



Picture credits: top left: WtE plant in Olsztyn, Poland, by courtesy of Doosan Lentjes GmbH; top right: © zlikovec – stock.adobe.com; bottom: WtE plant in Warsaw, Poland, by courtesy of Doosan Lentjes GmbH, © MPO Sp. z o.o. w m.st. Warszawie.

# Waste to Energy 2024/2025

Technologies, plants, projects, players and backgrounds of the global thermal waste treatment business

**Extract**

17<sup>th</sup> edition, 2024

ecoprogram GmbH

## Waste to Energy 2024/2025

**The leading standard reference in the global WtE business. The 17<sup>th</sup> edition includes:**

- Global market development forecast 2024–2033 on a country-by-country basis
- New constructions and extensions, capacities, shutdowns, and investment volumes
- Analysis of more than 2,800 plants and about 850 projects on a country-by-country basis
- Analysis of market factors, trends and support schemes for the world's most important markets
- Market shares of all important operators and technology providers
- Investment and operational costs and revenues with exemplary calculations
- Explanation of backgrounds, technologies and operating modes of thermal waste treatment

In addition, you will get access to **ecoprogram's waste & bio Data** (WtE module) for 1 year. This online database contains details on all WtE plants and projects, such as capacity, status, start of operation, technology and more. It also includes a weekly updated WtE Project Tracker and a weekly updated list of active plants.

The study is available starting from **3,300.– € net**.

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[...]

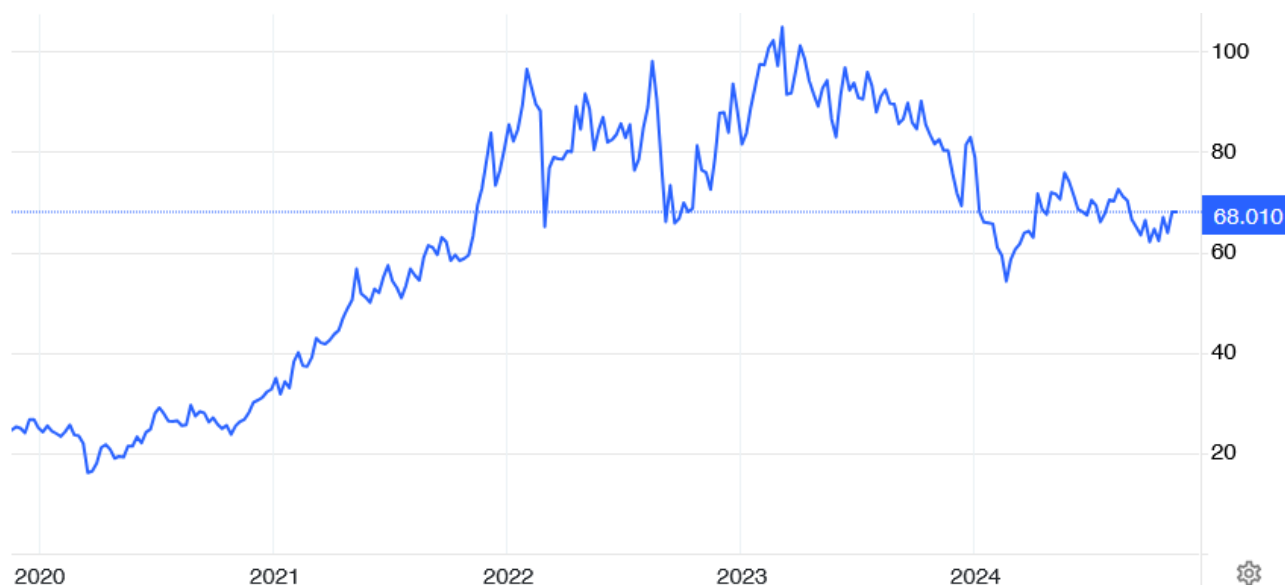
### 11.3 Decarbonisation

In the years to come, decarbonisation will be one of the most dynamic and relevant market drivers in the WtE market. However, its effect on the WtE market is complex. We will describe some of the main effects in the following.

