



# **Innovative Financing and Private Investment for Decentralized Renewable Energy Projects with Smart Grids**

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15 September 2022



# Outline

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2. Opportunities and Changing Energy Landscape
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# Key Energy Challenges in Asia and the Pacific



## Energy Access

- Roughly **350 million people** remain without adequate supply, and **150 million people** still have no access to electricity
- About **1.6 billion people** without access to clean cooking

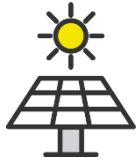
## Energy Security

- IEA scenarios suggest **doubling of electricity demand in the region by 2040**
- Cumulative renewable energy investments of **\$6.0 trillion by 2040**
- Cumulative electricity grid investments of **\$6.4 trillion by 2040**

## Environmental Sustainability

- About **50% of global CO<sub>2</sub> emissions from fossil fuels**
- Approximately **25% of CO<sub>2</sub> emissions from coal power generation**

# Opportunities and Changing Energy Landscape



Energy Landscape	Global Commitments	ADB's Commitment
<p>Profound changes in Asia and the Pacific:</p> <ul style="list-style-type: none"><li>• <b>Falling cost</b> of renewable energy vs. conventional energy</li><li>• Emerging new and innovative <b>low-carbon energy technologies</b></li></ul>	<p>Global commitments to universal access and climate action:</p> <ul style="list-style-type: none"><li>• Sustainable Development Goal 7: <b>Universal Energy Access by 2030</b></li><li>• Paris Agreement: <b>Nationally Determined Contributions (NDCs)</b></li></ul>	<p>ADB is the Asia and the Pacific Climate Bank:</p> <ul style="list-style-type: none"><li>• <b>\$100 billion of cumulative climate finance by 2030</b> from our own resources</li><li>• At least <b>75% of our operations support climate action</b> for the period 2019 to 2030</li></ul>



# ADB's Energy Portfolio in 2021

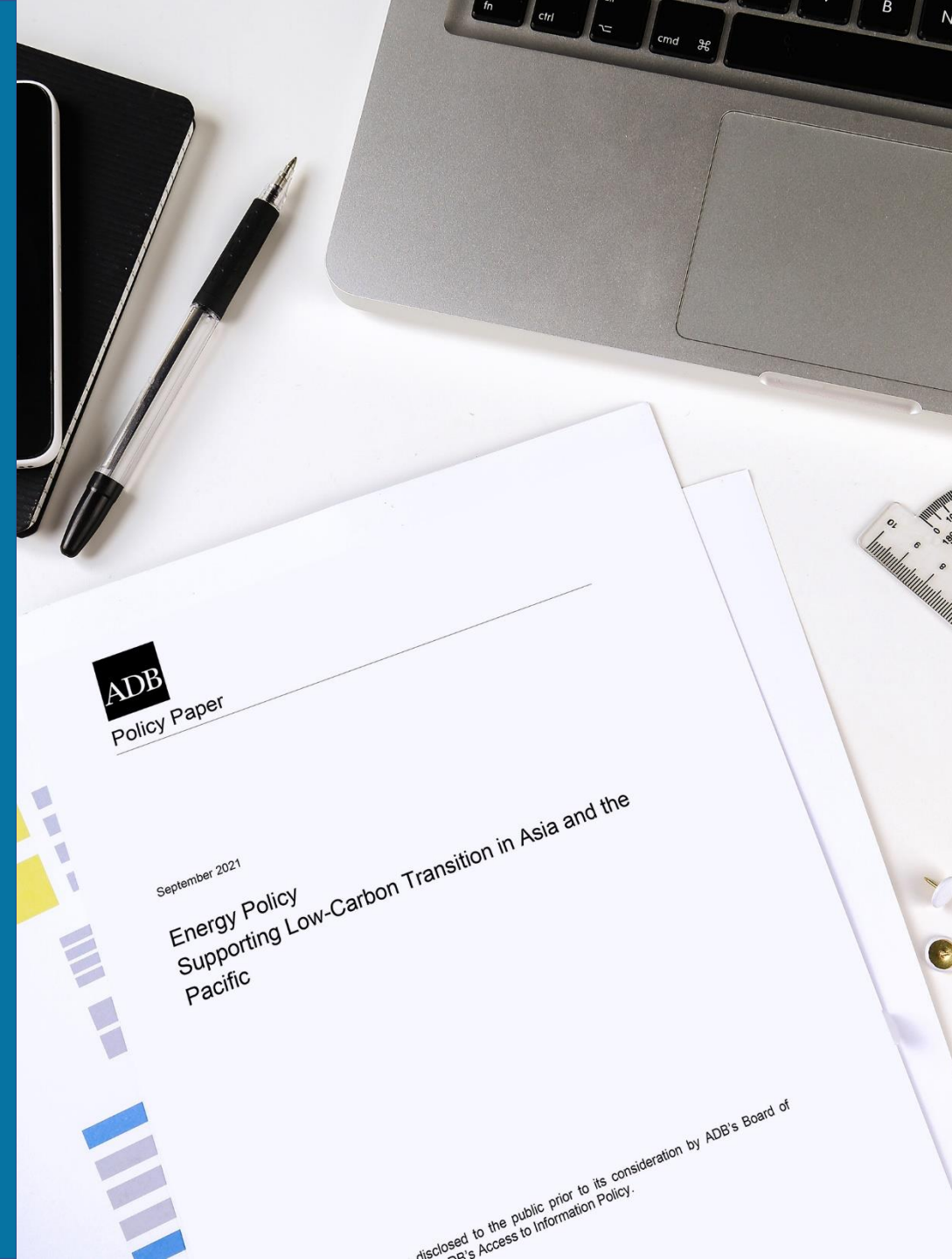
- About **\$1.7 billion** total energy sector lending approved across **19 energy projects**
- Approximately **\$693 million** in climate finance were approved in the energy sector
  - **\$659 million** climate mitigation (clean energy projects),
  - **\$ 34 million** climate adaptation,
  - **\$317 million** in energy efficiency,
  - **\$376 million** in renewable energy
- **17 projects** addressed climate change and disaster resilience



