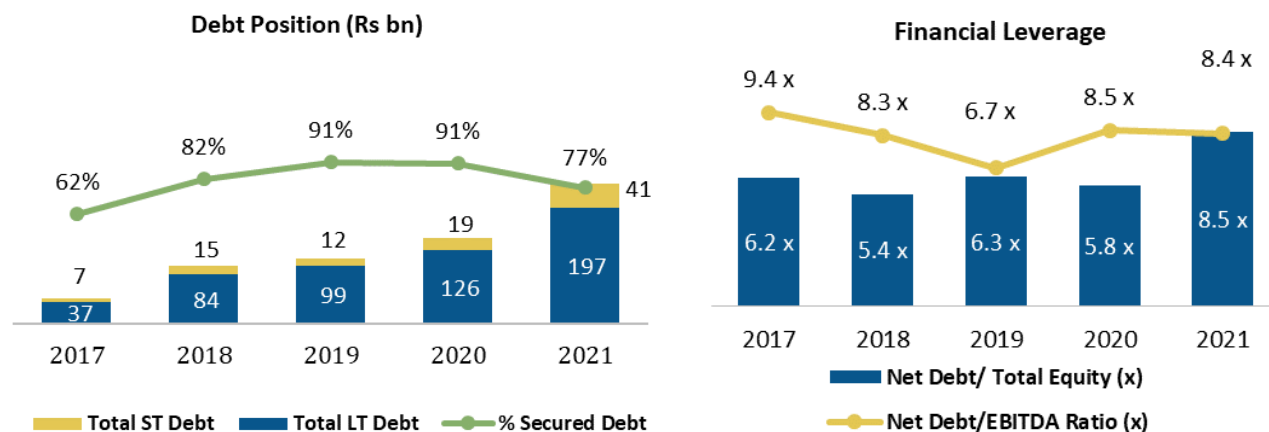
The above visual illustrates the company’s financing strategy for its projects at different stages of project lifecycle. A senior debt facility at the SPV level provides the majority of the debt portion of project construction financing, the equity portion coming from debt raising at parent level, internal accruals, asset monetization and debt top-up of operational assets. Once projects are operational and stabilized, the company aims to refinance initial project financing with longer tenure debt at lower rates. Further, strategic equity sales of operational assets have been successfully carried out to recycle capital in pipeline projects.²⁴

The following charts analyze AGEL’s capital structure over the past five years.

²⁴ Total Energies. Total to Acquire from Adani a 20% Interest in the Largest Solar Developer in the World. January 2018.

Rapid Increase in Financial Leverage as AGEL Ramped Up Capacity Addition

Figure 15: AGEL Debt Position and Financial Leverage (Rs bn)



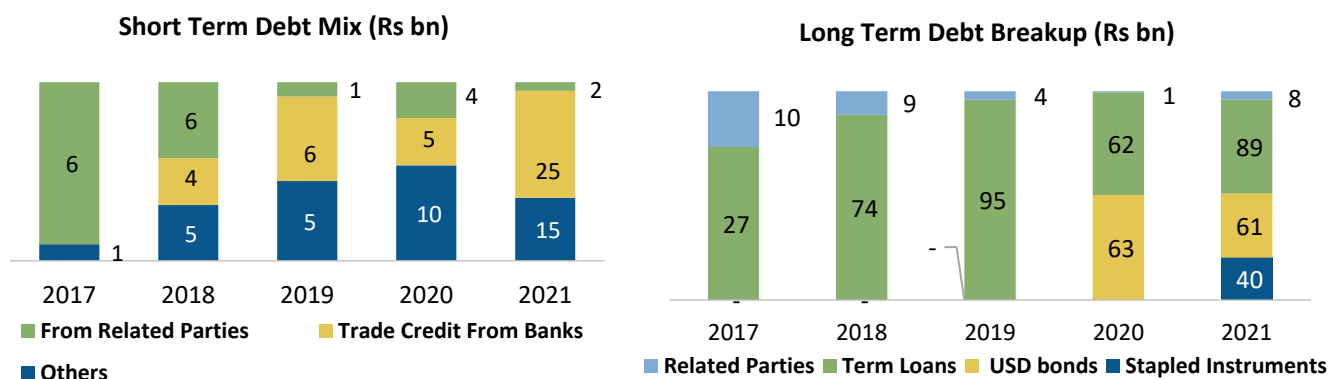
Total debt increased 5.5x since 2017, consistent with capacity expansion, which rose almost 4.5x. Majority of the debt is secured, with the ratio decreasing to 77% in FY2021 as AGEL issued unsecured NCDs to Total SE.

Leverage rose substantially from an already high base of 6.2x due to current growth stage and no cash generation from under-construction projects.

Source: AGEL annual reports, 2018-21 (*restated figures used for 2017-20 where appropriate).

Diversification of Debt Sources as AGEL Taps into Different Avenues, Domestic and Foreign

Figure 16: AGEL Short and Long Term Debt Mix (Rs bn)



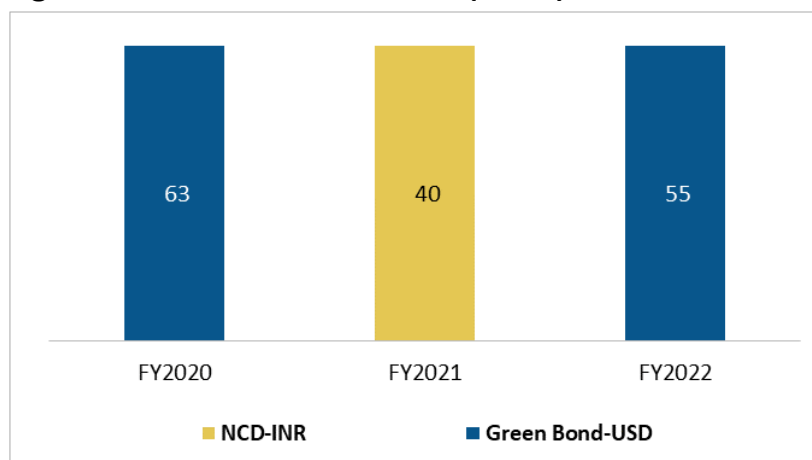
Short term financing was used mainly for working capital requirements. Funding mix changed from dependence on inter-corporate loans to bank financing.

Debt profile changed -- secured loans and related party borrowings joined by bond instruments, to increase average maturity and lower interest cost.

Source: AGEL annual reports, 2018-21 (*restated figures used for 2017-20 where appropriate).

Bond Instruments Added Through Debt Refinancing and Asset Monetization Initiatives

Figure 17: AGEL Bond Issuances (Rs bn)



Source: AGEL annual report 2020 & 2021, AGEL press release, Refinitiv.

