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

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Outline

1. Key Energy Challenges in Asia and the Pacific
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## Key Energy Challenges in Asia and the Pacific

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<th>Energy Access</th>
<th>Energy Security</th>
<th>Environmental Sustainability</th>
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<td>• Roughly <strong>350 million people</strong> remain without adequate supply, and <strong>150 million people</strong> still have no access to electricity</td>
<td>• IEA scenarios suggest <strong>doubling of electricity demand in the region by 2040</strong></td>
<td>• About <strong>50% of global CO₂ emissions from fossil fuels</strong></td>
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<td>• About <strong>1.6 billion people</strong> without access to clean cooking</td>
<td>• Cumulative renewable energy investments of <strong>$6.0 trillion by 2040</strong></td>
<td>• Approximately <strong>25% of CO₂ emissions from coal power generation</strong></td>
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<td>• Cumulative electricity grid investments of <strong>$6.4 trillion by 2040</strong></td>
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# Opportunities and Changing Energy Landscape

## Energy Landscape

Profound changes in Asia and the Pacific:

- **Falling cost** of renewable energy vs. conventional energy
- Emerging new and innovative low-carbon energy technologies

## Global Commitments

Global commitments to universal access and climate action:

- Sustainable Development Goal 7: **Universal Energy Access by 2030**
- Paris Agreement: **Nationally Determined Contributions** (NDCs)

## ADB’s Commitment

ADB is the Asia and the Pacific Climate Bank:

- **$100 billion of cumulative climate finance by 2030** from our own resources
- At least **75% of our operations support climate action** for the period 2019 to 2030
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.

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**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
Thank you!