

How does the Energy Recovery Plant function?

The main goal of the Energy Recovery Plant located in Maia is to recover the waste materials that cannot be reused through composting or recycling processes, by turning them into electrical energy.

With two treatment lines that are in continuous operation and are practically automatic, the Plant has the capacity to treat 380,000 tons per year treating, on average, nearly 1,100 tons of waste per day and generating around 170,000MWh of electrical energy per year, of which nearly 90% is injected into the public grid, supplying a population of around 150 thousand residents.

Municipal waste energy recovery involves recovering heat energy through a controlled thermal treatment process and transforming it into electrical energy.

The Energy Recovery Plant therefore aims to carry out a controlled thermal treatment of municipal waste that does not have the potential to be recovered by organic recycling and multimaterial processes, recovering its endogenous energy for the production of electrical energy.

Hence, the operation circuit begins when undifferentiated municipal waste is received from the various circuits of the Municipalities within the area of LIPOR, being stored in a receiving pit which has the capacity to store the equivalent to six days of current production. This process takes place inside a closed building which is kept under low pressure to avoid the spread of odors. The waste is then transferred by a claw onto 2 (two) treatment lines where it is burned at high temperatures (1000°C to 1200°C) in the presence of excess oxygen.

Gases are released from this process at high temperatures, passing then through an energy recovery boiler, where the heat is used to produce steam, and is later transformed into electrical energy in a turbo generator. The Plant is self-sufficient in terms of energy; it uses around 10% of the total energy produced to work, thus providing 90% of the energy it produces to the National Electric Grid.

How does the Energy Recovery Plant function?

This plant operates under a strict operational and control scheme in accordance with the highest environmental standards. The inert gases and materials from the combustion process are subject to a strict environmental monitoring and control system. Before being released to the atmosphere, the gases are neutralized and filtered using high-efficiency equipment. Since the beginning of the Plant's activity, the ashes produced throughout the gas treatment process have undergone an inertization process with hydraulic binders, and are then disposed of in landfill.

As the maximum limit of the Alvéolo Norte do Aterro Sanitário (landfill site) has been reached, the place used to dispose of inert ash, the previous inertization process was suspended, and the ashes resulting from the gas treatment system began to be sent to a Waste Disposal and Recovery Integrated Plant (CIRVER).

The waste combustion process also produces slag and ferrous materials that are recovered separately, and the ferrous materials are then sent for recycling.

The Plant's operation is directly monitored by a Commission coordinated by the Portuguese Environment Agency (APA). It is supported by an External Monitoring Program (PMExt) that assesses the environmental, psychosocial, and public health factors in the surrounding area.

There is also a Committee of local authorities, including the municipality of Maia, who has been following the entire project from the very beginning.

Slag recovery project

Two byproducts result from the treatment of Municipal Waste (MW) at the Energy Recovery Plant: fly ash and slag (bottom ash).

The main components of slag correspond to non-combustible materials and can be used as granular material to replace soil or natural aggregates obtained in the extraction industry.

How does the Energy Recovery Plant function?

Its most common uses include:

- . Granular material for landfill: intermediate coverage of other waste;
- Aggregates for paving, as granular bases or mixed with bituminous and hydraulic binders;
- Aggregates for concrete products, such as concrete blocks and prefabricated elements or in-situ concrete.

Technical data on the Energy Recovery Plant

Treatment Capacity:

- 380,000 Tons of waste/year (For a LHV of 7700kJ/kg)

Electrical energy production:

- 25MWh

Process Line:

- Receiving waste collection vehicles;
- Weighbridge with automatic weighing device;
- MW receiving pit: 18,000m³.

Discharge:

- Discharge pit in the closed building under pressure;

Feeding the treatment lines:

- An overhead crane supports the claw and is operated by a single operator from the control room;
- Feeding hoppers.

Combustion:

- Combustion grates inclined at 26° and combustion chambers;
- Slag extractors;
- Vibrating conveyor belts;
- Magnetic sorting system;
- Discard pits (slag and ferrous scrap).

How does the Energy Recovery Plant function?

Treatment of combustion gases:

- - Reactors;
- - Bag filters;
- - 68-meter-high chimney.

Control Room:

- Overhead crane and claw controls;
- CCTV;
- Process control IT system;
- Synoptic energy panels.