

**The 1st Workshop for APEC Initiative
for Enhancing Quality of Electric Power Infrastructure**

**ADB's Policy and Practices in Financing
High Quality Energy Infrastructure**

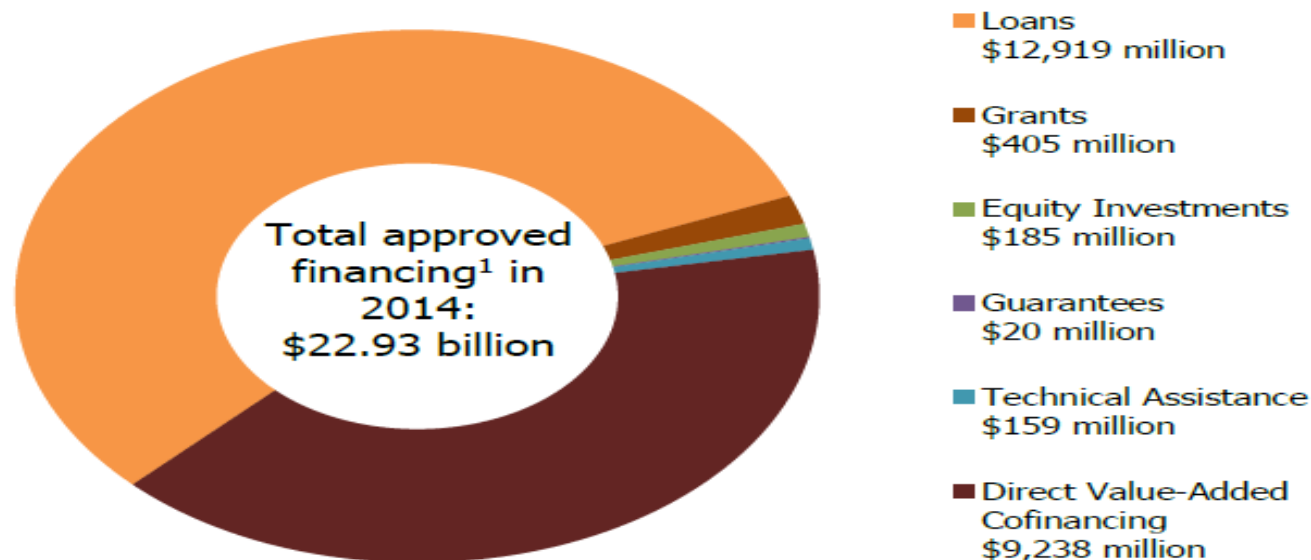
Dr. Yongping Zhai
Technical Advisor, Energy Sector Group
Asian Development Bank



ADB Fast Facts

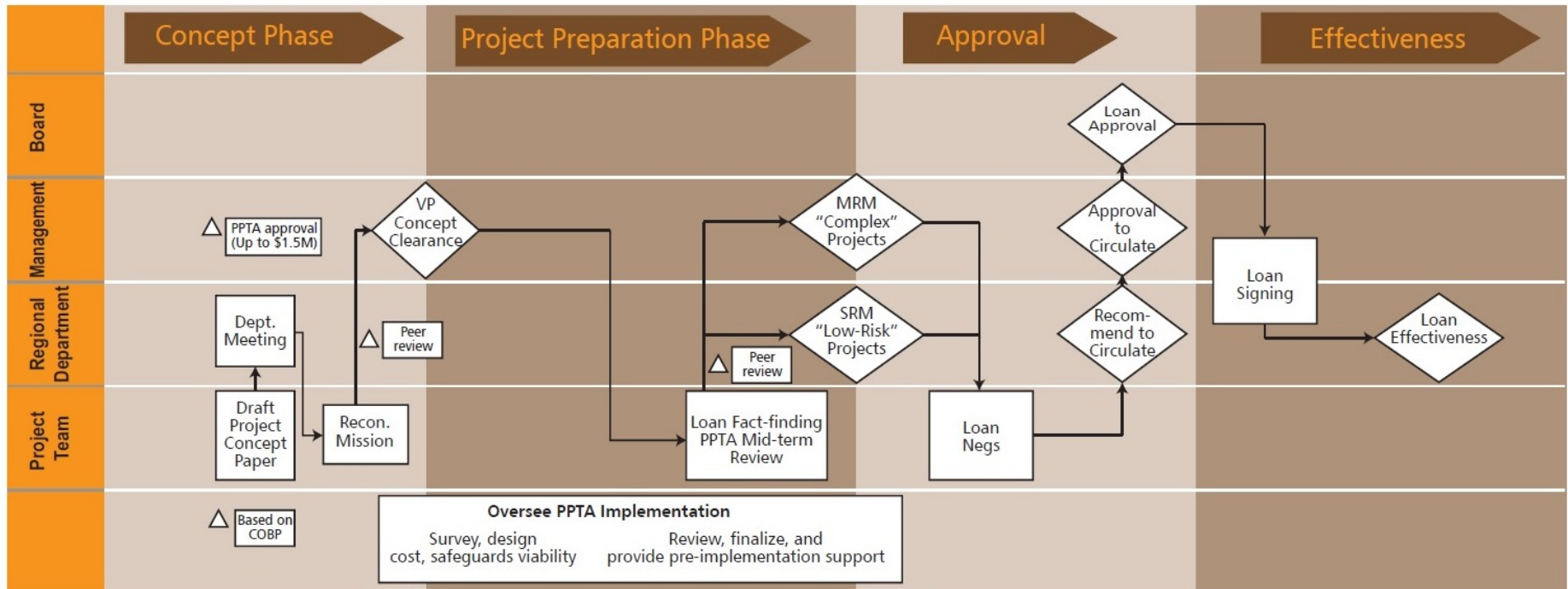
President:	Takehiko Nakao
Headquarters:	Manila, Philippines
Founded:	1966
<u>As of 31 December 2014</u>	
Members:	67
Regional members:	48
Nonregional members:	19
Field offices:	32
Total employees:	2,997
Nationalities employed:	60