#### ETS and the waste sector

Fighting climate change first of all means fighting greenhouse gases such as CO<sub>2</sub>. For doing so, amongst others, emissions trading systems have been set up. The worldwide largest one is the EU Emissions Trading System (EU ETS). The EU ETS is based on a cap-and-trade system. Branches include are, so far, energy production and energy-intensive industries, such as the production of steel, glass, or cement, as well as the aviation business. From 2026 onwards, [...]

**Figure 290: Price development of EUA futures (EUR/t of CO<sub>2</sub>)**



Source: [tradingeconomics.com](https://tradingeconomics.com), retrieved 18.11.2024

Operators of covered facilities or businesses that emit CO<sub>2</sub> must provide valid CO<sub>2</sub> certificates. A cap is in place for the total amount of greenhouse gases that may be emitted by the installations covered by the system and only a limited quantity of new certificates is available per year, which is also reduced over time. In 2013, the cap was 2.1 million certificates; ever since, the number has been declining in various steps. As of 2024,

[...]

## Saudi Arabia

Last update: 09-2024

Inhabitants [million]	32.2	Number of waste incineration plants	0
Municipal solid waste [1,000 t]	20.8	Incineration capacity [1,000 Mg/a]	-
of which thermally treated [1,000 t]	-	Average age of incineration lines	-
Electricity from waste 2021 [GWh]	-	Share of total electricity production 2021 [%]	-
Heat from waste 2021 [TJ]	-	Share of total heat production 2021 [%]	-

### Management summary

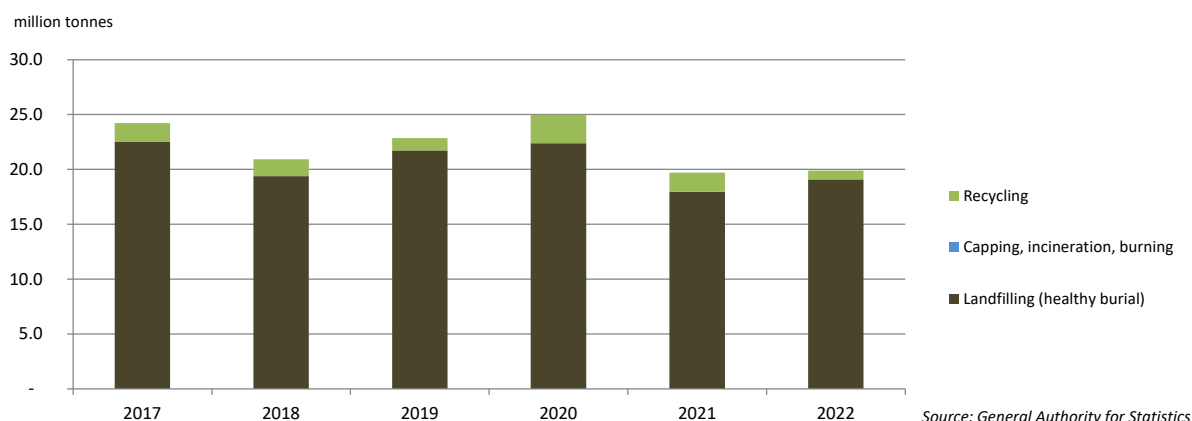
Saudi Arabia's WtE sector is still at an early development stage. In general, mainly due to large amounts of MSW still being landfilled, we see a great potential for WtE in Saudi Arabia. Incentives for the use of WtE have not yet been established. However, WtE gate fees are planned to be introduced.

### Background / market factors / legal framework

Saudi Arabia has seen rapid urbanisation and economic growth over the past decade. Thus, nearly half of the country's total waste amount of 53 million tonnes comes from the three large cities Riyadh, Jeddah, and Dammam.

In 2022, according to official statistics by the Ministry of Municipal and Rural Affairs, the amount of collected municipal waste decreased by 11.1% to 20.75 mt, compared to 23.34 mt in 2021. Organic materials accounted for 41.8% of all municipal waste, plastic constituted 10.5%, and paper accounted for 8.3% in 2022.

