

Implementing Paris Agreement in Asian Developing Countries

Asian Development Bank's Supporting Role

Yongping Zhai, Technical Advisor
Energy Sector Group, Asian Development Bank

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Accelerating Low-Carbon Technology Transfer: Helping Developing Countries
Implement Nationally Determined Contributions

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Outline of Presentation

Part 1:

Asian Developing Countries' Commitment (INDCs)
and Challenges

Part 2:

ADB's Role: Financing Low Carbon Development
through Innovations

Part 1

Asian Developing Countries' Commitment (INDCs) and Challenges

Developing Asia's Context

- Low energy access
(electrification, clean energy for cooking)
- High carbon development path

ENERGY ACCESS SITUATION IN ASIA-PACIFIC



4.2 Billion
Population in Asia



1.8 Billion
People without access to clean cooking



426 Million

People without access to electricity



Electrification Rate in Selected Asian Countries (2013)

	Electrification Rate	Population without Access to Electricity (million)
Bangladesh	61%	60
Cambodia	34%	10
India	81%	237
Indonesia	81%	49
Laos	87%	1
Mongolia	90%	0.3
Myanmar	32%	36
Nepal	76%	7
Pakistan	73%	50
Philippines	80%	21
Sri Lanka	94%	1
Thailand	99%	1
Vietnam	97%	3

Source: REN21 – GSR 2016

Coal Fired Power Plants in Asia

	Current Plans			2°C Scenario			
	2015	2020	2015-2020	2020	2030	2040	2050
China	891	1,054	163	934	943	470	145
India	193	296	103	181	135	81	30
Indonesia	24	49	24				
Vietnam	11	36	25				
Philippines	6	13	7				
Pakistan	0	6	6				
World	1,927	2,334	407	1,987	1,612	718	271

Source: New Climate Finance 2016

Asian Developing Countries INDCs

All Asian development countries submitted INDCs
(except Timor-Leste and Uzbekistan)



Renewable Energy:

60% countries indicated quantified renewable energy targets in terms of Increasing shares of renewable energy or non-fossil fuels in energy mix; increasing shares of renewable energy in electricity generation; installing new/additional renewable energy capacity

Incentive policies for renewable energy through subsidy or feed-in-tariff rate, tax exemption etc.

Renewable target	Country
100% RE share in Power generation	Fiji, Samoa, PNG, Vanuatu, Tuvalu
RE share in Power generation /power consumption/installed capacity above 30%	India, Sri Lanka, Bhutan, Nepal, Myanmar, Tajikistan, Kyrgyz, Cook Island, Palau, Tonga
RE share in Power generation /power consumption/installed capacity at the range of 20%-30%	Mongolia, Lao, Thailand, Indonesia



Other Measures included in INDCs

- Energy efficiency
- Adopt high efficient and low emission clean coal technology in new power generation
- Retrofit existing power generation units by using modern technology
- Develop renewable energy and increase use of renewable energy
- Improve existing transmission and distribution network
- Extension and enhancement of power grid

Developing Asia's Challenges in Energy Transition

- **Increase energy demand along with fast economic growth**
- **Limited growth in natural gas power and significant increase in new coal-fired power units with little commitment to CCS**
 - ✓ Only China intends to demonstrate CCU/CCS technology
- **Existing power infrastructure not fitting needs**
 - ✓ e.g high renewable energy penetration adding huge pressures on power grid and requiring power storage
 - ✓ centralized power grid network v.s distributed renewable resources
- **large population without access to modern energy**
- **Lack suitable and affordable low carbon technology**
- **Difficulty in financing low carbon energy investment**
- **Lack of effective policy & regulatory framework**
e.g subsidy to fossil fuels and inadequate carbon price signal

Developing Asia's Potentials in Energy Transition

- **Decarbonizing Power Sector**

- Adopting high-efficient and low emission clean coal technology and CCS ready for new coal-fired power generation units

e.g Ultra/Supercritical technology (45-50% efficiency) savings 30% carbon emissions compared a subcritical technology with 35% efficiency

- High efficient gas-fired power generation as near term option

e.g a CCGT(efficiency 60%) saving more than 50% carbon compared to clean coal technology

- Increase uptake of renewable power
- ✓ Flexible power generation, smart grid and energy storage is crucial for increasing integration of RE
- ✓ Distributed renewable power generation and mini, off-grid expanding access to renewable power

