UNFCCC Asia and Pacific Regional Workshop on Preparing Technology Transfer Projects for Financing

Essentials of Clean Energy Financing and ADB’s Assistance Modalities

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ASIAN DEVELOPMENT BANK

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Outline of Presentation

- Brief ADB introduction
- Low-carbon financing basics
- ADB’s financing modalities
- Case studies
- Lessons learnt from public-private partnerships
- ADB special programs in climate financing
[Additional]
- ADB programs on technology transfer
Asian Development Bank
The Asian Development Bank (ADB):

- Multilateral development finance institution established in 1966
- Poverty reduction is overarching mandate
- Provides financial and technical assistance
- 67 members – 48 from Asia and Pacific region
- Annual approved financial assistance:
  - $6-14 billion during 2004-2009
  - Above $13 billion annually from 2011 onwards
ADB’s Long-term Strategic Framework and Climate Change

ADB’s “Strategy 2020” (2008-2020)

- Inclusive Economic Growth
- Regional Integration
- Environmentally sustainable growth
  - Environment including climate change: one of the five core areas of operations
  - Aims to scale up support for projects that address climate change
Renewable Energy Examples

- Multi-tranche Financing Facility - National Power Grid Development Investment Program (India)
- Inner Mongolia Wind Power Project (PRC)
- Gujarat Paguthan Wind Energy Financing Facility (India)
- Public-Private Infrastructure Development Facility (solar projects) (Bangladesh)
- Uttarakhand Power Sector Investment Program (India)
- Renewable Energy for Remote Island and Mountain Communes (Viet Nam)
Energy Efficiency Project Examples

- Guangdong Energy Efficiency and Environment Improvement Program (PRC)
- Nagpur Water Supply Project, with energy efficiency improvement (India)
- Preparing Lahore Rapid Mass Transit System (Pakistan)
- Power Transmission Enhancement Project (Azerbaijan)
- Demand Side Management (DSM) for Municipal Street Lighting (Sri Lanka)
- Asian Clean Energy Private Equity Funds (Regional)
Low-carbon finance basics
TYPICAL RENEWABLE ENERGY PROJECT CASH FLOWS

Equity → Debt

Contractor

Operator

Project Company

Offtaker

CER Purchaser

Fuel Supplier

Fuel Supply Agreement

EPC Contract

O & M Contract

Power Sales Agreement

Feed in tariff

Sale of CERs

Feed in tariff

Power Sales Agreement

Fuel Supply Agreement
Conventional Energy Project
Typical Risk Allocation

- Most construction risk taken by Contractor via EPC Contract
- O & M risk shared with operator
- Technology mostly proven
- Fuel price risk passed through to Offtaker
- Some finance risks such as FX and interest passed through to Offtaker
Renewable Energy Project
New Risk Characteristics

- Unproven technology needs support from Contractor
- No fuel cost (solar, hydro) but lower/intermittent availability; or
- Unfamiliar fuel supply risks/costs (risk husk, other biomass, etc.), all local currency
- Higher capex / MW than conventional fuels
Renewable Energy Project

Issues

- High upfront capital costs and low capacity factor during operation
- Relatively low return and uncertainties over tariff level
- Credit risks of off-taker
- Intermittent resource (not base load) - availability and quality of data is limited
- Technical and economic criteria of equipment
- Project size tends to be small – high transaction costs
- Newly implemented and untested government supports (tariff, tax incentives)
- Long term fixed interest rate finance is rare
- Carbon finance is under-utilized
Due Diligence focused on Renewable Energy Projects
Business Due Diligence

A. Market Analyses

✓ Power Market: Demand, Supply Competition, Regulations
✓ Regulatory and Policy Framework for Wind Power Development
✓ Recent Development in Wind Power Market
✓ Forecasting Tariff Change Trends and Their Implications for the Project
✓ Operation Analysis on Selected Existing Wind Farms
✓ Analysis of the Power Grid Operator – Off-taker
✓ Project Economic Analysis
B. Engineering Verification

