Picture credits: top: MBT plant Northern Malta, with kind permission of BTA International GmbH, EFACEC Engenharia e Sistemas,Vassallo Builders Ltd and WasteServ Malta Ltd. down left: with kind permission of BTA International GmbH. down right: with kind permission of WELTEC BIOPOWER GmbH.

The Market for Mechanical Biological Waste Treatment in Europe

Locations, plants, backgrounds and market estimations

Extract

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The Market for Mechanical Biological Waste Treatment in Europe

The business with mechanical biological waste treatment plants (MBT plants) continues to be a strong market. In the past 5 years, an average of about 25 new MBT plants were constructed annually in Europe. In this way, an average of about 2.2 million annual tons were commissioned each year.

In early 2017, Europe has a total of about 570 active MBT plants with a treatment capacity of 55 million tons.

ecoprog expects another 120 facilities with an estimated capacity of almost 10 million annual tons to be commissioned between 2017 and 2025. Thus the market situation will continue to be strong in the coming years, although the speed of construction will decrease somewhat.

In many countries, the modernisation of existing plants will replace the new construction business. One reason for this is the production of RDF, which is increasingly pushed to reduce the landfilling fraction of the MBT plants. The altered composition of residual waste as a result of a stronger separate collection also requires investments in existing plants.

Against this backdrop, ecoprog has analysed the existing European MBT plants and forecast the future market development by using a transparent methodology.

The study **"The Market for Mechanical Biological Waste Treatment in Europe"** includes:

- The description and analysis of 520 MBT plants and 200 projects in Europe by site, including technical data and contact addresses.
- A valid estimation of the future market development by country, based on a transparent methodology.
- A competition analysis of the most important MBT plant operators on the European market.
- An overview of the most important plant technology as well as costs and revenues on the MBT market.
- A comprehensive explanation and analysis of the European legal framework.

The study is available in **German and English from 3,400,- € plus VAT**.

Contact:

Janne Heumer
ecoprog GmbH
Tel. +49 221 788 03 88 13
j.heumer@ecoprog.com

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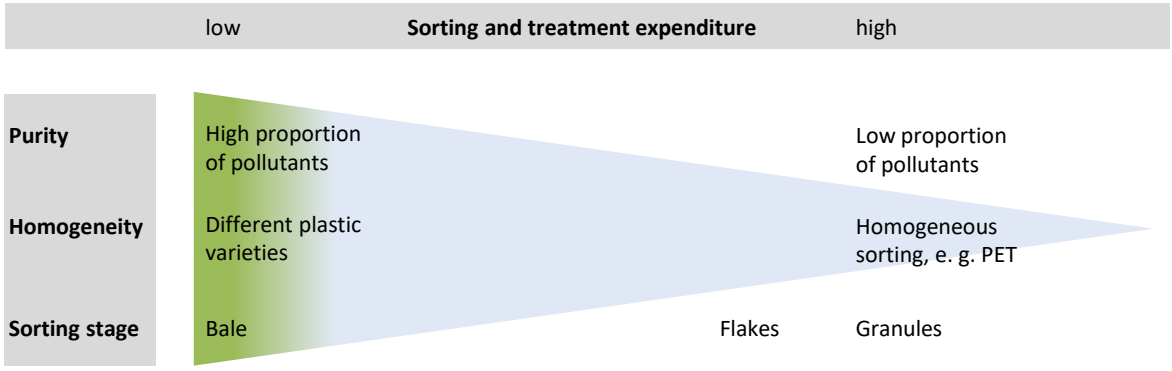
Different plant outputs also need different technology. Which kind of technology is applied, depends on the type of the customer and also on its own technology:

