

# Towards a sustainable waste management

Summary of IEA Bioenergy Task 36 workshop,  
Rome 17 May 2016



IEA Bioenergy



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## Summary

This workshop discussed the development of Mechanical Biological Treatment (MBT) and Waste-to-Energy (WTE) in a sustainable waste management. The workshop had focus on the Italian system but the situation in France and Germany were also presented and discussed. The workshop was arranged by IEA Bioenergy task 36, [RSE](#) and [Atia ISWA Italia](#) at the Malagrotta waste management plant in Rome. The presentations are available at the ISWA Task 36 website amongst the [publications](#).

### General waste data Italy

Municipal waste generation has declined in Italy during the last 5 years and was in 2014 9% lower than in 2010. The average amount was 488 kg/capita/year. The amount differs between different parts of Italy with the highest amount in central Italy, the declining trend is valid for the whole country though.

Italy has set a goal of 65% separate collected MSW (for the year 2012). The northern part of Italy is closest with an average of approx. 57% while the south of Italy is far off with only 31% separately collected in 2014. The difference between regions spans between 67% for the best down to 12.5%.

According to Eurostat Italy are recycling (including composting) about 46% of their waste, 21% is energy recovered and then 34% landfilled.

### Mechanical Biological treatment

Quite often there is a misunderstanding where MBT is considered as an alternative to WtE. It is important to remember that MBT is not a final treatment method but rather is an option to source separation or as further refinement of the residual waste fraction. It generates a number of waste flows that will go to different treatments after the MBT-plant. Some of this might be in the form of solid recovered fuels (SRF) or other combustible waste but other parts are metals, plastic, paper, and a stabilised organic fraction. In most cases the organic fraction will be put at a landfill. MBT is also a collective name for the type of treatment; the actual plant can be designed for different outputs depending on the purpose of the plant.

Martignon presented that in Italy there are 117 MBT plants in operation, and the majority of those are located in the southern and central parts of Italy. The capacity is roughly 13.5 Mtonnes/year to be compared to that of Germany that is 6.1 Mtonnes. There also seem to be a correlation between the number of MBT-plants and the rate of separate collection. The separate collection is much higher in the northern parts of Italy than in the southern parts, and the difference spans between 67 % separate collection down to 12.5 %. Out of the MBT plants somewhere in between 42-55 are producing SRF mainly concentrated to northern and central Italy. The treatment capacity of those plants is around 5.3 Mtonnes/year where Lazio is the region with the largest capacity (1.9 Mtonnes/year).

Lombardi also presented a study of how the output of the two MBT-plants in Rome could be optimised to minimise the part put into landfill. The thought was to mix some of the fractions from the plant to generate SRF that could be sent for energy recovery. The conclusion was that there is a potential to generate a larger stream of SRF with the same classification as is currently produced.

Both Germany and France have optioned for increased source separation to achieve their recycling

targets. Also their experience of MBT has not been that good. However France also sees an increased need for the production of SRF which will be achieved through some kind of sorting plant.

## **Waste Incineration**

Italy today has 45 operating waste incineration plants with the average capacity of 161 000 tonnes/year (total capacity of all plants is 6.3 Mtonnes/year). The average size is larger than for France (110 000) but smaller than Germany (290 000). Four large plants constitute 34.5 % of the total national capacity. The plants are not distributed equally over Italy, the majority (62%) is situated in the northern part of Italy. There is a need for more capacity to treat residual waste in the southern and central parts of Italy, the demand is judged to be around 8 plants with a capacity of 1.8 Mtonnes/year. In both Germany and France there has been little or no newly developed capacity on WtE the last few years. The projection for France is also that there will not be needed any additional WtE capacity but there will be a need for some plants treating SRF.

In 2012 15 of the Italian plants were considered R1-plans. Italy has applied their own climate correction for the calculation of the R1 status and the correction depends on the temperature. In 2013 the Italian plants recovered 4.2 TWh electricity and 1.5 TWh of heat and approximately 25% of the plants were combined heat and power plants (CHP).

Of the bottom ash, more than 80% is recovered in different applications while the rest is disposed at landfills.

At the workshop Zagaroli also presented the plans for a new gasification plant at the Malagrotta site. There is already one existing but that one was taken out of operation when the classification was changed from R1 to D10 with the Waste framework directive. The main motives for a gasification plant in their case would be the vitrification of the bottom ash- thus making it much easier to use as construction material. The thought with the new gasifier would be to make a syngas and not just a two stage combustion plant. The SRF needed for the gasification plant would be produced in the existing MBT plant at the site.

## **Conclusions**

MBT should not be considered as an end waste treatment option but rather as an intermediary method. This is important to remember so that waste streams are not double counted or compared on the wrong basis. It is also important to look at the output qualities when considering the effect of the method.

WtE plays an important role in building a sustainable integrated waste management, both now and in a foreseeable future. There might still be some expansion in capacity in Italy while the capacity in Germany and France currently are quite well balanced with the need.

MBT has played a quite large role in many countries; however in the effort to divert organic waste from landfills the method has limitations. There does not seem to be a large increase in new capacity of MBT. However there is a potential to divert more of the MBT residues from landfill through optimisation of the process.

Although there are large differences between different member states in EU, it is also worth noticing that there can be just as large differences within a member state as well. Italy illustrates this well with the differences between north and south.

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