In line with its financing strategy, AGEL has been able to successfully replace outstanding term loans with bond instruments, such as green bonds and stapled instruments. In June 2019, AGEL issued a BB+ rated US\$500 million green bond to refinance existing debt – which was then the highest rated Indian renewable bond issuance – and followed it up with another senior secured green bond issue amounting to US\$362.5 million in October 2019. In FY2021, the company issued Rs401bn of stapled instruments or unsecured NCDs to Total SE as part of an asset monetization of its operational assets. The NCDs have a maximum maturity of 35 years and no repayment for the first 25 years.²⁵ Quite recently, in September 2021, the company raised US\$750 million in green bonds to fund the equity portion of the capex for projects under construction.²⁶

Project Level Recourse Financing Raised With Corporate Guarantee and Share Pledges by Parent

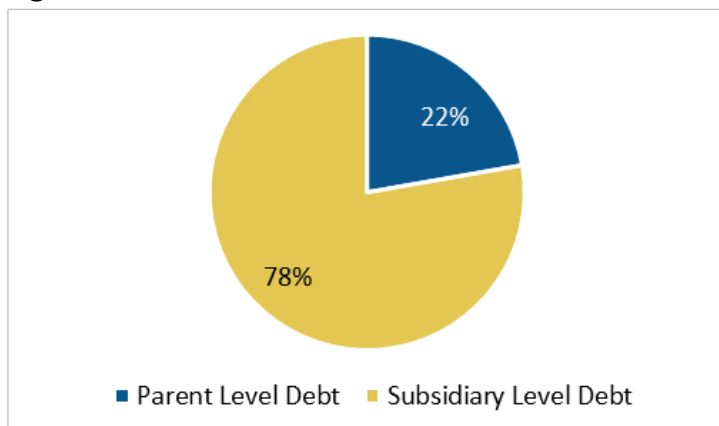
With 75% of capital expenditure to be financed through debt, the majority of the company's debt is raised at SPV level in the form of secured term loans. In March 2021, AGEL secured a US\$1.35 billion project finance facility from a consortium of 12 international banks, in one of Asia's biggest project finance deals.²⁷

²⁵ Adani Green Energy Limited. Adani Green Energy Limited annual report 2020.

²⁶ The Economic Times. Adani Green raises \$750 mn via green bonds. September 2021.

²⁷ Financial Express. Adani Green raises \$1.35 billion debt from 12 banks. March 2021.

Figure 18: Standalone Debt



Source: AGEL annual report, 2021.

In Summary

- AGEL's leverage has soared continuously over the past five years to fund its aggressive pipeline. Its Net Debt/Equity ratio has been consistently higher than similar pure play renewable energy companies operating in India. Leverage needs to be managed at sustainable levels so that its ability to continue to raise debt at competitive terms is not impaired.
- The company's debt mix has diversified over the years, in terms of sources and currency, as it demonstrated its business model and debt repayment capabilities. A diversified lender pool will help AGEL secure debt from the most economical source.
- AGEL's US\$1.35bn project finance facility will be used in a revolving manner where refinancing of loans will be taken up through bond issues. Hence, a key deliverable will be the ability to refinance the construction debt so that capital is available for pipeline projects.
- The company has been successful in refinancing its debt, its latest green bond issue raised at an annual coupon of 4.4% – another direct competitor, Azure Power, raised a green bond at 3.6% at about the same time. Refinancing at lower rates will be required for the company to stay cost competitive, which is the most critical aspect of the business.
- Equity capital will be secured through asset monetization, promoter equity infusion and internal accruals. This requires steady and consistent internal cash generation – including quick realization of receivables and ability to monetize operational assets.

NTPC Limited

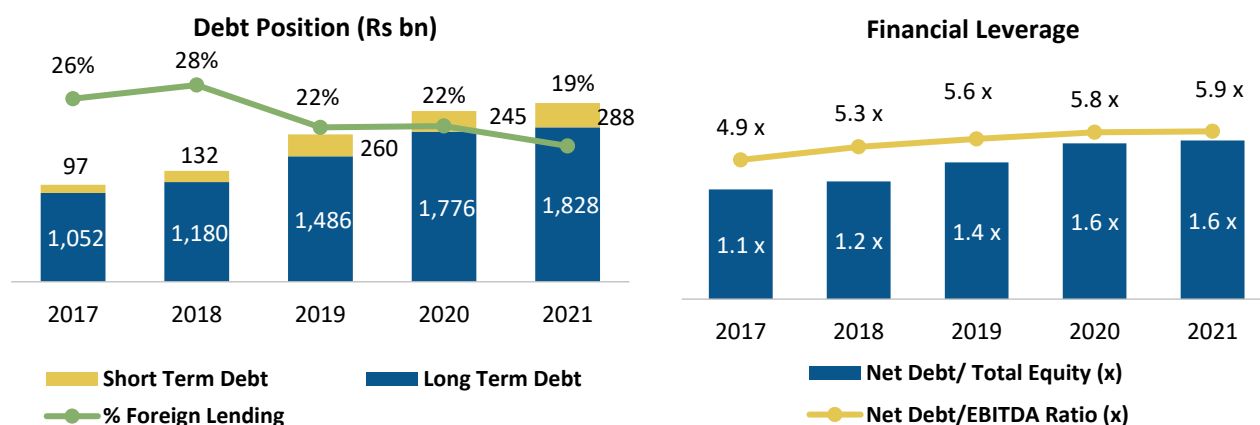
NTPC is India's largest power utility and a Maharatna Central Public Sector Undertaking (CPSU), with an installed capacity of 66.9GW (including JVs). NTPC's core function is the generation and distribution of electricity to discoms in India. The company also undertakes consultancy and turnkey project contracts that involve engineering, project management, construction management and operation and management of power plants, in India and elsewhere.

In line with the Government of India's renewable energy goals, NTPC has set a long-term target to add renewable capacity of 60GW by 2030.

In line with the Government of India's renewable energy goals, NTPC has set a long-term target to add renewable capacity of 60GW by 2030²⁸ and no new coal-fired plants other than those already in the pipeline.²⁹ Below charts analyze NTPC's capital structure changes over the past five years.

Rising Debt Levels to Augment the Growth of Pipeline Thermal and Renewable Assets

Figure 19: NTPC Debt Position (Rs bn) and Financial Leverage



Majority debt is long term in nature and rising since 2017 to primarily fund NTPC's thermal capacity pipeline. Reliance on foreign lending has shown downward trend.

Steadily increasing leverage, while better than peers, is still at elevated levels. Coverage ratio is inching upwards despite strong and steady cash flows from thermal business.

