Solid & Hazardous Waste

Mexico requires significant investment in both hazardous waste and municipal solid waste management. Less than half of both municipal solid waste and hazardous waste receives proper handling, confinement and/or treatment in Mexico. In recent years, Mexico's Environmental Protection Attorney's General Office, PROFEPA, has stepped up enforcement efforts aimed at ensuring the proper management of hazardous waste, thereby creating significant opportunities for suppliers of specialized technology, services and equipment. Likewise, many local governments are investing considerable resources in solid waste infrastructure and services. Nevertheless, virtually all urban areas in Mexico still lack adequate waste management facilities and processes.

The SEMARNAT has put in place programs to promote waste minimization and recycling but these represent only partial solutions. Mexican cities are home to a large number of illegal dumps, while industrial waste is often mixed with municipal waste, discharged into sewers or water bodies, and improperly stored on-site. These conditions create a great risk to public health and the environment.

The border regions and large metropolitan areas offer the opportunities for companies specializing in solid and hazardous waste treatment. Border projects also benefit from funds made available from the North American Development Bank (which finances municipal solid waste projects within 100 km of the border) and other financing mechanisms. Likewise, urban areas have the greatest need for new landfills and have the greatest amount of financial resources to meet the need.

Municipal Solid Waste

As in the case with many developing nations, Mexico faces serious difficulties in the management of urban refuse and solid waste. It is estimated that over 82,000 tons of solid waste is generated in the country every day. Yet, there is a general lack of proper treatment and disposal facilities, institutional capacities are weak, and financial support at local and municipal levels is frequently deficient. The problem is exacerbated by (a) the sustained population growth; (b) the high rate of rural migration to urban settings; and (c) an increase degree of industrialization and associated local consumption patterns. For example, during the last several decades, Mexico has been urbanizing rapidly (currently, more than 60% of the population of 97 million live in cities with over 15,000 inhabitants). Per capita generation of urban refuse has also increased. It is estimated that 0.7 kilograms to 1.3 kilograms of solid waste is generated per person per day, with an average organic content of about 71%. Regrettably, of all the solid waste generated, only 77% is collected (62 tons), and less than 35% is disposed of under sanitary conditions (29,000 tons). Per capita solid waste generation is linked to household income and city size.

In recent years, Mexican cities have been involving the private sector more and more to assist them in managing the collection, transportation and/or disposal of municipal solid waste (MSW). Today, 39 Mexican cities have some form of private sector involvement in solid waste management.

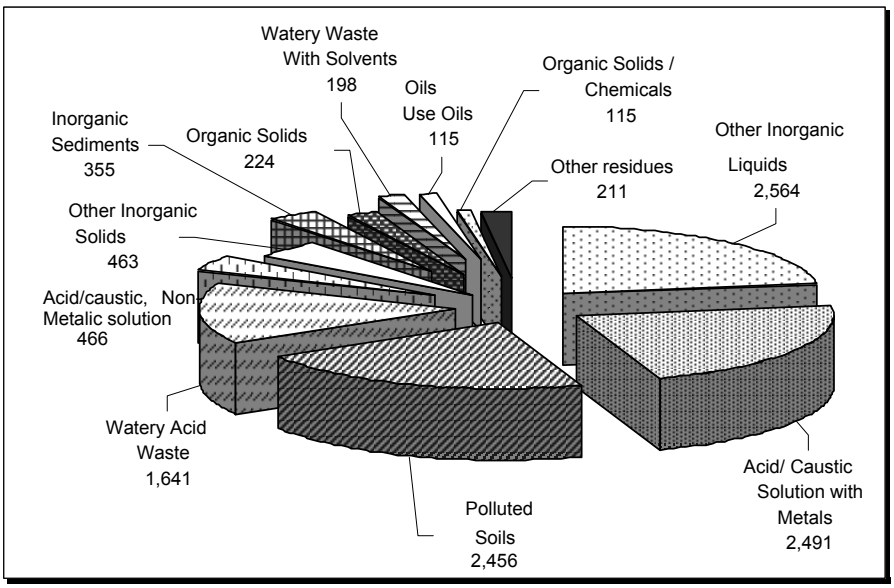
According to SEDESOL (Secretariat of Social Development), the federal department responsible for providing technical and administrative assistance to municipalities related to MSW, the cities that are good candidates for private sector involvement in the near future include those listed in the table below.

