



International Capital Awaits a Robust Policy Environment in India's Renewables Infrastructure Sector

Possible US\$500 - \$700 Billion Investment in the Coming Decade

Executive Summary

- India is set to achieve 144 gigawatts (GW) of renewable energy by the end of financial year (FY) 2021/22.
- The Central Electricity Authority is now targeting an ambitious renewable energy target of 523GW by 2030.
- Investment capital available globally currently exceeds renewable energy opportunities.
- For global public, private debt and equity capital seeking steady long-term returns, there is a huge investment opportunity in India's electricity and transportation sectors to provide new generating capacity and grid development by 2030.
- Meeting these ambitious renewable energy targets plus associated grid integration and expansion requirements will require US\$500-700bn of new investment by 2030.
- India's thermal capacity additions hit a decade low in FY2018/19. Net capacity additions from coal over the past three years have been 7GW, 5GW and just 3.4GW, respectively.
- During FY2018/19 India failed to capitalise on the momentum gained during previous years through record low solar and wind tariffs, with only 10.3GW of renewable generation capacity added in FY2018/19.
- Tendering activity accelerated in June 2019 with 13GW of renewable energy auctioned and tendered during the month. All of the tariffs were contracted



for 25 years with zero indexation, while also being 20-30% less than NTPC's average domestic coal-fired power tariffs.

- The government is paving the way for increased renewables investment:
 - The priority lending limit for the renewable energy sector is likely to be removed, to allow private banks to lend more to renewable energy infrastructure projects.
 - The renewable sector is being set up as a sector of its own, differentiated from the power sector which is suffering from debt and financial woes.
 - A proposed tariff policy revision is integral to the '24x7' power supply ambition.
 - A payment security mechanism for power generators is also a significant regulatory reform.
 - Declaring large transmission projects to be of national importance addresses a major transition-related concern.
 - A battery manufacturing tender proposal could unlock up to a US\$50bn investment "Make in India" opportunity for global investors.
- IEEFA sees India's renewable energy targets as both critical for enhancing India's energy security and as being entirely achievable with the right policy and contractual risk-return framework, which in turn will attract the right investment.

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Status of Renewable Energy in India

The pursuit of India's renewable energy mission to improve domestic energy security has been a mixed bag of progress, achievements and challenges.

A near-term mega target of 175 GW of renewable energy by FY2021/22 was always going to be a mountainous task given the structural challenges India's electricity sector faced to begin with. However, according to IEEFA's India renewable energy tracker, India is set to achieve 144GW of renewable energy by the end of FY2021/22. IEEFA's India renewable energy tracker maintains a list of ongoing capacity auctions and tenders in the pipeline which we use to forecast renewable capacity additions in the medium-term.

**India is set to achieve
144GW of renewable energy
by the end of FY2021/22.**

As of June 2019, India had installed 82GW of renewable energy (including ~2GW of behind-the-meter rooftop solar capacity). Of the 21GW of renewable capacity installed since the beginning of FY2017/18 and an additional 35GW awarded to date, more than 90% of it has been contracted for tariffs between Rs2.43-2.80/kilowatt hour (kWh) with zero indexation for 25 years. This is 20-30% less than average domestic coal-sourced thermal tariffs from India's largest energy conglomerate NTPC, of Rs3.38/kWh.¹

Figure 1: India's Renewable Energy Projections FY2021/22

(MW)	Installed Capacity as of	Capacity Additions	Estimated Capacity Additions				Total
			FY2018/19	FY2018/19	FY2019/20	FY2020/21	
Utility Scale Solar	26.7	6.5	7.5	11.6	14.0	59.8	
Rooftop Solar	4.4	1.6	2.0	3.0	4.0	12.9	
Wind	35.3	1.7	5.0	6.4	6.4	53.1	
Biomass+Run of River	13.8	0.5	0.5	0.5	0.5	15.3	
Floating Solar				0.1	1.4	1.5	
Hybrid Wind & Solar	0.1			0.4	0.7	1.2	
Total	80.3	10.3	15.0	22.0	27.0	143.8	

Source: CEA, MNRE, Media Reports & IEEFA Estimates.

Note: Installed capacity as of FY2018/19 includes 2.4 GW of behind-the-meter rooftop solar.

On the other hand, India's thermal capacity additions hit a decade low in FY2018/19. From the highs of 20GW of new thermal power plants commissioned

¹ NTPC, Performance Highlights for Q4 and FY2019, 25 July 2019.

every year between FY13 to FY16, net capacity additions from coal over the past three years have been 7GW, 5GW and just 3.4GW, respectively.