- **Improving energy efficiency in energy end-use sectors**

Energy saving in Buildings sector

- ✓ Energy saving opportunities: Lighting, water heating , heating and cooling, building envelope
- ✓ For example: LED technology(saving energy 50% - 70%), solar thermal, heat-pump technology, gas thermal systems, condensing boiler, integrated technologies for district heat and cooling(DHC)

Energy efficiency improvement and fuel switch in Industry

- ✓ Energy saving opportunities: Use lower-carbon fuels and feedstocks; Increase recovery of excess energy; Deployment of innovative low- carbon process technologies

Energy efficiency improvement in transport sector

- ✓ Electric vehicles (both battery electric and plug-in hybrids)
- ✓ Biofuel: e.g Ethanol-sugarcane have mitigation potential 79%-87%
- ✓ Mode shift

Global Climate Battle: Succeed or Fail in Asia

- Asia energy transition is crucial for the world meeting Paris Agreement goals
 - ✓ *Asia accounting for more than half of global energy consumption in 2035 and 50% of global GHG emissions in 2030*
- Need for policies to control use of fossil fuel and incentivize low carbon energy development
- Scale up investment in low carbon energy technology
- Innovative technology/solutions and business models to bring down the cost of low carbon energy
- Total investment in power sector alone at least :US\$4 trillion from 2016 to 2030 (US\$270 billion /year), of which more than 30% in renewable energy

Part 2

ADB's Role: Financing Low Carbon Development through Innovations

ADB Energy Sector Priorities

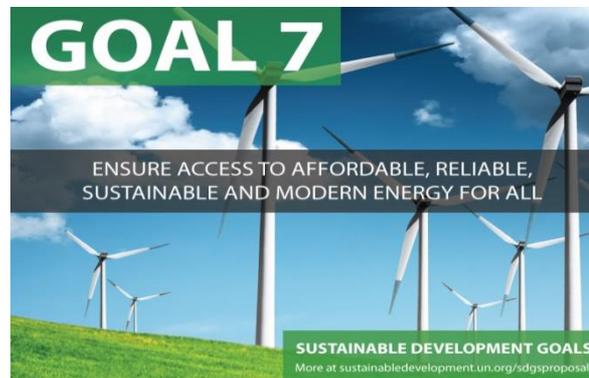
- Support SDG7 and INDCs in Energy Sector

- Focused Areas

- *Energy access*
- *Renewable energy*
- *Energy efficiency*

- Expanding Operations with Innovations

- *Advanced technologies*
- *New financing instrument*
- *New business model*
- *Cross border energy initiatives*



ADB's Support in Low Carbon Technology Transfer

- ❑ **Supporting application and deployment of new low carbon technologies and solutions**
 - Renewable power integration
 - Smart grid
 - *High-voltage transmission super-grids*
 - *Mini grid with battery storage technologies, off-grid solutions*
- ❑ **Supporting development and demonstration of strategic clean energy technologies**
 - *E.g CCS, power storage*
- ❑ **Improve energy efficiency in both energy supply and energy use**
 - ✓ E.g High efficiency technology for power generation, USC, A-USC, CCGT

❑ **Low carbon technology transfer**

- Focus on region-specific priority technologies for low carbon transition
- Develop integrated approach to facilitate technology transfer and investment
- ✓ E.g piloting Hunan technology promoting mechanism
- Build DMCs capacity for adopting and absorbing new low carbon technologies
- Foster technology innovation
- Facilitate regional cooperation on technology transfer in particular South-south cooperation

❑ **Innovation in financing model and business model**

- Innovate financing platform
- Establish risk mitigation instruments
- Assist DMCs in access to international financing mechanism