**Figure 34: Shares of incineration, recycling and landfilling of municipal solid waste in Saudi Arabia**



Only about 5% of the Kingdom's MSW is being recycled and the remaining 95% are mostly being landfilled. The Kingdom has set the target of 90% diversion of wastes from landfills by 2040, with more stringent targets adopted for certain waste streams. As part of the Saudi Green Initiative (SGI), the City of Riyadh is to achieve [...]

[...]

From 2025 onwards, Danish plant operators will be obliged to self-check 5% of the waste they receive (corresponding to every twentieth load of waste). If the waste contains no or an insignificant amount of waste suitable for material recovery, the waste is considered correctly sorted and can be incinerated as planned. However, if there is more than a significant amount of waste suitable for material recycling, [...]

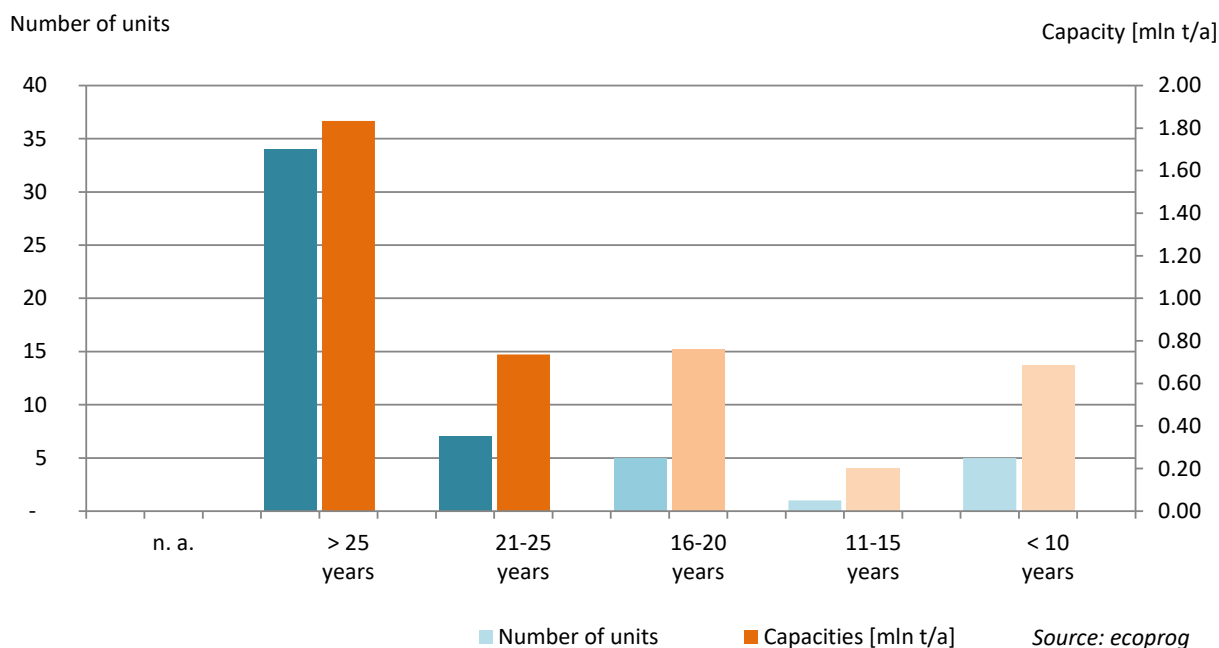
Plants

As of October 2024, according to our data, 29 WtE facilities with a capacity of about 4.05 million annual tonnes are operational in Denmark.

This includes 3 smaller plants on the Faroe Islands and Greenland (both of which are included in this analysis). With 27 years on average, Denmark’s WtE plant asset is one of the oldest in Europe. Many plants were shut down in the 1990s when new EU directives on the limitation of waste incineration plant emissions were transposed into Danish law.

However, in recent years, some smaller plants were closed, too. These plants [...]

