FACTSHEET

CLEAN TECHNOLOGY FUND-RENEWABLE ENERGY INTEGRATION (CTF-REI) INVESTMENT PLAN FOR INDIA

CIF CLIMATE INVESTMENT FUNDS

BACKGROUND

As the world takes action to meet the Paris Agreement goals and provide access to modern energy sources to reduce energy-related CO_2 emissions to limit climate change, the share of renewables has been growing at an accelerated pace. The growth in installed capacity of solar and wind has more than doubled between 2018 and 2023, and the share of global electricity generation nearly doubled during this same period. In fact, according to the IEA, there was 50% more renewable capacity in 2023 than in 2022, and the expectation is faster growth over the next 5 years.

The integration of variable renewable energy into the grid poses unique challenges and is a key barrier to the scaling up of renewable energy. A September 2024 IEA report also notes that failing to undertake integration measures inline with the climate energy pledges, "...the global power sector could jeopardise up to 15% of solar PV and wind energy or variable renewable energy (VRE) generation in 2030."

To address system-wide barriers to the integration of higher shares of intermittent renewable energy generation into the grid and take advantage of the opportunities arising from the energy transition, the Climate Investment Funds launched the Renewable Energy Integration (REI) program in 2021.

The REI Program aims to enhance the flexibility of energy systems for a smooth integration of higher shares of variable renewable energy generation into the grid and increase off-grid access to renewable energy. CIF selected India as one of the pioneer countries for REI investment, alongside Colombia, Brazil, Costa Rica, Fiji, Mali, Kenya and Türkiye.

THE CHALLENGE

India stands at a critical juncture in its holistic energy transition journey. As the nation is preparing to meet its pressing need to cater to its growing energy demands, the structure and composition of its energy mix are poised to change with an increasing share of renewable energy.

India's per capita power consumption at 1,255 kWh is well-below the global average. Demand for electricity in the country is expected to grow by ~55% in the coming decade. As on September 2024, India had an overall installed power generating capacity of 417 GW, comprising 52.3% coal, 6.2% natural gas, ~40% renewables and 1.7% nuclear. The renewable energy installed capacity in the country was 178.98 GW (including 46.85 GW large hydro). As per the Central Electricity Authority's (CEA) estimates, the installed power generation capacity is poised to reach 899 GW and 1466 GW by the end of FY32 and FY40 respectively.

Following its COP26 announcement of Net Zero emissions by 2070, the Government of India released an updated Nationally Determined Contribution (NDC). The updated NDC by 2030 includes: (a) reducing emissions intensity of its GDP by 45% from 2005 levels; (b) achieving 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources; and (c) enhancing carbon sinks by an additional 2.5-3 billion tons CO_2eq.

To help achieve these goals, the Government of India has launched a series of actions and initiatives, including putting into place the National Solar Mission, along with other national missions such as the National Green Hydrogen Mission, and other relevant national missions on Energy Efficiency and on Battery Storage & Transformative E-mobility among others.

However, the current electricity infrastructure faces constraints. Among the key challenges are a critical need to further develop the transmission infrastructure and distribution systems, upgrading the grid, and a need for diverse funding options with long tenors and affordable terms for the upfront financing required to scale up renewable energy deployment. Other constraints include the need for innovative procurement frameworks and a power market design to accommodate the rise in renewable energy generation.

INVESTMENT PLAN HIGHLIGHTS

The REI Investment Plan was developed by the government of India in collaboration with the Asian Development Bank and the World Bank Group (IBRD and IFC). It aims to seek both financial support and technical expertise for initiatives aimed at enhancing renewable energy integration. The strategy encompasses three primary facets: the deployment of Energy Storage Systems (ESS) to increase grid flexibility, the fortification of infrastructure to boost renewable energy, and technical assistance across renewable energy grid integration value chain.

Through the Clean Technology Fund, CIF will provide $70 million in funding, which is expected to mobilize $865 million in co-financing from partner multilateral development banks, and the private sector by 2028.

1 | Project 1: Power System Strengthening Project

- CIF/CTF: $25 million
- ADB: $200 million
- Private Sector: $200 million

The project includes strengthening the distribution infrastructure and deployment of Battery Energy Storage System (BESS) for distribution utility, mobilizing the private sector to facilitate RE capacity additions to support BESS integration at distribution level, and the provision of technical assistance.

2 | Project 2: Integrated Renewable Energy Solutions Providing Round-the-Clock Supply for Commercial and Industrial Consumers

- CIF/CTF: $10 million
- ADB (PSOD): $100 million
- Private Sector: $100 million

The project includes the deployment of 200 MW of renewable energy integrated with BESS to provide round-the-clock energy for India's Commercial & Industrial sectors.

3 | Projects 3: Power Supporting Grid Strengthening in One or More Renewable Energy Rich States
4 | and Project 4: Offshore Wind Development Program

- CIF/CTF: $25 million
- IBRD: $200 million

Project 3 will support grid strengthening and transmission capacity expansion in two renewable energy-rich states, which includes the development of 400 kV double-circuit intra-state transmission infrastructure to facilitate the evacuation of renewable energy and ensure the grid is climate-resilient and capable of integrating advanced technologies. Project 4 will address the infrastructure challenges associated with offshore wind energy development, that includes financing and technical support for the development of grid infrastructure for power evacuation and port infrastructure in Tamil Nadu and Gujarat and the establishment of a

guarantee or risk-sharing facility, along with lines of credit, to mitigate risks for offshore wind developers.