The Central Electricity Authority (CEA) is now targeting an even more ambitious renewable energy target of 523GW by 2030 and has significantly progressed thinking on the critical associated issue of grid firming via large scale storage.²

The Indian government's clear ambition to support its rapidly growing economy with low-cost, low emission, domestic sourced fuel for the electricity and transportation sectors provides an investment opportunity of US\$500-700bn in new generating capacity and grid development by 2030 for global public, private debt and equity capital seeking steady long-term returns.

Post-Election Tailwinds

In FY2018/19 India failed to capitalise on the momentum gained during previous years through record low solar and wind tariffs. Only 10.3GW of renewable generation capacity was added in FY2018/19, which was 15% less than 14GW added during FY2017/18.³

Recent Surge in Tendering Activity

After another comprehensive mandate for the Bharatiya Janata Party (BJP) in India's 2019 national elections, the renewable power ministry looks keen to put things 'back on track'.

Tendering activity accelerated in June 2019 with 13GW of renewable energy auctioned and tendered during the month. Adani Green Energy and ReNew Power, two of India's leading renewable energy developers, were awarded 720 megawatts (MW) of wind and solar hybrid generation capacity by Solar Energy Corporation of India (SECI). Adani bid Rs2.69/kWh for 600MW and ReNew Power bid Rs2.70/kWh for 120MW.

**Renewable tariffs in
June 2019 were 20-30%
less than NTPC's average
coal-fired tariffs.**

Other auctions included SECI's 1.2GW solar tender resulting in tariffs between Rs2.54-2.55/kWh, and NTPC's tender for 750MW of solar capacity in Rajasthan which saw tariffs fall even further to Rs2.50/kWh.

The above tariffs were contracted for 25 years with zero indexation, removing fuel

² India's Central Electricity Authority (CEA), [Draft report on optimal generation capacity mix for 2029-30](#), February 2019.

³ See IEEFA's report discussing some of the [key policy and planning issues](#) during the year that hindered the pace of tendering and commissioning of renewable energy projects.)

price inflationary pressures while also being 20-30% less than NTPC's average coal-fired power tariffs.

Additionally, there were retendering activities of 900MW in Gujarat of previously undersubscribed tenders. For example, SECI revamped a tender from January 2019 to award a massive 6GW solar generation capacity linked with 2GW of module manufacturing. The earlier manufacturing-linked tender had seen a poor response from the industry.

Apart from the sprightly tendering activity, there were other tailwinds on the policy, regulation and planning fronts.

Removal of Priority Lending Limit

The Ministry of New and Renewable Energy (MNRE) recently requested the Reserve Bank of India [remove a priority lending limit](#) for the renewable energy sector to allow private banks to lend more to renewable energy infrastructure projects. In addition, the Minister of State (IC) Power and New & Renewable Energy, R. K. Singh has requested the banks differentiate the renewable energy sector from the power sector.

Given the ongoing financial distress in India's thermal power sector, lending activity has understandably dried up. The Ministry's move is an effort to curtail the impact of financial stress spilling over to the lending flow into the renewable energy sector.

New Tariff Policy

The Ministry of Power has sought to expedite the process of introducing a [new tariff policy](#), on the drawing board for more than a year.

The new tariff policy will punish power distribution companies (discoms) for unscheduled power cuts, except in the case of technical faults or natural calamities, as power cuts severely impact economic activity. The policy will force discoms to maintain the supply of power, which would in turn reduce curtailment of low-cost renewable energy supply.

In addition, the Ministry will look to work with state governments to remove barriers like cross-subsidy surcharges and undesirable duties on open access sales or captive generation for commercial & industrial (C&I) users. While this is difficult for distribution companies medium term, developing the C&I sector opens up a critical new supply of capital while expanded distributed generation capacity will enhance grid resilience.

**The tariff policy revision
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The tariff policy revision would be an important structural change in India's power sector and integral to achieving the '24x7' power supply ambition.

Payment Security Mechanism for Power Generators

In July 2019, the MNRE released guidelines to formalise a [payment security mechanism](#) for power generators. Discoms will now have to open and maintain a line of credit (LOC) before power is dispatched from the local load dispatch centre. Failure to provide a line of credit will mean power will not be dispatched for the discom.

[Delayed payments](#) have been an area of major concern for the sector, leading to stranded assets. They have also severely affected the cashflows of small private solar and wind power generation companies.

