



## Indian Municipal Solid Waste Management Sector- Opportunities for U.S. companies

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### Overview:

India has nearly 8,000 cities of which 465 have populations of over 100,000 and 53 urban areas have populations of over 1 million. The population density in these cities is also very high. It is estimated that about 55 million tons of municipal solid waste (MSW) is generated in India annually. Seventy percent is collected and only 12.5 percent is processed or treated. In comparison, a US-EPA report indicates that in 2010, Americans generated about 250 million tons of trash. Thirty-four percent was recycled and composted; 12 percent was combusted for energy; and about 54 percent was discarded in landfills. It is to be noted however that the types of waste are somewhat different between American and Indian cities.

The Municipal Solid Waste (Management and Handling) Rules, 2000 issued by the Ministry of Environment and Forests, Government of India, under the Environment (Protection) Act, 1986, regulates the sector. The municipalities have primary responsibility for managing solid waste and are assisted by state level by urban development authorities. The Pollution Control Boards at the state level are entrusted with the enforcement of the regulations.

According to a Status Report on Municipal Solid Waste Management published by India's Central Pollution Control Board and a "Toolkit for Solid Waste Management" published by the Ministry of Urban Development, Government of India, the waste processing technologies reportedly used in India are: composting, vermi-composting, Bio-methanation (suitable only for segregated organic waste), refuse-derived fuel, gasification/pyrolysis (suitable only for segregated dry waste) and incineration (suitable only for segregated waste). Mechanical composting and vermi-composting are the most widely used methods in many parts of the country. Refuse-derived fuel is also done in some large integrated facilities. India has insufficient experience with large-scale gasification, pyrolysis and incineration units. According to findings published in the "Toolkit, 'Some projects have failed due to mismatch in waste quality'. The country is still searching for effective technology solutions that are suitable for use in India. According to the Status Report, some of the leading states in municipal waste management are Andhra Pradesh, Delhi, Goa, Haryana, Gujarat, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttarakhand and West Bengal.

The reports indicate that development of disposal infrastructure, i.e., sanitary landfills, has made the least progress due to factors ranging from land scarcity to lack of technical and financial capacity in cities. Recognizing the challenge, the Government of India has been advocating regional arrangements for waste management- whereby a single, relatively large site is developed to serve the waste disposal requirements of a group of Urban Local Bodies. The states of Gujarat, Maharashtra, Karnataka and Andhra Pradesh have taken initiatives to identify

regional or common landfills for disposal of municipal solid wastes. Also according to the above-cited Status Report, about 59 landfills had been constructed in the country through 2011; 376 landfills are being planned and 1,305 landfill sites have been identified for future use.

### **Opportunity:**

The opportunities for imported technology are mainly in transportation, treatment and disposal of MSW. Except for a few emerging technologies, American companies can expect to face competition from domestic and European suppliers.

Competitive export opportunities for U.S. firms in India's MSW sector are in the following sub-sectors:

#### 1) Mechanized cleaning equipment

Road sweeping has traditionally been a manual job in Indian cities. There is lot of fine dust on Indian roads. Some indigenous manufacturers such as Atlas Equipments ([www.atlasequipments.com](http://www.atlasequipments.com)) have developed road sweeping machines which are being supplied at low cost to municipal bodies. End-users are slowly shifting toward imported, good quality road sweeping machines without any bag/cartridge filters. Bucher Shoerling (Switzerland-headquartered) and Johnston (UK) sweepers are operating in India. Eureka Forbes represents Bucher Schoerling road sweeping machines through its 180 offices located throughout India.

#### 2) Waste transportation-

According to media reports, Kolkata Municipal Corporation (KMC) has purchased 16 portable compactors and five prime movers using ADB funds as a first step in modernizing the daily transportation of 3,500 tons of garbage. The KMC has reportedly sought a \$16 million grant from the Government of India under the JNNURM to set up additional 70-75 compactor stations and 20 movable compactors to replace open garbage collection points. Each compactor machine can collect 14 tons and can compress it to 10-11 tons. The cost of setting up one compactor station is reportedly around \$0.2 million. One compactor station replaces two to three open garbage disposal points. Currently, Kolkata has 580-600 such open disposal locations, which means the city of 4.5 million has a potential demand for about 200 units. To date, the KMC has procured compactors from the India operations of Hyna Group of Netherlands and TPS Infrastructures of India (a leading manufacturer of solid waste management equipment). Several other Indian cities also use waste transfer stations and/or mobile compactors.

#### 3) Waste handling machinery

Leading U.S. companies like Caterpillar have a strong presence in this segment, with its full range of waste handling Dozers. Indian material handling equipment companies such as JCB offer a suite of Loader / Excavators that include a range of attachments to help facilitate the hauling, dumping, shredding, clearing and transfer of waste.

