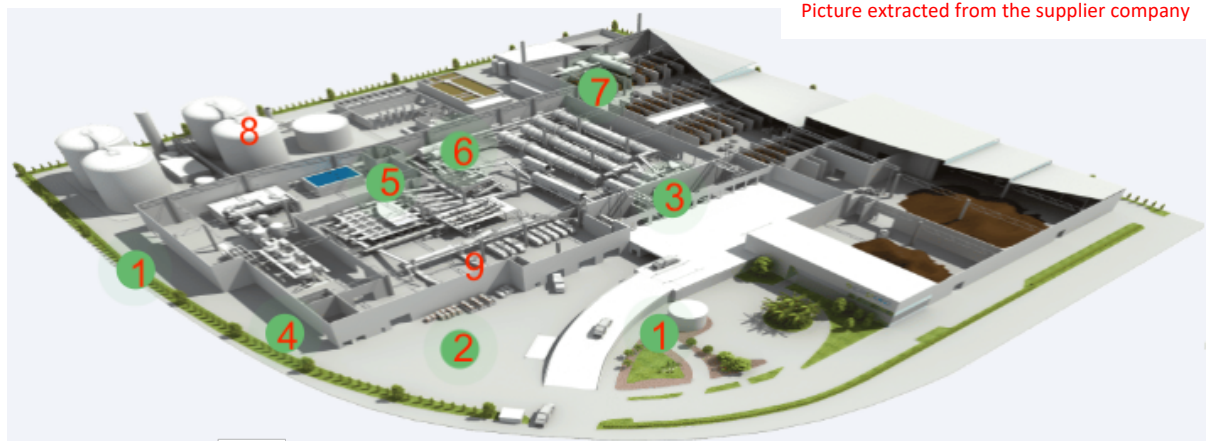


WASTE TREATMENT PLANT

Generalities:

With regard to environmental development, we can offer you an ecological and technological system that provides an excellent solution to solid waste, environmental pollution and landfill problems.



- 1/** This is an area where various types of waste are received in a pit.
- 2/** This area is used to pretreat the organic fraction of the remaining bag and the FORM bag. This includes the BRS, which defibres the paper and cardboard fraction in order to incorporate it into the organic fraction of the remaining bag prior to passing through the composting tunnels.
- 3/** This area is for composting the organic fraction of the remaining bag.
- 4/** This is the area for the wet pretreatment of the organic fraction from the FORM.
- 5/** A cogeneration plant transforms biogas generated during anaerobic treatment into electricity.
- 6/** Wastewater Treatment Plant
- 7/** The treatment of the plant's air through chemical and biological processes.
- 8/** A biomethanisation line for the organic fraction of the FORM bag.
- 9/** Refuse classification and storage line.

TRARE is a Spanish waste treatment plant that was developed under an intelligent patent. Its aim is to recover most of the raw materials in waste and convert them into electricity.

Advantages:

The municipality has used landfills to deposit garbage for several years. This has been threatening the environment and public health.

By eradicating landfills and waste, we would eliminate this pollution threat, purify the climate and water, and improve health. Not to mention the mayor's successful efforts to sanitise his district in a radical and technical way, thus completing one of his most arduous tasks.



All daily household waste will be treated and delivered directly to the waste treatment plant during the day. Storage of garbage will no longer be necessary.

This will encourage people to recycle household waste, improve health and reduce municipal expenditure.



Either the municipality or an external entity will be responsible for collecting the rubbish and transporting it directly to the treatment plant every day. **NO LARGE OBJECTS ARE ALLOWED!** Landfills will be converted into parks or buildings for the benefit of the city and country.

Background: Waste needs to be treated.

The development of life in any habitat inevitably results in the production of waste. In natural habitats, this waste is naturally reincorporated into the life cycle. In urban environments, however, waste production is more intensive. Consequently, nature lacks the capacity to regenerate all of this waste, meaning it **must be treated in some way**.

The treatment of urban solid waste is one of the **most fundamental problems** facing consumer societies. The situation is worsening as the amount of **waste generated per inhabitant increases** with improvements in living standards.

Adequate waste management is essential for **maintaining human health** and preserving the environment.

This involves, among other things, the **regular collection** of waste and its treatment in specialised facilities.

The role of TRARE:

Methanization -> Electricity



Picture extracted from the supplier company

TRARE is a facility that treats municipal waste comprehensively. It primarily processes the following types of waste:

- **Selectively collected organic matter (FORM).**
- **Undifferentiated waste (residual fraction or RFORM).**

This type of waste includes a wide variety of materials, including paper, cardboard, glass, plastic, Tetra Pak cartons, bricks, metal and bulky materials, as well as plant remains.

TRARE produces the following resources from the waste it receives:

- Compost is an organic fertiliser that can be used in agriculture and gardening.

- Biogas is a mixture of methane and carbon dioxide that can be used to generate energy.