In IEEFA's opinion, the payment security mechanism is a significant regulatory reform which will ensure any inefficiencies from discoms will not trickle down to generation companies, creating stranded assets. Simultaneously, the mechanism will enforce financial and operational discipline.

'National Significance' Status on Power Transmission Projects

The MNRE has invoked special powers to declare transmission projects worth Rs40,000 crore (US\$5.5bn) to be of [national importance](#). This action will facilitate and de-risk more than 66GW of renewable energy projects already under development or planned for the future. This is a proactive and decisive measure by the government, addressing a major transition-related concern.

Anti-dumping Duty Returned

Anti-dumping duties of 25% on imported solar modules - imposed by the Indian government in July 2018, has been a clear overall policy failure, providing no material uplift in domestic manufacturing for the upstream solar sector whilst having the major impost of creating uncertainty and increasing tariffs in tenders since, as developers have incorporated this cost into tariffs bid.

The Central Electricity Regulatory Commission recently [ruled to give back the charged safeguard duty](#) on 5.4GW of solar projects by Bhadla Solar Power. This will make the project profitable with 1.9 to 2.2% additional return on equity as estimated by CRISIL ratings.

This does not by any means improve the situation that already exists in the Indian solar industry due to the active anti-dumping duty regime; however, it is an example of good governance from the regulators that will instil investor confidence.

Battery Manufacturing Tender

The government of India is planning to issue tenders inviting global and local companies to set up a [50GW battery manufacturing base](#) in India. NITI Aayog, the Indian government's planning think-tank, will seek proposals from states to identify

locations for plants, and is likely to provide duty waivers, exemptions and other fiscal benefits to battery manufacturers. The proposal is estimated to be a US\$50bn investment opportunity for global investors.

A recent report from the CEA projects an [optimal energy mix for India's electricity system](#). The report estimates India's renewable energy capacity will be 523GW by FY2029/30, including 300GW of solar, 140GW of wind, 10GW of biomass and 73GW of large hydro power. Additionally, this generation capacity will be accompanied by 34GW/136GWh of battery storage capacity.

From its initial plan of 'all new four-wheelers to be electric by 2030', the government appears to have revised its electric transport strategy. The new strategy entails progressively electrifying its massive fleet of [two and three-wheelers from FY2023/24 onwards](#) and then a move to four-wheelers.

In order to meet its international climate commitments as well as the rising air pollution problem, IEEFA notes it is likely that India will look to converge its power and transport industries.

Policy Headwinds

Retrospective Changes

During the recent recovery in tendering activities, state discoms have repeatedly cancelled already awarded tenders or have forced developers to agree to even lower tariffs. In certain cases, discoms have asked developers to match the lowest tariff caps — essentially turning reverse bids into low feed-in tariffs (FiT).

In July 2019, the government of Andhra Pradesh called for a [renegotiation](#) of its already awarded renewable energy tenders on the grounds of corruption and collusion, arguing that while contractually agreed, the tariffs lock Andhra Pradesh into 25 years of tariffs well above the likely cost available today.

IEEFA notes it is positive the MNRE has responded rapidly to address this issue, given the sovereign risks implied undermine global investor confidence at a time when India is seeking a massive US\$500bn+ of new investment in the electricity sector alone by 2030. Unless corruption can be proven, it is important that the rule of law be adhered to.

Excessively Low Tariff Caps

In the last 6 to 8 months, a number of tenders have seen a dull response and have been significantly undersubscribed. IEEFA notes developer responses clearly show the tariff caps as too aggressive, particularly in light of higher policy risks. This is a false economy given the magnitude of capital investment required, particularly as any tariff below Rs3/kWh is immediately materially lower than the current wholesale price, with deflation locked in for the 25-year contract life.

The MNRE must engage with state discoms and the industry to revise tariff caps so that they are reasonable. Also, protecting the sanctity of contracts is an important

aspect of improving the 'ease of doing business' in India. The MNRE must resolve these issues immediately to avoid injuring India's energy transition progress.

