

## CASE STUDY

# Renewable Energy Sector Development Project, India

August 2026



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## ***Executive Summary***

*India's power sector is heavily dependent on fossil fuels. This has resulted in high greenhouse gas emissions, air pollution, and resource depletion, posing significant environmental and health risks. Meanwhile, electricity demand has continued to rise, driven primarily by industrial and commercial consumption. Recognising these challenges, the Government of India has set renewable energy installed capacity target of 500 GW by 2030.*

*In October 2019, NDB approved a USD 300 million loan to Rural Electrification Corporation (REC) Limited to finance the construction of renewable energy power plants and associated evacuation transmission lines. The project delivered substantial development, environmental, and economic benefits. Operational renewable energy capacity of 655.6 MW was installed, contributing meaningfully to India's clean energy supply. Beyond generation capacity, the project facilitated critical transmission infrastructure. As NDB's first non-sovereign operation in India, the Rural Electrification Corporation project marked the Bank's initial engagement in green financing through a domestic development finance institution in India.*

*Key takeaways include the importance of regulatory stability, institutional capacity, and robust project preparation in renewable energy investments.*

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## **1. DEVELOPMENT CONTEXT**

India's power sector is heavily dependent on fossil fuels. In 2019, coal, gas, and diesel-based electricity accounted for nearly 63% of installed capacity, while renewables contributed for about 35%. This energy mix resulted in high greenhouse gas emissions, air pollution, and resource depletion, posing significant environmental and health risks. Meanwhile, electricity demand continued to rise, driven primarily by industrial and commercial consumption. Recognising these challenges, the Government of India has set an ambitious renewable energy target, initially aiming for 175 GW by FY2022 and later revising the target to 500 GW by 2030. India also committed to its Paris Agreement Goals, including reducing emissions intensity and increasing the share of non-fossil energy.

India has huge potential for electricity generation from renewable energy sources. The renewable energy potential was estimated at 900 GW, including 750 GW of solar energy. This potential, if harnessed, could play a crucial role in meeting India's energy needs in a sustainable manner. Further, the cost of generating electricity from renewable sources had a declining trend. Accordingly, the role of renewables in the energy mix has gained prominence. The Renewable Energy Sector Development Project was conceived to accelerate clean energy deployment aligned with national and global climate goals.

## 2. Project Description

The Renewable Energy Sector Development Project was financed through a non-sovereign corporate loan of USD 300 million extended by the New Development Bank (NDB) to REC Limited, a government-owned financial institution under India's Ministry of Power. Approved in October 2019 and disbursed in June 2020, the loan carried a 10-year tenor and was intended to support Government of India's priorities in clean energy expansion. The project marked **the first non-sovereign NDB operation in India** and demonstrated NDB's ability to fund large-scale renewable energy deployment through a domestic financial intermediary with flexibility in sub-project selection.

| Project Description |                                                                |
|---------------------|----------------------------------------------------------------|
| Country operation   | India                                                          |
| Approval date       | September 10, 2019                                             |
| Completion date     | June 2, 2022                                                   |
| Total project cost  | USD 493.92 million                                             |
| NDB financing       | USD 300 million                                                |
| Borrower            | Rural Electrification Corporation                              |
| Type of loan        | Non-sovereign                                                  |
| Alignment with SDGs | SDG 7 – Affordable and Clean Energy<br>SDG 13 – Climate Action |

REC Limited utilised the financing to on-lend to five renewable energy sub-projects, four wind and one solar project, implemented by private sector developers. These sub-projects were in the states of Gujarat and Rajasthan and complied with stringent technical, financial, environmental, and social eligibility criteria. Long-term Power Purchase Agreements (PPAs) of at least 15 years were mandatory prior to financing approval.

| Sub-Projects Cost Details |                                               |               |                    |
|---------------------------|-----------------------------------------------|---------------|--------------------|
| S. No.                    | Sub-Projects                                  | Capacity (MW) | Cost (INR million) |
| 1                         | Adani Wind Energy Kutch Five Limited          | 130.00        | 8,856.00           |
| 2                         | Adani Wind Energy Kutch Six Limited           | 75.60         | 4,910.00           |
| 3                         | Adani Wind Energy Kutch One Limited (SECI I)  | 50.00         | 3,738.50           |
| 4                         | Adani Wind Energy Kutch One Limited (SECI II) | 50.00         | 3,124.60           |
| 5                         | Avaada Sunce Energy Private Limited           | 350.00        | 14,933.30          |
| <b>Total</b>              |                                               | <b>655.60</b> | <b>35,562.40</b>   |

**Source:** Project Completion Report 2024, NDB.

Originally targeting 615.6 MW of installed capacity, the project ultimately delivered 655.6 MW, exceeding initial expectations. Total project cost amounted to INR 35,562.4 million (about USD 493.92 million equivalent<sup>1</sup>) and the implementation was completed by July 2022.