City	State	Population	Production/tonnes/day
Aguascalientes	Ags	669,389	640
Ensenada	B.C.	394,323	375
Los Cabos	B.C.S.	122,947	115
Campeche	Cam.	221,858	210
Monclova	Coa.	195,262	185
Frontera	Coa.	67,563	65
Saltillo	Coa.	598,294	570
Delicias	Chih.	118,308	110
Cd. Juarez	Chih.	1,312,185	1,560
Tuxla Gutierrez	Chis.	454,262	430
Chilpancingo	Gro.	202,159	190
Iguala	Gro.	126,925	120
Irapuato	Gto.	451,593	430
Salamanca	Gto.	229,624	220
Uruapan	Mich.	271,240	240
Morelia	Mich.	637,771	600
Mazatlan	Sin.	389,890	370
Villahermosa	Tab.	543,410	515
Xalapa	Ver.	413,872	390
Coatzacualcos	Ver.	270,319	255
Guadalupe	Zac.	109,477	104

Industrial Waste

Mexican industry produces in the neighbourhood of 10 million tons per year of hazardous waste.

Inventory by Type of Hazardous Waste (thousands/tons/yr)



Another type of industrial waste requiring special treatment is PCBs, the generation of which is estimated at 8,000 tons per year.

The lack of proper collection, treatment, and disposal of hazardous waste is a serious problem in Mexico. Although new treatment technologies such as waste to energy schemes, recycling, reclamation and remediation are beginning to take hold in Mexico, the vast majority of hazardous waste produced in Mexico is not properly disposed of.

The drivers that may translate the hazardous waste treatment solutions into private sector opportunities are, among others:

- Stricter enforcement of existing hazardous waste mandatory standards.
- Creation of mandatory soil remediation standards.
- Reducing the cost of treatment alternatives by breaking the RIMSA monopoly on hazardous waste confinement. This will drive down not only confinement and transport costs (as there is only one facility in the whole country) but also recycling and other treatment due to competitive factors.
- Developing and implement training, education and public relations programs to inform SME industries regarding the multiple options available in the marketplace, as well as the need to separate non-hazardous from hazardous industrial wastes
- Developing and maintaining an accurate and reliable national hazardous waste inventory.

Contaminated Site Remediation and Restoration Program

The Mexican Environmental Infrastructure Commission (COMIA) is spearheading a program to develop and implement a plant to restore over 300 contaminated sites across Mexico. The program.

The COMIA is currently finalizing the list of contaminated sites, which is expected to reach approximately 300. Once the inventory is complete, a trust will be created, consisting of approximately US$10 million, which will be used to provide the landowners short-term loans to contract private companies to conduct the site remediation. In exchange for the loan, the trust will take a security interest in the property, which will be released once paid back.

The program includes both a carrot and a stick: The carrot being the loan (in many cases the property is so contaminated that title is no longer marketable) and technical assistance in assessing the problem and choosing the contractor), and the stick being PROFEPA, who, if the remediation is not carried out, will condemn the property.

Canadian companies interested in provide site remediation and restoration services under the program are advised to contact the COMIA directly as indicated below.

Contact: Ing. Alejandro Nyssen
Position: Secretario Técnico
Dependency: Comisión Mexicana de Infraestructura Ambiental COMIA
Address: Lancaster N° 15, piso 4
Col. Juárez
06600, México D.F.
Tel (52-55) 5229-1179
Fax: (52-55) 5229-1193

e-mail: comia@cce.org.mx

Regional Opportunities

Mexico City Area

- CFE (Federal Electricity Commission)—CFE, Mexico's state-owned power company, is a major producer of PCBs and currently has large volumes (roughly 84,000 litres) stored in a facility in warehouse in Nuevo Leon. CFE is now interested in learning about technologies able to help them manage and mitigate their existing and new PCB generation liabilities.
- Mexicana de Aviación and Mexico City Airport—collection, treatment and recycling of used oils
- Cement producers, CEMEX and Apasco, waste to energy opportunities including:
  - Used oils
  - Drilling sludge from the oil and gas industry (emerging opportunity with good potential for growth);
  - Used tires: growing market—Apasco has its own tire shredder, but requires collection and transportation services (but in most cases unwilling to pay for it; CEMEX looking into acquiring tire shredder.
  - Garbage pellets (will only work if sponsored by the city government).
- Grupo Penoles, interested in:
  - Acquiring technology to recycle and reuse metallurgical waste, including on-site remediation/reclamation of metal scrap and tailings, which later may be sold to the cement and construction industry.
  - Purchasing recycled computer chips and PC cards to use them in the company's input processes.
  - Monitor and reduce CO2 emissions.
- Grupo Herdez—alternative waste treatment methods (including waste to energy) for:
  - large quantities of pineapple rinds, mango peels and pepper seeds;
  - used oils, used batteries, used reactive and chemical substances, and used solvents and bases;
- Grupo Modelo—an important producer of yeast bagasse, is looking for treatment technology that will enable them to sell the product in the waste-to-fuel market.