**Figure 138: Capacities and lines by age in Denmark**



With an average capacity of almost 139 ktpy per plant, the capacities of the Danish WtE plants are quite low in a European comparison. Without considering the 3 largest plants in Copenhagen, Glostrup and Roskilde, the remaining 26 facilities have an average size of about 98 ktpy. The many smaller plants in Denmark are mainly the result of the waste management system’s peripheral organisation and the orientation towards providing district heating. Due to their high energy yield (especially in heat recovery), [...]

Market development

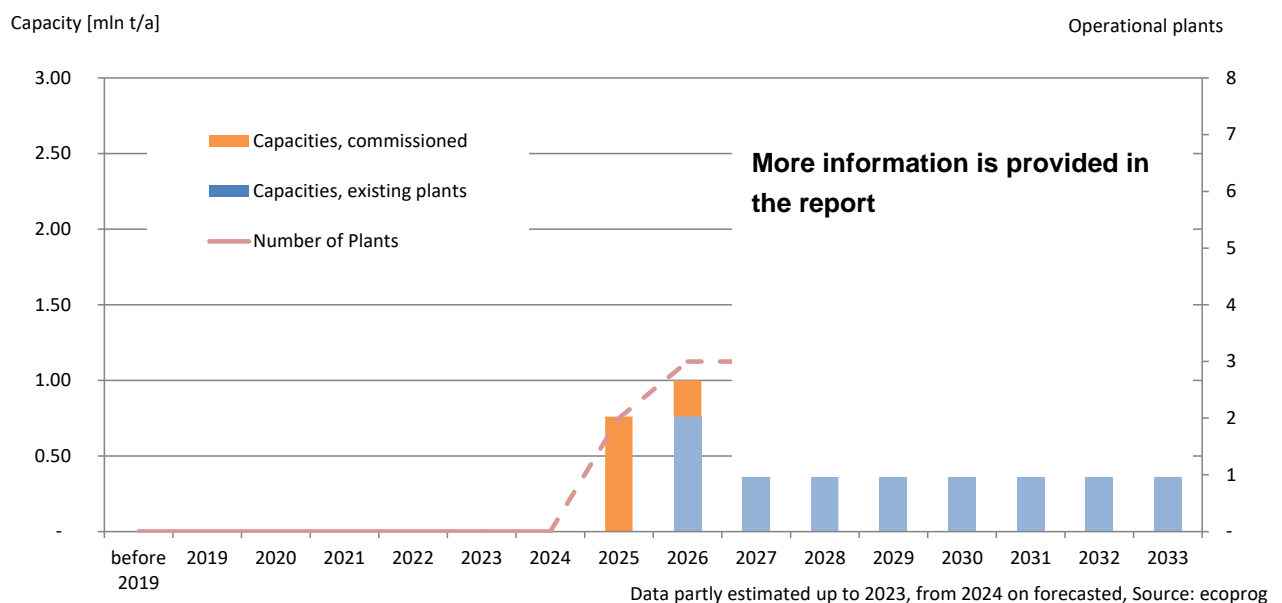
The increased market development in Australia was mainly sparked by the landfill taxes implemented by all federated states. This has resulted in a WtE planning boom in the past. However, many of these projects were not realised.

Some of the projects directly compete for waste amounts with each other. In addition, like in any young WtE market, many stakeholders in the Australian WtE market lack experience.

As of October 2024, during the last 3 years we have monitored relevant information on [...] WtE projects with a combined annual capacity of at least [...] million tons. Two plants currently under development near Perth, Western Australia, are located more or less adjacent to each other.

The East Rockingham facility was scheduled to start operations by late 2024. However, as of October 2024, the project has been handed over to teams of insolvency administrators. The project manager East Rockingham RRF Project Co is in a legal battle in the Federal Court with partners and contractors, [...]

**Figure 108: Development of plants and capacities in Australia**



Australia clearly has a significant demand for WtE capacities, primarily against the backdrop of lacking alternatives for landfilling and further increasing landfill taxes. Therefore, we expect several of the current proposals to be promising. However, despite the quite favourable market conditions, [...]