5 | Project 5: Stand-alone BESS

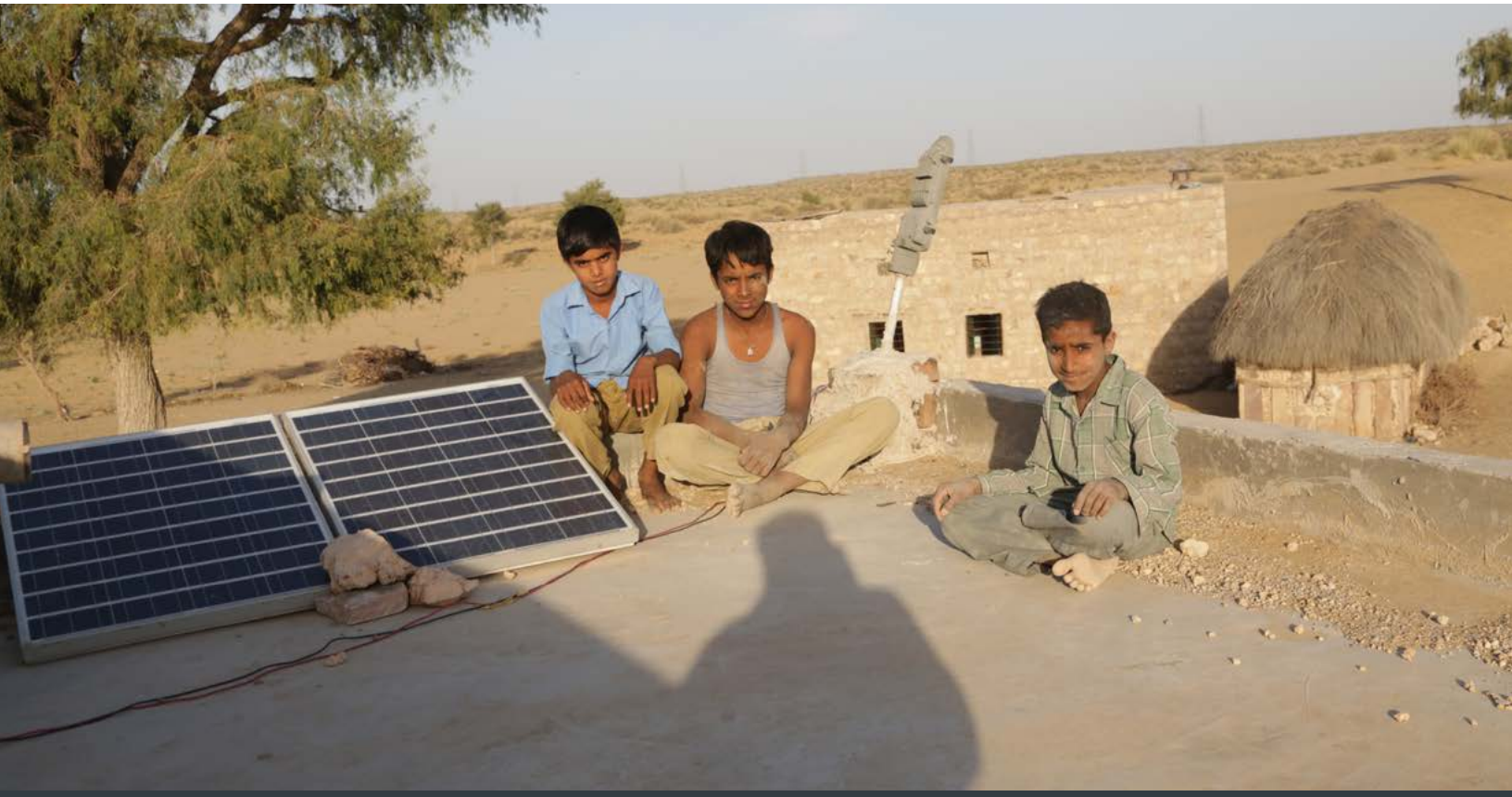
- CIF/CTF: $10 million
- IFC: $45 million
- Private Sector: $20 million

The project aims to finance greenfield private sector BESS that will deliver 180MW/360MWh of BESS capacity that will help address participation constraints associated with the high costs of implementing pioneering utility-scale BESS capacity and demonstrate the commercial viability of a utility-scale BESS at affordable prices.

IMPACT

REI will play a crucial role in integrating renewable energy in India, including:

- Approximately 1815MW of increased renewable energy generation capacity will be integrated;
- Over 4200 ckm (circuit kilometers) of transmission and distribution lines constructed;
- Over 1500 MWh of increased energy storage capacity;
- Approximately 14,000 green jobs created;
- Improved electricity reliability;
- And a reduction of emissions by approximately 3.5 $MtCO_2$/year.



THE CLIMATE INVESTMENT FUNDS

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