Flow of International Capital

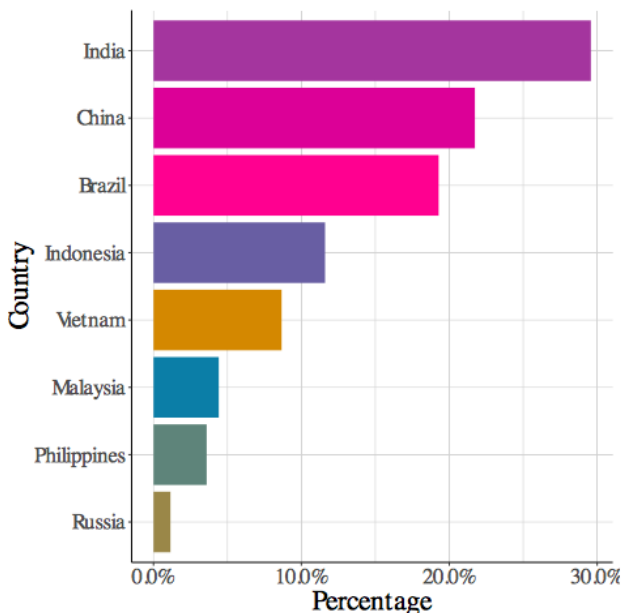
India's National Electricity Plan (NEP) 2018 highlights an ambitious 275GW of renewable energy generation capacity to be built by FY2027/28. As described, this target was recently upgraded to 500GW by FY2029/30 by the MNRE secretary Anand Kumar, and even further to an aspirational 523GW as per the new CEA modelling. When grid upgrades are added, this will require US\$500-700bn of new investment by 2030. As such, international capital is likely to play a key role.

IEEFA sees the renewable energy targets as entirely achievable with the right policy and contractual risk-return framework.

Supporting this assertion, Singapore-based EDHEC Infrastructure Institute (EDHECinfra) and Global Infrastructure Hub (GI Hub) surveyed 300 respondents, including 130 global asset owners with a total of US\$10 trillion of assets under management (AUM). Its recent report '2019 Global Infrastructure Survey – Benchmarking' found India to be the top market for infrastructure growth potential among emerging economies.

Meeting the renewable energy target will require US\$500-700bn of new investment by 2030.

Figure 2: Emerging Markets with the Most Infrastructure Growth Potential in the Next 5 Years



Source: EDHEC Infra Institute, Global Infrastructure Hub.

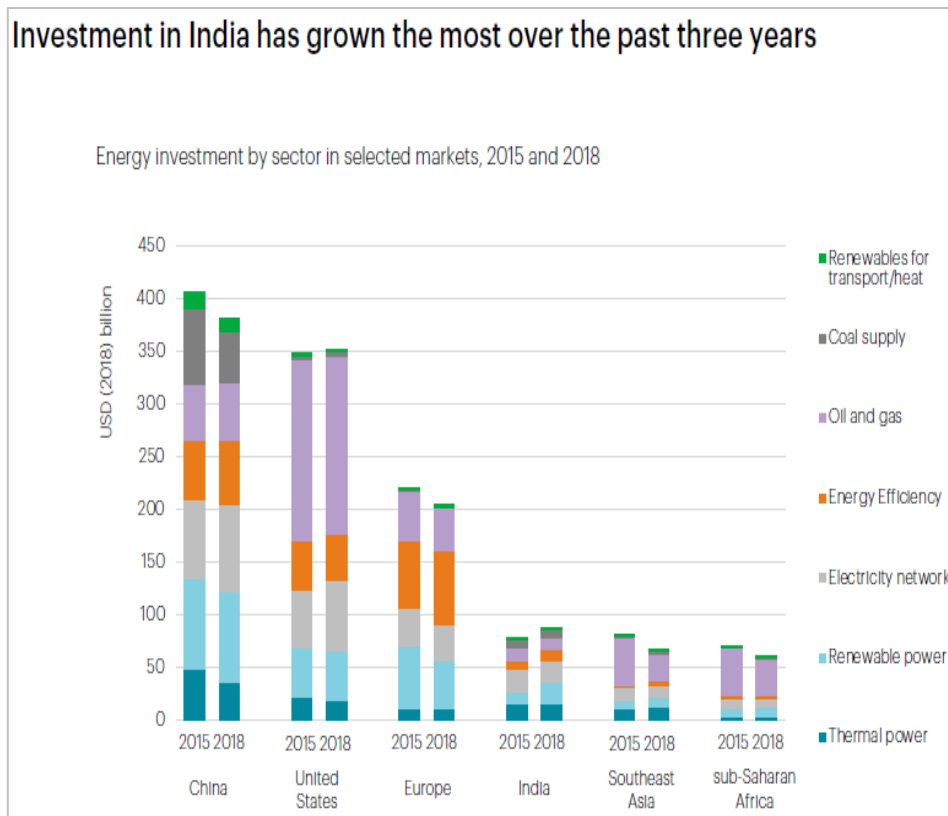
Over 80% of solar procurement globally is expected to be achieved by reverse auction in 2019, up from just 10% in 2018.⁴

India's introduction of the reverse bidding auction regime started in early 2017 and brought transparency, visibility and competition into the renewable generation and power transmission sector, removing the scope for potential corruption evident in many traditional non-transparent generation investment processes across Asia. India's championing of the reverse auction process has been a success in delivering massive deflation in 2019.