In our project outlook, we have considered [...]



**Figure 109: Project outlook Australia**

#	Project	Unit / plant*	Capacity (t/a)	Start	Status
1	East Rockingham	plant	300,000	2024	under construction
2	Kwinana	plant	460,000	2025	under construction
3	Werribee	plant	240,000	2026	under construction
4	Melbourne Dandenong	plant	100,000	n/a	approved
5	<b>More information is provided in the report</b>				
6					
7					
8					
9					
10					
[...]	[...]	[...]	[...]	[...]	[...]

As of October 2024

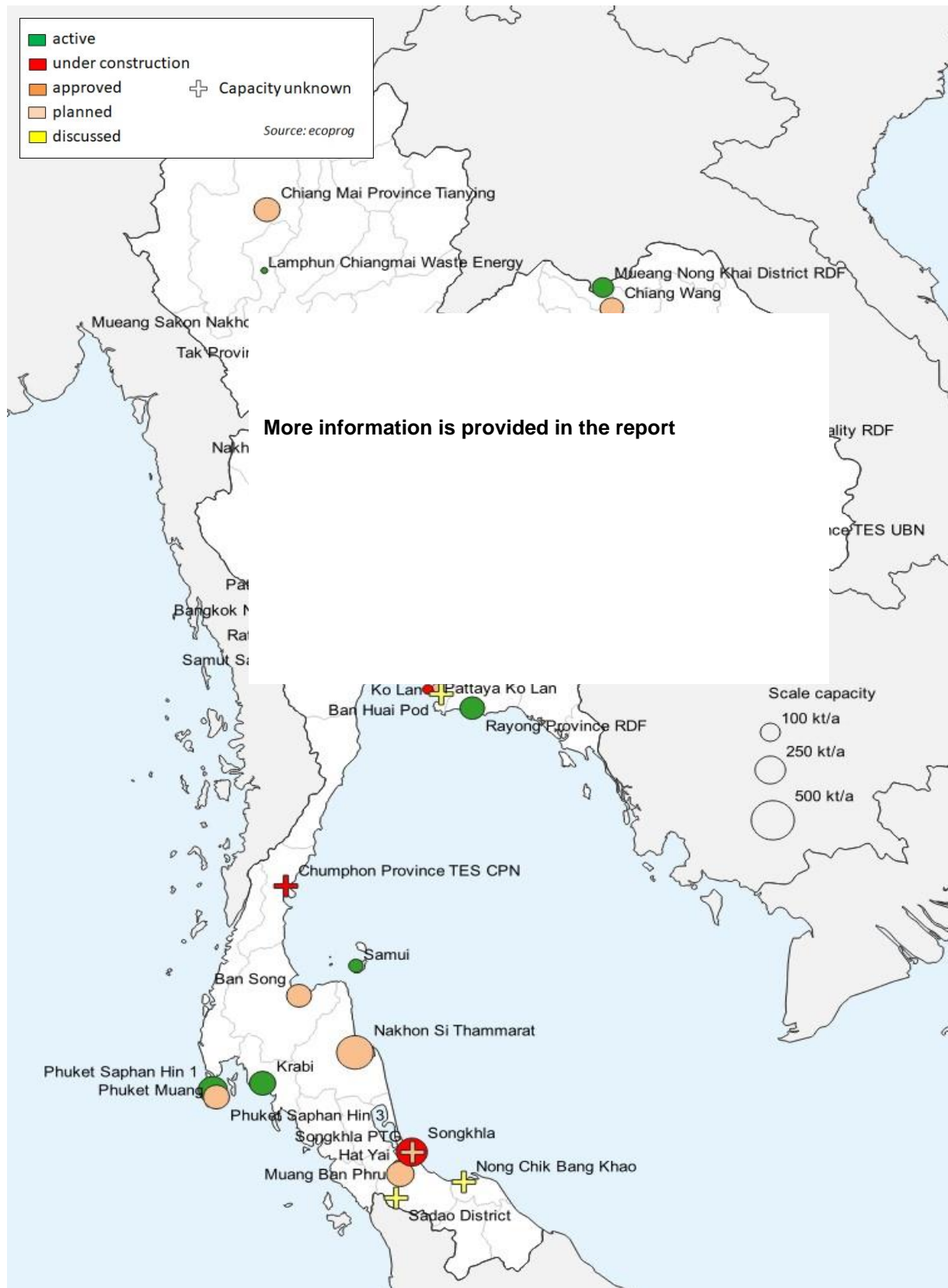
\* "Plant" refers to a completely new facility, while "unit" refers to a new unit to be installed at an existing plant. Details for all plants and projects and weekly updates are provided in our database waste & bio Data to which you have access.