HOW WE HELPED IN 2014

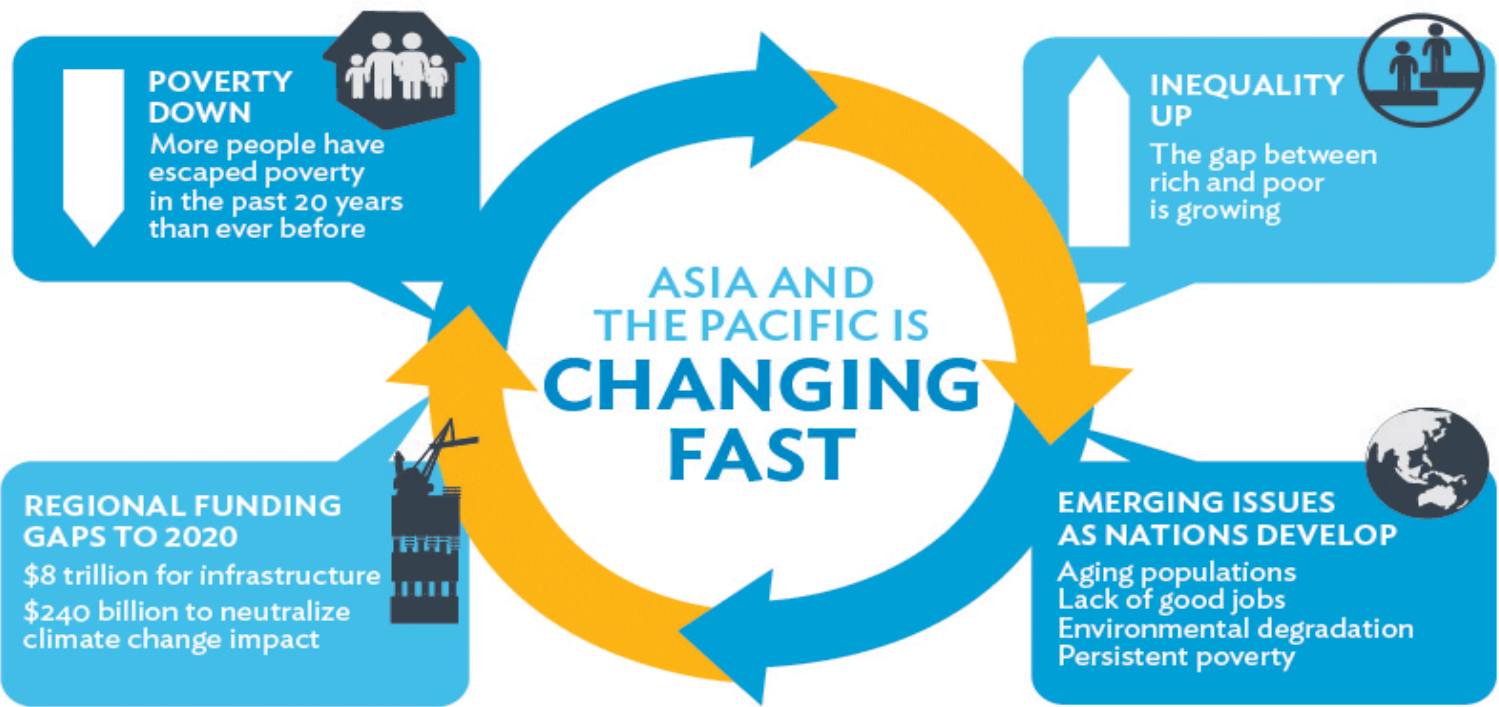


1/ Includes Ordinary Capital Resources, Special Funds Resources and Cofinancing Operations

Loan Delivery Functional Responsibilities



MRM = management review meeting, PPTA = project preparatory technical assistance, Recon. = reconnaissance, SRM = staff review meeting, VP = vice president.



AND SO IS ADB



WHO WE ARE
ADB is an international development finance institution. We provide loans, grants, and expertise to our developing member countries to help them alleviate poverty and create a world in which everyone can share in the benefits of growth.

President **Takehiko Nakao** Headquarters **Manila, Philippines** Founded **1966**

67 Members **48** Regional members **19** Nonregional members **32** Field offices **2,997** Total employees

ADB IS CHANGING **MTR**

BE A PART OF IT

Reduction in Procurement Processing Standard Time

	Current Practice	Current Standard	New Standard
1S1E	172	122	96 (ADB: 20)
1S2E (\leq \$10 million)	266	197	136 (ADB: 30)
1S2E ($>$ \$10 million)	383	197	136 (ADB: 30)

1S = single-stage, 1E = single-envelope, 2E = two-envelope.