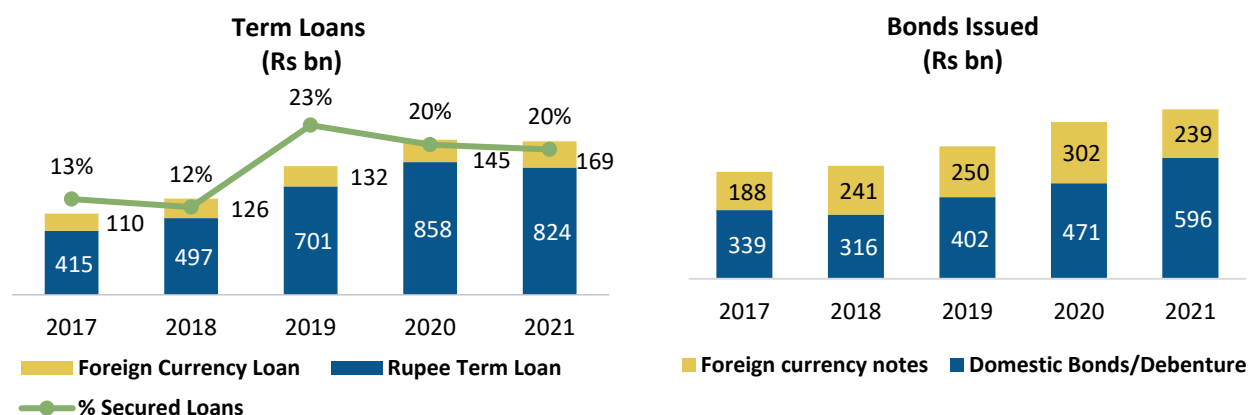
Source: NTPC annual reports, 2018-21 (*restated figures used for 2017-20 where appropriate).

²⁸ The Hindu Business Line. NTPC revises its RE targets to 60GW by 2030. September 2021.

²⁹ Mint. NTPC pivots from thermal to green. September 2020.

Long-Term Debt Weighted by Domestic Term Loans While Also Having a Healthy Mix of Bonds Issues

Figure 20: NTPC Term Loans and Bonds Issued (Rs bn)



Nearly 55% of long-term debt is term loans, the majority unsecured from domestic banks. Foreign loan book has shifted from being dollar denominated to yen.

Bond lending weighted towards domestic sources. Overall bonds issued increased since 2017 but share in total debt has gone down. More than half of the bonds secured and raised domestically.

Source: NTPC annual reports, 2018-21 (*restated figures used for 2017-20 where appropriate).

Diverse Profile of Outstanding Bond Issues With a Noteworthy Foreign Lending Program

Figure 21: NTPC Bond Issues

Year	Total Issues	EUR	Rs	US\$
2016	12		21	37 ³⁰
2017	4	44	27	
2018	3		6	30
2019	6		130	33
2020	5		107	
2021 ³¹	3		72	
Total	33	44	457	100

Source: Refinitiv.

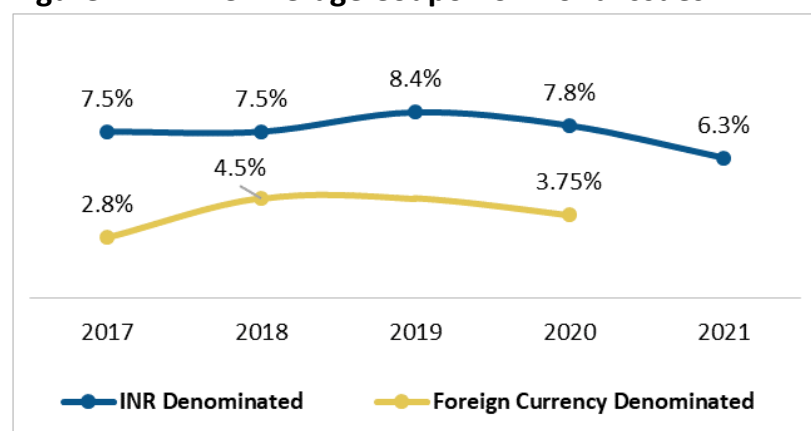
In the domestic market, given NTPC's dominant position in the energy sector and majority sovereign ownership, it has extensively tapped the bond markets, primarily through private placement. The weighted average coupon rate on

³⁰ Raised in FY 2016.

³¹ Raised in FY 2022.

domestic issues has trended down over the past five years from 7.5% in 2017 to 6.3% in 2021, in line with the trajectory of 10-Year government bond yields. NTPC recently got shareholder approval to raise up to Rs180bn through the issue of bonds/debentures on a private placement basis.³²

Figure 22: NTPC Average Coupon on Bond Issues



Source: Refinitiv.

The company's foreign bonds portfolio is part of its Medium-Term Note Program (MTN), which started in 2006. The current size of MTN program is US\$6bn, up from US\$1bn in 2006. NTPC has raised debt capital several times from global markets through this program, primarily in USD and euro, most notable being its Green Masala bond issued in 2016, which set an example of an Indian utility using its fossil fuel-based balance sheet to finance renewable energy projects. Some other notable issues include a euro-denominated bond worth EUR500 million in February 2017, a five-year Masala Bonds offering for Rs20bn in April 2017 and US\$400 million and US\$450 million Eurobond issuances in March 2018 and 2019 respectively. NTPC standalone (parent) has issued 90% of the outstanding issues with the remaining 10% from Northeastern Electric Power Corporation Limited (NEEPCO) and THDC India Limited, which it acquired in FY2020.

Term Loans Dominated by Unsecured Domestic Lending With Rising Exposure to Foreign Lenders

NTPC's domestic term loan book is dominated by unsecured loans from banks. It had an undrawn balance of Rs35.3bn available under various sanctioned loans from domestic banks and financial institutions as of FY2021.

On the foreign lending side, the company's loan book shifted from being dollar denominated to yen from FY2018. In 2018 the company raised India's first unsecured 10-year loan in the offshore loan market in yen, with another yen denominated loan of US\$300 million in 2019. In February 2020, NTPC raised a JPY

³² Financial Express. [NTPC gets shareholders' nod to raise up to Rs 18,000 cr via bonds.](#) September 2021.

loan of US\$750 million, which was the largest ever syndicated JPY loan raised by any Asian corporate from the offshore Samurai loan market. The loan proceeds were to fund installation of Flue Gas Desulphurization (FGD) system, new hydro projects and ultra-supercritical thermal projects. In September 2020, NTPC entered into a loan agreement with JBIC, the Japanese Government policy-based financial institution, for US\$482 million under JBIC's "GREEN" initiative for global environmental conservation projects. The company raised a euro-denominated loan in April 2021 and a Rs50 billion term loan from domestic lenders in August 2021.

