

Sustainable Waste Management In India

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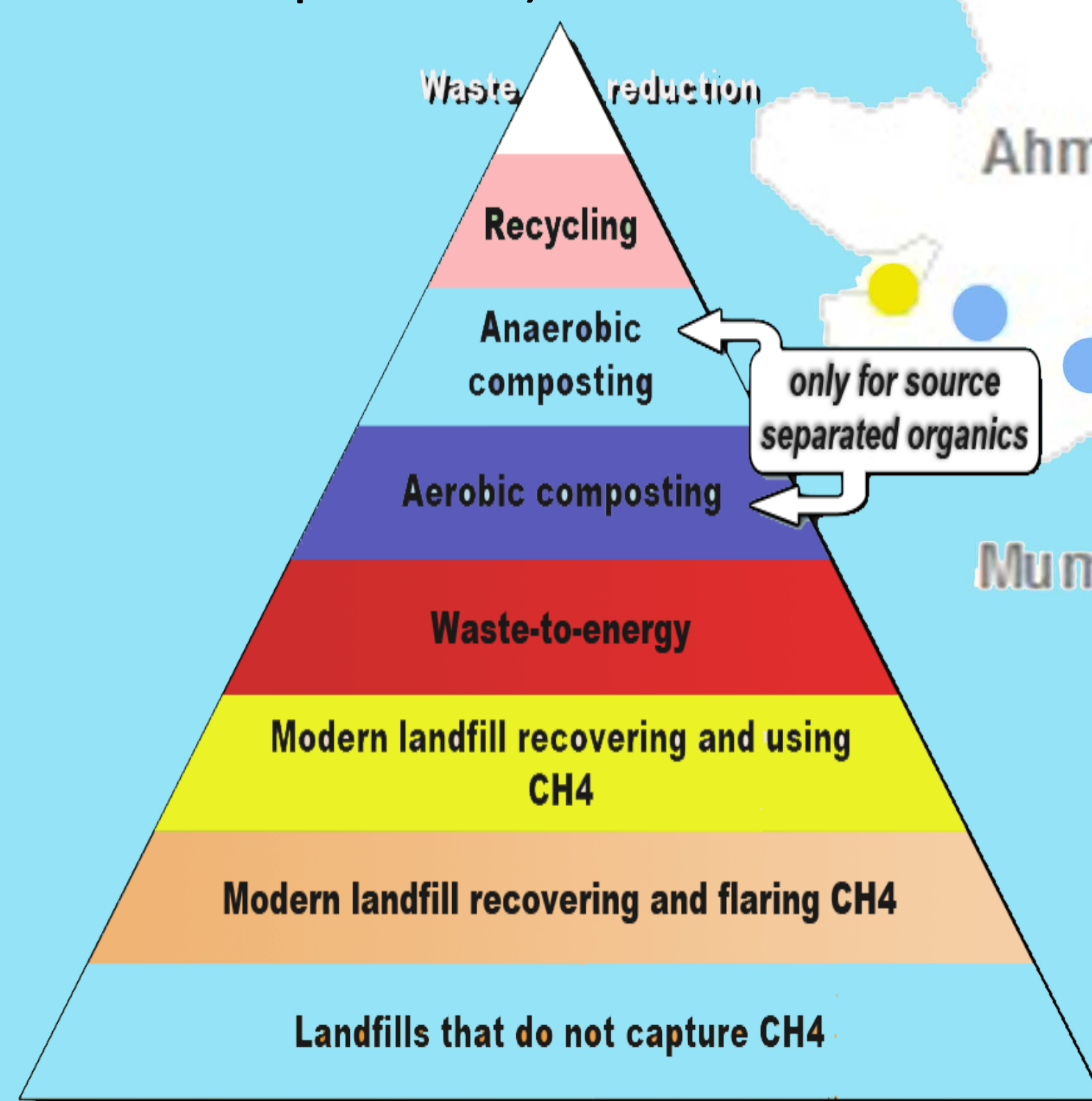


COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

EARTH ENGINEERING CENTER

Present Situation

- Population of India: 1.2 billion, Urban population: **330 million**
- Urban MSW generation: >50 million tons per year; estimated to increase to 100 million by 2017
- Over **200 cities** need SWM facilities
- Tonnage of these cities is in the range of 150 – 9800 TPD
- Infrastructure is lagging behind the rapid economic growth
- Open dumping is the norm
- Energy crisis and need for decentralized power generation
- Material recovery from waste only through rag-picking (which is at best superficial)