Reduction in Consultant Recruitment Standard Time

	Current Practice	Current Standard	New Standard
TA	180	112	90
Loan	368	245	120

Asia Pacific Energy Challenges



4.2 Billion
Population in Asia



1.8 Billion
People without access to
clean cooking



600 Million

People without
access to electricity

Asia Pacific's Energy Trilemma

- Accessibility: 600 million people without access to electricity (and intermittent services for those who have access)
- Affordability: costs of supply are high (or unsustainable subsidies)
- Sustainability: air pollution and CO₂ emissions

GOAL 7

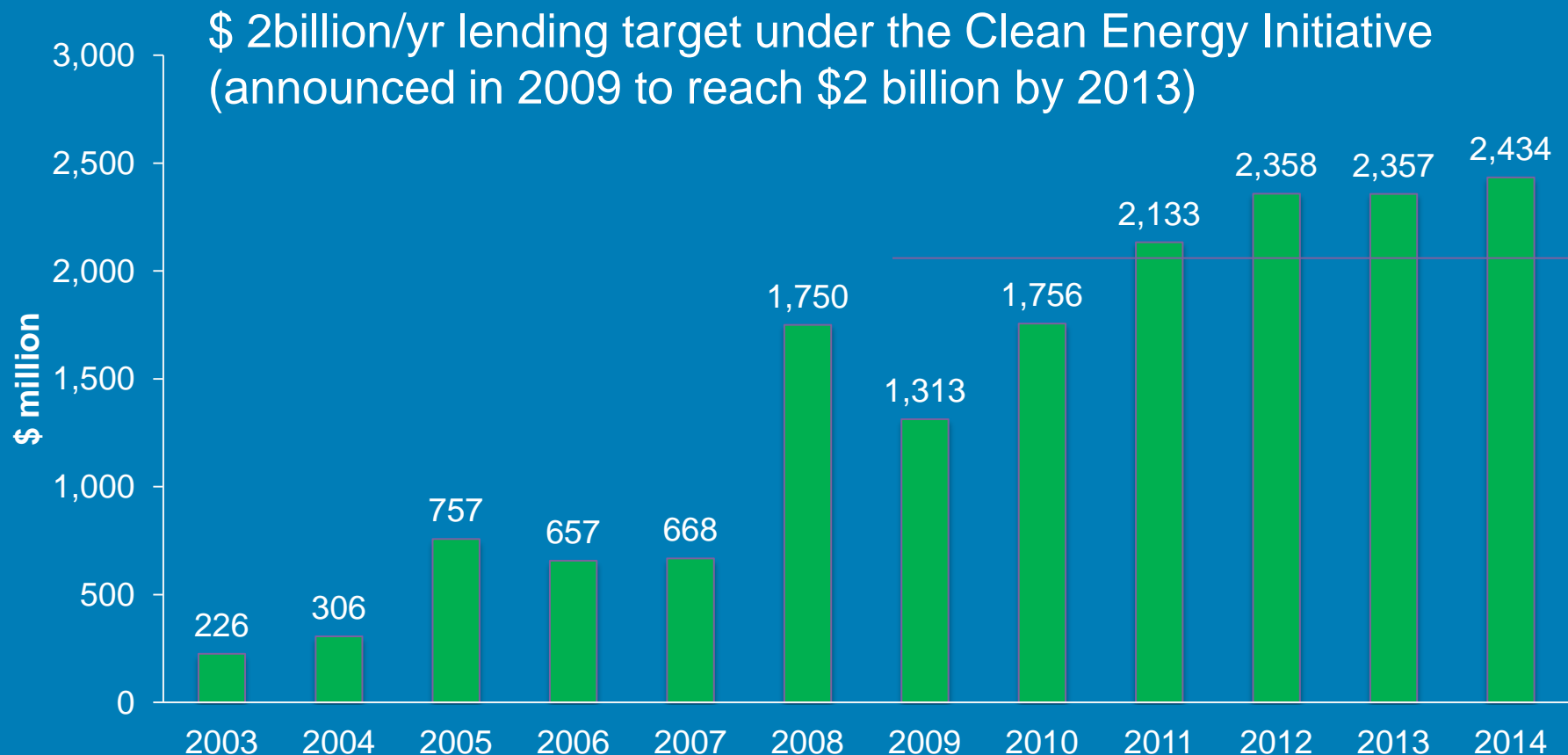
A photograph of several white wind turbines on a green hill under a blue sky with white clouds. The turbines are arranged in a line across the landscape. The image is overlaid with a green banner at the top and a dark grey banner in the middle, both containing text. A green banner is also at the bottom right with more text.