- The quality of the sorted recyclables, e.g. plastic or paper, differs by customer. Many of such customers are specialised sorting plants that “refine” the plastic, e.g. to mono-fraction granulate, by processing it through further sorting stages. Depending on the equipment of the sorting plants, their input material (i.e. an MBT plant’s output) requirements vary as well. Demands are usually higher for paper that is delivered to a paper mill directly, as many paper mills only have small capacities for installing further sorting and cleaning processes.
- The RDF the MBT plants produce is incinerated in different types of power plants, e.g. in waste incinerators, RDF power plants (power plants especially designed for these refuse-derived fuels), cement mills and coal-fired power plants. The requirements of these plants vary significantly. Co-incinerators usually make high demands on the RDF as this may not significantly affect their primary business purpose, for instance the production of cement. Waste incineration plants can often handle material that has only undergone minor pretreatment, after all, they generally incinerated unsorted waste. Waste incinerators therefore make considerably lower demands, however, this also holds true for the prices. The grain size of the RDF does not play a major role for an RDF power plant equipped with grate combustion technology; however, when fluidised bed incineration is applied, the individual RDF particles are blown in and may therefore not exceed a specific maximum size.
- The specifications of the individual countries even differ for landfilling, e.g. in terms of technology or referring to individual limit values, such as the carbon share (TOC).

Figure 6: Processing efforts for plastics (secondary raw material)



Source: ecoprog

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The probably largest economic advantage of MBT plants is their small size and therefore their logistical advantages, especially in rural areas.

Due to expensive incineration technology and flue gas cleaning, a waste incineration plant needs minimum amounts of waste in order to run cost-efficiently. In rural areas especially, this may result in a very large catchment area and high transportation costs.

Depending on the location and the settlement structure, this effort may be reduced by installing several smaller MBT plants. They do not only reduce the waste's weight (due to the loss of moisture), but also make it easier to transport, thanks to smaller grain sizes and a decreased reactivity. When there are recycling centres or landfill sites located more favourably towards an MBT plant, this may save additional transportation costs.

The RDF that is produced in such an MBT plant, may subsequently be incinerated in a central RDF power plant, then entailing lower transportation costs.

Figure 30: Transportation routes to a treatment plant in a rural location

Catchment area of a waste incineration plant *vs.* *catchment area of 3 MBT plants*

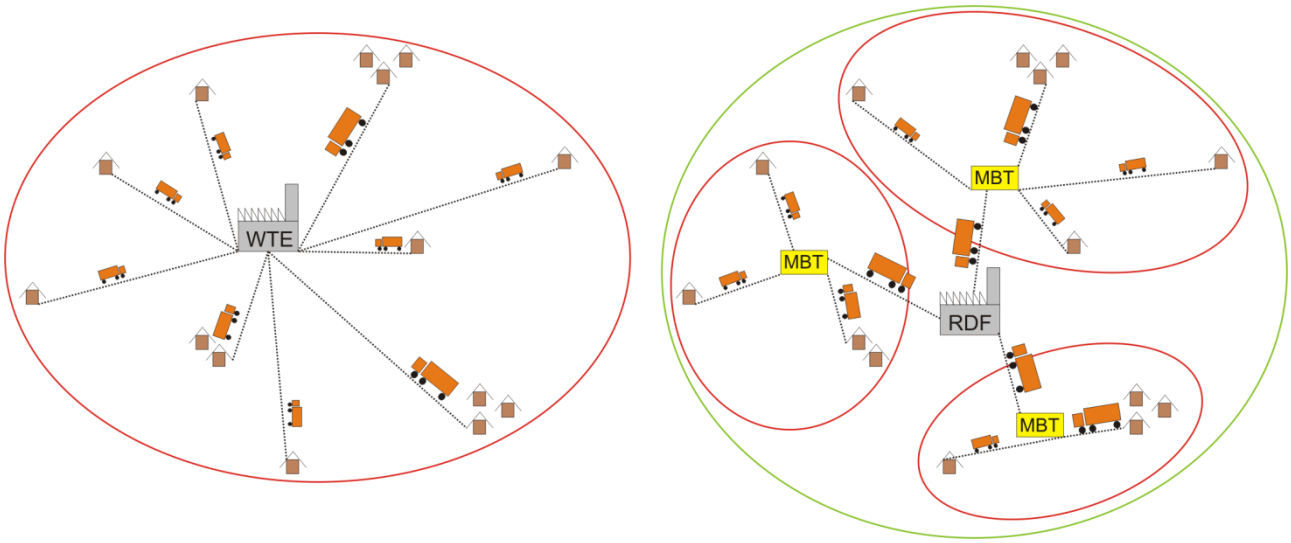


Illustration: ecoprog

The specific volume limits of waste incinerators and MBT plants depend on the waste, a plant's location – and are very controversial.

