



Mexico

# Hard Times Or Promising Future For Composting In Mexico?

In the past, MSW composting facilities have failed due to lack of planning, technical support and inadequate regulations. A new technical approach is needed to recycle the great amount of organics in the waste stream.

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**SINCE** the early 1970s in Mexico, organics recycling has been considered a most important part of the solution to municipal solid waste (MSW) management problems. In fast-growing urban areas with more than 40 percent of the waste flow made up of organics, composting seemed to be the logical environmental solution. Municipal operating budgets began to include construction of recycling facilities. Surprisingly, however, lack of adequate planning and technical support in the decision-making process caused projects to fail.

In 1974, the Mexico City Government built a MSW composting plant in San Juan de Aragon, in the eastern city limits. The fa-



The inability to remove all contaminants from incoming feedstocks resulted in low quality composted products.

cility started operating with a capacity of 225 tpd (although originally designed for 750 tpd (See Table 1). Scavengers hired to separate the materials picked only recyclables that they could sell so the resulting composted product was heavily contaminated with glass and plastic, and was not bought or even accepted by farmers. Moreover, lack of spare parts and adequate tools caused equipment deterioration.

After some years, technology provider Buhler-Miag left, making operation and maintenance harder. The composting plant was not running most of the 1980s, and finally it was dismantled in 1992. Belts and conveyors were integrated to picking lines at a material recovery facility installed in its place.

### Experiences At Other Composting Sites

In the northern city of Monterrey, a municipal MSW composting plant started operations in 1972. Compost quality was also the problem. A study in 1984 revealed deficient materials recovery. Compost produced but never sold accumulated in the facility yards, reaching 120,000 tons. Finally, a fire ruined the facility in 1986.

In the agricultural state of Oaxaca, another composting plant was installed. Initially the product was given for free to farmers who began to try it, more or less successfully on their crops. Unfortunately the composting plant was never formally incorporated into the municipal administrative structure, so it never had its own budget. During the early 1980s, a new municipal administration decided to sell the compost to get money for maintenance. Because of the ever present contaminants, nobody wanted to buy it and soon the plant became an economic and political problem and ceased operations. The abandoned building still remains surrounded by waste in the city's open dump.

The Tonalá and Zapopan plants in Jalisco were installed in 1984, but again

operations soon stopped because the low quality product could not be sold. In 1994, the Tonalá plant was granted to the Caabsa Eagle Company which restarted operations in three of the eight available windrows. Actually the plant is producing only five tpd, much under its original designed capacity; most of the compost is used for public green areas and local greenhouses.

The Merida plant, in the Caribbean state of Yucatan, was installed in 1993. Af-

**TABLE 1. Capacity of MSW composting plants in Mexico**

Location	Design Capacity (tpd)	Operational Capacity (observed) (tpd)
Acapulco, Guerrero	-	0
México, D. F. (San Juan de Aragón) (1)	750	225*
México, D. F. (Bordo Poniente) (2)	200	0
Tonalá, Jalisco(3)	600	5
Zapopan, Jalisco (3)	600	180*
Monterrey, Nuevo León (4)	120	-
Oaxaca, Oaxaca (5)	200	10*
Mérida, Yucatán (5)	200	25
Villahermosa, Tabasco (1)	-	0
Toluca, Edo. De Méx. (1)	600	-

(1) Data by Incremi survey study

(2) Dirección General de Servicios Urbanos

(3) Information by Ing. Adolfo Cárdenas from Caabsa Eagle

(4) Data by Arq. José M. Vázquez from SIME-PRODESO

(5) Information by local officials

\* Average production during operational stages

- Data unknown or unavailable

ter a superficial study, investors calculated that revenues from recovered materials and compost sales would cover the initial cost. However, technical problems arose. First, the reception hopper got clogged with waste, since the walls' slope was not enough for the high humidity Mexican waste. The grinder also got jammed for the same reason and engines had to stop very often. To make things worse, the recyclables accumulated, because it was not easy to find consistent markets in the region. Actually this facility is operating intermittently, but well under its design capacity.

The Villahermosa city plant, purchased from Gondard, a French firm, was installed in 1993. Although the most advanced technology plant in the country, it never operated. Its design included organics separation by pneumatic and gravity systems, but the municipal-

ity had never considered high start-up and operational costs. Also, in the Acapulco, a facility was purchased but never built.

### Successful Smaller Projects

During these years, several smaller scale yard trimmings composting plants developed slowly and quite successfully, like Morelos, UNAM University, Cuautitlan Izcalli, Uruapan, Yucatan, Leon, Valle del Mezquital and Alameda Oriente. All of them had an average production of 20 tpd. The clean compost produced was well accepted and used for landscaping and greenhouses.

In Mexico City, after the success of the yard waste composting plant of Alameda Oriente, a much bigger plant was planned in Bordo Poniente, the city's sanitary landfill. The project and construction were granted by the city government to the agricultural University of Chapingo, which had little experience in composting equipment design. Contrary to international standards, the original design considered a big mechanized plant to process 200 tpd of yard trimmings and other green waste.

Mechanical failures appeared since the beginning. Two 65 hp electric chippers were not powerful enough to grind the waste volume required. The manual hopper gates clogged with the weight, and vehicles planned to carry ground materials to the windrows were unable to turn their load. An old tub grinder from the former plant of Alameda Oriente was moved to grind the yard waste that had accumulated. In the 2002 city government budget, three smaller grinders are to be purchased.

### Identifying Solution

Ironically, for decades large-scale MSW composting projects have not worked properly if at all. Large amounts of money, have been expended in vain, over and over, to solve critical environmental problems. Incremi, an environmental consultant company, was hired to make a survey analysis on the possible causes of these circumstances.

The results suggest that failures on the projects can be attributed to the lack of serious studies of feasibility and an inadequate technology selection by decision makers. Public officials have been

inconsistent in the design, building and operation of the plants, and unable to start economically and technically feasible projects. Foreign experience has been neglected, and the international technology trends ignored. No quality or quantity efficiency standards could be established, and governments made decisions without qualified professionals to question the results. Besides technical-economical reasons, there also are political and social ones.

Legislation on adequate administrative and financing systems for the proper bidding of the projects and construction are urgently needed as well as regulations for the continuing operational and maintenance budgets. Experienced and specialized technicians and officials must be assured they will remain in charge, despite changes in the governments or political parties.

Additional recommendations call for the elaboration of a national plan to de-



**Inadequate technology selection has been identified as a major cause for past failure of large-scale MSW composting projects in Mexico.**

velop compost technology and the products market. There should be participation of technical committees that supervise purchasing, construction and operational processes. Separated waste collection systems and automated separation must be considered.

In spite of all this, composting is still a required environmental solution in most cities and the possibilities are great. Perhaps only a new approach is needed. ■

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