ENSURE ACCESS TO AFFORDABLE, RELIABLE,
SUSTAINABLE AND MODERN ENERGY FOR ALL

SUSTAINABLE DEVELOPMENT GOALS

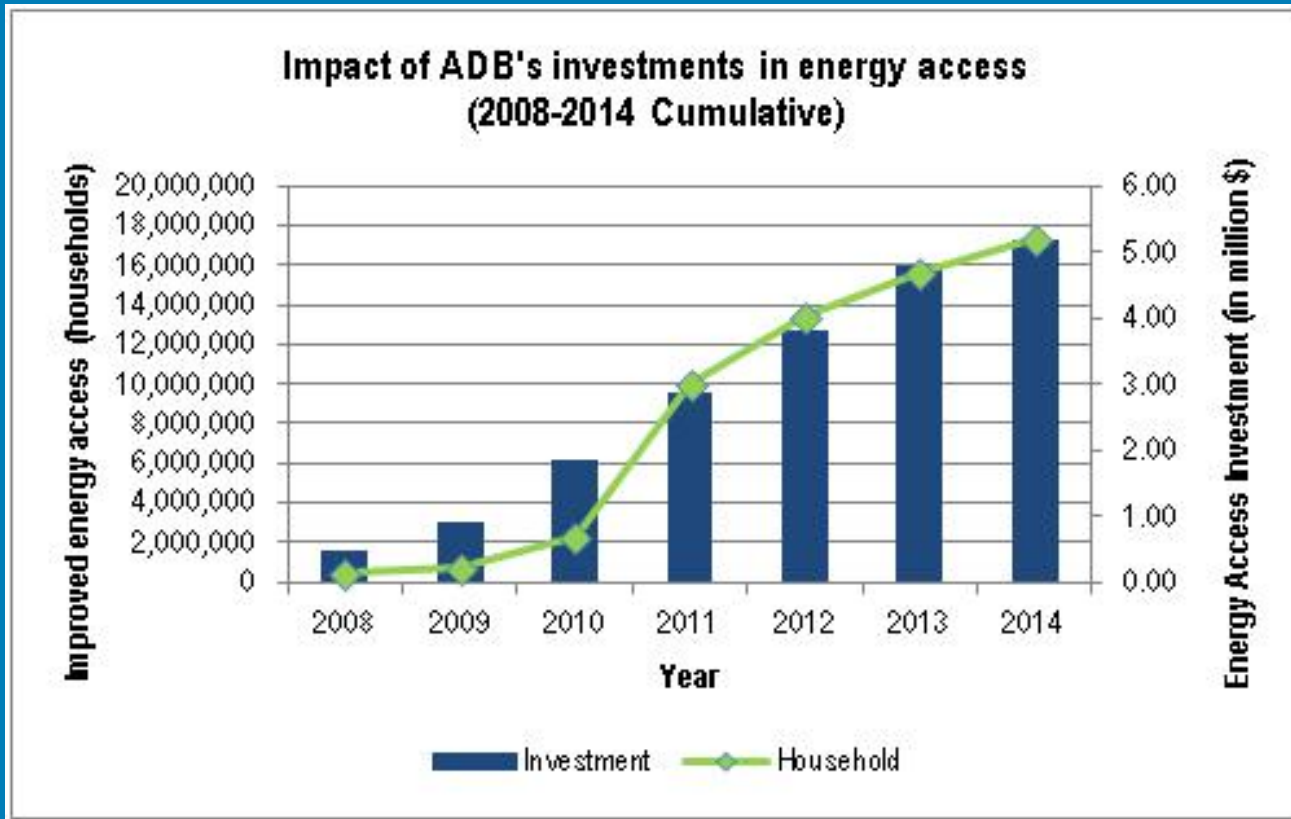
More at sustainabledevelopment.un.org/sdgsproposal

ADB's Clean Energy* Investment 2003-2014



*Clean Energy = renewable energy (hydro, solar, wind, geothermal),
+ energy efficiency (including supply side, demand side)