In Summary

- NTPC's capital structure is geared towards raising debt at the parent level, which is then provided to subsidiaries for capex requirements. Majority debt is unsecured and raised through term loans. With Government of India as the majority shareholder (51%), NTPC maintains sovereign credit ratings, which helps with access to funds at competitive rates and from diversified sources. This helps bolster the balance sheet to fund pipeline projects.
- Further, strong cash generation from the thermal business – its tariff structure allows complete recovery of fixed and variable expenses while also providing for a fixed return on equity – helps maintain robust liquidity.
- On the flipside, net leverage as indicated by net debt/EBITDA has increased to 5.9x, remaining in uncomfortable territory. Moreover, the ratio may swell further given the rapid expansion envisaged and the FGD installations under way. This will increase the share of under-construction projects delaying cash generation, while addition of renewable assets will also put downward pressure on average tariffs, as seen from recent auctions.
- NTPC has been successful in mobilising debt capital from domestic and foreign markets at competitive terms in the past. It enjoys patronage with domestic lenders due to long-standing relationships and the fact that majority lending is unsecured. It is also able to raise capital globally, as evident from its raising of the yen loan and previous foreign currency bonds.
- Key items to monitor will be the ability to 'walk the talk' on delivery on its expanding RE business and commitment not to build any new coal plants beyond its current pipeline, given the global focus on decarbonization, the growing number of coal divestment policies and managing stranded asset risks. Next step is to arrange financing for pipeline projects on a timely basis and competitive terms, while managing leverage at sustainable levels.

Comparison of the Three Companies

Figure 23: Comparison of the Three Companies

In Rs bn FY 2021 Numbers	NTPC	Tata Power	Adani Green	Comments
EBITDA³³	340	69	22	While NTPC's EBITDA is many times higher, AGEL's EBITDA has grown the fastest over the past five years
% EBITDA Margin	30.5%	21.3%	71.5%	AGEL's operating margins are significantly higher, being a pure play RE company and given the absence of ongoing fuel input costs of thermal power operations
Market capitalization³⁴	1,230	483	1,780	AGEL's market cap is higher – even though it lags the other two companies in terms of installed capacity and revenues – given its green profile and the global shift of capital vying for RE assets
Net Debt	2,021	394	237	NTPC's net debt is highest, reflecting its much larger operations
Net Debt/ Total Equity	1.6x	1.8x	8.5x	AGEL's leverage is higher due to its current rapid expansion phase and no contribution from under construction projects
Net Debt/EBITDA	5.9x	6.2x	8.4x	
Average Interest cost³⁵	6.4%	8.2%	8.5%	NTPC's average interest cost is lowest due to its sovereign rating
% ST Loans³⁶	13.6%	30.4%	17.3%	Tata Power ranks highest here, which indicates a higher working capital requirement, mostly stemming from unrealised receivables
% Foreign lending³⁷	19.3%	8.5%	34.9%	AGEL has capitalised well on its green profile to tap foreign funds
% Bonds in Total debt	39.5%	32.2%	42.2%	AGEL's higher bond lending in overall mix indicates access to a more internationally diversified lender base with lower interest rates and longer tenures
% Bank/FI Loans in Total debt³⁸	47.6%	46.4%	51.9%	A high proportion of term loans as in the case of AGEL is not the most optimum source of debt to fund RE assets as they usually have higher lending rates and shorter tenures. Higher % of secured lending leads to lower capacity to borrow additional funds against the company's assets, while lower % standalone debt leads to headroom to expand balance sheet at parent level.
% Secured lending³⁹	32.7%	45.0%	77.3%	
% Standalone debt	82.4%	47.6%	22.2%	
% CAGR Gross debt	16.5%	-3.0%	53.1%	Tata Power has decreased gross debt levels over the past five years, which improves its debt raising capacity in the future

Source: IEEFA Analysis, company reports.

³³ EBITDA does not include other income and Share of Profit of Associates and Joint Ventures.

³⁴ Google Finance. Sourced 29 September 2021.

³⁵ Calculated using cash interest paid for the year.

³⁶ Includes current maturity of long-term loans.

³⁷ Does not include adjustments for current maturity of long-term loans

³⁸ Does not include commercial papers.

³⁹ Does not include adjustments for current maturity of long-term loans.

Overall, NTPC has the benefit of having GoI parentage, making it easier to tap a diverse set of investors, but its predominantly thermal power asset base is increasingly a hindrance in global capital markets. AGEL has capitalised exceptionally well on its green profile, evident from its highest market capitalisation, asset monetization and bond lending program. Tata Power to its credit has been able to pare down debt, which improves debt raising capability in the future, but has yet to secure access to patient global pension/corporate capital. On AGEL and Tata Power's books, the high proportion of term loans from banks and financial institutions (which usually doesn't match the life of asset and comes with more stringent terms) is not the optimum source of capital to fund RE assets. Tata Power has the backing of its parent, Tata Sons, but looking ahead will need alternative sources of capital. Gearing for all the three companies is on the higher side, which impairs the ability to raise debt at favourable rates.

The next section analyses the companies' capacity expansion plans and the associated capex.

Capacity Expansion Plans and Capital Required

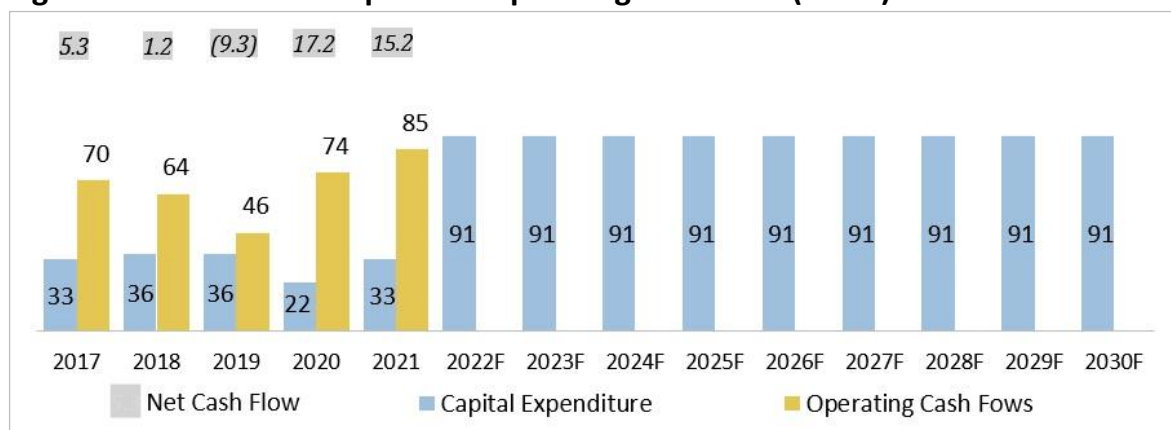
The companies' plans to add capacity require a large capital outlay over the next several years. A common global financing structure to fund renewable energy projects is 70-80% debt capital and 20-30% equity. The three companies will need to use existing debt facilities as well as securing new sources of capital to fund the expansion.

**A common global financing
structure to fund renewable
energy projects is
70-80% debt capital
and 20-30% equity.**

Tata Power Company Limited

Tata Power's installed capacity stands at 15.9GW with 8.9GW coming from legacy thermal power assets. The company plans to phase out coal-based capacity and expand clean and green capacity to 80% by FY2030.

