



*Any attempt towards foreign investing on technology supply and transfer in Iran's waste market requires scrutinized studies about the waste profile and component, how the current authorities and local governments are dealing with waste collection, transfer and disposal, and the concerns and challenges that the waste management is confronting with, nowadays. To address these issues, this brief report is prepared by UNIDO-ITPO consultant in Iran in line with the project of "Support to Iran's SMEs through investment promotion and technology transfer in energy and environment" Feb. 2018*

**i. Waste Management in Iran, an overview:**

The current population of Iran is over 79 Million as of February, 2017, based on the latest United Nations estimates. Having 31 provinces, 1100 Cities and 2500 Villages, the country is expected to daily generate huge amount of municipal and other wastes. According to the freshest information from the Tehran Waste Management Organization, the annual waste production rates in Iran are said to be 7,200,000 tons, of which 70% are organic material convertible to compost, 20% recyclable dry materials and 10% are other wastes (rough estimation).

The organization of waste collection is not that uniform. In the country's biggest city, Tehran, 57% of the recycled materials were collected from door-to-door services, 34% of households served by curbside sorting collection schemes and 9% by buyback centers.

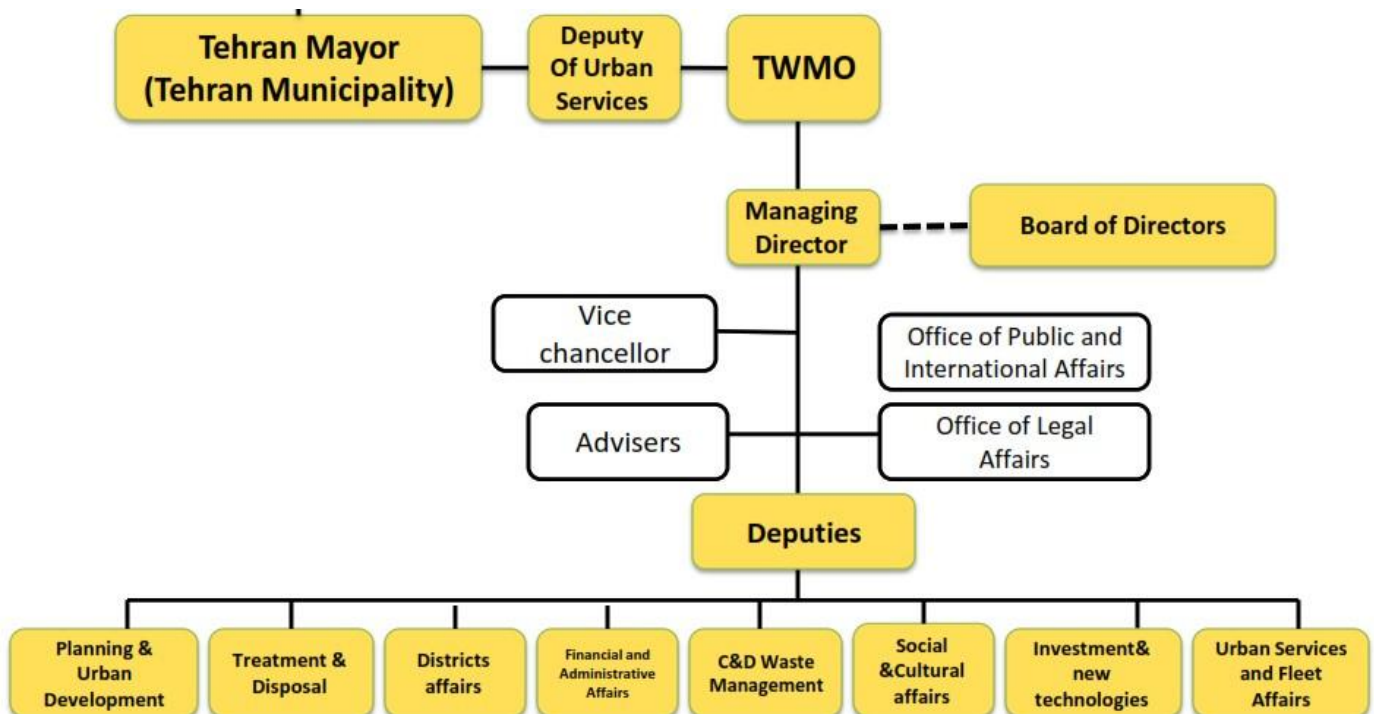
Most of (municipal) waste is brought to landfills. In Northern provinces, where the rate of waste generation is very high, the lands and spaces are very limited for disposal. For example the province of Mazandaran has 10 landfills used to dispose and eliminate about 22,000 tons of waste per year collected from 12 municipal districts. There is serious concern about ecosystem damages and groundwater pollution because of informal and non-standard landfilling in many areas across the country.