- Resource Re-assessment (wind, solar, hydro, others)
- Equipment Procurement and Performance Evaluation
- Wind Farm Design Optimization
- Power Grid Integration
- Dispatch Arrangements
- Construction Scheduling and Supervision Arrangements
- Completion Testing and Validation Arrangements
- Maintenance Scheduling Reliability Enhancement
C. Corporate Governance

- Corporate Development Strategy
- Operational/Organizational Structure and Capacity
- Operations of the Board and Shareholders Meetings
- Capability of the Management Team
- Technical and Operational Human Resource
- Incentive Structure
- Shareholders Support
- Relationships with Stakeholders (local government agencies, service contractors, off-taker…)
- Corporate Citizen Responsibility and Support to Hosting Communities
D. Environmental and Social Safeguards

- Environmental Impact Analysis Review
- Land Acquisition and Resettlement Issues
- Analysis on Social Issues and Poverty Alleviation
- Other Compliance, Anti-Corruption, and Safeguard Issues
- Analysis on CER Potentials and Arrangements
A. Sponsor Creditworthiness Assessment

- Reviewing Sponsors’ 3 Years Audited Financial Statements
- Track-records/Financial Performance of Sponsors’ Existing Wind Farms
- Ability to Inject Adequate Equity
- Quality of Guarantees on Project Completion/Debt Service Gap Coverage (if applicable)
Financial Due Diligence

B. Project Financial Analysis

- Reviewing Project Construction Costs and Financing Plan
- Reviewing Projections on Project Operational Costs
- Reviewing Accounting and Auditing Policies of the Project Company
- Developing/Reviewing Project Financial Model
- Conducting Cash Flows and Financial Statement Analysis
- Break-even Analysis and Sensitivity Analysis
- Debt Service Coverage Analysis
- Mechanisms and Accounts for Debt Services and Financial Settlements
C. Insurance Consultation

- Reviewing Current Insurance Markets
- Identifying/quantifying Insurable Risks
- Recommendation of Suitable Insurance Plan
Legal Due Diligence

- Advice on Applicable Laws, Regulations, and Policies
- Integrity checks of Sponsors
- Reviewing the Legal Status of the Project Company (Shareholders Agreement, By-laws, registration…)
- Reviewing Project Licenses/Permits/Contracts
Project Success Factors

- Sound regulatory environment
- Strong government support
- Clarity in project formulation, preparation and documentation
- Real priority projects of the country
- Transparency in sponsor selection and contract negotiation
- Committed sponsors
- A fair deal for all parties
ADB’s Financing Modalities
How ADB can Assist Financing

- Public sector loan with sovereign guarantee (through central government)
- Public sector loan without sovereign guarantee
- Private sector loan to Project Company
  - Longer tenor
  - Local currency possible
- Equity
- Partial Risk Guarantee & Partial Credit Guarantee
- Carbon finance
- Advisory service
- Grant funding
Project Eligibility Criteria

- Economic viability
- Financial viability: necessary but not sufficient
- Project must have development impacts and/or demonstration effects
- Project must fit the country strategy and sector strategy
- ADB must play a catalytic role and add value
<table>
<thead>
<tr>
<th>Country</th>
<th>Project Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>Geothermal power</td>
</tr>
<tr>
<td>India</td>
<td>Wind power</td>
</tr>
<tr>
<td>Lao, PDR</td>
<td>Small hydropower</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Waste composting</td>
</tr>
<tr>
<td>China, PR</td>
<td>Geothermal space heating</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Hydropower</td>
</tr>
<tr>
<td>Philippines</td>
<td>Energy-saver bulb distribution</td>
</tr>
<tr>
<td>China, PR</td>
<td>Landfill gas</td>
</tr>
<tr>
<td>Mongolia</td>
<td>Boiler efficiency improvement</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>Small hydropower</td>
</tr>
<tr>
<td>China, PR</td>
<td>Urban transport system</td>
</tr>
</tbody>
</table>
Example: Run-of-River Hydro