Recent Trends

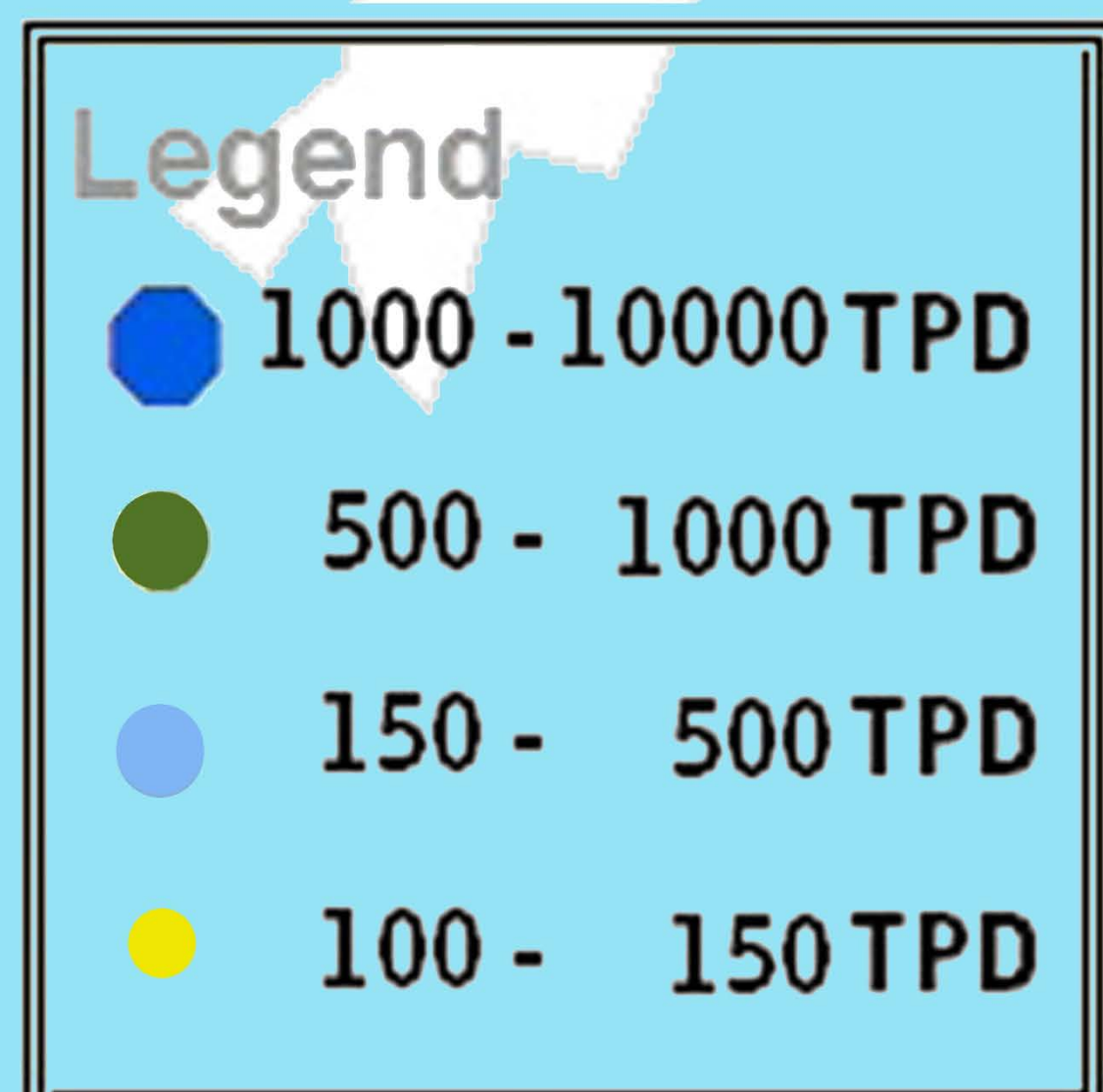
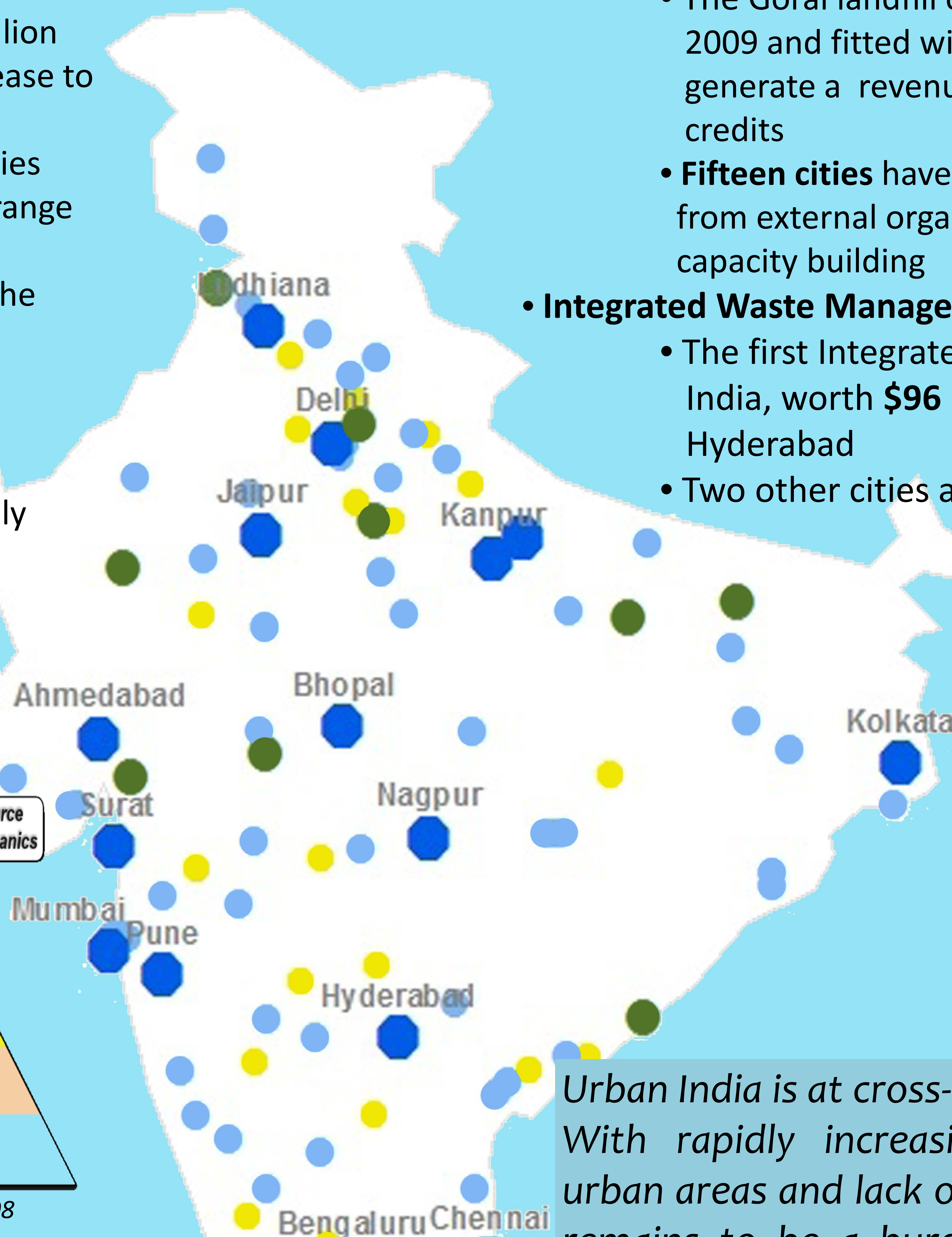
- **Aerobic Composting:** is the most widely employed waste management technique with 56 facilities in 43 cities. It will continue to be the major method.
- **Waste-to-Energy:** is backed up by state Incentives (high rate of return is expected for plants with capacities above 1000 TPD). Proposals for most cities generating MSW above 500 TPD are in process. There are **6* WTE plants** in India
- **Modern Landfills:** Three of the largest cities in India, Mumbai, Ahmedabad and Pune have successfully built landfills with LFG recovery. The remaining 12 large cities are in need of such facilities.