[…]

7.5 Estonia

Inhabitants (million)	1.3	Number of MBT plants	3
Municipal solid waste 2014 (1,000 Mg)	470	Treatment capacities (1,000 Mg/a)	265
MBT capacity share of overall waste (%)	56	Average plant age	6

Management summary

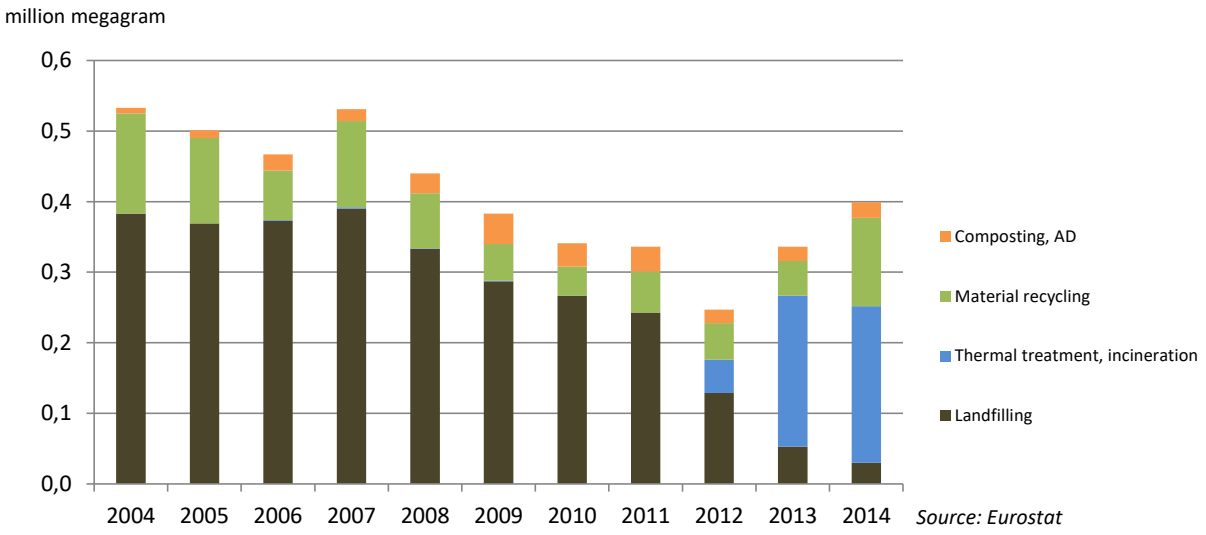
Ever since the waste incineration plant in Tallinn was commissioned in 2013, Estonia has residual waste treatment overcapacities. We do therefore not expect any new MBT plants to be constructed by 2025.

Background/legal framework

Until the mid of the decade, most of the provided funds for the Estonian waste disposal sector was spent for landfilling. Hundreds of landfills, most of them small and of lower standard, have been closed since the mid-1990s. Instead, 5 central landfill sites were built, complying with EU regulations.

Like most other Eastern European states, Estonia was also granted transitional periods for implementing the EU Landfill Directive. Until 2010, the amount of landfilled biodegradable waste should have been reduced by 35% in comparison to the 1995 amount and it has to decline by 75% by 2020.

Figure 1: MSW treatment in Estonia 2004-2014



The MSW amount in Estonia decreased by about 40% between 2007 and 2012, down to 334,000 tons and mainly because of the European financial and economic crisis as well as the adjustment of the national towards EU law. […]

Landfill tax/landfill ban

When introducing the EU Landfill Directive in 2005, the country also established a landfill ban for 64 different waste streams.

Since 2000, the Netherlands differentiates between a “high” tax for landfilling waste that would be suitable to go to thermal recovery and a “low” tax for landfilling waste with a density of over 1.100 kg/m^3, as this waste is then classified as not being suitable for thermal recovery. The low tax currently amounts to 17 EUR and the high tax is over 100 EUR.

Incineration tax

In January 2015, a tax amounting to 13 EUR per ton was introduced for the thermal recovery of MSW. However, this tax only has to be paid for national waste and not for waste imports.

RE legislation

Renewable energies are currently subsidised through the SDE+ programme (*Stimulering Duurzame Energie*, English: “Stimulating Sustainable Energy”). In 2016, the volume of the programme amounts to 8 billion EUR. Since the same year, subsidies may be applied for in two phases. A biogas plant that secured subsidies will receive them for 15 years.

