New integrated installations for the management of Municipal Solid Waste at Pentakomo Community Council, Region of Limassol, Cyprus

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Abstract

In December 2013, the Cypriot Ministry of Interior issued an international open tender for the construction and operation of an integrated solid waste management facility (IWMF) for the treatment of the Municipal Solid Waste (MSW) from the Limassol district. A Cypriot-Dutch consortium was awarded the project and the contract was signed in March 2015. The new IWMF is designed to receive and process a maximum of 140,000 t/a of mixed MSW. Moreover, the facility will foresee necessary provisions for the treatment of a further 20,000 t/a of industrial and household recyclables sorted at source.

The plant constitutes a major part of the Cyprus Solid Waste management strategy and is expected to contribute significantly to the country's targets with respect to diversion from landfill, material recovery and energy recovery. It is noted that to date, Cyprus has a high landfilling rate of 80% and diversion from landfill is a major objective for the government in line with the European Waste Framework Directive.

The main challenge of the new waste treatment facility is thus to produce high-quality products and secondary fuel in order to increase recycling and recovery rates. In response to these expectations, the Limassol IWMF is geared towards maximizing material recycling and energy recovery through the production of secondary fuel. After the mechanical sorting and recovering of recyclables, 60% of the initial input of waste, amounting to approx. 84,000 t/a, will be further treated in the Biological Treatment Unit in order to produce SRF. The main products generated at the IWMF are ferrous and non-ferrous metals, plastics, paper, glass, secondary fuel and compost. In order to use secondary fuel for energy recovery as for example in energy-intensive industry processes, a quality of at least 14 MJ / kg has to be achieved. Potential residues resulting from the treatment will be disposed at a specifically constructed landfill with a total capacity suitable for 25 years of operation. The main sub-units of the Limassol waste treatment facilities are:

- The **Weighing and Control Unit** for daily recording of incoming materials and outgoing products (materials recovered for recycling) with the use of weighbridge
- The **Waste Reception Area** for receiving mixed waste and / or pre-sorted recyclable waste consisting of maneuver areas for trucks and container transfer vehicles and a bunker area for receiving mixed waste and / or sorted at the source materials to be further treated.
- The **Mechanical Sorting Unit** for mechanical sorting and storage of recyclables providing the mechanical equipment required for the automated sorting processes as well as a hand-sorting cabin for non-acceptable waste. Moreover, the Mechanical Unit will contain an area for compression and baling of recyclable materials.
- The **Biological Treatment Unit** for the biodegradable fraction resulting from both the mechanical sorting of mixed waste and from sorting green and organic waste at source will include a bio-drying and a composting area as well as sections for the production of secondary fuels and compost refinery and packaging.
- A **Sanitary Landfill** for the residues derived from mechanical sorting and treatment of mixed waste, recyclables from sorting at source and presorted green and organic materials.

It is expected that upcoming policies and practices relating to resource efficiency, circular economy and increased material recovery and separation at source will all contribute to changes in MSW waste volumes and composition as well as to changing market conditions for secondary fuels, renewable energy and recyclables. The plant operations will therefore need to show great adaptability to adapt to such changing conditions.

A key innovation of the proposed solution is the introduction of a purpose built press designed to efficiently separate organic from inorganic materials through press-induced liquefaction of the organic fraction of the waste. The method constitutes an efficient waste separation method that leads to a clean organic fraction as well as high-quality SRF/RDF.

The plant is currently under construction and is expected to be operational by the end of 2016. The facilities will be operated by the consortium for a period of 10 years.