ADB's Contribution to Energy Access* 2008-2014

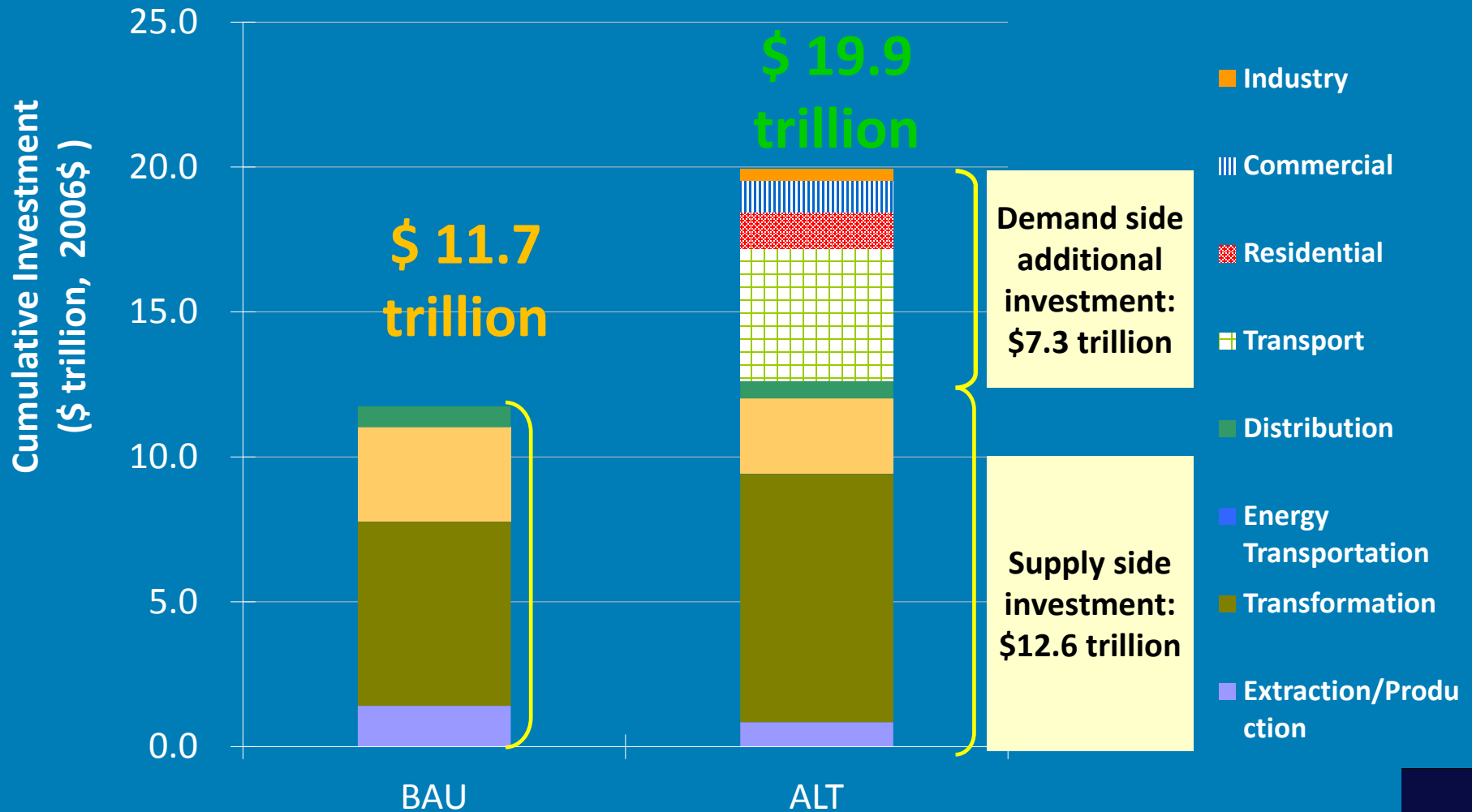


\$5.2 billion
total ADB investment
in energy access
(2008-2014)

86.4 million
number of people
benefiting from
ADB's energy
access investments

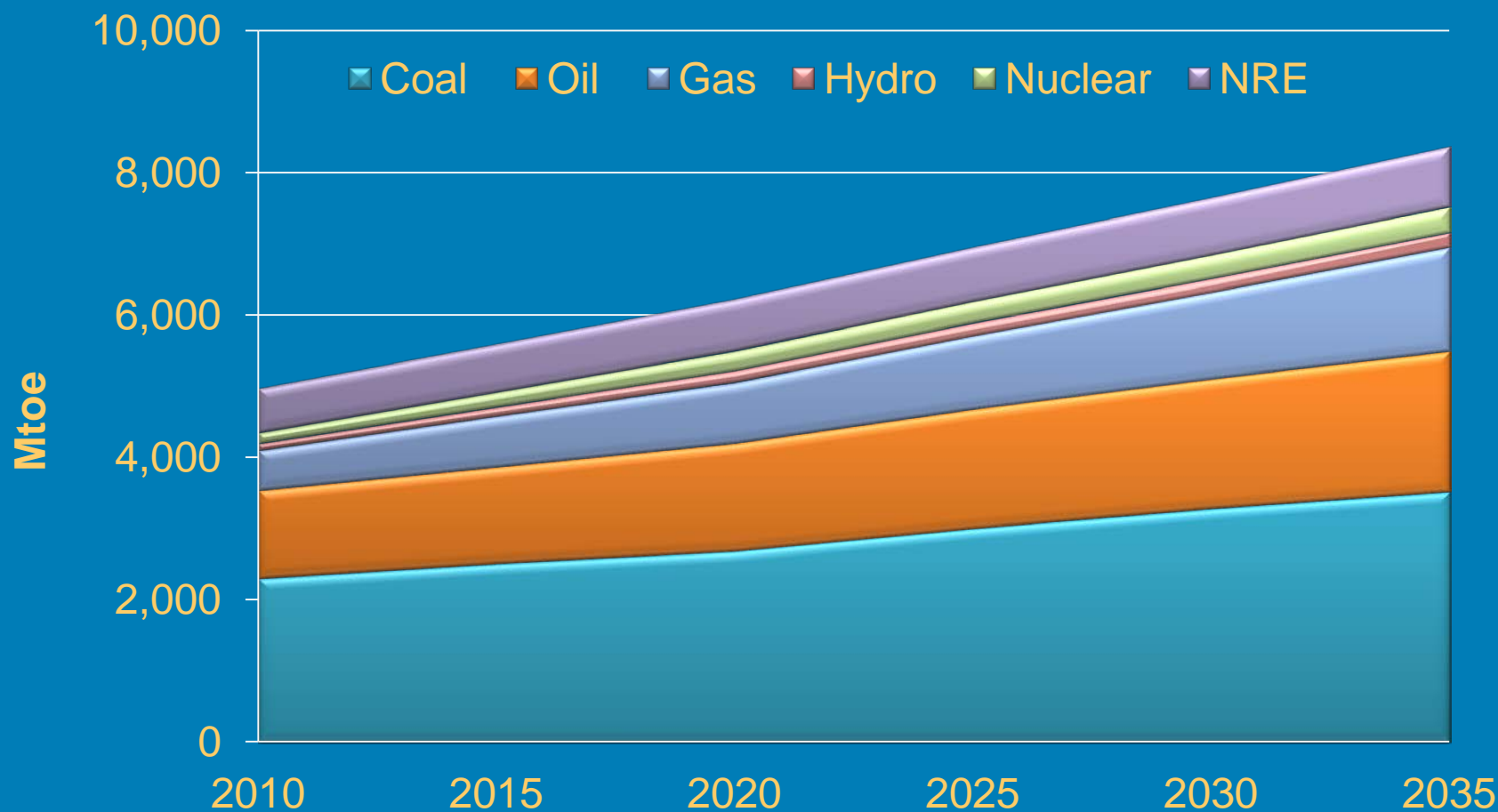
*Energy Access = providing modern energy/electricity access to people