- 98 MW run-of-river type hydro project (Xiaogushan Hydro) in Gansu Province, PRC
- Displaces 109 MW coal-fired power generation
- ADB Loan: $35 million (approved in 2003)
- Total Project Cost: $87 million

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- Total volume of ERs expected (10 year): 3.7 million tCO₂
- Also avoids annual emissions of 240 tons of particulate matter and 1,910 tons of SO₂
- Contracted ER volume (with World Bank): 2 million tCO₂
- Total Contract value: US$8.50 million
- Contract price: US$4.25/tCO₂ VER basis
Example: Coalmine Methane

- Capture of CMM from coal mining operation in Shanxi province, PRC
- Using CMM as a fuel in a 120 MW generation plant (combined cycle)
- Reduces methane release & displaces coal-fired power generation (baseline)
- ADB Loan Approved in 2004: $125 million
- Total project cost: $205 million

----------------------------------------
- Total volume of ERs expected (10 yrs): 29 million tCO₂e
- Contract ER volume (with World Bank): 3 million tCO₂e
- Contract value: US$12.75 million
- Contract price: US$4.25/tCO₂e VER basis
- If all ERs sold at $4.25/tCO₂e = US$120 million
ADB’s “One Roof” Strategy

Private Sector and Regional Departments: Complementary Roles for PPPs

Support DMC governments in sector and regulatory reform

Financially and socially sustainable PPP

Build capacity of agencies and support technical preparation

Catalyze private investments, add value

ADB Regional Department
ADB Private Sector Operation
Private Sector
Case studies
Thailand Solar Power Project
Project Features

- 73 MWp (gross) thin film voltaic solar plant in Lopburi province, Thailand
- Sponsors CLP, Mitsubishi and EGCO
- Power Purchase Agreement with EGAT under Small Power Producers programme automatically renewable every five years
- EPC contract with Sharp and Ital Thai
- Long term performance guarantees from Sharp on photovoltaic module
- Loan documents signed June 2010
- Scheduled Commercial Operations Date 2012
Financing Features and ADB Assistance

- Project cost Bt 9 billion = $271 m
- Funded by grant from Clean Energy Fund, sponsor equity, pre-sale of some CERs to Future Carbon Fund & debt
- ADB debt Bt 1.7 billion = $51 m with 18 year tenor at market rates
- Thai commercial bank debt Bt 3.4 billion = $102 m with 12.5 year tenor
- Total debt Bt 5.1 billion = $153 m (56% gearing)
- ADB and banks provided the financing on a limited recourse basis
Inner Mongolia Wind Power Project
Project Features

- 49.5 MW wind farm in Inner Mongolia (Chifeng)
- Sponsors Datang, Kyushu, Sumitomo
- Off-take by Northeast China Grid Co.
- Tariff set by the local Price Bureau according to Renewable Energy Law and Regulations
- Emission reduction of 140,000 t of Carbon dioxide per annum
Financing Structure

ADB

Industrial and Commercial Bank of China

Equity 33.3%

Debt 66.7%

Risk participating by International commercial banks

Total Project Cost
CNY 500 Million
(US$ 73 million)

Datang Renewable Power

Kyushu Electric Power

Sumitomo
Features of ADB Assistance

- CNY denominated loan ($24 million equivalent)
- Unfunded risk participation by foreign banks ($5 million equivalent)
- Loan tenor of 15 years
- Debt/Equity 66.7 : 33.3
Gujarat Paguthan Wind Energy
183 MW wind farm in Gujarat (126 turbines, 800 kw) and Karnataka (103 turbines, 800 kw)

Gujarat Paguthan Energy Corp (GPEC) also owns 655 mw gas-fired combined cycle power plant

GPEC is 100% owned by CLP Group. Largest wind project undertaken by CLP at the time

Enercon constructs the project and provides O&M services

Off-take by Gujarat Urja Vikas Nigam and Bangalore Electricity Supply Company with fixed tariff for 25 years and 10 years, respectively
Financing Structure

- Debt 80%
- Equity 20%

ADB

Local Banks

GPEC [CLP Group]

