

Finding Carbon Finance for Landfill Projects:

Ongoing Pilot Activities in Shandong Province

Methane to Markets Partnership Expo

Beijing, October 31, 2007

Vinay Deodhar, CDM Specialist & Team Leader CMI-TSF

Li Bo, Chief Coordinator SPPMO

ADB

Outline

- Funding gap and project finance for LF projects
- ADB role in carbon finance
- Case study of the Shandong LFG project

Funding Gap in LF Projects

- The main stakeholders for LF projects - City governments, who have the primary responsibility of waste management
- The service is generally financed from the collection of property tax
- However, many other priorities use up the property tax collection
- As a result, Solid Waste Management is left inadequately funded
- Preferred financing model is increasingly public-private-partnership (PPP)

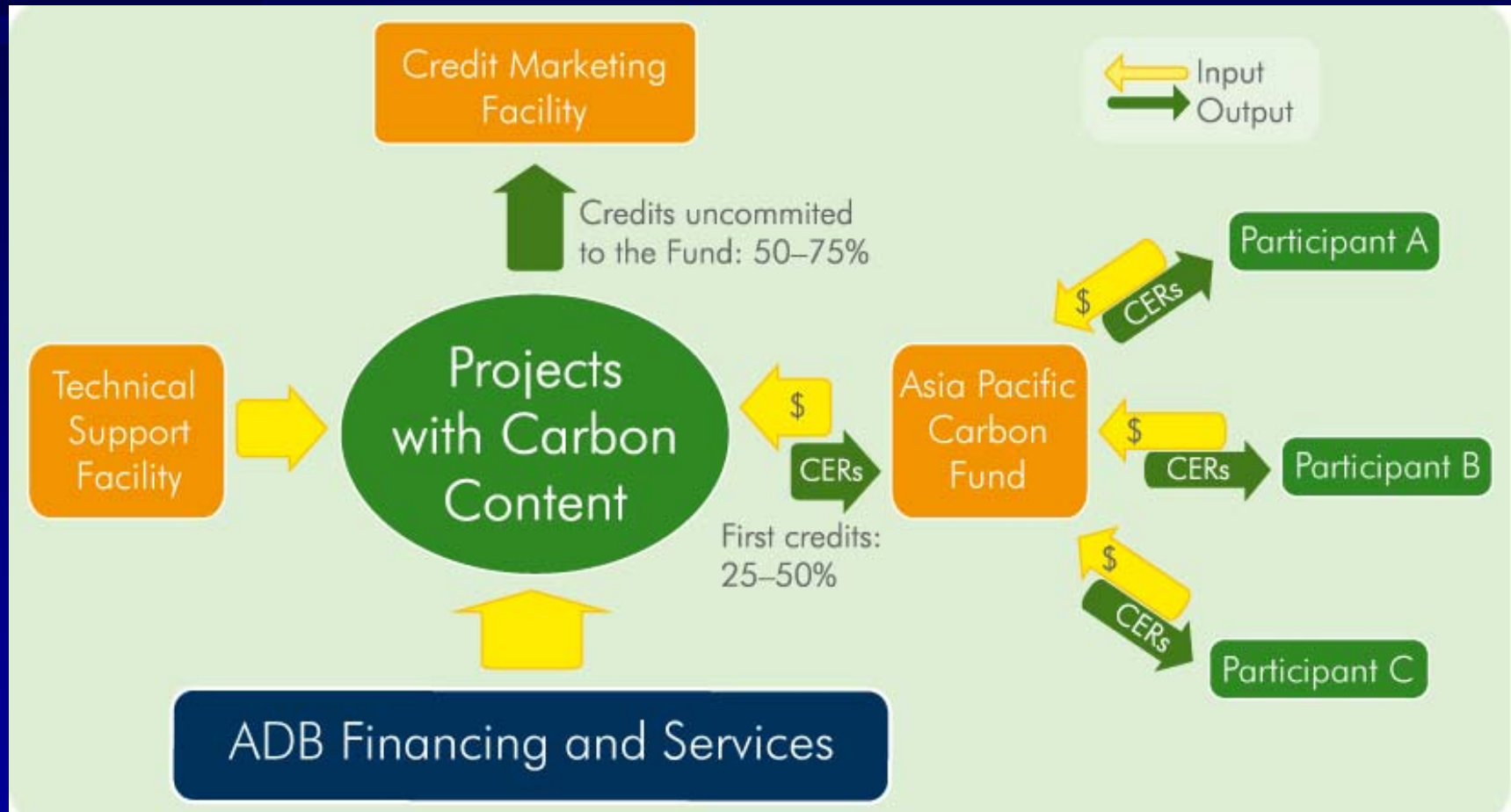
Project finance for LF projects

- The PPP model works on off balance sheet terms
- Tipping fees being the revenue stream and selection criteria for selection of private partner in the bidding process
- In this process carbon finance is a worthy addition to make the projects investment grade
- LFG capture and utilization projects satisfy all the eligibility criteria of CDM methodology
- The CDM revenues for such projects helps in removing major investment barrier