Investment Requirements: BAU vs Alternative (2010-2035)



Fossil Fuels Will Continue to Dominate

Primary Energy Demand in the Asia-Pacific



Source: ADB, APERC 2013

ADB's Energy Policy Highlights

- ADB energy policy highlights:
 - Promoting energy efficiency and renewable energy
 - Maximizing access to energy for all
 - Promoting energy sector reform, capacity-building and governance
 - Regional integration (electricity grid interconnection)
- Mainstreaming clean energy into ADB's operations, at least \$2 billion annual investment for clean energy (renewable energy, energy efficiency)

Expanding ADB Energy Sector Operations

- Overall energy sector lending currently at about **\$3-4 billion** per year.
- With OCR/ADF merger, the lending in the energy sector is expected to reach **\$5 billion** per year by 2017.
- Clean energy lending increasing from **\$2 billion** towards **\$3 billion** per year beyond 2017.
- Mobilize climate and other co-financing (e.g. Green Climate Fund, Clean Investment Funds)
- **\$95 million** available for allocation under Clean Energy Financing Partnership Facility (CEFPP) to support Operations (grants, PPTAs, CDTAs, RETAs)

Technology Innovation

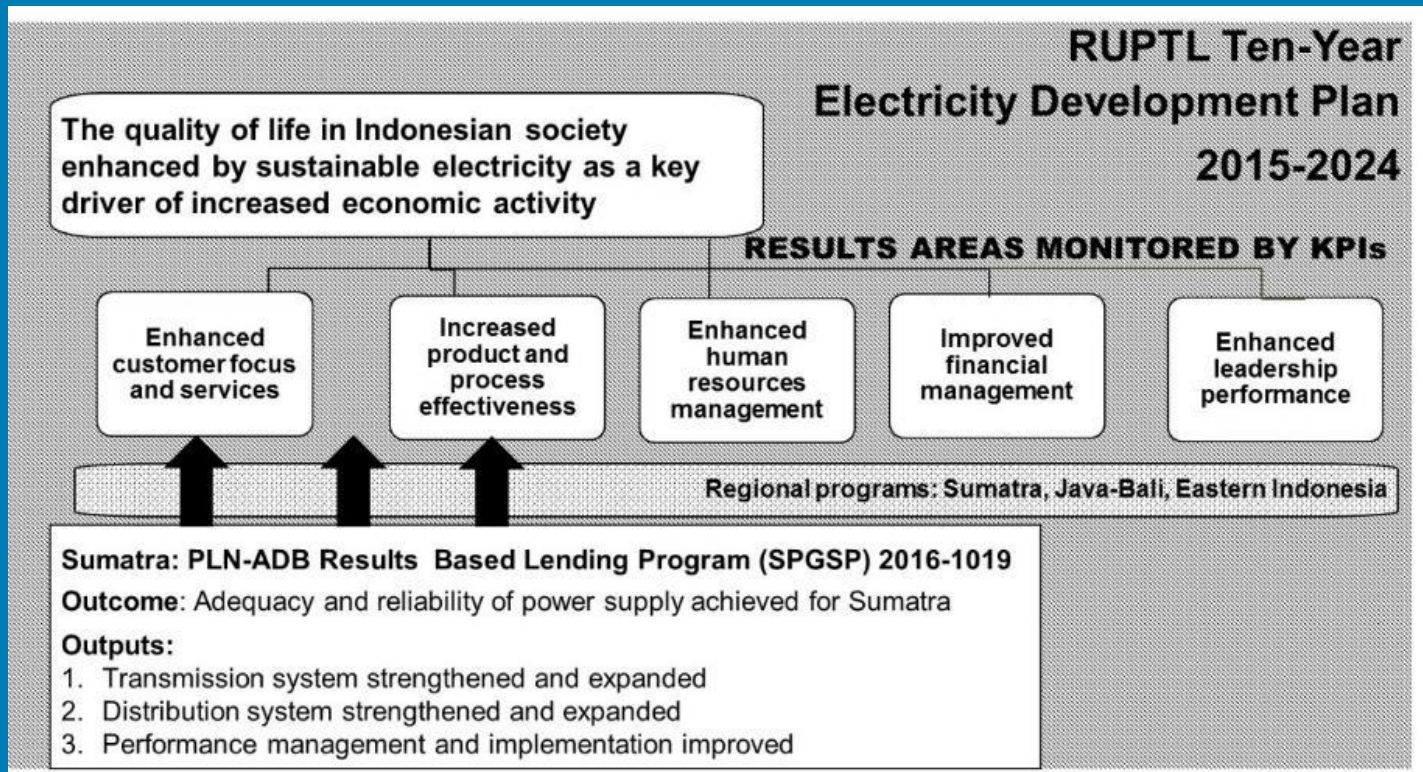
- **Distributed renewable (e.g. rooftop solar)**
 - *Supporting India's Solar Rooftop Program*
- **Smart grid/smart meters - promoting renewable energy and energy efficiency**
 - *Uzbekistan Advanced Electricity Metering Project*
- **Mini grid with storage – providing affordable renewable energy**
 - *Maldives Renewable Based Hybrid Mini-Grid Project*
 - *Solar Energy Development in Solomon Islands*
- **Cost Effective innovative transmission /distribution**
 - *Nepal Power Transmission Project/Myanmar Power Transmission Project (using aluminum compact core conductor)*
 - *Single Wire Earth Return in Mongolia*