Total Project Cost
RS 9.9 billion
($249.5 million)
Features of ADB Assistance

- Indian Rupee denominated loan ($117 million equivalent)
- Loan tenor 13 years
- Recourse to GPEC
Biomass Power Project in Thailand
Project Features

- 125 MW Biomass Power Plant
- The plant uses wood waste products (woodchips and wood bark) as a fuel
- Ultimate Sponsor: The Double A Alliance – leader in pulp and paper business and biomass power generation in Thailand
- Power off-take by EGAT (90 MW) and industrial users. Project benefits from renewable energy tariff under the SPP program
- Savings of about 4 million tons of CO₂ over first 10 years
- At least 500,000 tons/year of agricultural waste is sourced and income paid to small farmers
Features of ADB Assistance

- THB denominated loan and/or guarantee ($78 million equivalent)
- Up to 50% of CER pre-financed by Asia Pacific Carbon Fund and Future Carbon Fund (under consideration)
- CDM Technical support for CDM application and preparation of documents
Lessons Learnt from Public-Private Partnerships
Future of PPPs in ADB: Strategy 2020

“ADB will promote public–private partnerships in all of its core operational areas, gaining experience first in MICs, and then expanding these efforts to all DMCs.”

“Partnerships with international development agencies, multilateral and bilateral institutions, will become central to planning, financing, and implementing ADB operations.”
Key Benefits of PPPs

• Disciplined procurement approach for government
• Implementation of the project to time and budget
• Opportunity to leverage innovation and information from the Private Sector
• Clear /efficient allocation of risks throughout the life of the project
• Integrated approach to the maintenance of the asset over the whole lifecycle (government is purchasing the long term provision of public services rather than an asset)
The PPP viability scale
Unfortunately the best lessons often come from the worst projects!
Why deals go wrong?

- badly prepared
- badly bid
- bad risk allocation
- bad market studies
- bad sponsors
- bad location
- bad technology
- bad operator
- bad idea
- bad politics
- bad advisors
- bad weather
- bad timing
- bad company
- bad incentives
Lessons learnt (1)

- Require Strong political will
- Effective and balanced PPP models, backed up by long term and stable policies
  - Enabling environment key (sufficient resources)
- PPP Champion
  - Change of culture within government
  - Change of culture within private sector
  - Involvement/consultation with the private sector
- Gvt. → upfront project development work
  - Identifications of projects – establish priorities
  - Time and costs to complete need to be understood
  - Land acquisition (compensation and resettlement, environmentally sensitive)
Lessons learnt (2)

• Need to have a pipeline but success of first few PPPs is vital
  ➢ Demonstration effect

• Transparent bidding

• Predictable legal and regulatory framework (standard Contracts) critical for PPP

• “Devil is always in the detail”: use experienced advisers, sponsors, lenders
Lessons learnt (3)

• Gvt. needs to understand "key issues" for both sponsors and lenders and show flexibility under changing circumstances

• Focus of government: mitigate risks that the market cannot assume at a reasonable cost

• Appropriate risk transfer

• Recognition recognition that PPPs are not:
  ➢ A magic solution to all short term budget problems
  ➢ A replacement for good public financial policies

• Instead, PPPs should be viewed as a tool available to serve the policies of government
Hope over experience

<table>
<thead>
<tr>
<th>Outcome compared with Forecast</th>
<th>Capital cost</th>
<th>Implementation time</th>
<th>Operating cost</th>
<th>Ridership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+50 to +100%</td>
<td>0 to +50%</td>
<td>0 to +200%</td>
<td>-33% to -67%</td>
</tr>
</tbody>
</table>

(Example of rail systems)

“So what if I underestimated costs and overestimated revenues? It all averages out in the end.”
Need to ensure interests are aligned

Economic interests must be aligned – is this in the long-term interest, not just of the developers / investors, but also the end users?
ADB’s Special Programs in Climate Financing
Climate Change “Priorities for Action”