# ADB's Energy Policy (2021)

## *Supporting Low-Carbon Transition in Asia and the Pacific*

- Approved on 20 October 2021
- Prioritizes energy efficiency, renewable energy, energy storage, decarbonization and electricity transmission and distribution expansion and upgrade
- Supports energy policy reforms, long-term planning, regional cooperation and greater private sector participation
- Promotes use of smart, digital, innovative and best available technologies
- Supports deployment of renewable-energy-based micro-grids and investment in smart and resilient power grids.
- Highlights need to address environmental liabilities of use of PCBs in transformers and sulfur-hexafluoride (SF6) in substations.





# ADB Financial Products & Lending Modalities

## Sovereign and Non-Sovereign Financial Products:

- Loans
- Grants
- Technical Assistance
- Guarantees
- Others

## Lending Modalities:

- Project lending
- Sector lending
- Financial intermediation
- Emergency assistance lending
- Multitranche financing facility
- Policy-based lending
- Sector development program
- Results-based lending
- Others



# ADB's Approved Clean Energy Projects

## Financial Intermediation Loan for Rooftop Solar in Sri Lanka:

\$50 million credit line, through the government, to multiple local banks for financing of rooftop solar PV systems.

## Concessional Loan for Energy Efficiency in India:

\$200 million loan, combined with \$13 million grant, to establish an energy efficiency revolving fund to finance LED streetlights, LED bulbs, ceiling fans, electric vehicles and charging stations through public Super-ESCO.

## Private Sector Loan for Wind Power in Thailand:

First project to integrate utility-scale wind power generation with battery energy storage in the country. ADB provided long-term financing of \$240 million.

## Sovereign Project Loan for Battery Storage in Mongolia:

\$100 million loan for the first Utility-Scale Energy Storage Project to support decarbonization and help increase renewable energy use by providing a large energy reserve, load shifting capacity, and emergency backup.

## Grant Support for Renewable Energy in Kiribati:

\$8 million grant for the South Tarawa Renewable Energy Project – ADB's first project in Kiribati's energy sector – to install climate-resilient solar power capacity on a water reserve.

## ASEAN Catalytic Green Financing Facility (ACGF)

- An initiative of the ASEAN Infrastructure Fund to accelerate green infrastructure investments in Southeast Asia
- Provides ASEAN governments with technical assistance and access to over \$1 billion in loans from cofinancing partners.
- Supports governments to identify and prepare commercially viable green infrastructure projects
- Supported the preparation of the 100 MW Cambodia National Solar Park Project





# ADB's Technical Assistance

## Developing Smart Grid Technology for Efficient Utilization of Renewable Energy in China:

\$0.9 million technical assistance to draft a smart grid roadmap, update technical standards, improve wind resource forecasting.

## Smart Energy System in Mongolia:

\$1.5 million technical assistance to upgrade the electricity transmission and distribution grid to enable uptake of variable renewable energy. Project aims to establish a smart integrated monitoring, and control energy system using innovative technologies and solutions.

