FORSU Biodigester

iren

A state-of-the-art plant

The **FORSU biodigester** in Reggio Emilia - an acronym that stands for Organic Fraction of Municipal Solid Waste - is a plant that was created according to the strategic approach of **circular economy** to treat the **organic fraction** of waste and the **green fraction** (cuttings, leaves and grass) from **separate waste collection.**

Thanks to innovative material and energy recovery processes, this waste is transformed into **quality compost, biomethane and food grade CO_2** for industrial and food uses. These are high-value products that derive from **sustainable waste management**, in this case from the processing of the organic fraction, which to date constitutes about 40% of the total waste produced in households.

167 THOUSAND
TONNES/YEAR OF organic AND GREEN WASTE, CUTTINGS, PRUNINGS PROCESSED

9 MILLION
CUBIC METRES OF BIOMETHANE PRODUCED ANNUALLY

53 THOUSAND
TONNES/YEAR OF QUALITY COMPOST PRODUCED

10 THOUSAND
TONNES/YEAR OF LIQUID CO2 USED FOR INDUSTRIAL AND FOOD USES

As in nature: waste transformation

In the plant, waste is treated in two distinct phases:

ANAEROBIC TREATMENT

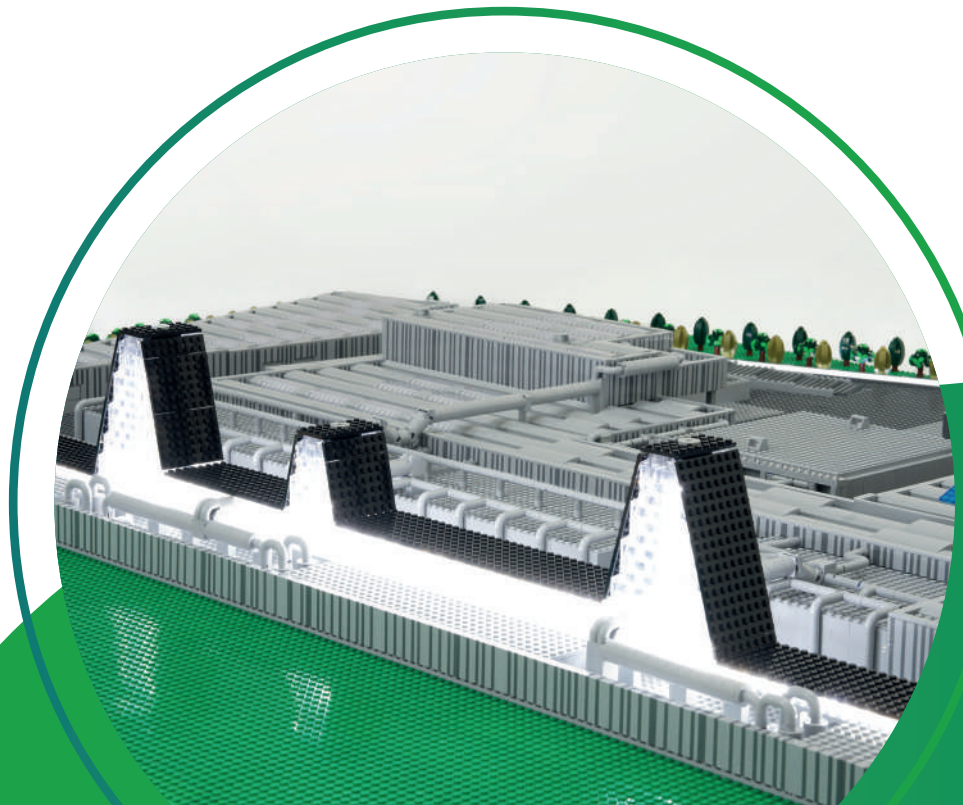
The first phase consists of **anaerobic treatment** i.e. in the absence of oxygen, of the organic waste **to extract biogas**. After weighing and recording, the waste is unloaded into an area isolated from the exterior, which is accessed through a double lock. **The waste pit is kept under vacuum**, therefore odours cannot spread into the environment. At this point, the waste is shredded, sieved, and **sent to digesters** which, in the absence of oxygen and thanks to the action of anaerobic bacteria, **produce biogas**, consisting mainly of methane and carbon dioxide. The biogas is then refined and transformed into biomethane. In addition, carbon dioxide from the anaerobic digestion of organic waste can be recovered through innovative purification and liquefaction processes. This is exactly a reproduction of what happens in nature, when organic plant waste is converted into methane and trapped in underground reservoirs.

AEROBIC TREATMENT

Anaerobic digestion is followed by the **aerobic stabilisation**, namely in the presence of oxygen, of the material coming out of the anaerobic treatment (digestate), which is **mixed with shredded plants and cuttings**, in order to give the product adequate air permeability (an essential factor in the compost production phase).

Within this process, other types of natural organisms (bacteria, fungi, etc.) carry out in an accelerated and controlled manner the same process that takes place within a forest, where branches, fallen fruit and leaves are transformed into compost; aerobic treatment is, in fact, the set of natural processes that lead to the degradation of organic matter, thanks to the action of a series of microorganisms operating in oxygen-rich environments that lead to the production of a family of compounds known as **humus**.

After mixing, **the aerobic composting process first takes place in 20 biocells** served by forced ventilation. Aerobic digestion lasts about **two weeks**: at the end, the material is sent to the maturation area, which is also served by forced ventilation. After about 2-3 weeks, the product is sieved and is **ready for use in agriculture as a mixed composted soil improver** or, more simply, **compost.**



Model made with LEGO® bricks by Riccardo Zangelmi. LEGO® Certified Professional Italia.

100% sustainable

The plant is located in a park of about 17 hectares, where more than 600 trees and 1,500 shrubs have been planted.

For the road paving, asphalts formulated by I.Blu, using innovative technologies, is able, were used. Which, thanks to innovative technologies, is able to reuse polymers derived from the recovery of sorted plastic and to produce new materials.

The plant is powered by 500kW of photovoltaic panels that allow the production of over 530,000Kwh of electricity per year.

FORSU is a plant designed as an opportunity for continuous dialogue with all stakeholders who share with Iren the values of sustainability: a visitor-friendly and welcoming facility with special classrooms and visiting points inside. For information on visits see **www.eduiren.it**

www.gruppoiren.it