Modalities

Finance
- Scaling-up Clean Energy

Knowledge
- Encouraging Sustainable Transport and Urban Development
- Managing Land Use and Forests for Carbon Sequestration
- Promoting Climate-resilient Development
- Strengthening Policies, Governance and Capacity

Partnership
Mitigation Financing

**ADB Internal**

- CE Financing Partnership Facility (CEFPF)
  - $95m ($250m target)

- Carbon Funds:
  - Asia Pacific CF (2008-12)
    - $152m
  - Future CF (Post-2012)
    - $115m

- Climate Change Fund (CCF)
  - $30m, incl. REDD $5m

- Other grant-financing, ADF, Japan Special Fund, etc.
  - $100m (2008)

**External: MDBs/GEF**

- Climate Investment Funds (CIF)
  - Clean Technology Fund (CTF)
    - Indonesia: $180m
    - Philippines: $125m
    - Viet Nam: $170m
  - Strategic Climate Fund (SCF)
    - Forest Investment Program (SCF-FIP)
      - $50m per country, 1-2 countries for subregions
    - Scaling-up RE for Low-income Countries Program (SCF-SREP)

- GEF – CC Focal Area
  - $1 billion global GEF-4
  - Target $2 billion GEF-5
### Adaptation Financing

<table>
<thead>
<tr>
<th>ADB Internal</th>
<th>External: MDBs/GEF</th>
<th>External: FCCC/Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate Change Fund (CCF)</strong>&lt;br&gt;$10m for adaptation**</td>
<td><strong>Climate Investment Funds (CIF)</strong>&lt;br&gt;▪ <strong>Strategic Climate Fund (SCF)</strong>&lt;br&gt;▪ Pilot Program for Climate Resilience (SCF-PPCR)&lt;br&gt;$614 m pledged, loan/grant</td>
<td><strong>Special CC Fund (SCCF)</strong>&lt;br&gt;(Thru GEF)&lt;br&gt;$123m global GEF-4&lt;br&gt;Target $500m GEF-5</td>
</tr>
<tr>
<td><strong>Other grant-financing, ADF, Japan Special Fund, etc.</strong>&lt;br&gt;Approx. $5m (2008)**</td>
<td></td>
<td><strong>Least Developed Countries Fund (LDCF) (Thru GEF)</strong>&lt;br&gt;$181m global GEF-4&lt;br&gt;Target $500m GEF-5</td>
</tr>
<tr>
<td><strong>Small Grants for Promoting Climate Change Adaptation</strong>&lt;br&gt;$1.2m **</td>
<td></td>
<td><strong>Adaptation Fund</strong>&lt;br&gt;(Thru GEF)&lt;br&gt;Up to $600m global by 2012</td>
</tr>
</tbody>
</table>
Clean Energy Program

- Formerly “Energy Efficiency Initiative,” launched in July 2005
- Expand ADB operations in energy efficiency to over $2 billion/year
- Promote investments in addition to advocacy
- Focuses on both demand and supply side (such as renewable energy)
  - **Supply side:** New technologies for power generation, renewable energy (including hydropower and cogeneration based on agro products)
  - **Demand side:** loss reduction on the consumer side of meters, cleaner production technologies in energy intensive industries, high-efficiency commonly used equipment and appliances – industrial motors, lighting, insulation, cooling etc.
CEP Priorities

- Provide analyses regarding costs/impacts of EE in Asia-Pacific
- Technology identification, accelerated deployment of leading choices
- Establish suitable financing models that help blend private and public funds to implement projects – the Clean Energy Financing Partnership Facility
  - Increase in grants and concessional loans to support project preparation, risk mitigation, and technology transfer
Clean Energy Financing Partnership Facility (CEFPF)

- **Objective:** ADB aims to
  - develop clean energy projects for financing
  - commercialize and replicate new clean energy finance instruments
- **Supports include:**
  - prepare projects for investment
  - share costs in implementing clean energy investment programs
  - support cooperation for science and technology to facilitate transfer of technology, knowledge and experience
  - build the capacity in the context of implementing clean energy investments and programs.
What CEFPF Supports