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In 2018, India's energy sector investment grew by 12%. According to International Energy Agency (IEA), energy sector investment grew the most in India between 2015-2018 compared to any other region in the world.

Figure 3: Energy Investment by Sector in Selected Markets



Source: IEA.

⁴ Reuters, [Global solar installations to reach record high this year](#), 25 July 2019.

The tendering results of the last 2-3 years have provided consistent evidence of global capital interest being focussed on India's renewable energy and power transmission sectors, notwithstanding the difficulties in currency hedging and the local nature of the 25-year tariffs on offer.

We list key examples below.

International Private Investors and Alternative Funds

SoftBank – An Early Mover into India

Japan's Masayoshi Son-led SoftBank is investing heavily in India's renewable energy sector through its energy arm SB Energy. The company owns more than 3GW of renewable capacity under development, awarded through competitive reverse bidding auctions.

Endorsing the deflationary nature of the Indian government-led International Solar Alliance (ISA), Softbank CEO Masayoshi Son went so far as to promise **free power** from its solar plants in India to ISA member countries after the completion of the asset's initial 25-year Power Purchase Agreement (PPA) period.

SoftBank recently invested US\$250m in **Ola Electric** - an electric mobility service company. Established in 2017, SoftBank has already valued the company at US\$1bn. This move highlights SoftBank's intention and vision to deploy capital in a transforming market with immense room for growth.

Brookfield – A Leading Alternative Asset Manager

Brookfield of Canada is one of the leading alternative asset managers globally with US\$365bn AUM. Brookfield is reported to be in the process of acquiring a 210MW wind farm from Axis Energy for Rs500 crores (US\$72m). This would be Brookfield's first direct acquisition in India. In 2017, it acquired SunEdison's 300MW of solar assets in India. Axis Energy's wind assets will take Brookfield's India power capacity to 510MW.

Brookfield is well-known for its long term, risk-averse investment philosophy. IEEFA sees its entry into the Indian renewable energy space as a very positive signal for the sector, as well as for other investors looking to deploy capital in India.

Brookfield was also reported to be considering acquiring an equity stake in cash-strapped wind energy developer **Suzlon Energy**, with the intent to infuse additional equity. Brookfield was reported to have done due-diligence of Suzlon's operations and maintenance arm during FY2018/19. However, the deal has reportedly fallen through with **lenders not agreeing** to Brookfield's aggressive demand of taking 60-70% haircut on the debt.

ORIX – A Leading Japanese Conglomerate

ORIX, a Japanese financial services and asset management company, owned a 49% stake in a total of 874MW of wind power projects with India's debt-strapped Infrastructure Leasing and Financial Services (IL&FS). ORIX is now looking to buy the final 51% stake in the projects. Orix is one of the leading conglomerates in Japan with a presence in leasing, financing, life insurance, banking, asset management, automobile related services, real estate, environment and energy services.

Sembcorp – Investing Locally in SEIL

Singapore based integrated energy player Sembcorp [plans to invest](#) more in its Indian subsidiary Sembcorp Energy India Limited (SEIL). The company owns 1.7GW of capacity in India including 550MW under development, as of June 2019.

The company looked to have an initial public offering (IPO) in FY2018/19 of a fresh issue of up to US\$587m shares and up to 147m shares offered from its existing shareholders. However, Sembcorp has now decided to change its IPO plans and instead pour additional private capital into SEIL.

Institutional Investors

Recently McKinsey & Company produced a [report](#) for Norwegian Government Pension Fund Global (GPF) reviewing investment in global markets for unlisted renewable energy infrastructure. McKinsey suggested that institutional investors are increasingly developing a new asset class for unlisted renewable energy driven by exceptionally low global bond yields, the attractive risk-return-tenor characteristics of the infrastructure market, and the increased maturity of renewable energy technologies.

Institutional investors are increasingly developing a new asset class for unlisted renewable energy.