Figure 97: Feed-in tariff in the Netherlands (phase 1/2016)

Plant	Basic price (EURct/kWh)	Correction price (EURct/kWh)	Actual subsidy (EURct/kWh)	Projects handed in from
Heat				
New plants	6.0	3.1	2.9	1 March 2016
Existing plants	5.6	1.7	3.9	1 March 2016
Electricity (CHP)				
New plants	8.7	3.2	5.5	1 March 2016
Existing plants	8.6	3.3	5.3	1 March 2016
Processing into biomethane				
New plants	6.0	2.2	3.8	1 March 2016
Existing plants	5.9	2.2	3.7	1 March 2016

Source: Dutch Ministry of Economic Affairs, 2016

Contrary to the subsidisation schemes in other countries, SDE+ defines a basic price that does not depend on the technology used and a correction price. The government redetermines both prices each year. The correction price is approximately the electricity market price. The actual feed-in tariff is the difference between basic price and correction price.

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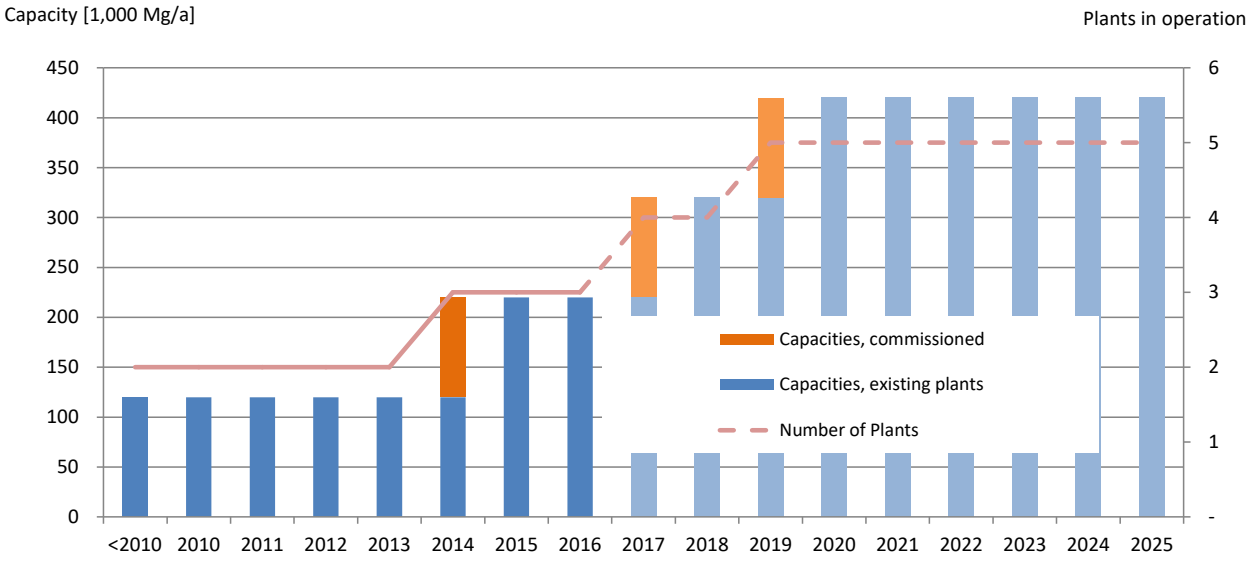
Market development

Even though Norway has sufficient thermal treatment capacities, further plants will be realised for the mechanical treatment of residual waste. After the plant in Skedsmo was commissioned in 2014, another facility will soon be completed in Stavanger. Start of operations had initially been planned for 2016. The plant will sort out the plastic fraction from residual waste and process it into plastic flakes.

Figure 102: Market forecast Norway



Data estimated up to 2016, from 2017on: forecast, source: ecoprog

In our forecast, we assume that some similar projects might be implemented in larger cities. However, the low utilisation of the active plant shows that these capacities will not be needed. Norway is a rich country with advanced waste treatment infrastructure. We therefore expect that the aforementioned projects will rather be pilot plants for alternative types of residual waste treatment, which the cities will finance through gate fees. In this case, high utilisation will not be necessarily needed for cost-efficient operations.