Impetus for Investment in SWM

- Clean Development Mechanism (CDM) under Kyoto Protocol will be the major contributor to revenues
- Central Govt. funding for SWM facilities will keep the capital costs low
- Increasing number of tenders for SWM facilities
- Requests for proposals for new WTE facilities (despite failures of earlier plants)
- Policies in many states favor foreign investments

Business Opportunities

- **Landfill closures, LFG capture**
 - The Gorai landfill of Mumbai was capped in September, 2009 and fitted with LFG capture. It is expected to generate a revenue of **\$21 million** in form of carbon credits
 - **Fifteen cities** have indicated that they need assistance from external organizations for technological support and capacity building
- **Integrated Waste Management Facilities**
 - The first Integrated Waste Management project in India, worth **\$96 million** is under construction at Hyderabad
 - Two other cities are developing such plans



Urban India is at cross-roads of dealing with its wastes. With rapidly increasing population, migrations to urban areas and lack of infrastructure, waste handling remains to be a burden. However, there is a rising awareness about the necessity and opportunities

Business Opportunities

- **WTE plants**
 - The estimated power generation potential from urban wastes in India, by 2012 is **3200 MW**
 - RDF for industrial **solid fuel markets** is sought after
 - Gasification of MSW on small and large scales is being extensively studied
- **Consultancy Services**
 - All previous projects involved foreign (mainly European) consultancies

Caution

- Reduce risk in downscaling of foreign technologies
- Research and modifications to WTE technologies, considering local conditions is required
- Need for robust contracts and commitments among the entities involved
- Include the already existing robust recycling system in the design plan