The capacity to deploy trillions of dollars of global capital immediately is limited; however, the scope is growing rapidly. The renewable energy industry is expected to be a multi-trillion-dollar industry by 2030 according to McKinsey & Co.

As figure 4 shows, the top two Indian renewable energy companies feature in leading global renewable energy infrastructure transactions.

Figure 4: Renewable Energy Investments by Global Investors

Buyer	Seller	Acquisition target	Project phase ¹	Total capacity of acquired asset GW	Deal value USD, billions	Investment model	Ownership structure
CPPIB INVESTMENT BOARD	ENBRIDGE	Renewable energy portfolio (2018)	Non-operating Operating	1.8	1.3	Indirect investment	<ul style="list-style-type: none"> CPPIB (49%) Enbridge (51%)
	NEXTERA ENERGY	Renewable energy portfolio (2018)	Operating	0.4	0.7	Direct investment	<ul style="list-style-type: none"> CPPIB (100%)
	ADB	ReNew Power Ventures (2018)	Operating	4.9	0.4	Indirect investment	<ul style="list-style-type: none"> CPPIB (16.2%) GS (48.6%) ADIA, Jera, GEF
CDPQ	enel	Renewable energy portfolio (2018)	Operating	1.8	1.4	Indirect investment	<ul style="list-style-type: none"> CDPQ and CKD IM (80%) Enel (20%)
	DONG ENERGY	London Array (2017)	Operating	0.7	1.1	Direct investment	<ul style="list-style-type: none"> CDPQ (25%) E-on (30%) Ørsted (25%) Masdar (20%)
OMERS	ARCLIGHT	Leeward Renewable Energy (2018)	Non-operating Operating	1.7	Undisclosed	Indirect investment	<ul style="list-style-type: none"> Omers (100%)
ABP	CapitalDynamics	Renewable energy portfolio (2018)	N/A	1.2	0.4	Fund investment	<ul style="list-style-type: none"> ABP, CalSTRS and ADIA
	Primary investment	Askalen (2017)	Non-operating	0.3	1.2	Direct investment	<ul style="list-style-type: none"> ABP (100%)
PFA	Ørsted	Walney Extension (2017)	Non-operating	0.7	1.3	Direct investment	<ul style="list-style-type: none"> PFA (25%) PKA (25%) Ørsted (50%)
PGGM	EDF	Renewable energy portfolio (2018)	Operating	0.9	Undisclosed	Direct investment	<ul style="list-style-type: none"> PGGM (50%) EDF (50%)
TEMASEK	CypressCreek Renewable Energy	Renewable Energy (2018)	Non-operating Operating	0.3	0.7	Indirect investment	<ul style="list-style-type: none"> N/A
GIC	Greenko	Greenko (2015-2018)	Non-operating Operating	4.5	1.0	Indirect investment	<ul style="list-style-type: none"> GIC (60%) ADIA (15%) Founders (25%)
ADIA	CapitalDynamics	Renewable energy portfolio (2018)	N/A	1.2	1.2	Fund investment	<ul style="list-style-type: none"> ABP, CalSTRS and ADIA
	Greenko	Greenko (2015-2018)	Non-operating Operating	4.5	0.3	Indirect investment	<ul style="list-style-type: none"> GIC (60%) ADIA (15%) Founders (25%)

Source: McKinsey & Company.

ReNew Power and Greenko

ReNew Power with 7.5GW of capacity installed and under development and Greenko with 4.7GW of capacity installed are India's two leading renewable energy companies.

ReNew Power is backed by a mix of international private and institutional investors: Goldman Sachs; Canada Pension Plan Investment Board (CPPIB); Abu Dhabi Investment Authority (AIDA); JERA of Japan (a joint venture of TEPCO and Chubu Electric Power); and a U.S. based alternative asset manager [Global Environment Fund \(GEF\)](#). GEF is a private equity asset manager with a focus on clean energy,

energy efficiency, and sustainable natural resource management companies. The company has invested around US\$1bn in these sectors worldwide.

In June 2019, the company raised **US\$300m** through a rights issue from three of the backers infusing US\$100m each. In the past, ReNew had raised long term debts from the **Asian Development Bank (ADB)** and the **Overseas Private Investment Corporation (OPIC)** of total US\$640m. It had also accessed the international market through US\$475m of **masala bond issues** in February 2017 and US\$375m of **green bonds issues** in March 2019, offering a yield of 6.67% per annum for five years.