Figure 24: Tata Power Capex and Operating Cash Flow (Rs bn)⁴⁰



Source: Tata Power annual reports, 2018-2021, IEEFA Analysis, Refinitiv.



The current renewable energy infrastructure pipeline stands at 1.3GW. The company needs to add ~2.3GW of RE assets per year till 2030 to reach the target capacity of 25GW. This would mean an aggressive growth through organic and inorganic avenues, supportive of the aggressive Government of India development plans. Further, to fund its plans Tata Power will require capital investment of an estimated Rs91bn annually until 2030. The company's average capex for the past five years has been ~ Rs30bn.

Equity portion of project construction will primarily come from internal accruals, monetization of assets (either IPO of RE business or floating an InvIT) or through capital infusion. The latter will come from a global investor seeking access to the Indian renewables growth platform and/or the promoter, Tata Sons, which is among the biggest business conglomerates in the country.

A large proportion of operating cash flow stems from the regulated business of the company, which includes the thermal generation and distribution assets in Delhi, Mumbai and the recently added Odisha⁴¹ discoms. Operating cash generation has been strong vis-à-vis the capital expenditure in the previous five years but the net cash flows have been dampened due to high debt servicing.

Overall, given the ambitious RE plans, current debt facilities and internal cash generation, Tata Power needs to raise considerable funds if it wants to keep on track with those plans. Moreover, debt refinancing, repayment falling due in the next few

⁴⁰ Projected capital expenditure considers only solar PV additions.

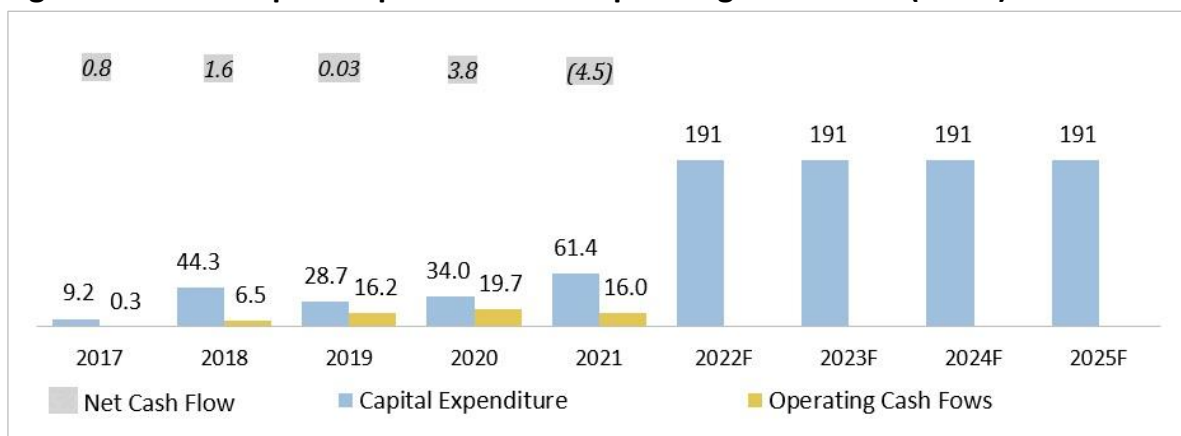
⁴¹ Mercom. [Tata Power Completes Acquisition of 51% Stake in Odisha DISCOMs](#). January 2021.

years and requirements from other businesses such as Odisha discoms will make capital management a key priority for the company.

Adani Green Energy Limited

AGEL has an installed capacity of 5.4GW, split between solar and wind assets. In its endeavours to become the world's largest renewable energy company by 2030 (ENEL Group has nearly 49GW of RE under management⁴²), AGEL has plans to add a combined 25GW capacity by 2025.

Figure 25: AGEL Capital Expenditure and Operating Cash Flows (Rs bn)⁴³



Source: AGEL annual reports, 2018-2021, IEEFA Analysis, Refinitiv.



The current pipeline stands at 18.9GW, the combined result of acquisitions and competitive bidding. From 2022-25, the company needs to add ~4.9GW of RE assets a year to reach its target of 25GW, translating to annual capex of Rs191bn to 2025. Pipeline capacity added to installed capacity totals 19.4GW, which brings AGEL close to its capacity addition target.

The outstanding debt facilities primarily include the US\$1.35bn revolving project finance facility, which initially will fund solar-wind hybrid projects, to be refinanced to fund other projects.

Issued in August 2021, its US\$750m green bond will provide the equity capital required for funding the capex along with NCDs issued to Total SE of Rs4bn. Further, the promoter group also offloaded a 20% stake in AGEL to Total, lending the

⁴² Enel Green Power. [Enel Green Power once again breaks its own record for renewable capacity built in a single year](#). January 2021.

⁴³ Projected capital expenditure considers solar PV additions.

possibility of an equity infusion by the promoter to fund construction. Recently, the Adani Group revealed plans to invest US\$20bn in clean energy generation, component manufacturing, transmission and distribution over the next 10 years⁴⁴.

There are sizeable facilities in place to support both the debt and equity portion of its future capex but the sheer size of the company's expansion plan requires it to secure capital on a continual basis. The revolving credit facility is envisaged to fund multiple projects as operational projects get refinanced with longer tenured debt at cheaper rates, as achieved earlier by issuing offshore bonds. The key will be in securing credit facilities in the future on competitive terms. Moreover, asset monetization efforts, as conducted with Total, will be imperative to fund the equity portion of the construction – a large part of the asset base will be under construction going forward and will not contribute to internal cash generation.

NTPC Limited

NTPC has an installed generation capacity of 66.9GW with more than 80% or 55.3GW coming from thermal power. The company envisages a dramatic transformation over the next nine years following its recent announcement⁴⁵ to have 60GW of total renewable generation capacity by 2030 from the current base of 5.1GW⁴⁶. As a gauge of the sheer size of this plan, it requires doubling the capacity that it added since its inception, within a decade.

⁴⁴ Mint. [Adani group looks to invest \\$20 billion in renewable energy](#). September 2021.

⁴⁵ The Hindu Business Line. [NTPC revises its RE targets to 60 GW by 2030](#). September 2021.

⁴⁶ Includes hydro capacity.

Figure 26: NTPC Capital Expenditure and Operating Cash Flows (Rs bn)⁴⁷



Source: NTPC annual reports, 2018-2021, IEEFA Analysis, Refinitiv.



The company will have to add 6.1GW renewable capacity on average till 2030 if it wants to reach the target of 60GW. This translates to ~Rs237bn (US\$3.2bn) investment annually for just the RE (wind and solar) business. NTPC also is adding a 11.8GW pipeline of coal and hydro assets in the next couple of years, which will require additional capital of ~Rs915bn – that is, if all the legacy coal plant proposals proceed, and if the hydro plans can overcome the myriad delays of the past decade.