### Competition

The first 2 projects under construction are executed by experienced actors. For the East Rockingham project, operator Veolia has chosen Kanadevia Inova (formerly Hitachi Zosen Inova) as technology provider and EPC contractor, together with Spanish construction company Acciona. The Kwinana project is also executed by Veolia, which has chosen Keppel Seghers as technology provider and Acciona as EPC contractor.

The facility at Laverton, Melbourne, [...]

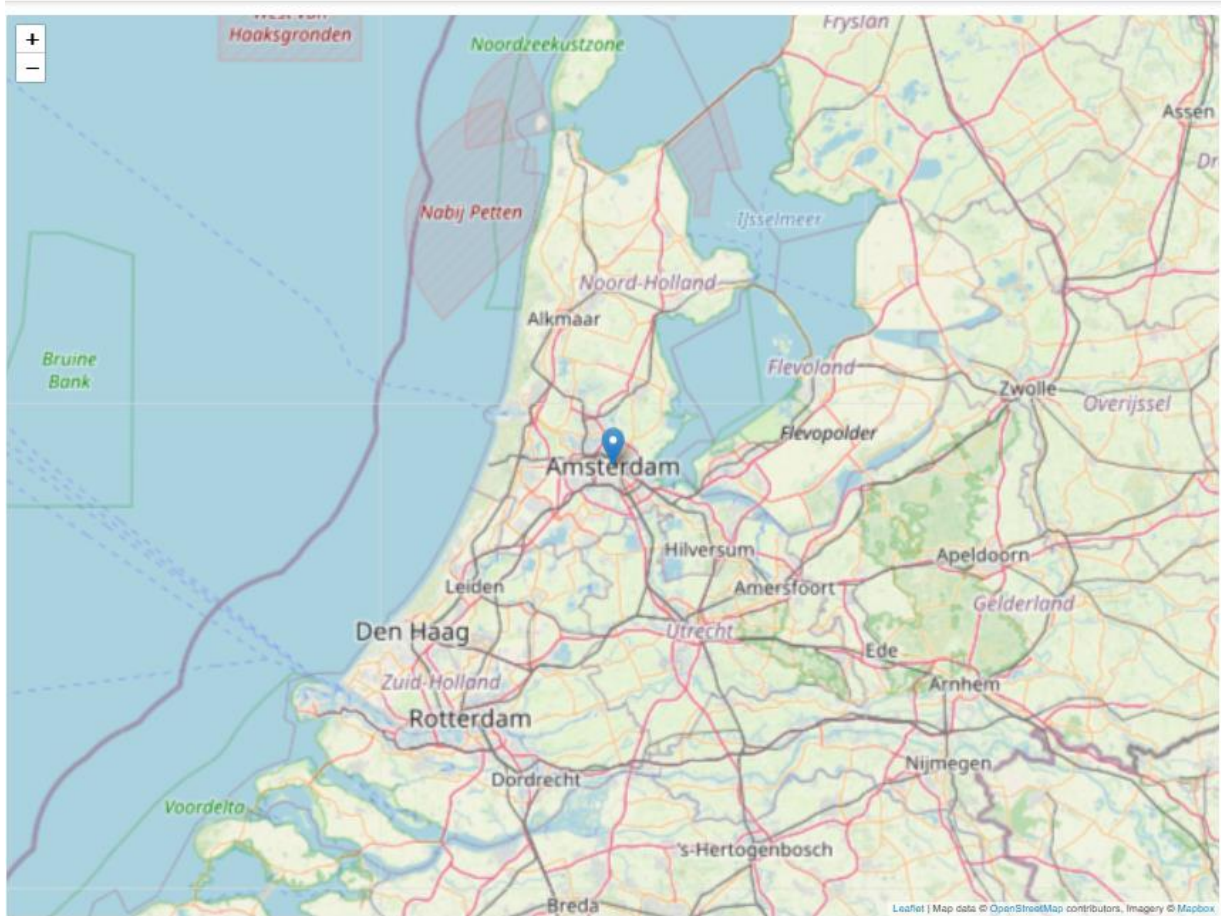
Figure 97: Locations of plants and projects in Thailand