Also, in Industry, most of the wastes are landfilled. Following a case study from industrial plants located between Tehran and Karaj dated May 2015, the machinery and equipment industry generate 23% of all industrial wastes. The major hazardous waste-generating industries include chemical and plastic, electronics and metallic minerals. The most common way for industrial waste storing until final disposal is warehouse (33%) and keeping waste in open space (23%). The primary option for disposal of the waste lies on landfilling and about 62% of industrial solid waste is buried, 10% burned, and 11% disposed in an unknown manner. Compared to landfilling the rate of recycling and reuse is low: 17%, resulting of the lack of a recycling system.

**ii. Responsibility and Organization of Waste Management:**

The responsibility for governing waste affairs is organized hierarchically: a national level with ministries and environmental agencies, a regional level with governors or provincial, a local level, consisting of municipalities and city councils, and a fourth level of the stakeholders, where most of the program implementation and actual instructional action is happening. The national level consists of the Ministry of Health, Treatment and Medical Education focusing on healthcare waste inspectorate, the Ministry of Interior for supervision and coordination and the Department of Environment for enforcement responsibilities. Additionally, the Ministry of Agriculture Jihad and the Ministry of Mines and Industries contribute to regulations dealing with other hazardous wastes. Allegedly, there is no independent organization responsible for waste management at provincial level. At local respectively city level, the responsibility of solid waste management is fixed by the Waste Management Law. But Iranian municipalities transferred many operations, control and development functions to the Solid Waste Management Organization. And there are sub-contractors who are in charge of collecting waste and disposals. The following chart represent the structure of Waste Management Organization in the city of Tehran, TWMO.

*Organizational Chart of Tehran Waste Management*





**iii. Today's Main Concerns of Waste Management:**

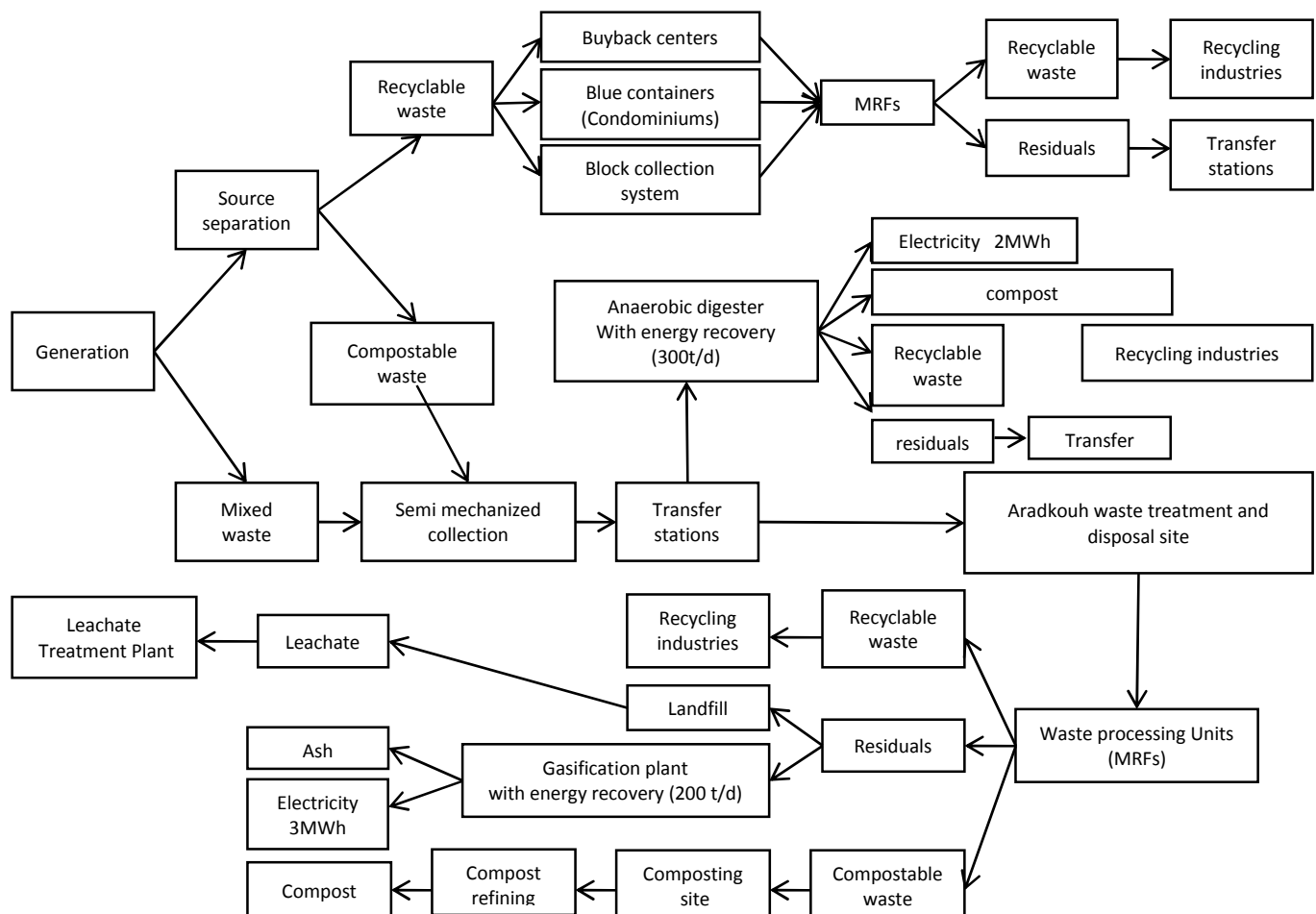
Referring to the facts and figures presented in the beginning of this document, the UNIDO-ITPO consultant would list the main challenges and concerns of waste management in Iran and mainly in the big cities as follows:

- J Organic and wet leftovers accounts for 62% of the waste compositions (in Tehran) comparing to the average world as for 46%. This will cause less calorific value of the wastes to be converted to energy/fuel while having difficulty for collection and disposal.
- J The wetter waste will result in greater amount of leachate. For 1 ton of waste, 0.1 m<sup>3</sup> of leachate will be left which will damage the environment, soil and groundwater reserves. Reported by the municipality in Jan 2018, every day, 5400 m<sup>3</sup> of leachate is released to the soil and the atmosphere around the landfills, of which 15% equivalent to 1000 m<sup>3</sup> is generated solely in the landfill of Tehran.
- J Almost 75% of the whole wastes collected from the sources, is landfilled which result in annual emission of 6 Million ton of CO<sub>2</sub>. Other 25% is recycled or converted to fuel and energy. The government is willing to reach the 20% and 80%, respectively by the end of the 5-year development plan.
- J Recycling from the source is one of the main challenges nowadays. The current rate of recycle is 7%. This is due to lack of public awareness and cooperation together with inadequacy of municipality equipment and collection system. The government has decided to reach to 30% according to the 5-year development plan.
- J There are absolute lack of modern technology for waste processing around the big cities. Currently, 5 waste to energy plants are active with nominal capacity of 11 MW. The only waste to energy plant active in AradKooH landfill around the capital, has the capacity of 3 MW. This Chinese technology works with 200 tons of wastes per day. Besides that, anaerobic digestion technology for electricity generation of 2 MW is an Italian technology provided by SEKO Company with the capacity of 300 tons/day. Referring to the latest reports, the actual capacity of the latter plant is 500 kW (25% of the nominal) due to technical barriers. This means that at best, only 500 tons (6% of the input wastes to the site) are utilized to generate energy. There is indisputable need for foreign investment and technology transfer for waste processing in next years and especially around the big cities and northern coastline.
- J The financial resources of the local authorities are not sufficient for waste management. While, collection and transfer of waste in Tehran to 23Km away in AradKooH site is tremendously costly task, only 20% of

the budget required, are gathered from the citizens. Moreover, the regulations and government acts in waste management are not well integrated or supportive enough. For instance, the government can promote some markets or private sectors to buy the recycled or re-used wastes or compost with guaranteed price.

) The annual financial loss occurred by miss management of wastes in the country in 2017 is estimated as 8 Billion Euro of which, 95% is associated with leachate and the rest is related to soil destruction, greenhouse gas emission and wasting dry recyclable materials.

*Flowchart of Waste Management in Tehran:*



*\* The data and facts have been collected from the official documents and seminars by the municipality and the reports provided by the research and development division of Tehran Waste Management Organization (2015-2018). Inquiries about the content are welcomed through [a.mokhtar@unido.org](mailto:a.mokhtar@unido.org)*