HANDBOOK FOR ROOFTOP SOLAR DEVELOPMENT IN ASIA

Financing Innovation

- \$600 million for Indonesia Result Based Lending for Sumatra Power Grid Strengthening Project – the first RBL in the energy sector, effective way to expand the lending



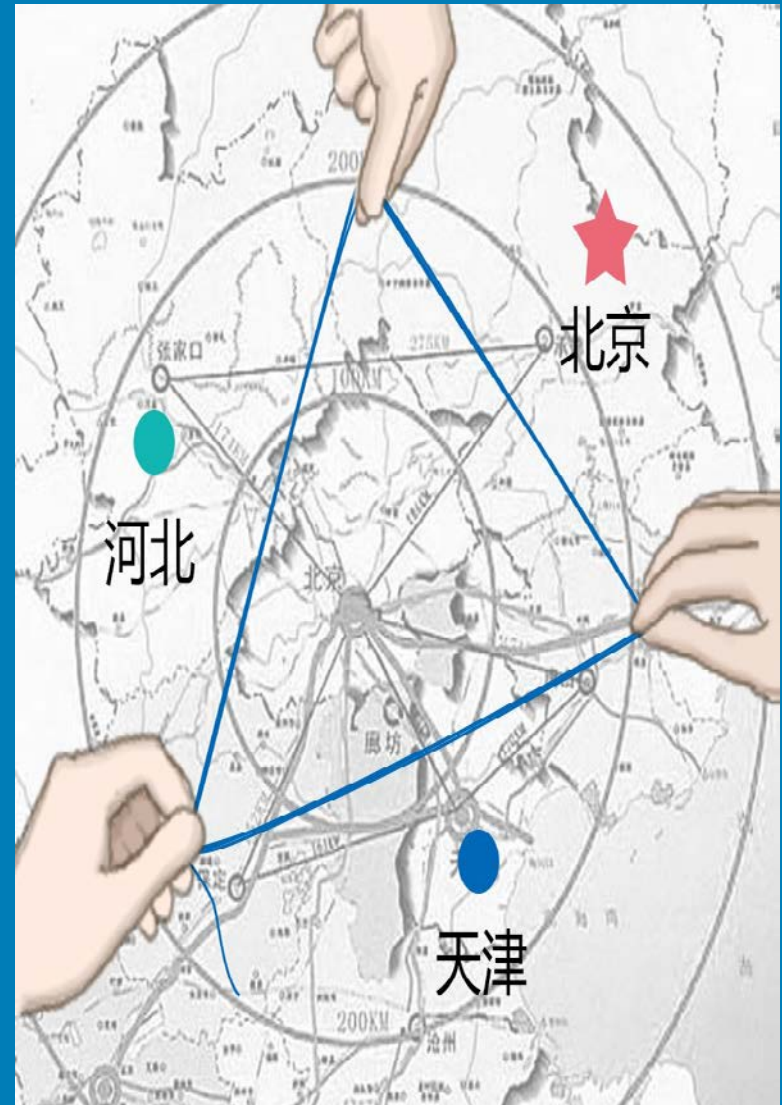
Introducing New business models



- Simpa Networks (“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, a venture-backed technology company with a bold mission: to make modern energy simple, affordable, and accessible for everyone.
 - **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.

Multi Sector Holistic Approach

- **PRC Beijing-Tianjin-Hebei Air Quality Improvement Program**
 - \$300 million programmatic policy-based lending with horizontal packaging to enhance Government's clean air action plan.
 - Policy actions for (i) reduced PM2.5 emissions from **energy, industry, transport, urban and agricultural sectors**; (ii) strengthening environmental policy and regulatory framework; and (iii) development of social protection system for inclusive industrial restructuring.
 - Project being peer reviewed by Energy, Transport and Urban SGs



Cross Border Energy Initiatives

■ Central Asia

- *TUTAP (Turkmenistan, Uzbekistan, Tajikistan, Afghanistan, and Pakistan) Transmission Interconnection*
- *TAPI (Turkmenistan, Uzbekistan, Pakistan and India) Gas Pipeline (ADB providing transaction advisory services)*

■ Greater Mekong Sub-region

- *With progress in physical interconnections in GMS, a Regional Power Coordination Center (RPCC) is being established with ADB support*

■ SASEC

- *Bangladesh-India Interconnection*
- *Nepal-India Interconnection*
- *Bhutan Hydropower Export Project (first cross border CDM)*
- *Sri Lanka – India Interconnection Study*

■ Northeast Asia

- *Power Interconnection Study*

ADB's Policy on Coal Power Plants

- ADB will encourage member countries to adopt available cleaner technologies, such as supercritical and ultra-supercritical boilers, and selectively support coal-based power projects if cleaner technologies are adopted and adequate mitigation measures are incorporated into the project design.
- Some member countries with smaller size grids may need to install coal-based power plants using subcritical boiler technology. Such diversification will improve power system reliability and energy security, and may be the least-cost option.
- ADB will also assist member countries in collaborating with developed countries on long-term technology transfer agreements for new and better technologies under development.