NTPC’s current Medium Term Note program (MTN), which it uses to raise funds from offshore markets, has an upper ceiling of US\$6bn (Rs450bn) of which US\$4.3bn (Rs322.5bn) was raised by April 2019. On the domestic loan front, the company has Rs35bn of undrawn balance available under various sanctioned loans from domestic banks and financial institutions as of FY2021. Further, the company’s foreign lending has a JPY loan facility of US\$750m (Rs56.2bn) availed in FY2020, a SMBC yen loan facility of Rs35bn availed in FY2021 and a syndicated term loan in euro equivalent to US\$260m (Rs19.5bn) raised recently. These facilities will fund capex for thermal, hydro and renewable assets while also refinancing existing debt. The company has recently also proposed to raise Rs180bn in new bonds/debentures to fund future capex.

The equity portion of the capex will be funded by internal cash accruals, paring stake in JV with Steel Authority of India Ltd and the proposed IPO of the renewable

⁴⁷ Projected capital expenditure considers solar PV additions.

business, NEEPCO and NTPC Vidyut Vyapar Nigam Ltd.⁴⁸

On the operating cash flow front, the regulated nature of the thermal business provides stable cash flows, primarily to cover debt repayment and capital expenditure. Given higher capitalization of assets going forward, the cash flows are expected to rise. Cash generation from the regulated business provides comfort but it may not be enough to fund the capex requirement for the RE, thermal and hydro business, to service outstanding debt obligations and to fund dividends and share buybacks.

The cash generation and the debt facilities combined will have to be augmented by new capital raising. Moreover, the current leverage of 1.6x, backed primarily by thermal assets, makes the task of raising capital for funding pipeline capacity a momentous one. NTPC faces the massive task of raising debt from the capital markets at attractive rates, without compromising its credit ratings or putting undue pressure on its bottom line. Adding to the enormity of the task, the company has not raised funds of this magnitude in the past and may need to approach a completely new set of investors.

Shifting Landscape of Renewable Energy Financing in India

As the sector went mainstream in the past decade, India's renewable energy financing landscape has transformed. The Government of India's renewable energy plans and the associated policy support have been a major factor in this shift. Much has changed for the sector in terms of becoming financially attractive for investors and lenders but major financing gaps still need to be plugged. The table below lists some of the factors that have led to a better financing environment for the sector and some of the major bottlenecks.

⁴⁸ The Economic Times. [NTPC planning IPOs of 3 units to raise \\$2 billion](#). October 2021.

Figure 27: Renewable Energy Financing Landscape

	Factors Responsible for Growth	Bottlenecks
1)	Demonstrated feasibility of RE technology has led to banks and financial institutions gaining confidence to lend to the sector	Limited sources of non-recourse debt as large portion of debt still borrowed through recourse against parent balance sheet
2)	Clean-up of bank balance sheets over the years has made them stronger and reduced exposure to the power sector, which has helped lending to the RE sector	Lack of non-bank debt sources as Indian banks and FIs remain the dominant lending agencies which have a lower risk tolerance and asset liability mismatch while lending to RE projects
3)	Government Policy initiatives from long-term power purchase agreements (PPA) to providing financial incentives have helped mobilise capital in the sector	Shallow corporate bond market which is far less liquid and underdeveloped compared to global markets, making it difficult to raise debt through bond issues
4)	Rise of ESG-led financing and climate advocacy globally have led governments, regulators and financiers to divert money towards climate-conscious sectors	High premium required by offshore investors to invest in Indian RE assets due to regulatory delays, currency risk and difficulty finding investment-grade projects
5)	Advent of new financing instruments such as InvITs, green bonds and Masala bonds has helped reach a wider investor base and appeal to a variety of investors	Lack of domestic institutional financing which globally has played a major role in mobilizing funds for renewable assets
6)	Entry of large conglomerates with balance sheet strength has given more confidence to lenders, mainstreaming RE sector	Poor sustainability led disclosures on such lines as ESG, which help investors evaluate investment options

Source: IEEFA analysis.

Despite efforts to establish the credibility of RE sector in India among lenders, domestic sources of lending remain limited and are not the most appropriate for funding RE assets. There is ample foreign capital that can potentially be tapped by Indian developers but only a few well-established players have been able to exploit it, the marquee names of NTPC, AGEL and Tata Power among them. The next section examines sources of capital, domestic and foreign, to be deployed for expansion plans.

There is ample foreign capital that can potentially be tapped by Indian developers but only a few well-established players have been able to exploit it.

Funding Avenues for Renewable Energy Players

Tata Power, AGEL and NTPC will require major financing drives to stay on track to reach their renewable energy goals. Given the nature of infrastructure projects such as renewables, 70-80% of financing is done using debt, so it is imperative to secure debt funding in a timely manner on favourable terms.

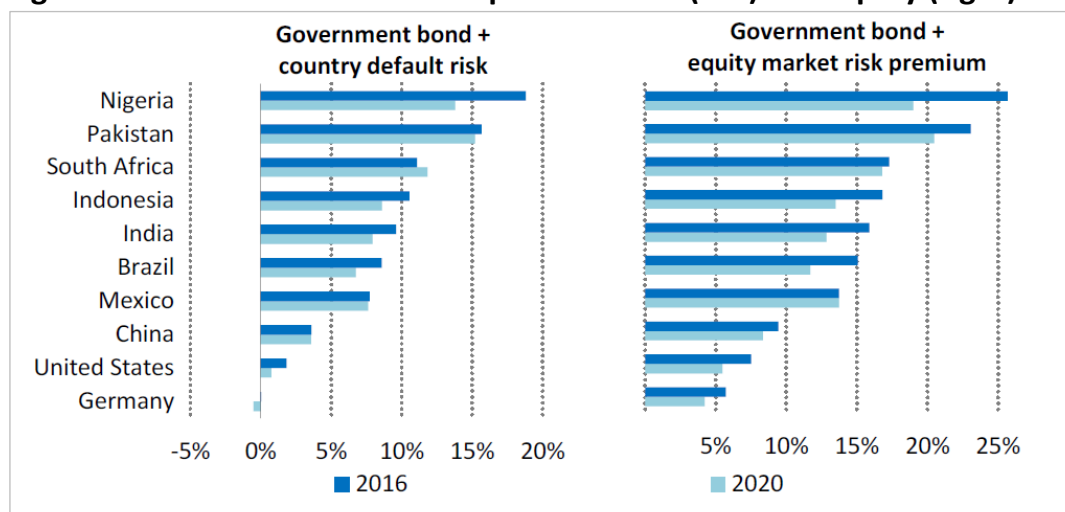
Figure 28: Capacity Addition Plans and Capital Requirement

Company	Renewable Energy Target	Average Additions Year Required	Current Installed Capacity	Capital Required pa
Tata Power	25GW by 2030	2.3GW	4.0GW	Rs 91bn
Adani Green Energy	25GW by 2025	4.9GW	5.4GW	Rs 191bn
NTPC Limited	60GW by 2030	6.1GW	5.1GW	Rs 237bn

Source: IEEFA analysis, Company reports.