### 3. DEVELOPMENT IMPACT

The project delivered substantial environmental and economic benefits. Operational renewable energy capacity of 655.6 MW was added, generating approximately 1,584 GWh of electricity annually, contributing meaningfully to India's clean energy supply. This output has resulted in an estimated reduction of 0.56 million tonnes of coal consumption and 1.13 million tonnes of CO<sub>2</sub> emissions each year, directly supporting India's climate commitments and Sustainable Development Goals-7 (Affordable and Clean Energy) and 13 (Climate Action).

| Expected Outcomes against the Actual Achievement           |                                                                                                        |                                                                                                        |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Expected Outcome                                           | Performance Indicators                                                                                 | Actual Achievement                                                                                     |
| Reduction in coal consumption and CO <sub>2</sub> emission | By 2023<br>Reducing coal consumption of 488,292 tonnes and carbon emissions of 986,667 tonnes annually | By 2023<br>Reduced coal consumption of 561,277 tonnes and carbon emission of 1,134,144 tonnes annually |
| Annual power production from renewable energy sources      | By 2023<br>Annual power generation from NDB-financed sub-projects reaches 1,600 GWh                    | Annual production of power from sub-projects is about 1,584 GWh <sup>2</sup>                           |

**Source:** Project Completion Report 2024, NDB.

Beyond generation capacity, the project facilitated critical transmission infrastructure, including 1,200 km of 33 kV lines and 72 km of 220 kV lines, strengthening grid connectivity. Employment impacts were also significant, with around 1,000 jobs created during construction and 280 long-term operations and maintenance positions. Local communities benefited through corporate social responsibility initiatives focused on education, healthcare, skill development, and access to clean water.

From an economic perspective, all sub-projects achieved Economic Internal Rates of Return well above the prescribed threshold of 10%, under both low and high carbon price scenarios, indicating strong economic viability. Financial returns exceeded the weighted average cost of capital, confirming sustainability for both developers and lenders while demonstrating the catalytic role of development finance in accelerating low-carbon growth.

<sup>1</sup> Based on the appraisal exchange rate.

<sup>2</sup> From November 2022 to October 2023.

## 4. SUCCESS FACTORS

Several interrelated factors explain the strong performance and successful outcomes of the Renewable Energy Sector Development Project.

**First, policy and regulatory alignment** played a decisive role. The project was closely aligned with India's national renewable energy strategy, clear government targets, and long-term policy signals. A relatively stable regulatory framework provided investor confidence and reduced uncertainty, particularly critical in capital-intensive renewable energy investments.

**Second, the financial intermediary model proved effective.** Instead of financing individual projects directly, NDB provided a corporate loan to REC Limited, an experienced public sector financial institution with deep sectoral expertise. This structure enabled rapid deployment of funds, efficient sub-project selection, and effective risk management. REC's internal appraisal systems, including integrated risk rating, ensured that only technically feasible, financially sustainable, and PPA-backed projects were financed.

**Third, timing and liquidity support during the COVID-19 pandemic** significantly enhanced project relevance. The single-tranche disbursement in 2020 provided critical long-term liquidity at a time when private capital markets were constrained. This flexibility allowed project construction to continue with minimal delays despite global disruptions.

**Fourth, robust environmental and social (E&S) risk management systems** underpinned sustainable implementation. All sub-projects conducted Environmental and Social Impact Assessments and implemented Environmental and Social Management Plans consistent with national regulations and international good practices. No involuntary resettlement, indigenous people's impact, or significant biodiversity risks were identified, and compliance was continuously monitored through audits, site visits, and digital tracking systems. The project maintained a low environmental and social risk rating throughout its lifecycle. NDB actively engaged with REC and provided guidance on matters related to E&S.

**Fifth, strong implementation capacity and monitoring arrangements** were instrumental in the project's success. REC appointed project management agencies for real-time monitoring of construction progress, fund utilization, and regulatory compliance. Developers employed proven technologies, established supply chains, and experienced contractors, reducing execution risk. Regular reporting, field visits, and performance reviews ensured alignment with agreed milestones.

**Sixth, economic and financial soundness reinforced sustainability.** All sub-projects demonstrated Financial Internal Rates of Return above their respective Weighted Average Cost of Capital (WACC) levels, while Economic Internal Rates of Return remained robust under sensitivity analyses. This resilience to cost increases and revenue fluctuations reduced long-term viability risks.

**Finally, demonstration effects** amplified the project's impact. As NDB's first non-sovereign operation in India, the REC project marked the Bank's initial engagement in green financing through a domestic development finance institution. It strengthened REC's capacity, encouraged private sector participation, and showcased a scalable model for mobilising large volumes of capital into renewable energy while maintaining strong governance, financial discipline, and environmental safeguards.

## 5. KEY TAKEAWAYS

The Renewable Energy Sector Development Project represents a successful example of how development finance institutions can accelerate clean energy transition through innovative financing structures. By combining long-term international financing with a strong domestic intermediary, the project exceeded its original capacity addition targets and delivered measurable environmental, economic, and social benefits.

Key takeaways include the importance of regulatory stability, institutional capacity, and robust project preparation in renewable energy investments. The requirement for signed long-term PPAs prior to financing effectively mitigated off-take risk, while strong environmental and social systems ensured sustainable outcomes and community acceptance. The project also highlighted the value of flexibility and timely liquidity support during periods of economic stress.



## **About BRICS-NDB Knowledge Portal**

The BRICS-NDB Knowledge Portal is a joint initiative of BRICS and NDB. The Portal aims to institutionalise the existing knowledge available across BRICS Working Groups by systematically compiling them in alignment with NDB priority areas and sharing good practices from NDB's operations.

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