ADB role in carbon finance

- Provide underlying finance – Loan, equity, guarantees
- Through REACH and CDM Facility ADB provided capacity building and technical support
- The new Carbon Market Initiative (CMI) approved in December 2006 has three elements:
 - **Asia Pacific Carbon Fund** to provide co-financing for CDM eligible projects for purchasing part of carbon credits
 - **Technical Support Facility** to assist project developers in CDM documentation and registration and
 - **Carbon Market Facility** to help in selling balance carbon credit

CMI: Three Components



Carbon finance for ADB SWM projects

- As a part of CMI ADB is assisting several municipal solid waste management projects in its DMCs involving waste to energy, landfill gas capture and use/flaring. Examples:
 - PRC: LF projects in Shandong and Anhui provinces, agricultural waste to energy projects
 - India: Solid waste composting in Rajasthan, Kerala, Karnataka, Uttarakhand states
 - Bangladesh: Solid waste composting in Dhaka

One of the projects where carbon finance is being considered is in the Shandong province

Case study of the Shandong Province LFG project

Program Objectives

- ADB provided loan to Provincial Government for the **Shandong Hai River Basin Pollution Control Project (SHRBPCP)**.
- Main objectives are to:
 - Improve municipal wastewater collection, treatment, and reuse;
 - Provide municipal solid waste collection and disposal;
 - Adopt clean industrial processes and improve waste management; and
 - Support the institutional development of public utilities
- CDM potential of the SWM subprojects assessed during project preparation and considered as one of the innovative features of the project.

Project Location



Shandong, 2nd most populous province in China (93 MN), with an area of 156,700 Km²

Project Location

- Lying in the eastern part of the North China Plain with 3 major rivers the Yellow River, Hai River and Huai River
- SHRBPCP includes 3 SWM subprojects
 - **Zouping County** (area 1252 Km² population 700,000)
 - **Linqing City** (area 957 Km² population 730,000)
 - **Linyi County** (area 1,016 Km² population 520,000).

Project locations



SWM Project parameters

Sub-project	Design Capacity (t/day)	Treatment Process	Design Life (yrs)	Landfill Area (ha)	Total Capacity (m ³)
Zouping SWM	400	Sanitary Landfill	15	32.1	3,257,000
Linqing SWM	400	Sanitary Landfill	15	15.7	2,108,817
Linyi SWM	200	Sanitary Landfill	20	20.4	1,368,400