A large part of debt capital currently raised by these companies is through term loans from banks and FIs domestically. Mainly used during construction, these term loans, although raised at competitive rates, do not usually match the life of renewable projects. Financing secured during the construction phase of the projects is usually at higher rates given the execution risk involved, so refinancing at lower rates and longer tenures is imperative for companies. Debt capital needs to be arranged during two phases of project life, first during construction and then to refinance existing projects at lower rates.

Figure 29: Indicators of Cost of Capital for Debt (left) and Equity (right)



Source: IEA 2021.

Offshore investments, debt and equity alike, can play an important role in helping Indian companies secure low-cost financing. As per IEA, although emerging markets and developing economies account for about 40% of energy investments and emissions reductions under IEA climate-driven scenarios in the future, they currently hold only 10% of global financial wealth.⁴⁹ The above illustrates the difference in cost of capital in developing and developed countries. It does not account for other costs incurred by foreign investors in developing nations, such as

⁴⁹ IEA. *Financing Clean Energy Transitions in Emerging and Developing Economies*. June 2021.

currency hedging costs, but it underscores the opportunity for Indian companies to leverage low-cost debt and equity capital from foreign investors to boost the internal rate of returns (IRRs) for their projects.

Some avenues for the three companies to raise capital are discussed below.

Bond Market Issuances

Sustainable bond issuance including green, social, sustainability and sustainability-linked bonds could now collectively exceed US\$1 trillion in 2021.⁵⁰

Green Bonds

Issued to support specific climate-related or environmental projects, green bonds are not new for Indian companies, which raised US\$ 7.8bn through green bonds during 2015 to September 2021 period. Still, compared to global issuances which were US\$442.2bn in 2021 (till October) alone,⁵¹ Indian issuers have a large scope to tap this market.

NTPC was the first to issue a green bond in the sector in India, while AGEL has done so three times. Usually, these bonds are priced at coupons lower than their conventional counterparts and used to refinance existing debt.

Sustainability-linked Bonds

Another set of bond instruments, these have been used extensively by global utilities such as Enel and Total Energies to raise capital for their green energy initiatives. Issuance of bonds with sustainability-linked pricing means that issuers pay a lower coupon on their debt if pre-agreed ESG key performance indicators (KPIs) are achieved or a higher coupon if targets are missed.

The issuance of these instruments increased nearly four-fold, year-on-year, in the first six months of 2021 to US\$160bn. In India SLBs were used for the first time in FY2021 by Ultratech Cement⁵² while Adani Electricity Mumbai recently raised US\$300m in sustainability-linked bonds.⁵³

Globally, green and sustainability bond and loan issuances totalled US\$809.5bn in this year's first half, nearly tripling year-on-year. The Asia-Pacific region's share of the global total edged up to 14% in this period from 13.3% for the whole of last year.⁵⁴

⁵⁰ S&P Global. [To Mitigate Greenwashing Concerns, Transparency And Consistency Are Key](#). August 2021.

⁵¹ Refinitiv. [The Green Bond Guide](#). As of 19 October 2021.

⁵² UltraTech Cement. [UltraTech Cement raises US\\$ 400 million through India's first sustainability-linked bonds](#). February 2021.

⁵³ Business Line. [Adani Electricity Mumbai issues \\$2-billion sustainability-linked bonds](#). July 2021.

⁵⁴ South China Morning Post. [What is driving an almost 200 per cent growth in sustainability-linked debt financing](#). August 2021.

Pooled Investment Vehicle

Infrastructure investment trusts (InvIT's) allow companies to monetize operational cash generating assets by pooling multiple assets under a single entity (trust structure). Renewable energy asset owners can capitalize on InvITs either through selling their operational projects to an already established InvIT or floating an InvIT on their own. Indigrid, India's first power sector InvIT, has recently acquired an operational solar asset from Fotowatio Renewable Ventures (FRV), while the InvIT itself was floated by Sterlite Power, which transferred its operational transmission assets into a trust entity. Recently KKR-sponsored Virescent set up India's first renewable-focused InvIT⁵⁵. InvITs are fast becoming a preferred route for private equity investors (domestic and foreign) to hold operating infrastructure assets and for infrastructure developers to monetize their investments in these projects. InvIT proceeds can either be used to fund equity portion of projects or can be given as a loan to project SPVs to cover the debt portion. Tata Power was recently mulling with the idea of floating with its own InvIT to monetize its RE assets.

Loans from Offshore Lenders

A viable alternative to raising term loans domestically is to tap foreign lenders willing to take exposure to the renewable energy sector. Bank of America (BoA) has a goal of deploying US\$1 trillion by 2030 in its Environmental Business Initiative to accelerate the transition to a low-carbon, sustainable economy⁵⁶. In December 2019, Fourth Partner Energy, a distributed solar company in India, raised a local currency revolving credit facility of US\$50 million from BoA⁵⁷. Similarly, JBIC of Japan – in a scheme called Global action for Reconciling Economic growth and Environmental preservation ("GREEN") – supports environmental projects in developing countries in the form of loans, guarantees and equity financing. NTPC raised a US\$482 million loan under this facility in FY2021. Similarly, several other global institutions such as HSBC, Barclays and Deutsche Bank have committed top dollars towards sustainable finance.

Equity Investments

Public Listing Through IPO or SPAC Route

Another avenue to monetize assets and unlock value in renewable companies is to publicly list the business on stock exchanges, either locally through a spin-off initial public offering (IPO) or in global markets through a special purpose acquisition company (SPAC) route. An IPO is quite common; SPAC is a company with no commercial operations that is formed strictly to raise capital through an IPO for the

⁵⁵ The Economic Times. [KKR-backed renewable InvIT raises ₹460 crore from AIMCo and other investors](#). September 2021.

⁵⁶ Bank of America. [Bank of America Increases Environmental Business Initiative Target to \\$1 Trillion by 2030](#). April 2021.

⁵⁷ Bank of America. [In Its First Investment Into Indian Clean Energy, Bank of America Extends 356.5 Crore INR \(US\\$50 Million Equivalent\) Local Currency Revolving Credit Facility to Fourth Partner Energy](#). December 2019.

purpose of acquiring an existing company. Renew Power, one the largest pure play renewable energy companies in India, was recently listed on the Nasdaq exchange through the SPAC route. A public listing provides the added advantage of tapping a wider investor base for future debt or equity issuances.