- General Criteria:
  - be consistent with the country partnership strategy
  - be catalytic and be high demonstration value in the sector
  - have good potential for replication and scalability

- Sectors of Interest:
  - New facilities using energy efficient- or renewable energy technologies
  - Existing facilities with fuel switching or retrofitting for energy efficiency by at least 30%
  - New fuel facilities to produce, store and convey clean fuels
Carbon Market Program:
Make the carbon market work for development finance
**CDM Concept**

Industrialized Country (Annex B)

Entity A
- GHG Emissions

Developing Country (non-Annex B)

Entity B
- Project Activity
- Emission Reduction

① Finance

Technology

(Capacity Building)

② Carbon Credits
CDM Reality

Industrialized Country
(Annex B)

Entity A
☑ GHG Emissions

Developing Country
(non-Annex B)

Entity B
☑ Project Activity
☑ Emission Reduction

① Carbon Credits

② Payment
ADB’s Value-added

- Make the market function better to provide additional financing to development programs – the CDM is a “tool” to advance sustainable development
- Contribute to provide a long-term price signal for low-carbon technologies and policies
- Develop and demonstrate a model that can be replicated by financial institutions
ADB’s Future Carbon Fund

- Purchase post-2012 carbon credits from projects proposed today
- Pay upfront, to help developing countries reduce the upfront capital constraint of installing clean energy systems
- Provided to project developers/sponsors who receive ADB financial support and CDM-specific technical assistance
- Associated costs and risks are largely reduced due to “piggy back” design and strategy
  - General technical, financial and legal due diligence carried out by ADB main operations to process/approve financing
ADB’s Attempt: Turning Cash Flow into Financing

**ADB Modality**

1. Financing
   - 1. Tech Asst
   - 2. Carbon Credits

**Standard “Pay-on-Delivery”**

1. Carbon Credits
2. $/€

Project phase: Development

Year: 0 1 2 3 4 5 6 7 8

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1. Carbon Credits
2. $/€
### Impact on project finance: Example 1

Run-of-River Hydropower plant

**Emission reductions and carbon credit value**

<table>
<thead>
<tr>
<th></th>
<th>Annual CERs 2010-20</th>
<th>Total CERs up to end-2012</th>
<th>Total CERs Post 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions reduction (tCO2e)</td>
<td>134,811</td>
<td>404,433</td>
<td>943,677</td>
</tr>
<tr>
<td>Potential revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$5/ton</td>
<td>$ 674,055</td>
<td>$ 2,022,165</td>
<td>$ 4,718,385</td>
</tr>
<tr>
<td>$10/ton</td>
<td>$ 1,348,110</td>
<td>$ 4,044,330</td>
<td>$ 9,436,770</td>
</tr>
<tr>
<td>$15/ton</td>
<td>$ 2,022,165</td>
<td>$ 6,066,495</td>
<td>$ 14,155,155</td>
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</tbody>
</table>

**Indicative project financing plan (with volume and pricing examples)**

<table>
<thead>
<tr>
<th></th>
<th>$5-10/ton</th>
<th>$10-15/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Investment Cost</td>
<td>$ 49,090,000</td>
<td>$ 49,090,000</td>
</tr>
<tr>
<td>Financing Sources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government &amp; Other</td>
<td>$ 21,529,046</td>
<td>$ 16,979,175</td>
</tr>
<tr>
<td>ADB</td>
<td>$ 22,000,000</td>
<td>$ 22,000,000</td>
</tr>
<tr>
<td>APCF (50% of CERs)</td>
<td>$ 2,022,165</td>
<td>3,033,248</td>
</tr>
<tr>
<td>FCF (75% of CERs)</td>
<td>$ 3,538,789</td>
<td>7,077,578</td>
</tr>
<tr>
<td>Ratio (APCF&amp;FCF/Total)</td>
<td>11.3%</td>
<td>20.6%</td>
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</table>
Impact on project finance: Example 2