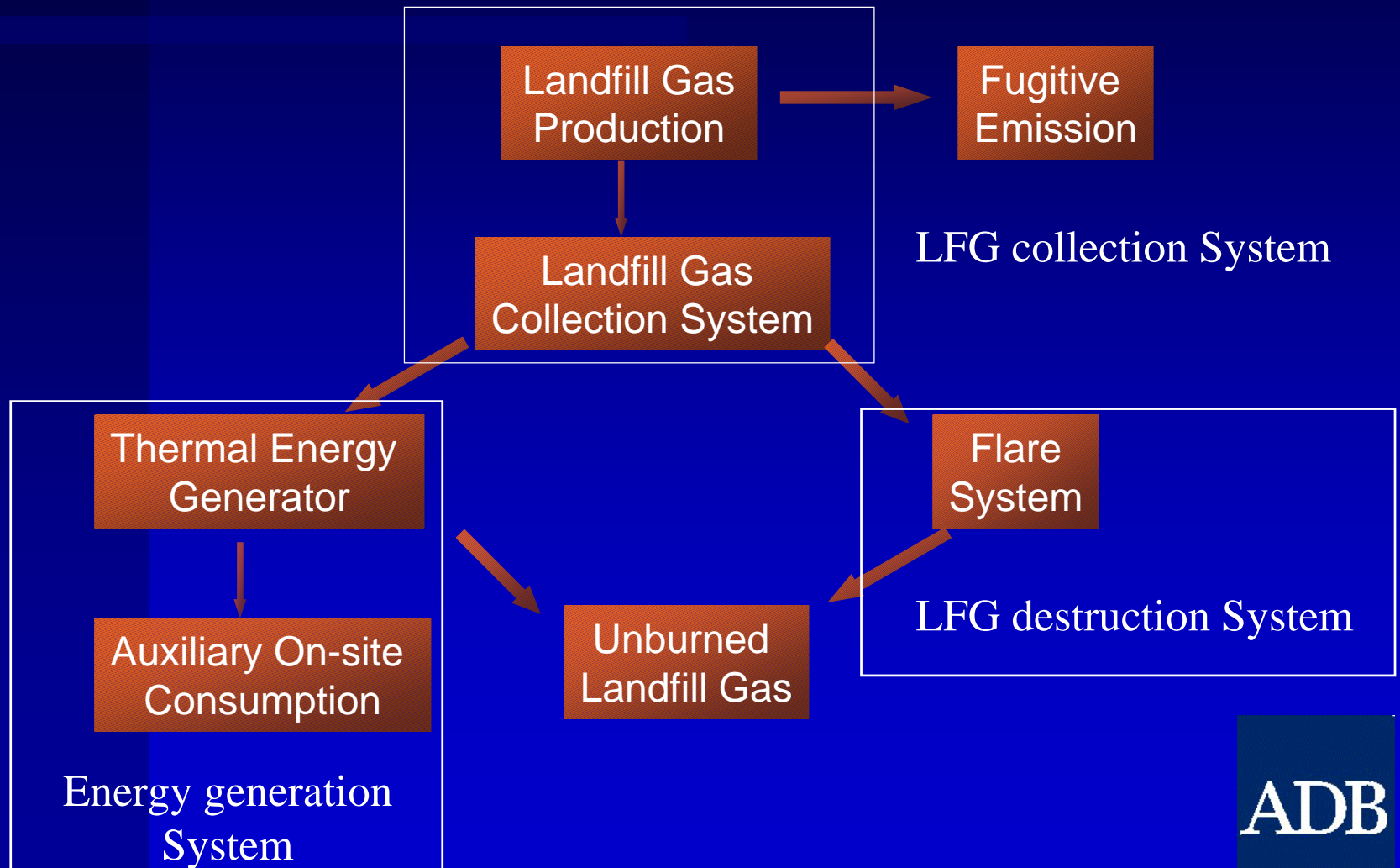
Sustainable Development objectives of the project

- Institutionally - promote significant improvement in solid waste collection and management efficiency,
- Technically - remove technological barriers to efficient extraction and utilization of LFG, and
- Financially - alleviate financial burden for the use of LFG as fuel and obtain additional revenue with carbon credits.

Potential CDM Benefits

- Additional financial revenue.
- Improvement in waste collection efficiency
- Improvement in waste treatment practice through
 - Proper sealing of the landfill
 - Proper compaction of waste.
- Utilization of LFG for heat, hot water, and electricity generation

Components of LFG capture & flare projects



Estimated Emission Reduction

Year	Zouping SWM (tCO ₂ e)	Linqing SWM (tCO ₂ e)	Linyi SWM (tCO ₂ e)
2008	6,720	1,120	449
2009	12,182	2,088	857
2010	16,193	2,864	1,185
2011	16,582	10,379	7,570
2012	16,582	11,891	8,645
Total	68,260	28342	18,704

ADB Role

- ADB loan for the underlying project for construction of the SWM projects;
- TA through the CDM facility for the project development, training, and capacity building;
- Up-front financing for purchase of CERs under APCF HOA signed with the provincial government

Loan 2237: SHRBPCP

Activity	Schedule	Comment
Conceptualization	July-05	By ADB CDM Facility
Preliminary assessment of CDM potential	Nov-05	By CDM Consultants of ADB
Training/Capacity Building of local/provincial Government officials	Apr-Jun-06	By CDM Experts
PIN / PDD For the three subprojects prepared	Mar-07	By ADB International Consultants
CDM Reassessment	Jul-07	By CMI National Expert
Discussions with APCF	Sep-07	With ADB - APCF staff
HoA with APCF signed	Oct-07	By APCF and Provincial Government

Next Steps

- Finalization of PDDs with support by a CDM expert
- Revision of detailed design and construction plan to ensure capture of all the LFG
- Approval from Chinese DNA, Validation by a DOE and Registration by CDM EB
- Physical construction and commencement of operation by May 2008
- Staff training on construction management, O&M and Operationalizing the monitoring plan
- Dissemination of experience to other counties and cities within Shandong province and in China

Lessons Learned

- Prior understanding of CDM concept for SWM projects is essential especially for smaller scale landfill plants
- External financial support at the preparation stage of CDM component is crucial
- Technical support in the construction phase of landfill plant and for O&M is essential for reducing risks in assuring the promised emission reductions
- Smaller scale LFG projects are better bundled together if possible so as to
 - Reduce preparation time
 - Reduce transaction costs and
 - Maximize carbon credits
- Capacity building of the SWM onsite staff of the Implementing Agencies is crucial to ensure sound waste treatment and disposal

Thank you!

ADB