Joint Ventures With Strategic Investors

In lieu of listing an entire business via an IPO, RE companies can also get into strategic investment via joint ventures with global oil and gas majors diversifying into zero emissions. An increasing number of these are eager to gain an exposure to Indian RE assets.⁵⁸ This can help recycle capital selectively from assets where the RE company thinks it has an opportunity to unlock the highest value.

Among global oil and gas majors, BP will make annual clean energy investments of US\$5 billion by 2030. Total announced that ~US\$2.5bn of its planned overall investment in 2021 will go into renewables and electricity. Shell is targeting a 25% share of investment in clean energy capital expenditure by 2025 and Eni's strategic plan for 2021-24 targets 20% of average yearly capex of 7 billion euros to clean energy projects.⁵⁹

Private Equity Investors

Private equity investments in the renewable energy sector are primarily through an equity raising and several global PE investors so far have taken an interest in Indian green energy companies. Notable examples include Goldman Sachs backed ReNew Power, Royal Dutch Shell backed Cleantech Solar Energy, Helion Ventures backed Azure Power and Warburg Pincus backed CleanMax Solar. Private equity investors bring not only capital but also operational and financial expertise in managing renewable assets – and an added credibility, which helps in reaching a global investor base. Further, clean energy platforms owned by PE investors are also interested in acquiring renewable assets separately. PE firm Actis Llp acquired two solar projects totaling 400MW from Acme Solar Holdings Ltd in 2020 through Actis Long Life Infrastructure Fund.⁶⁰

Globally there is a shortage of high-quality clean energy projects. This is compounded by inadequate channels to guide available funds in the right direction and a lack of intermediaries capable of matching surplus capital with the sustainability needs of companies and consumers.⁶¹

Other Foreign Institutional Investors

Institutional investors such as sovereign wealth funds (SWFs), global pensions and infrastructure funds are passive in nature and have a major role in providing capital. These players initially invested in India's RE sector indirectly through fund of funds but over time a lot of direct equity investment – either through investments in

⁵⁸ IEEFA. [IEEFA: Global capital mobilising for India's \\$500bn renewable energy infrastructure opportunity](#). February 2021.

⁵⁹ IEA. [World Energy Investment 2021](#). May 2021.

⁶⁰ Moneycontrol. [Actis to invest \\$850 million in two green energy platforms in India](#). March 2021.

⁶¹ IEA. [World Energy Investment 2021](#). May 2021.

existing companies, incubating their own platforms and/or acquiring operational or near completion assets – has also taken place.

Notable examples include pension funds such as Canada Pension Plan Investment Board (CPPIB), which is a major investor in ReNew Power; Caisse de dépôt et placement du Québec (CDPQ), which owns a 51% controlling stake in NYSE-listed Azure Power. Among SWFs, Abu Dhabi Investment Authority (ADIA) holds a stake in ReNew Power and Greenko Energy Holdings, while Singapore's GIC is the majority shareholder in Greenko.⁶²

Pension funds and SWFs are ideally suited to invest in renewable energy assets as they bring long term patient capital at low return hurdles. They also have low risk thresholds and so usually invest in operational projects, which have long term cashflow visibility and are de-risked.

Domestic Institutional Investors

Pension funds and insurance companies have historically made liability-driven investments in assets that are more liquid and less risky. The domestic institutional investor is a latent investor class that has globally provided large amounts of capital for renewable energy assets. A focused approach by RE companies to tap into DIIs, helping them evaluate project attractiveness and pitching investment grade assets, can help attract large capital investments directly, rather than through issue of bonds. For example, Orsted in Denmark has been able to recycle its capital employed in offshore wind assets by bringing in local pension funds as co-owners.

Capital from Multilateral Development Banks

Clean energy-related commitments by development finance institutions (DFIs) have stepped up in recent years with the most growth coming from multilateral development banks (MDBs), which provided a total of US\$66 billion towards green funding in 2020 with 76% pledged through investment loans.⁶³ The proceeds going towards renewable energy were US\$11.9 billion⁶⁴ while South Asia accounted for 12% of the total flows during the year.

In India, MDBs such as the World Bank, the International Finance Corporation (IFC), the Asian Development Bank (ADB), Germany's KfW and Japan International Cooperation Agency (JICA), among others, have committed capital for renewable energy projects in the past in two main channels: first, by providing concessional loans to commercial banks such as State Bank of India (SBI) and development banks such as IREDA; and second, through equity investments in Independent Power Producers (IPPs).

⁶² IEEFA. [IEEFA: Global capital mobilising for India's \\$500bn renewable energy infrastructure opportunity](#). February 2021.

⁶³ Mercom India. [Climate Financing by Multilateral Development Banks Reaches \\$66 Billion in 2020](#). July 2021.

⁶⁴ Part of MDB mitigation finance.

MBDs differ from global and local commercial banks in that they do not seek to maximize investment returns, which allows them to invest in high-risk countries and sectors. Among their key aims is supporting socioeconomic development of such countries. Rising clean energy commitments by these institutions present a viable source of capital for Indian energy companies.

Conclusion

Technology driven transformative decarbonization is the theme for global energy markets in 2021. Solar and wind energy are gaining global investor favour over high carbon fossil fuels. Governments globally are charting their individual paths to transition to a greener future, led by greater adoption of renewable sources of energy, enhancing energy independence and improving current account deficits in the process.

India is also moving steadily towards achieving its goal of 450GW of installed renewable capacity by 2030, led by public and private entities. Naturally, enormous sums of capital will be required to keep moving towards this goal, as will a significant step-up in activity relative to the last few years. The government has been doing its part, providing a very clear policy framework, concessional loans, viability gap funding, generation-based incentives, concessional grid access terms and tax incentives to the renewables sector. However, to make the transition successful and economically viable, the means of attracting investment capital from the most economical global sources must be enhanced.

Globally, a flood of capital is vying for opportunities in zero emissions and renewable energy infrastructure assets, led by the advent of ESG investing.

Globally a flood of capital is vying for opportunities in zero emissions/renewable energy infrastructure assets, led by the advent of ESG investing. India presents attractive prospects for these investors to deploy capital and gain exposure to the country's growing renewable energy sector in a low risk policy environment while delivering on the global commitments of the Paris Agreement.

To leverage these prospects and attract this global capital, Indian companies have numerous financing avenues, ranging from green bonds and loans to InvITs. Into the future, the ability to secure this capital will be critical for these companies to reach RE goals. This will entail taking steps such as adopting green bond frameworks, enhancing credit rating of projects, adopting globally recognized ESG frameworks and principles and creating a robust investor outreach program.

Further, given the growing concerns towards ESG greenwashing and keeping a “clean” image, conventional utilities such as NTPC and Tata Power also must deliver on commitments not to build new coal plants beyond current pipelines. Adani Green will need to convince its parent entity that aligning with the Paris Agreement is a prerequisite to maintaining access to an ever-wider pool of global investors looking to support India’s energy transformation at the speed required.

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