Wind Power project

Emission reductions and carbon credit value

<table>
<thead>
<tr>
<th></th>
<th>Annual CERs 2010-20</th>
<th>Total CERs up to end-2012</th>
<th>Total CERs Post 2012</th>
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</thead>
<tbody>
<tr>
<td>Emissions reduction (tCO2e)</td>
<td>63,794</td>
<td>191,382</td>
<td>446,558</td>
</tr>
<tr>
<td>Potential revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$5/ton</td>
<td>$318,970</td>
<td>$956,910</td>
<td>$2,232,790</td>
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<tr>
<td>$10/ton</td>
<td>$637,940</td>
<td>$1,913,820</td>
<td>$4,465,580</td>
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<tr>
<td>$15/ton</td>
<td>$956,910</td>
<td>$2,870,730</td>
<td>$6,698,370</td>
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Indicative project financing plan (with volume and pricing examples)

<table>
<thead>
<tr>
<th></th>
<th>$5-10/ton</th>
<th>$10-15/ton</th>
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</thead>
<tbody>
<tr>
<td>Total Investment Cost</td>
<td>$55,422,222</td>
<td>$55,422,222</td>
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<tr>
<td>Financing Sources</td>
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<tr>
<td>Equity</td>
<td>$13,995,164</td>
<td>$11,842,117</td>
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<tr>
<td>ADB loan</td>
<td>$38,795,556</td>
<td>$38,795,556</td>
</tr>
<tr>
<td>APCF (50% of CERs)</td>
<td>$956,910</td>
<td>1,435,365</td>
</tr>
<tr>
<td>FCF (75% of CERs)</td>
<td>$1,674,593</td>
<td>3,349,185</td>
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<tr>
<td>Ratio (APCF&amp;FCF/Total)</td>
<td>4.7%</td>
<td>8.6%</td>
</tr>
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</table>
Impact on project finance: Example 3

Small Waste-to-Energy projects

Emission reductions and carbon credit value

<table>
<thead>
<tr>
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<th>Total CERs up to end-2012</th>
<th>Total CERs Post 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions reduction (tCO2e)</td>
<td>43,840</td>
<td>131,520</td>
<td>306,880</td>
</tr>
<tr>
<td>Potential revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$5/ton</td>
<td>$219,200</td>
<td>$657,600</td>
<td>$1,534,400</td>
</tr>
<tr>
<td>$10/ton</td>
<td>$438,400</td>
<td>$1,315,200</td>
<td>$3,068,800</td>
</tr>
<tr>
<td>$15/ton</td>
<td>$657,600</td>
<td>$1,972,800</td>
<td>$4,603,200</td>
</tr>
</tbody>
</table>

Indicative project financing plan (with volume and pricing examples)

<table>
<thead>
<tr>
<th></th>
<th>$5-10/ton</th>
<th>$10-15/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Investment Cost</strong></td>
<td>$30,851,000</td>
<td>$30,851,000</td>
</tr>
<tr>
<td><strong>Financing Sources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government &amp; Other</td>
<td>$13,647,951</td>
<td>$12,168,351</td>
</tr>
<tr>
<td>ADB</td>
<td>$15,394,649</td>
<td>$15,394,649</td>
</tr>
<tr>
<td><strong>APCF (50% of CERs)</strong></td>
<td>$657,600</td>
<td>986,400</td>
</tr>
<tr>
<td><strong>FCF (75% of CERs)</strong></td>
<td>$1,150,800</td>
<td>2,301,600</td>
</tr>
<tr>
<td><strong>Ratio (APCF&amp;FCF/Total)</strong></td>
<td><strong>5.9%</strong></td>
<td><strong>10.7%</strong></td>
</tr>
</tbody>
</table>
Impact on project finance: Example 4