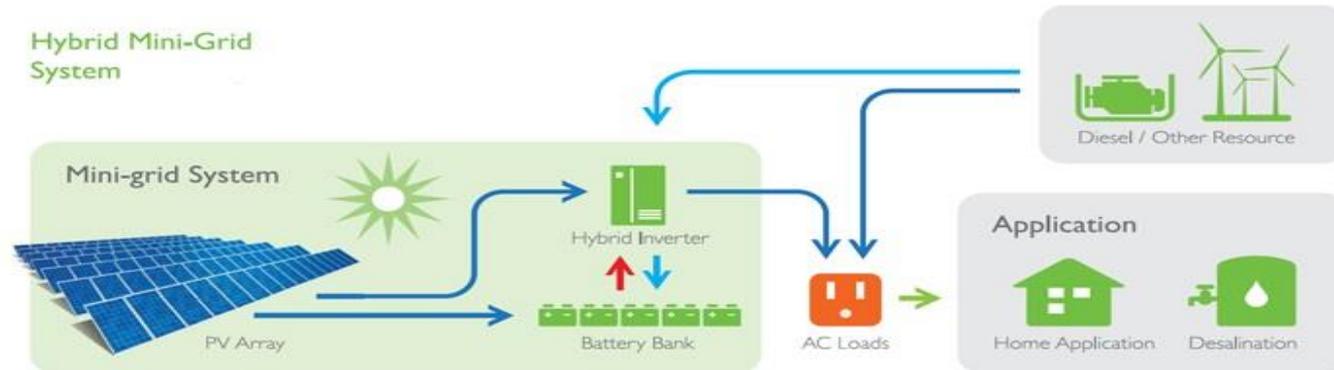
China Qinghai Delingha Concentrated Solar Power Project

- The first and the largest utility scale CSP plant in China. 50 megawatt capacity with 7 hours thermal storage, which annually generates 197 gigawatt hour of electricity at any time of the day; 154,000 tons of carbon dioxide emission avoidance;
- Total project cost \$322 million of which \$150 million ADB loan, \$97 million equity contribution, and \$75.58 million is co-financed by the Export-Import Bank of China;
- Completion/commercial operation 2018.



Solar Based Hybrid Mini-Grid Project in Maldives

- Current generation 100% imported diesel based and high cost (US cents 30-50/KWh) resulting heavy subsidies in the sector
- The project is transformational shifting whole country towards renewable energy with solar PV, efficient diesel generation, battery storage and advance energy management systems
- Estimated \$140 million -ADB and SREP \$50 million, EIB and IsDB \$60 million. Additional \$5 million from first ever JFJCM project to pilot advance storage and energy management systems
- The knowledge and innovations in the project for improved and more effective adoption of advance technologies towards large penetration of renewable energy in island nations.



Solar Energy Development in Solomon Islands

- **Solomon Islands Solar Power Development Project**
 - Proposed 1.8MW grid connected PV installation for the Honiara grid.
 - Ground mounted.
 - Funding to be approved in 2016. Commissioning 2017.
- **Solomon Island Household Solar System Private Sector Trials**
 - 2015 design of 'fee for service' private sector models to expand energy access in rural communities
 - Utilizing innovative technologies from remote payment and remote system controls
 - Building on successful models trialed by ADB in other countries.



Simpa “Off Grid Pay-As-You-Go Solar Project” in India



ADB Investment: \$2 million equity investment in 2013, \$5 million CTF loan under preparation in 2015

