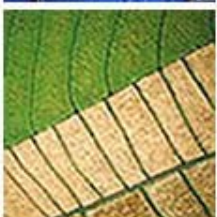




Waste to Energy: A strategy for Low Carbon Growth

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Waste – How Much ?

Municipal Solid Waste (2006)

- 2.0 billion tons, increasing 8%/year
- Regional estimates and projections
 - LAC region - 131 million tons (2005)
→ 179 million tons (2030)
 - Africa - 200 million tons
 - Asia - 280 million tons (2005)
→ 650 million tons (2025)

Industrial Waste (selected countries)

- Non-hazardous - 1.1-1.8 billion tons/year (excluding mining)
- Hazardous - 150 million tons

Waste agricultural biomass

- 5 billion tons/year eqv. 1.2 billion tons of oil



Why Convert Waste to Energy

Environmental Benefits

- Resource Efficiency
- Promoting use of renewable resources
- Climate change benefits
 - Replacing fossil fuels
 - Avoiding methane generation

Economic Benefits

- Usually cheaper source of energy
- Decentralized source of energy
- Avoided cost of fuel transportation/energy distribution

Socio-Political Benefits

- Enhanced energy security due to less dependence on imports
- Enhanced access to energy particularly in rural areas
- Local employment generation



Barriers

Policy Barriers

- Waste management policies continue to be end-of-pipe with emphasis on “collect & dispose”
- **Lack of recognition of waste as a resource**
- **Lack of fiscal incentives**
- Lack of clarity in roles & responsibilities of central vs. local governments

Technical Barriers

- **Lack of access to technologies**
- **Lack of capacity in assessing and selecting technologies**
- Lack of R&D capacity to adapt technologies to suit local condition
- Apprehensions about feasibility, safety, and profitability of Waste to Energy ventures
- Lack of experience



Barriers (cont'd)

Systemic Barriers

- **Lack of supportive infrastructure such as segregation, sorting**
- **Unreliable and inadequate data on waste quantification and characterization**
- Prevalence of NIMBY syndrome

Social Barriers

- Lack of recognition of waste as a resource
- Waste generators unwilling to take actions for segregation
- **Apprehensions that waste to energy systems will adversely affect the livelihood of rag-pickers**

Financial Barriers

- Local authorities have severe budget constraints
- **Financial institutions/banks still prefer investing in manufacturing sector**



Major Issues

Municipal Waste

- Low collection efficiency – waste reaching the disposal site lower than actual generation
- **No source separation – co-mingled waste**
- **Higher organics, especially food waste (50-80%), thus higher moisture content and lower calorific value**
- Due to higher organics, higher rates of decomposition leading to methane generation. Due to co-mingled nature, methane may get accumulated in pockets
- Systems to take into consideration the jobs already provided in un-organized sector
- Issues related to waste dumps

Industrial Waste

- **Need for proper segregation of hazardous and non-hazardous waste**
- Advantage of availability of significant quantities in a small area



Major Issues (cont'd)

Waste Agricultural Biomass

- Widely available but highly dispersed
- Voluminous and thus transportation costs play an important role
- Seasonal variations
- Need to look into prevailing uses



A suggested approach for Waste to Energy Project

1. Selection of pilot sites – assessment of waste generation, quantity & characteristics, current practices of disposal, feasibility of collection
2. Identification, assessment and selection of suitable technologies – technology information, methodology of sustainability assessment of technologies
3. Assessment of energy generation potential
4. Development of business partnerships for implementation
5. Development of replication mechanism
6. Policy recommendations to facilitate overcome barriers
7. Capacity building and dissemination of results and experiences





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Thank You...