Technical principles:

1. Examples of a facilities with a capacity of 240,000 tn./year



Picture extracted from the supplier company

Surface:

- 6-8 Ha

Types of treatment:

- Treatment of organic fractions and other municipal waste using mechanical and biological processes.
- Selection of light packaging fractions.

2. Recovered effects/products:

- We collect paper, cardboard, glass, natural and coloured plastics, bricks, scrap metal, magnetic scrap, aluminium, batteries and compost for biogas production.

3. Production:



Picture extracted from the supplier company

Biogas production (Nm³ /Kg) (nominal): 0.55

Electricity production: (MWh/year): 13,000

Compound production (tons/year) (nominal): 23,025

Biostabilizer production (tons/year) (nominal): 14,762

Recovered byproducts (tons/year) (nominal): 36,285

4. Process for waste treatment:

Pretreatment, methanation and cogeneration and composting.

Pretreatment:

The purpose of pretreatment is to separate the organic matter contained in the two fractions of recyclable materials from the unsuitable materials that cannot be used and are rejected by the plant.

Methanation and cogeneration:

One of our plants' objectives is to produce biogas through the methanation process using organic matter from selective collection.

Prior to this, the organic matter separated during pre-treatment undergoes wet treatment, whereby it is introduced into three agitator tanks (pulpers) and mixed and broken down in water. This process not only dilutes the organic matter, but also causes sand and glass (inert materials) to settle and plastics (floating materials) to rise to the surface, separating them from the organic matter.

The resulting pulp is transported to four 4 tanks with a capacity of 6,700 m³, which act as digesters. These act as anaerobic fermentation reactors, keeping the pulp closed and preventing contact with oxygen at a temperature of 37 °C for 20 days.

During this time, anaerobic fermentation releases biogas — a mixture of methane and carbon dioxide — which can be used as a renewable fuel for generating electricity and heat.

The biogas is then directed to a gasometer for storage and regulated output. The gas is kept at an equivalent atmospheric pressure of 20 mb.

From there, it is directed to the cogeneration plant, which is equipped with five Jenbacher 20-cylinder engines with a total power output of 5.24 MW.

Combusting the biogas generates electricity, which is exported to the grid, as well as heat, which is used to maintain a stable temperature of 37 °C in the digesters.

Composting:

Composting is an intensive biological process involving the decomposition and stabilisation of organic matter under aerobic conditions. It is used for both organic matter from pre-treatment and organic matter from selective collection after methanisation. This enables the production of compost of different qualities from these two materials.

History:

This ecological waste treatment plant was established in Spain in 1998. The Environmental Authority decided to build and operate it in order to eliminate the threat to the environment and the general population. In December of that year, the technical and administrative requirements, operating regulations, and competition criteria for selecting a private partner were approved.

Facilities:

This plant treats two types of waste: organic waste from selective collection, and undifferentiated waste, also known as residual waste.

Recyclable materials and organic matter that has not been correctly sorted at source are extracted from the undifferentiated waste. The latter is used to produce compost through an aerobic process.

Biogas (a mixture of methane and carbon dioxide) is generated from organic waste through an anaerobic fermentation process known as biomethanisation. This biogas can then be used to generate electricity.



Picture extracted from the supplier company

Targets:

- Minimise the environmental impact of the facility.
- Improve the health and safety conditions for staff.

- Adapt to changes in the quality and quantity of the input waste.
- Maximise biogas production.
- Maximise compost production.
- Minimise plant rejects (waste that cannot be used) and reduce your environmental impact.
- Reduce the percentage of organic matter in the plant rejects.
- Recover as many recyclable materials as possible.

The conditions for acquiring the plant are as follows:

Financing:

The approximate cost of a complete plant for a 240,000-tonne-per-year facility is 175 million Euro. This price may vary depending on various technical factors and population size. This price includes all administrative costs, assembly, travel, time, turnkey studies and more.

The district or city does not need to contribute financially. IBF (International Business & Financial Solutions), or a company designated by IBF, will be the investor. With its experience and knowledge of international business, IBF will be able to help districts and cities achieve their goal of having an ecological plant of this prestigious category.

There are three imperative conditions:

- a) The district or city should allocate a plot of land measuring between six and eight hectares.
- b) They have accepted a twenty-five-year concession.
- c) The mayor will provide a letter of credit (SBLC via SWIFT MT760) for an initial period of three years, renewable annually.

The SBLC must be issued by a bank with a European presence, such as HSBC, Deutsche Bank, Barclays or BNP Paribas, for the amount of one hundred and seventy-five million euros for each urban waste plant to be installed in the district and/or city. The beneficiary of the SBLC will be IBF (International Business & Financial Solutions), or another company designated by IBF as the investor.

Preliminary step to follow for the start of the project:

The district/city must issue a letter of intent to the IBF, agreeing to undertake the project and referencing the above conditions.



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