Biomass (rice husk) Power project

Emission reductions and carbon credit value

<table>
<thead>
<tr>
<th>Emissions reduction (tCO2e)</th>
<th>Annual CERs 2010-20</th>
<th>Total CERs up to end-2012</th>
<th>Total CERs Post 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions reduction (tCO2e)</td>
<td>420,000</td>
<td>1,260,000</td>
<td>2,940,000</td>
</tr>
<tr>
<td>Potential revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$5/ton</td>
<td>$2,100,000</td>
<td>$6,300,000</td>
<td>$14,700,000</td>
</tr>
<tr>
<td>$10/ton</td>
<td>$4,200,000</td>
<td>$12,600,000</td>
<td>$29,400,000</td>
</tr>
<tr>
<td>$15/ton</td>
<td>$6,300,000</td>
<td>$18,900,000</td>
<td>$44,100,000</td>
</tr>
</tbody>
</table>

Indicative project financing plan (with volume and pricing examples)

<table>
<thead>
<tr>
<th>Total Investment Cost</th>
<th>$5-10/ton</th>
<th>$10-15/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing Sources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equity</td>
<td>$39,675,000</td>
<td>$25,500,000</td>
</tr>
<tr>
<td>ADB loan</td>
<td>$115,000,000</td>
<td>$115,000,000</td>
</tr>
<tr>
<td>APCF (50% of CERs)</td>
<td>$6,300,000</td>
<td>9,450,000</td>
</tr>
<tr>
<td>FCF (75% of CERs)</td>
<td>$11,025,000</td>
<td>22,050,000</td>
</tr>
<tr>
<td>Ratio (APCF&amp;FCF/Total)</td>
<td>10.1%</td>
<td>18.3%</td>
</tr>
</tbody>
</table>
CMI Summary: Main Advantages for Project Developers/Sponsors

- Certain funds today, for commodity with uncertain value in the future
- Reduced budget commitments to close the financing plan of projects
- Comprehensive technical and implementation support
- Extra credits from successful project implementation can be marketed with ADB support for further financial upside
Thank you!

For more information:
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ASIAN DEVELOPMENT BANK
ADB’s Programs in Technology Transfer
Technology – Innovation, Transfer, Diffusion

Innovation: Asia Climate Change and Clean Energy (AC³E) **Venture Capital Initiative** will provide (i) equity (USD 100 million), and (ii) advisory, to 5-7 venture capital funds that will invest in nascent companies with climate mitigation and adaptation technology products.

Transfer: Asia Clean **Technology Exchange** will establish a marketplace that will bring together commercial buyers and sellers of low carbon technologies and assist them with executing transactions. **Tech-transfer CDM** will use carbon credits to lower the cost of energy-efficient and/or renewable energy technology products and make them affordable in developing countries.

Diffusion: Climate **Public-Private Partnership Fund** will mobilize private equity investment at scale, in the order of $ billions, in partnership with the world’s largest pension funds and sovereign wealth funds for low-carbon and resource-efficient infrastructure in Asia.
**VC Initiative: Equity Investment**

**ADB’s role (1):**
- Dedicate circa $100 million to multiple VC funds
- Leverage its network to invite commercial investors and government agencies to co-invest in VC funds

**Possible schedule subject to management approval**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call for Proposal Issuance</td>
<td>Mid 2010</td>
</tr>
<tr>
<td>Proposal Submission</td>
<td>Early Q3 2010</td>
</tr>
<tr>
<td>Short-listing/Due Diligence</td>
<td>Q3-Q4 2010</td>
</tr>
<tr>
<td>ADB’s Investment Approval</td>
<td>Q1-Q2 2011</td>
</tr>
</tbody>
</table>
VC Initiative: Technical Support

ADB’s role (2):

- Secure funds (own and donors) to provide a pool of technology experts and consultancy firms for VC funds
- This allows VC funds to expand their focus sectors, allocate more resources to early stage opportunities, reduce transaction costs, and give a better chance to boost return profile
Tech-Transfer CDM

- Annex I Govt
- Technology/Patent owner in Annex I
- Manufacturer in non Annex I
- Consumer base

Payment

Commercial transaction

Financial flow from the sale of technology

Provides new technology at lower costs

CERs

CPA

ADB