Greenko is owned by two sovereign wealth fund investors: the Government of Singapore Investment Corporation (GIC) and the Abu Dhabi Investment Authority (ADIA). Over the last decade these funds have invested a total US\$2.2bn in Greenko, with two new rounds of primary equity to a total of US\$824m raised in June and July 2019. The funds deployed will be used to build two **mega energy storage projects** of 1.2GW each in Pinnapuram, Andhra Pradesh and Saundatti, Karnataka.

Multilateral Development Banks

Asian Infrastructure Investment Bank

In July 2019, the Asian Infrastructure Investment Bank (AIIB) announced **US\$100m loan to L&T Infrastructure Finance Company Limited (LTIF)**, a subsidiary of L&T Finance Holdings Ltd and a leading non-bank financier of renewable energy in India. The financing marks AIIB's first loan to a non-banking finance company (NBFC). L&T will use this capital to fund solar and wind energy projects in India. Given the power sector stress in India's mainstream public sector banks, NBFC's will play a key role in funding infrastructure projects going forward.

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Japan International Corporation Agency

Japan International Corporation Agency (JICA) has executed a Rs5,000 crore (US\$700m) loan agreement for the 1GW Turga Pumped Hydro Storage project in the Purulia district of West Bengal. The project entails building four reversible pump turbines of 250MW each.

Pumped Hydro Storage technology is an extremely important facet of the energy transition as India looks to integrate large amounts of renewable energy into the grid. It allows a further diversification of energy storage systems along with batteries to provide flexible supply capacity.⁵

⁵ IEEFA, **Pumped Hydro Storage in India**, March 2019

KFW

KFW, the German state-owned development bank, has been supporting India in its energy transition through investments in renewable energy and grid enhancement projects. In 2011, KFW provided concessional financing and technical assistance to commission the [125MW Sakri Solar Power Plant](#) in the Dhule district of Maharashtra. KFW is continually looking to support energy storage and energy efficiency projects in India.

GIZ

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), a German development agency, [actively operates in India](#) and provides financial and technical assistance for renewable energy projects.

The traditional multinational development banks such as the World Bank, its financial services arm the International Finance Corporation (IFC), and the [Asian Development Bank \(ADB\)](#) have always been involved in thermal power and transmission infrastructure projects. However, recognising the global pivot to cleaner energy technologies, the development banks have decided not to invest in coal-fired power assets globally going forward.⁶ This move is expected to redirect funds towards clean energy projects in India.

Development banks have decided not to invest in coal-fired power assets globally going forward.

ADB intends to deploy US\$3bn annually by 2020 in new low emissions lending across Asia.

Global Energy Utilities

Global energy utilities not only bring foreign debt and equity capital but also play an important role in the energy transition through their access to international technical expertise.

India's renewable energy sector has managed to attract attention and participation from some of the leading global power utilities.

Engie

The French power utility made inroads into India's renewable energy market through signing a PPA with SECI for the 100MW Mirzapur solar power plant in Uttar

⁶ IEEFA, [Over 100 Global financial institutions are exiting coal, with more to come](#), 27 February 2019

Pradesh in June 2016. In July 2019, the utility announced that its total renewable capacity in India had [exceeded 1.5GW](#).

Enel

The Italian utility's renewable energy arm Enel Green Power owns [170MW](#) of renewable energy capacity in India. In IEEFA's view, the utility is a global transition leader. Its presence and experience in the global market has enabled the power utility to dramatically drive down renewable energy tariffs.

Continuum Wind Energy

Continuum Wind Energy backed by Morgan Stanley Infrastructure Partners, is looking for buyers. Royal Dutch Shell, Norway's state utility Statkraft, and CLP India (China Light and Power) are in a [race to acquire](#) Continuum, which has more than 700MW of operational wind assets and a development pipeline of almost 1,700MW.

Fortum

The Finnish state-owned power utility started its first solar business in India. In June 2018, Fortum sold part of its Indian [185MW solar portfolio](#) to UK Climate Investment (40%) and Elite Alfred Berg (14%), a Finnish asset manager.

Top Indian Conglomerates

In addition to the foreign investors backed renewable energy companies, Indian power giants such as Tata Power and the Adani Group are at the forefront of the energy transition. Their expertise in the Indian infrastructure business, and the political clout they wield to influence government policies will play a key role in shaping the energy markets.

Tata Power

Tata Power is one of the largest private integrated energy companies with generation, transmission and distribution businesses. It has also operated a clean-tech fund since 2011 in partnership with the IFC.