#### 4) Waste-to-Energy technologies

India's Ministry of New and Renewable Energy has predicted that there exists a power generation potential of about 1500 MW from the MSW generated in India. For this reason, the Government of India is actively promoting waste to energy technologies, by providing various incentives and subsidies for these projects. However, according to reports, only 2 percent of the potential has been tapped. The Delhi Municipal Corporation, in partnership with the Jindal Group, processes around 1,300 tons of solid waste to generate 16 MW of electricity. Delhi signed a public private partnership agreement for a second waste-to-energy plant using Chinese technology which will generate 24 MW of electricity on daily basis after consuming 1,200 tons of municipal waste. Pune and Ahmedabad are among a few cities that have also begun waste to energy projects using MSW.

#### 5) Landfill projects

The opportunity areas are design and development of new large capacity landfills; landfill methane mining and landfill rehabilitation; supply of specific hardware such as geomembrane. Maharashtra, Andhra Pradesh, Karnataka, and Gujarat have taken the initiative to set up engineered landfills. According to the JNNURM Toolkit report, the Ahmedabad Urban Development Authority has opened a regional MSW landfill with a 50 ton per day capacity, combining waste from 11 towns and using transfer stations. The Chennai Municipal Corporation has consolidated 200 acres of waste from disposal sites into one 30 acre site. Landfill Methane Recovery projects are being initiated under the Methane to Market (M2M) Partnership Project. Tata Consulting Engineers, in partnership with URS Corp of U.S. jointly designed one of the first landfill methane recovery projects in Mumbai under this Partnership. Media reports indicate that the Kolkata Municipal Corporation is working with a consortium of European companies for a rehabilitation plan of its old dump site covering an area of 11.6 hectare and a volume of 2 million cubic meter of waste. A list of Indian and American firms who are involved in this M2M Partnership is available at:

<http://sustainabledevelopment.un.org/index.php?page=view&type=1006&menu=1348&r=1580>

#### 6) Consulting opportunity

A range of consulting opportunities are available, ranging from integrated waste management facility design and project management to landfill closure and methane recovery projects. Several domestic companies (including several of the companies mentioned above) and international consultants such as Senes (Canada), COWI (Denmark), Ramboll (Denmark), Witteveen & Bos (Netherlands), Louis Berger Group (U.S.), Ernst & Young (U.S.), CDM Smith (U.S.), Wilbur Smith Associates (U.S.), among others, have set up offices and are actively pursuing municipal sector projects.

The Jawaharlal Nehru National Urban Renewal Mission- JNNURM (<http://jnnurm.nic.in/>) launched by the Government of India in 2006 provides opportunities for urban local bodies to create MSW facilities. According to information on its website, JNNURM financial assistance will be available to urban local bodies as a 100 percent grant from the Government of India to the implementing agencies for specific project proposals. As a result, Indian cities have implemented a number of municipal services projects that have greatly improved the infrastructures for handling of wastes over the last seven years. Forty-four solid waste management projects worth about \$320 million were approved under JNNURM, of which 12 had already been implemented as of November 2013. The U.S. companies must work with urban authorities and Indian project developers, such as IL&FS (see below for company information), and include their product/design specifications in the project proposal submitted to Government of India for funding through mechanisms like JNNURM. A list of Indian and international consultants recognized by the Ministry of Urban Development, Government of India for the JNNURM projects is available at [www.urbanindia.nic.in/programme/ud/consultants.htm](http://www.urbanindia.nic.in/programme/ud/consultants.htm)

Additionally, U.S. companies are advised to track the World Bank/ADB/Japan Bank websites and publications for International Cooperation (JBIC) soft loan and grant funded projects in the municipal sector. These projects offer significant front-end consulting opportunities and the possibility to supply equipment during the project implementation phase.

An indication of the opportunity in this sector can be gauged by the growing population of specialized waste management companies in the country. The National Solid Waste Association of India (NSWAI) was formed in 1996 to provide a forum for many of such companies. The association is also a member of the International Solid Waste Association ([www.iswa.org](http://www.iswa.org)) headquartered in Austria.