Why coal –based electricity?

- No practical alternative for base-load electricity; continued demand –supply gap in many countries
- Coal deposits fairly widespread across the region; coal is also easier to transport and trade
- Gas is not readily available, much more expensive and is subject to greater price volatilities
- Nuclear is not an option in most developing countries

Weaning away from coal is not currently practical; need to focus on minimizing its carbon and environmental foot prints

What if we don't support coal?

- Rather than retiring, low-cost rehabs will be done to extend life of aged and polluting plants
- High probability of wrong choices made for new plants
- Less leverage to push best available technologies
- No established evidence to support that No Coal approach has triggered cleaner technologies in fast growing developing countries

Case for High Efficiency Low Emission (HELE) Plants

- Large new capacity will be needed in next 15 – 20 years
- New markets (such as PAK, BAN, ASEAN) are opening up for coal
- HELE plants are competitive on levelized cost of electricity
- Retrofitting aging plants present significant low-cost opportunities to mitigate emissions

HELE should be a part of the low-carbon approach in developing countries, when there are no alternatives

Responsible and selective ADB approach in supporting coal-based plants

- Need to demonstrate overwhelming economic rationale
- As a minimum supercritical plant, more efficient plant than the last commissioned plants (3 years average)
- Ongoing sector reforms and conducive environment for other competing electricity generation technologies
-
- Established CCS dedicated fund (UK and AUS supported) supporting preparation of demonstration projects

Supported first generation supercritical plants in India and Pakistan; and IGCC in China

China Clean Coal Technology Project

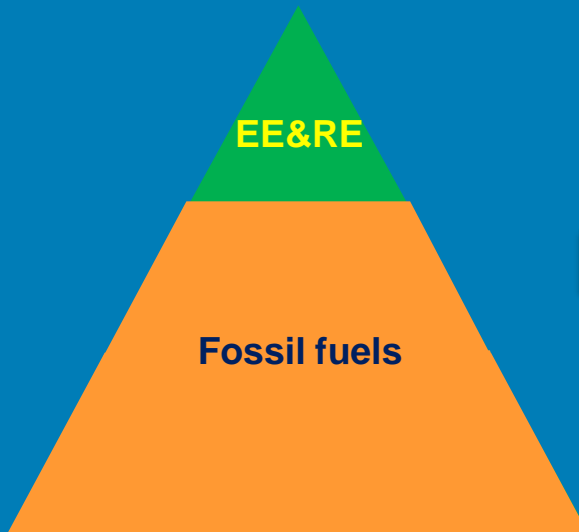
- ADB \$135 million direct loan (2010) & \$5 million grant from Climate Change Fund, with co-financing: \$285 million (CHNG and EXIM-Bank)
- Sponsors: China Huaneng Group (CHNG), China Datang Group, Guodian Group, Huadian Group, Shenhua , Peabody
- Demonstration of first-of-its-kind IGCC technology in ADB DMCs, ultra high efficient coal based power generation with criteria air pollutants emissions equivalent to those of natural gas based plants.



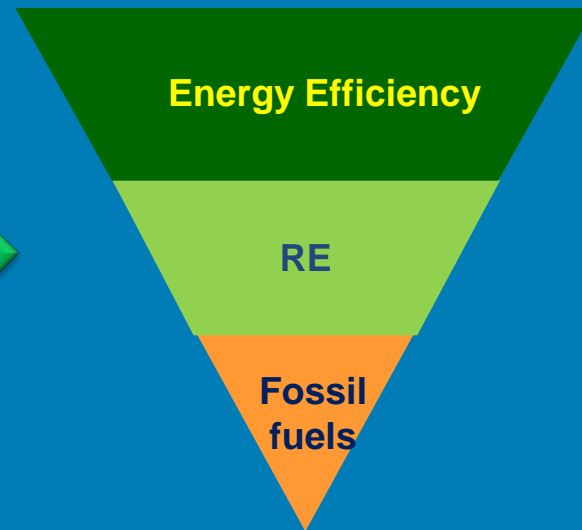
ADB Energy Sector Vision

Affordable Clean Energy for All

Current



Future



A photograph of ADB President Takehiko Nakao speaking at a podium. He is wearing a dark suit, a white shirt, and a pink tie. The background is dark with some blue lighting. The text is overlaid on the image.

**PRESIDENT NAKAO
SEEKS TO BUILD
A STRONGER, BETTER,
FASTER ADB**

ADB President Takehiko Nakao addresses the Opening Session of the Board of Governors at ADB's 48th Annual Meeting in Baku, Azerbaijan.



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

Yongping Zhai

Tel: 63-2-6325976

Email: yzhai@adb.org

Twitter: Yongping Zhai @zhaiyongping

THANK YOU!