## Gujarat Solar and Smart Grid Development Investment Program in India:

\$0.3 million technical assistance to develop smart grid distribution system for grid-connected solar PV from rural and agricultural areas.

## Promoting Distributed Solar Photovoltaic Systems for Enhanced Energy Access in Uzbekistan:

\$1.3 million technical assistance to promote development of distributed solar PV including sector strategy, installation of pilot 20 kW solar PV system and strengthen institutional capacity.

## Smart Grid Capacity Development in South Asia:

Training and capacity building covering South Asian developing member countries.



# ADB's Decentralized Renewable Energy Projects

## Financial Intermediation Loan for Rooftop Solar in Sri Lanka:

\$50 million credit line, through the government, to multiple local banks for financing of rooftop solar PV systems

## Multitranche Financing Facility for Solar Rooftop Investment Program in India:

\$500 million financial intermediation loans and \$5 million capacity development technical assistance to on-lend to local banks

## Upscaling Renewable Energy Sector Project in Mongolia:

\$20.6 million grant and \$40 million loan to install distributed renewable energy systems in remote and less developed regions and build capacity of public utilities to optimize grid control systems

## Pilot Project for Solar PV, Battery and Small Hydro Project in the Philippines:

\$0.5 million pilot project in Daguitan that combines solar PV, battery and small hydropower in irrigation canal to power eco-tourism sites

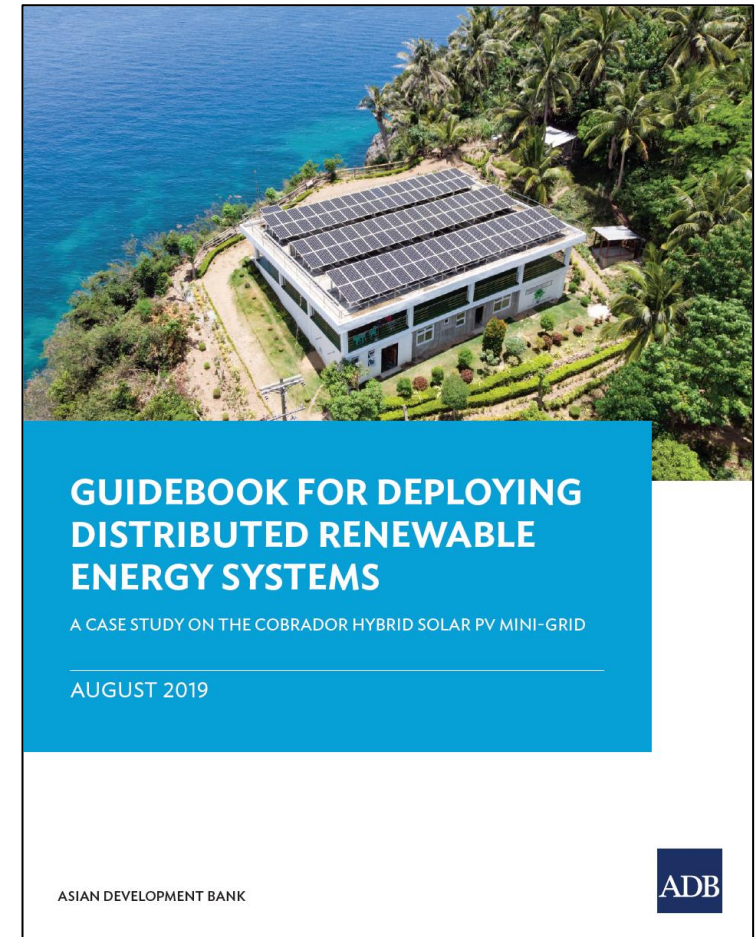




# ADB Case Study

## *Cobrador Hybrid Solar PV Mini-Grid*

- Remote and isolated rural areas
- Need for legal, regulatory and market environment
- Locally-available natural resources
- Use of geo-spatial mapping to determine best locations
- Hybrid Optimization of Multiple Energy Resources (HOMER) to model and determine least-cost options
- Solar PV + Battery + Diesel Mini-Grid solution to allow for affordable electricity access to rise from 8 hours to 24 hours per day
- Government support, capacity building, and grant funding were essential to attract private sector interest





An aerial photograph of a roof covered in solar panels. The panels are arranged in a grid pattern and are colored in shades of orange, red, and blue. A large white rectangular box is overlaid on the center of the image, containing the text "Thank you!".

**Thank you!**