Some leading waste management companies in India, which are also potential buyers/technology partners for American companies, are:

- IL&FS Waste Management & Urban Services Limited (IWMUSL), incorporated in 2007, provides end to end solutions for solid waste management to municipal corporations and townships in India and abroad. Details available at [www.iwmusl.com](http://www.iwmusl.com). Another division of IL&FS- the IL&FS Environmental Infrastructure & Services Ltd. ([www.ilfsenv.com/associates.html](http://www.ilfsenv.com/associates.html)), created a niche in the municipal waste sector by innovating viable waste processing business models for compost, construction/demolition waste and electronic waste management. The company has technology partnership with several American companies such as ESRI, Pitney Bowes, Honeywell Automation and Johnson Controls.
- Ramky Enviro Engineers Limited ([www.ramkyenviroengineers.com](http://www.ramkyenviroengineers.com)) is a leading provider of comprehensive environment management services. Since its inception in 1994, Ramky has offered a wide gamut of waste management services and has a presence in 55 locations in India.
- JUSCO- a Tata Group company, offers comprehensive waste management service and engineering/procurement/construction service in the urban sector- [www.juscoindia.com/municipal-solid-waste-management.asp](http://www.juscoindia.com/municipal-solid-waste-management.asp)

- JITF Urban Infrastructure Limited of the Jindal Group- focusing on the emerging opportunity of waste to energy- <http://towmcl.com/>
- UPL Environmental Engineers is a leading environmental engineering, construction and project management company. It has executed large SWM projects in several states, and is at the forefront of waste to energy projects. Details available at [www.upleel.com/CompanyProfile.html](http://www.upleel.com/CompanyProfile.html)
- SPML Infra Ltd. is India's leading infrastructure developer with significant experience in municipal solid waste management project development and operations. The company claims to manage over a million ton of waste every year in several large cities such as Delhi, Allahabad, Mathura, Dehradun and Madurai. Details available at [www.spml.co.in/downloads/2013/SPML%20SWM%20Brochure.pdf](http://www.spml.co.in/downloads/2013/SPML%20SWM%20Brochure.pdf)
- A list of prominent Indian companies working in the waste-to-energy sector is available through this link (compiled by a privately owned renewable energy consulting and research company): [www.eai.in/ref/ae/wte/comp/companies.html](http://www.eai.in/ref/ae/wte/comp/companies.html)
- The Industrial Plants & Waste Treatment Corporation in Mumbai ([www.ipwtgroupindia.com/solidwaste.htm](http://www.ipwtgroupindia.com/solidwaste.htm)) is a leading urban environmental infrastructure & services group- executing turnkey projects, supplying environmental equipment and providing environmental services. It distributes U.S.-made Cherrington beach cleaning equipment.

### Trade Events:

CS India will recruit a buyer delegation to WasteExpo ([www.wasteexpo.com](http://www.wasteexpo.com)) which will be held in Atlanta, GA- April 28-May 1, 2014. Showtime meetings will also be arranged with U.S. exhibitors interested in learning more about the Indian market for their products and services.

Among the trade shows held in India, the annual IFAT event organized by Messe München is a very good option for suppliers of a wide range of environmental technologies and services, including solid waste management. According to the end-of-show report, the first IFAT India held in Mumbai in October 2013 was a success, with 131 exhibitors from 17 countries (including several from U.S.) and around 5,000 trade visitors. The next event is scheduled for Oct. 9-11, 2014 in Mumbai. For details, please visit [www.ifat-india.com/](http://www.ifat-india.com/).

Waste Management and Recycling India 2013 was an exhibition exclusively for solid waste management and recycling in India:

[http://www.wmrindia.com/files/4572/downloads/WMR%20India\\_brochure\\_Intrnatl.pdf](http://www.wmrindia.com/files/4572/downloads/WMR%20India_brochure_Intrnatl.pdf)

The dates for the next edition have not been announced.

For the waste cleaning and transportation equipment industry, there is also local trade show option- the Clean India Show, slated for Nov 27-29, 2014 in Ahmedabad, Gujarat. For details, please visit [www.cleanindiashow.com](http://www.cleanindiashow.com)

### Web Resources & List of References:

Comprehensive document on solid waste management status, policy framework, technology options, published by Government of India:

<http://jnnurm.nic.in/wp-content/uploads/2012/11/SWM-toolkit.pdf>

Detailed Guidance Note published by Government of India on developing regional municipal solid waste management facility is available at

[www.urbanindia.nic.in/programme/uwss/mswm/msw\\_guide\\_note.pdf](http://www.urbanindia.nic.in/programme/uwss/mswm/msw_guide_note.pdf)

List of India's cities with million-plus population <http://moud.gov.in/urbanmorphology>

Various media reports and articles

Company and trade websites

### **For More Information**

The U.S. Commercial Service in Mumbai, India can be contacted via e-mail at: [arup.mitra@trade.gov](mailto:arup.mitra@trade.gov); Phone: +91-33-3984-6400; Fax: +91-33-3984-6353; or visit our website: [www.export.gov/india/](http://www.export.gov/india/)

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