Tata Power owns 2.6GW of operational renewable energy generation assets across India. It also has a solar module manufacturing capacity of 1.6GW.

Aligned with India's recent battery manufacturing ambition, Tata Chemicals announced a [Lithium-ion battery manufacturing capacity](#) in Gujarat's Dholera Special Investment Region with an investment commitment of Rs4,000 crore (~US\$600m). The facility will be powered with a very cheap C&I tariff of Rs4.65/kWh compared to average C&I tariffs of Rs8-10/kWh. This cost reduction will help Tata's cost competitiveness in battery manufacturing materially.

The Adani Group

The Adani Group is India's fastest growing infrastructure conglomerates with 4.5GW of renewable energy capacity under development, 13,464 circuit kilometres (ckt) of transmission lines (in the listed Adani Transmission) and 1.2GW of module manufacturing capacity. It also operates an integrated electricity business in the city of Mumbai, Maharashtra.

Adani Green Energy is a prominent listed player in India's renewable energy sector that has contributed to the growth of renewable capacity by regularly participating in competitive reverse bidding auctions, bringing to bear significant capital resources and as a result, driving down prices to the benefit of Indian electricity consumers.

NTPC & NLC

Apart from the top private players, state-owned utilities such as NTPC (India's state-owned thermal power utility) and NLC (formerly Neyveli Lignite Corporation) of Tamil Nadu has also played an important role of transition agents. NLC recently announced commissioning of a [100MW solar project](#) in the Tirunelveli District of Tamil Nadu, taking their total installed renewable capacity to 858MW.

NTPC has been successfully playing a role in facilitating renewable energy contracts of roughly 10-15GW for the central government as a third party for generation companies and discoms.

A Green Investment Bank

A Climate Policy Initiative (CPI) [report](#) from July 2019 emphasises building out the depth of debt and equity markets in India, focusing on financing green infrastructure. Whilst the likes of well-established Indian majors such as ReNew Power, Hero Energies, ACME and Greenko have been able to access international financing markets owing to their track record, their size and/or internationally credible equity investors, small and medium entities still struggle to access debt financing.

CPI suggests a need to create specific financial vehicles - Alternative Investment Funds (AIFs) - which are essentially managed pools of money that can be invested in pre-specified mandates. For instance, AIFs could invest in debt securities issued by renewable energy developers with already operational assets. This essentially reduces the cost of capital, as risk on already operating assets are lower, thus helping developers unlock equity, which could be infused into new projects.

Green Investment Banks have been very successful (and profitable) in mobilising capital in Germany (KfW), Brazil (BNDES), Australia (the [Clean Energy Finance Corp](#)), New York ([NY Green Bank](#)), England (the [Green Investment Bank](#), privatised in 2017 via a sale to Macquarie Group) and New Zealand ([New Zealand Green Investment Finance](#)).

In IEEFA's view, India needs a Green Investment Bank that could support AIFs and recycle capital through them. The bank would also serve as a key knowledge hub to demonstrate financial learnings for the entire sector, drawing on international learnings (particularly for first-of-a-kind projects involving Indian deployment of newer technologies e.g. batteries) while subsequently helping solve financial access issues. First loss lending support could prove a key catalyst to encouraging private finance to support subsequent projects, accelerating the energy transition.

Need for Robust Policy Environment

India's target for sustained annual GDP growth of 7-8% in the coming decade, combined with the pressing need to address energy security issues drawn from an ever-rising fossil fuel import burden, plus India's international climate commitments on reducing emission, demands an accelerated investment in renewable energy generation, energy storage, energy efficiency and electric transport technologies as well as power transmission infrastructure.

The investment capital available globally currently exceeds the opportunities. India must provide a robust policy framework to nurture investor confidence, to better access this to-date largely latent potential. International investors are patiently looking at the Indian market and waiting for it to offer a robust policy environment.

**Investment capital
available globally currently
far exceeds renewable
energy opportunities.**

After a promising start to the energy transition campaign, India's progress of late has been disappointingly 'one step forward, two steps back'.

The technology driven energy transition requires structural changes in India's power sector, plus a better coordination between the centre and state governments to resolve the challenges of land acquisition, grid-connection, and payments related issues. IEEFA reviewed some of the crucially needed policy reforms and turn-arounds in our previous [report](#).

Despite the structural challenges of a large, populous and diverse developing nation, India is progressing in the right direction. In IEEFA's view, the constant chaos born out of striving efforts to be a world leader is far better than the calm of inaction.

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

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