Figure 103: Project outlook Norway

Plant	Country	Biological Treatment	Capacity [tpy]	Start of operation	Status
Stavanger	Norway	no biological	100,000	2017	under construction

[…]

Plants and projects in Portugal

[…]

Barcelos

Status: active

Operator:RESULIMA
0 Vila Nova de Anha
Tel.: +351 258 350 330
www.resulima.pt

Capacity [tpy]: 12.000
Technical details: no biological treatment
Material recycling output [tpy]: 10.917

Remarks: The conversion of the facility from a mechanical treatment plant to a MBT is discussed. The capacity could then rise to 110,000 Mg/a.

Beja

Status: active

Operator:RESIALENTEJO
0 Beja
Tel.: +351 284 311220
www.resialentejo.pt

Start of operation: 2015
Capacity [tpy]: 30.000
RDF output [tpy]: n.a.

Chamusca

Status: active

Operator:RESIESTRELA, Valorização e Tratamento de Resíduos Sólidos, S.A.
0 Carregueira
Tel.: +351 249 749 010
www.resitejo.pt

Start of operation: 2013
Capacity [tpy]: 31.545
Technical details: no biological treatment
Material recycling output [tpy]: 8.207
RDF output [tpy]: n.a.

Eirol

Status: active

Operator:ERSUC
0 Coimbra
Tel.: +351 239 851 910
www.ersuc.pt

Start of operation: 2011
Capacity [tpy]: 180.000
Material recycling output [tpy]: 9.000
RDF output [tpy]: 52.500

Évora

Status: active

Operator:Gesamb
0 Évora
Tel.: +351 266 748 123
www.gesamb.pt

Start of operation: 2014
Capacity [tpy]: 113.000
Technical details: no biological treatment
Material recycling output [tpy]: 5.329

Fundão

Status: active

Operator:RESIESTRELA, Valorização e Tratamento de Resíduos Sólidos, S.A.
0 Fundão
Tel.: +351 275 779 330
www.resiestrela.pt

Start of operation: 2001
Capacity [tpy]: 57.463
Technical details: anaerobic digestion
Material recycling output [tpy]: 5.161

Leiria

Status: active

Operator:Valorlis
0 Leiria
Tel.: +351 244 575540
www.valorlis.pt

[…]

Plants and projects in Spain

[…]

Algimia de Alfara

Status: active

Operator:TETMA - LUBASA GROUP
46023 Valencia
Tel.: +34 963 379 999

Start of operation: 2010
Capacity [tpy]: 120.000

Alhendín

Status: active

Operator:RESUR Granada
18014 Granada
Tel.: +34 958 804 315
www.resurgranada.es

Start of operation: 1999
Capacity [tpy]: 90.000

Alicante

Status: active

Operator:FCC
28061 Madrid
Tel.: +34 913 595 400
www.fcc.es

Start of operation: 2009
Capacity [tpy]: 195.000
Technical details: anaerobic digestion

Alosno

Status: active

Operator:CESPA - FERROVIAL GROUP
28002 Madrid
Tel.: +34 (0)915 86 25 00
www.ferrovial.com

Start of operation: 2006
Capacity [tpy]: 10.000

Arico

Status: active

Operator:SUFI - SACYR VALLHERMOSO GROUP
28046 Madrid
Tel.: +34 91 545 50 00
www.gruposyv.com

Start of operation: 2011
Capacity [tpy]: 76.000

Ávila

Status: active

Operator:Urbaser
28703 Madrid
Tel.: +34 91 121 80 00
www.urbaser.es

Start of operation: 2003
Capacity [tpy]: 80.000
Technical details: anaerobic digestion

Barcelona 1

Status: active

Operator:UTE ECOPARC Barcelona, S.A
8040 Barcelona

Start of operation: 2008
Capacity [tpy]: 300.000
Technical details: anaerobic digestion

Barcelona 2

Status: active

Operator:EBESA
0 Barcelona

Start of operation: 2004
Capacity [tpy]: 240.000
Technical details: anaerobic digestion

Barcelona 3

Status: active

[…]

Price and product information

Contact:

j.heumer@ecoprog.com

+49 (0) 221 788 03 88 13

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