Guadalajara Area

Recycling Opportunities

Some of the most common industrial wastes generated in Jalisco for which a recycling market may exist include:

- Oils and lubricants used as an alternative fuel for cement kilns. Although still a good market, this niche is largely occupied by the environmental divisions of Mexico's two largest cement producers, Apasco and CEMEX. Other players currently in the business include INUBSA and Quimica RIMSA (not affiliated with RIMSA the hazardous waste treatment firm)

- Solvents and paints, hazardous and contaminated metals—e.g., lead (car batteries and steel production) and metal scrap from the electronics industry

- Collection, separation, confinement and recycling of non-hazardous industrial waste. This is a considerable niche market in each of the four regions analyzed. Currently, due to a lack of awareness regarding the difference between hazardous and non-hazardous industrial waste as well as a lack of non-hazardous industrial waste recycling and confinement service providers, recycling in this segment is considerably underexploited. Some of the best markets include plastics, metals, cardboard and carton, glass, and other scrap. Currently, two companies in Jalisco are involved in recycling non-hazardous industrial waste: Petrofina and ARI.

Flextronics—offers several industrial waste handling opportunities, including the following:

- Plastics, paints, metal-mechanic, used oils and greases, PC card scrap (metals), solvents and sulphuric acids. Currently, Flextronics treats these wastes through:

    - Hazardous waste confinement.
    - Metals (PC card) recycling—currently using the Chinese firm, ERR (Electronic Environmental Recycling) to recycle all its PC card scrap.
    - Plastics recycling—currently using the firm, Glesco.
    - Petrofina, SA de CV handles Flextronics solvents, used oils, thinner and paint sludge.

Honda

- Currently, RIMSA is Honda's principle supplier of hazardous waste management services, including transportation and confinement. Honda generates several types of hazardous waste, including:
    - Approximately 140 barrels per month of paint sludge from its wastewater treatment plant, as well as other solvents and paints
    - Rags contaminated with oils and greases
    - Metals

  The first two contaminants are confined and the latter is treated and recycled by Compañía de Acero, SA de CV, a Guadalajara-based metals recycling company whose main supplier is the auto and electronics industry and main customer is the steel industry.

Opportunities

- Honda is looking for technology to sufficiently dehumidify their paint sludge to enable it to be incinerated instead of confined.

- Honda does not yet participate in PROFEPA's Clean Industry program but is considering this option, which could represent an opportunity for Canadian firms certified as environmental auditors in Mexico.

Grupo Simec—Siderugica de Guadalajara—Opportunities:

- Industrial and hazardous waste recycling, including greases and used oils, dust collection filters, and steel scrap containing calcium, graphite and iron.
- Site clean-up technology. CSG spends approximately US$50,000 per year on site clean up. The company has used traditional excavation and confinement methods to date, but is interested in acquiring bio-remediation technology if economically feasible.
- Geo-membranes and poly liners. CSG is interested in purchasing a geo-membrane to temporarily confine its hazardous wastes.

Baja California

- Hazardous waste treatment, confinement and handling. Because of the abundance of maquiladoras and industrial plants along the border region, Baja California produces significant quantities of hazardous waste, most recently estimated at 33,000 metric tons per year According to Mexican environmental law and the maquiladora rules, all hazardous waste generated from material temporarily imported by a maquiladora must later be exported.

- Non-hazardous industrial hazardous waste. The Tijuana recycling and waste management company, Industrial Recicladora de Tijuana, SA de CV, is in the process of developing Tijuana's first non-hazardous industrial waste landfill. The company is looking for foreign investors to supply capital and the sanitary liner for the facility. The cost of the liner is estimated at US$70,000 and the total project is valued at approximately US$500,000. The landfill will have a capacity to dispose of 500 metric tons per day of non-hazardous industrial waste. The facility will include different cells for each type of waste including metals, plastics, solvents, and paper and cardboard products. All the permits accept for the municipal construction permit have been obtained.

- Recycling. Municipal recycling, like most Mexican urban areas, is dominated by the *pepenadores*, and therefore there exists little or no opportunity for foreign firms to penetrate this market. On the other hand, significant opportunities for industrial recycling, both hazardous and non-hazardous, exist in Baja California. Target products and industries include plastics, metals, and paper products including cardboard. There is also a good market to collect and recycle large quantities of used oils and tires from auto centers, both of which have a market for recycling and reuse in cement kilns. A collection center could also be a profitable business, provided that the right public relations campaign was implemented. A company in Ensenada, Baja California is currently doing well in the tire collection waste to energy market

- Plamex, a subsidiary of Plantronics, is a Tijuana-based maquiladora assembling communication headsets. The plant generates a variety of hazardous waste including chromium and other metals and plastics. Plamex currently has all its environmental needs

met, but they are always interested in learning about new technologies that may improve efficiencies and reduce costs.