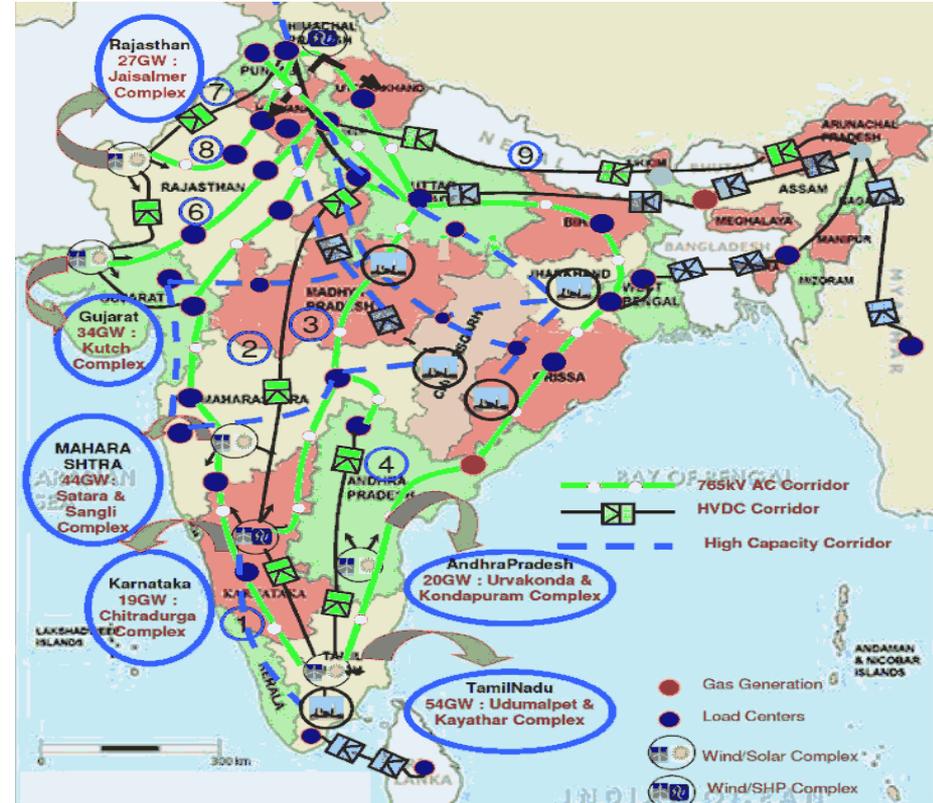
Investee: Simpa Networks

Strategy: Simpa offers an unique pay-as-you-go metering solution for off-grid solar home systems in rural India by using mobile phones technology to transform recurring energy expenditures into an eventual capital asset purchase. Scaling up of solar “leasing as a service” model.

Development Impacts: Increased access to affordable clean energy for base of the pyramid (BoP) consumers in rural India (10,000 systems installed as of April 2015), avoiding the greenhouse gas emissions by reducing kerosene usage.

India Green Corridor Project

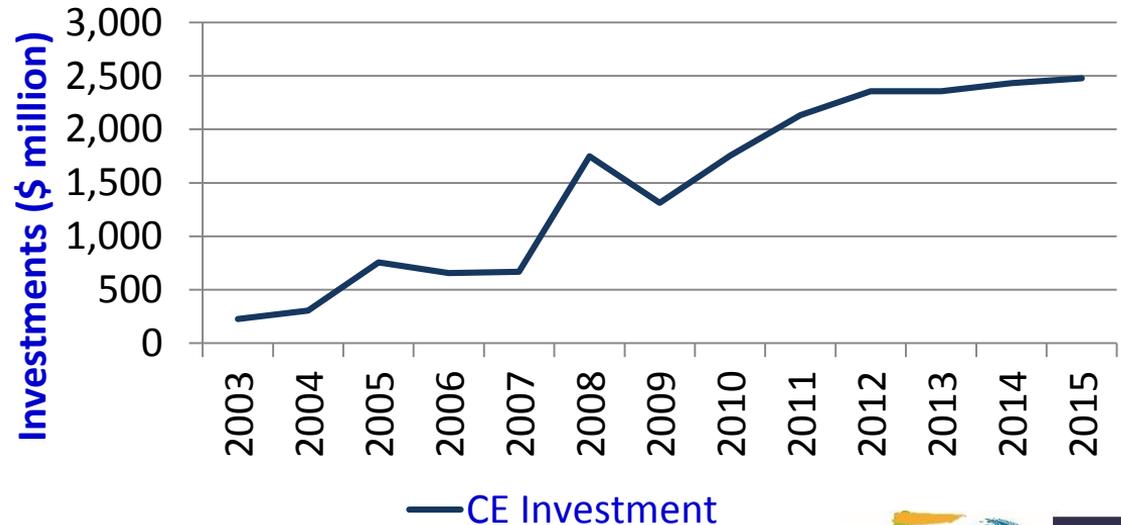
- India's "Green Energy Corridor" facilitates the transfer of RE from RE rich states to other states
- Absorption and smoothing out of the RE intermittency
- Static compensators (STATCOMs) to enhance grid stability
- \$500 million sovereign + \$300 million non-sovereign loans



ADB Clean Energy Investment 2003-2015

- Investments grown over the years
 - Renewable Energy
 - Energy Efficiency: supply side and Demand Side

Record of ADB's Clean Energy Investments
2003 - 2015



ADB Clean Energy Investment 2015

- In 2015 - \$ 2.5 billion

Clean Energy Investment-Public vs Private Sector, 2015 (\$million)



Public (66.1%)

\$1,833.2

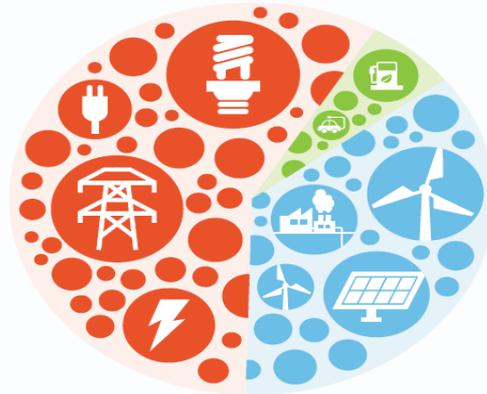
Private (26%)

\$644.5

Source: ADB Database 2015.

