India has ambitious renewable energy targets. As part of India’s Nationally Determined Contributions (NDCs) at the UNFCCC COP in Paris in 2015, India announced a 2022 target of 175GW of renewable energy, including 100GW of solar energy and 60GW of wind energy. These NDCs also included an implicit target of 350GW of renewable energy by 2030. Recently, at the UN Climate Summit in New York, India increased its ambitions by announcing an aspirational goal of 500GW of renewable energy by 2030.¹

India has made rapid progress towards these targets, with solar and wind capacities of 28.46GW² by March 2019 and 37.09GW³ by October 2019, respectively. However, India still has a long way to go towards its 2022 targets, in particular the solar ones. Given the federal structure of the Indian power sector—meaning that while the central government announces targets and provides high-level frameworks, the states are responsible for implementation—most of these capacities are likely to be procured at the state level, with some procurement happening at the central level as well.

In this context, India would need to not only double its efforts on state-level key initiatives that have been working well so far—such as the Renewable Purchase Obligation (where states announce targets on percentage of renewable procurement out of total electricity generation) and Solar Park Development (where states provide assistance on land procurement and grid interconnection)⁴—but also make sure that the key risks to renewable

² https://en.wikipedia.org/wiki/Solar_power_in_India
³ https://en.wikipedia.org/wiki/Wind_power_in_India
⁴ https://energy.stanford.edu/sites/g/files/sbiybj9971/f/3193_drivers_in_solar_discussion_paper_web1_0.pdf
deployment are managed well. In particular, the latter is going to be key to enable the required investment, which runs to the order of $100-1000 billion.⁵

**INDIA WOULD NEED TO MANAGE THE RISKS TO RENEWABLE ENERGY INVESTMENT, IN PARTICULAR THE OFF-TAKER RISK**

The risks to renewable deployment are manifold,⁶ including power markets, permits and interconnection, resource and technology, grid and transmission, financial sector, political, and currency. While detailed explanations of these risks are beyond the scope of this article, they fall broadly under the following categories: policy, markets, operations, and finance.

However, the biggest risk is the counterparty or off-taker risk, meaning the risk of either non-payment or delay of payment from the primary off-takers, i.e., the public sector distribution companies (DISCOMs). This risk could be the gating item in investment decisions and, even if the decision is made to invest, our analysis shows that this risk add close to 1.5 percentage points to the cost of capital (which typically runs between 10-15% in India. This makes renewable energy more expensive and less competitive.

The off-taker risk is starting to manifest in three different ways for renewable energy. One, we are starting to see significant delays in payments for both solar energy and wind energy. For example, in Telangana state, the cumulative dues to 3.6GW of solar projects stand at $203 million in June 2019.⁷ As another example in 2019, the DISCOMs in Maharashtra state were directed by the state regulator to pay $560 million of outstanding dues in 2018.⁸

Two, we are starting to see auction cancellations, the primary form of renewable energy procurement. For example, since the beginning of 2018, nearly 5GW of solar auctions have been cancelled in the states of Uttar Pradesh, Odisha, Gujarat and elsewhere.⁹ As another example, in 2018, the Solar Energy Corporation of India (SECI), a centralized procurement agency, cancelled 2GW of wind auctions.¹⁰

Three, beyond auction cancellations, we are also starting to see attempts at renewable energy contract renegotiations. For example, in 2019 the state of Andhra Pradesh is attempting to cancel existing solar and wind contracts totaling to more than 2GW of capacity.¹¹ As another example, in wind energy alone, 3GW of capacity worth $7.5 billion¹² in four states is facing uncertainty because of attempts at contract renegotiation.¹³

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⁵https://renewablewatch.in/2019/08/23/india-requires-700-billion-renewable-energy-investment
⁸https://mercomindia.com/maharashtra-discom-delayed-payments-three-wind-generators
⁹https://mercomindia.com/solar-auction-cancellations-need-a-fix
¹²We use a conversion rate of 1 USD = 70 INR
A key reason for this disarray is the dismal financial health of the DISCOMs. This is due to poor economic performance (in the form of the gap between cost and revenue for sale of every unit of electricity) as well as operational performance (in the form of aggregate technical and commercial losses). For example, in 2016 this resulted in a combined negative net worth for DISCOMs of $16.62 billion, with outstanding loans of $96.14 billion, outstanding payables against banks at 92 days, and outstanding payables against independent power producers at 121 days.