In accordance with existing law, Plamex exports to the US all of the hazardous waste produced from imported components. Plamex feels there is a considerable opportunity for hazardous waste handlers to do business with Baja California maquiladoras, particularly related to confinement (in Mexico), laboratory testing services, and recycling of hazardous materials.

AmeriCompass

Additional Contacts

Mexicana de Aviación
Av. Texcoco S/N
Col. Peñon de los Baños
CP 1560, México DF
Webpage: www.mexicana.com.mx
Contact: Dra. Bertha E. Rodríguez Ortega
Manager, Health, Security and Environment
Telephone: (52-55) 5786-6362
Fax: (52-55) 5786-6362
Email:bertha.rodriguez@mexicana.com.mx

Grupo Aeroportuario de la Cd de Mexico
Av. Capitan Carlos Leon S/N
Col. Peñon de los Baños
CP 15620, Mexico DF
Contact: Enrique Gonzalez Gonzalez
Director
Telephone: (52-55) 5571-3600
Ext. 2200
Fax: (52-55) 5726-0107
E-mail: enriquegonzalezglz@hotmail.com

Metalsa
Carretera Miguel Alemán, Km. 16.5 No. 100
P.O. Box 102
66600, Apodaca, NL
Web page: www.metlasa.com.mx
Contact: Ing. Yolanda López
Environmental Quality
Phone: 81-8369 7400 Ext. 4185
Fax: 81-8369 7400 Ext. 4256
E-mail: sandraf@metalsa.com.mx

GIRSA
Bosque de Ciruelos 180
Col. Bosques de las Lomas
CP 1700 México DF
Webpage: www.girsa.com.mx
Contact: Ing. Miguel Angel Valenzuela
Manager, Engineering Process and Environment Responsible
Telephone: (52-55) 5723-2800
Fax: (52-55) 5723-2876
E-mail: mavalenz@mail.girsa.com.mx

Cilag de México
Km 81.5 carretera Federal
CP 74160, Puebla, México
Webpage: www.janmx.jnj.com
Contact: Martín Perez
Supervisor, Security and Environment Protection
Telephone: (52-22) 2229-4400
Ext 2012
Fax: (52-22) 2229-4400
E-mail: jancil@janmx.jnj.com

Bayer de México
Via Morelos 330 E
Col. Santa Clara
CP 55540, Ecatepec Estado de Mexico
Webpage: www.bayer.com.mx
Contact: Ing. Ofelia Carbajal
Telephone: (52-55) 5728.3000
Ext. 7034
(52-55)5699-1477
E-mail:ofelia.carbajal.oc@bayer.com.mx

Flextronics de Mexico
Carretera Base Aérea No. 5850 Km 5,
Edif. 6
Col. La Mora
Zapopan, Jal.
México
451110 Guadalajara, Jal.
Mexico
Contact: Ing. Guillermo Álvarez Martínez,
Manager, Environment
Telephone: (52-33) 3818-3200
Fax: (52-33) 3818-3232

Compañía Siderurgica de Guadalajara
Calzada Lázaro Cárdenas No. 601
Col. La Nogalera
CP 44440 Guadalajara, Jal.
México
Webpage: www.gruposimec.com.mx
Contact: Juan Carlos Alvarez,
Director, Security and Environment
Phone: (52-33) 3669-5757
Fax: (52-33) 3812-2888
E-mail: jcalvarez@gruposimec.com.mx

Honda de Mexico
Carretera al Castillo 7250
CP 45680 El Salto Jalisco
Mexico.
Webpage: www.hdm.honda.com
Contact: Marco Aurelio Cruz Huesca
Manager, Environment
Telephone: (52-33) 3284-0145
Fax: (52-33) 3284-0040
E-mail: marco_a_cruz@hdm.honda.com
Contact: Lic. Rubén Recendiz
Director, Public Relations
Telephone: (52-33) 3284-0111
Fax: (52-33) 3284-0065
E-mail: Ruben_Resendiz@hdm.honda.com

Plamex
Av. Producción 12
Parque industrial Internacional de Tijuana
CP. 22390, Tijuana BC.
Mexico
Webpage: www.plantronics.com
Contact: Ing. Cesar López Ramos
Director, Engineering Plant
Telephone: (52-66) 4647-4811
Fax: (52-66) 467-4949
E-mail: cesar.lopez@plantronics.com