

# **Possible Strategies for Applying Co-Benefits Approach to Coal-fired Power Plants**

## **Workshop on Tranboundary Air Pollution in North-East Asia**

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# Outline

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- ADB's Activities
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# Introduction

- Energy demand is projected to double in the Asia and Pacific region by 2030;
- There is an urgent need for innovative ways to generate power while at the same time reducing greenhouse gas (GHG) emissions.
- As many of ADB's developing member countries (DMCs) forge ambitious plans to meet these challenges ADB is committed to helping them achieve access to clean energy for all.
- Improve energy efficiency and increase renewable energy supply will bring co-benefits.

# ADB's Energy Policy

- To help DMCs to provide reliable and affordable energy for inclusive growth in a socially, economically, and environmentally sustainable way.
- Three pillars:
  - promoting energy efficiency and renewable energy
  - maximizing access to energy for all
  - promoting energy sector reform, capacity building, and governance

# ADB's Activities

- From 1990 to 2009, ADB provided over \$25.8 billion in assistance for energy projects, extending electricity and modern fuels to hundreds of millions of people.
- Promote energy efficiency and renewable energy. Clean energy investments in 2010 reached \$1.76 billion with access-to-energy projects over \$950 million.
- Between 2003 and 2009 ADB's assistance connected 1.27 million households to electricity.
- Improving access to cleaner, renewable sources of energy is a key to mitigating climate change.

# ADB's Activities (cont)

- ADB is on track to reach its clean energy investment target of \$2 billion a year by 2013.
- The program has already invested \$2.8 billion over the past 2 years in renewable energy, energy efficiency, and clean technology deployment,
- Encouraging DMCs to embrace low-carbon energy generation and utilization. In 2010, ADB issued thematic bonds for the first time, thus raising \$244 million through Clean Energy Bonds.

# Potential Technologies for Co-Benefit Approach

## Carbon capture:

- Pre-combustion carbon capture: Integrated Gasification Combined Cycle (IGCC) + Carbon Capture and Storage (CCS)
- Post-combustion: Coal-fired ultra-super critical (USC) + CCS

## Carbon off-set (Hybrid):

- IGCC/USC + renewable sources (solar PV/ concentrated solar thermal, or tidal)

# Issues in CCS

- Legal and regulatory frameworks not yet established
- Coordination between power sector and oil/gas sector for CO<sub>2</sub> storage
- Substantial tariff increase required to operate IGCC+CCS commercially



# Issues in Hybrid

- Solar application is limited by geographical and solar condition (suitable in Gansu and Qinghai provinces in the PRC and South Gobi area in Mongolia)
- Cost of PV is decreasing but still an expensive option
- Limited commercial operation experience ( Spain and the US - Nevada) of CST and still expensive option
- CST technology has been not proven in cold climate and desert area
- Substantial feed-in-tariff is required to operate commercially

# Recommendations

## Carbon capture:

- Require further policy dialogue including sector coordination
- Initiate pilot project in East Asia to learn lessons

## Carbon off-set (Hybrid):

- Introduce feed-in-tariff and adjust tariff to commercially viable level
- Initiate pre/feasibility study on coal-fired power plant+PV/CST in cold climate and desert area to prove the technology
- Initiate conceptual study on coal-fired power plant+tidal in coastal area

# Reference

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# Thank You

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