These issues, including delays in payments as well as contract renegotiations, are not new to the Indian power sector. However, renewable energy contracts haven’t confronted these issues in a serious manner until now, given that renewables so far produced a small fraction of total electricity generated. Only recently (i.e., during 2014-2019), as the share of renewable generation has grown to close to 10% and renewables are becoming more mainstream, we have seen these system-wide issues, which were historically faced by fossil fuel generation, starting to pop up for renewables as well.

INDIA WOULD NEED BOTH SHORT-TERM AND LONG-TERM SOLUTIONS TO ADDRESS THE OFF-TAKER RISK

These issues are starting to have a real impact on investor perceptions and consequently actual investments. During the first half of 2019, renewable energy projects in India Rating’s portfolio saw 25% more downgrades than upgrades. This contrasts with same timeframe in the previous year which saw more upgrades than downgrades. While other issues, such as higher import duties on solar panels may be further contributing to investor risk perceptions, the DISCOM-related issues have raised serious concerns about India’s ability to reach its ambitious renewable energy targets.

Fixing these issues requires a comprehensive approach and may take a long time. In the short term, however, on the specific issue of payment delays, a potentially useful solution could be a Payment Security Mechanism (PSM). A PSM is typically a contingent facility that would be publicly funded (e.g., government), and would cover payment delays from DISCOMs. Our analysis has shown that, on average, DISCOMs would need about 12 months of payment support, which translates to the PSM fund size to approximately 15% of the capital expenditure of the project being supported.

Given the government’s renewable energy ambition, recognizing this issue of payment delays, many payment security schemes have been not only proposed but also put in practice. For example, the Solar Energy Corporation of India (SECI), a centralized renewable energy procurement agency, was provided approximately $70 million for a PSM in February 2019.

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16 https://mercomindia.com/share-solar-7-percent-total-power-capacity
Similarly, the state of Andhra Pradesh allocated $80 billion for a PSM in August 2019.\textsuperscript{21}

However, these payment security schemes, at the very best, are short-term in nature, and are not addressing the key issue in the long term. In the long term, these issues require comprehensively fixing up the weakest link in the Indian power sector (i.e., the DISCOMs).\textsuperscript{22} This requires not only improving the financial performance but also operational performance.

The Indian government is aware of these issues. The Ujwal DISCOM Assurance Yojana (UDAY), launched in 2015, has provided a good start.\textsuperscript{23} As a result, DISCOMs have shown a significant increase in rating upgrades in 2019 by rating agencies, due to improving aggregate technical and commercial loss levels during 2018, filing timely tariff petitions for 2020, and demonstrating greater cooperation in terms of submission of information and facilitating meetings and discussions.

However, despite the positive signs, the Indian DISCOMs are still not completely healthy yet.\textsuperscript{24} In 2018, the per unit gap between cost and revenue was still around half a US cent (INR 0.33 per unit) as opposed to a target of zero; and the aggregate technical and commercial losses were still around 20% as opposed to a target of 15%. Further, the outstanding payments to power producers have now ballooned to approximately $6 billion in February 2019.

This indicates that a lot more needs to be done, without which India’s power sector will continue to see the DISCOM-related issues addressed here, undermining investor confidence in renewable energy investment. At the end of the day, India needs healthy DISCOMs to achieve its ambitious renewable targets.

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\textsuperscript{21} https://mercomindia.com/andhra-payment-security-mechanism-power-purchase
\textsuperscript{22} https://www.brookings.edu/wp-content/uploads/2019/10/India’s-Power-Distribution-Sector.pdf
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