Clean Energy Investments by Project Type

Clean Energy Investment by Project Type, 2015 (\$ million)



Energy Efficiency (55.3%)

\$1,370.0

Clean Fuel (5.9%)

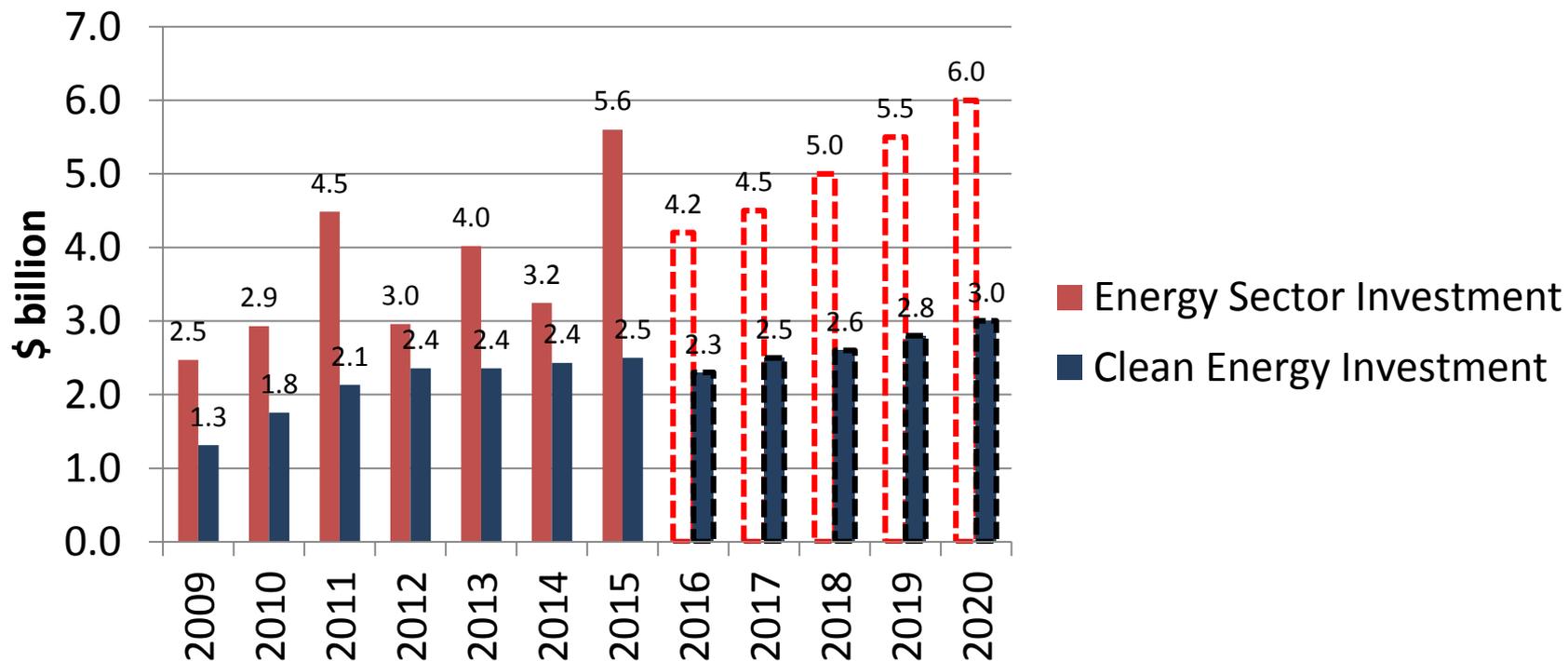
\$146.0

Renewable
Energy (33.8%)

\$961.7

Source: ADB Database 2015.

ADB Energy Sector Lending Outlook



ADB's Climate Finance Target

	Sector	Proposed contribution by 2020
Mitigation (goal: \$4 billion total by 2020)	Energy	\$3 billion
	Other sectors	\$1 billion
Adaptation (goal: \$2 billion total by 2020)		\$2 billion
	Total	\$6 billion



Asia Development Bank Rooftop Project / 571 KW / Manila, Philippine

Thank you!