### Active Plants

Please find further details for all plants, such as technical equipment, manufacturer, or address for 12 months at [www.ecoprolog.com](http://www.ecoprolog.com). The database is updated weekly.

#	Name	Operator	Start	Capacity [t/a]	Units
1	Bangkok Nong Khaem C&G	C&G Environmental Protection (Thailand) Co., Ltd.	2016	182,500	2
2	Chonburi	Chonburi Clean Energy	2019	100,000	1
3	Hat Yai	GiDEC Co., Ltd	2014	96,000	1
4	Kaeng Khoi 2 RDF	TPI Polene Power Company Limited	2015	n/a	1
5	Kaeng Khoi RDF	TPI Polene Power Company Limited	n/a	n/a	1
6	Khon Kaen	Alliance Clean Power Co., Ltd.	2018	144,000	1
7	Krabi	Alliance Clean Power Co., Ltd.	2020	182,500	1
9	Lamphun Chiangmai Waste Energy	Chiangmai waste energy Co., Ltd	n/a	3,200	1
10					
11					
12	<b>More information is provided in the report</b>				
13					
14					
15					
16					
[...]	[...]	[...]	[...]	[...]	[...]



< 1/1 >

**Category**

**1 Waste-to-Energy**

- 2 MBT plants
- 3 Sorting Plants
  - 3.1 Dry Recyclables
  - 3.2 Packaging
  - 3.3 Plastics
  - 3.4 Metal
  - 3.5 Paper
  - 3.6 Glass
  - 3.7 Bulky Waste
  - 3.8 Batteries
  - 3.9 E-Scrap
  - 3.10 Construction & Demolition
  - 3.11 Other Sorting Plants
- 4 Recycling plants
  - 4.1 Plastics, material
  - 4.2 Plastics, chemical
  - 4.3 Paper
  - 4.4 Other Recycling Plants
- 5 Biomass-to-Power
- 6 Anaerobic digestion
- 7 Hazardous waste

**Plant**

Name	Amsterdam
Country	Netherlands
Type	Waste to Energy
Province/Region	North Holland
Status	active
Investments	n/a
Start of operation	1993
Heat use category	district heating CHP
Input, capacity [t/a]	1,350,000
Input real	n/a
Input real (year of data)	n/a
Power generation capacity [MW]	77.0
Heat production capacity [MW]	5.1
Gross heat production [MW]	n/a
Average heating value [kJ/kg]	9,700
Fuel category	unknown
Size category	>20

**Remarks:** 04/24: New sales process for AEB has started. 05/23: The takeover of Afval Energie Bedrijf (AEB) by Rotterdam-based AVR Afvalverwerking (AVR) has been blocked by the Netherlands Authority for Consumers and Markets (ACM). 05/22: AEB will receive EUR 80 million per year subsidies for its proposed use of CCS. 04/22: 200,000 t RDF supply by Andusia for one year. As of 10/2020 maintenance works have been completed: hoppers and their cooling systems and new slag shafts.

**Search**

**Country**

**Downloads**

- WtE Project Tracker
- WtE, List Of Active Plants

ecoprolog's [waste & bio Data](#). Please find a trial version [here](#).