

TERRITORIO E RISORSE

Santhià (VC) | Italy

COMPOSTING AND SEMI-DRY ANAEROBIC DIGESTION PLANT



THE PLANT PRODUCES **QUALITY COMPOST** STARTING FROM ORGANIC **KITCHEN WASTE** AND REPRESENTS THE STATE OF THE ART OF THE WASTE RECOVERY ENTSORGA PROPRIETARY TECHNOLOGIES.

FROM 2020 IT ALSO PRODUCES BIOGAS BY USING **ANAEROBIC DIGESTION** AND THEN **BIOMETHANE FOR NATURAL GAS NETWORK**.

THE SYNERGY OF THESE TWO TREATMENT SOLUTIONS LIMITS FURTHER THE ENVIRONMENTAL IMPACTS AND OPTIMIZES THE MANAGEMENT AND WASTE RECOVERY PROCESSES.

PLANT DATA WITH EXTENSION TO ANAEROBIC DIGESTION

Company	Territorio e Risorse S.r.l.
Capacity	50.000 tpa of organic waste from separate collection. With the second extension, the plant is able to process 80,000 tpa
Treated waste	organic waste from separate collection
Final Output	<ul style="list-style-type: none">• High quality compost for agriculture use: up to 10.000 tpa• Biogas: till 4.500.000 m³/y, from which we can obtain up to 2.750.000 m³/y of Bio-methane to be put into the net• SRF from residual plastics: up to 3.000 t/y
Start up	Composting: from 2009 Anaerobic digestion: from 2020
Plant	composting and anaerobic digestion
Served basin	up to 730.000 inhabitants
Staff	14

COMPANY

Territorio e Risorse S.r.l., 100% controlled by IREN Group, is the owner Company of the Santhià (VC) composting plant. It was part of the Entsorga Group in the last 10 years and recently has been subject to extraordinary operation and agreements between Entsorga and IREN Groups.

PROJECT

The company **Territorio e Risorse S.r.l.** was founded in 2009 to build the Santhià plant and produce compost from **organic kitchen waste**.

The company is permitted to double **the treatment capacity**, with an **Anaerobic Digestion** unit that will be added to the composting section. In 2018, also the permit for Advanced Biomethane production was obtained.

COMPOSTING PROCESS

The compost production starts by mixing the organic waste and the digestate from **Anaerobic Digestion** section with a material mainly of vegetable origin, preparing a mixture that is placed in heaps using an **automatic bridge crane (1)**: the material is thus ready to be subjected to the **aerobic digestion biological treatment H.E.BIO.T. (High Efficiency Biological System)[™]**, an high efficiency and high automation system patented by Entsorga. The process takes place in a **closed area** and is accelerated through a **forced ventilation mechanism**, monitoring air, temperature and moisture with a **high level automation system (2)**. This confinement allows also a **highly effective odour control**, thanks to the use of a **patented biofilter (3)**. After about 40 days the fermented mixture is refined with a screening system to remove the non-compostable parts (inert, plastics, glass, ...) and is then sent to the **biocells (4)** for the **slow maturation** and **storage phases**. After a minimum of **90 days** since the waste arrived at the plant, the compost is ready to be used.

(1) **AUTOMATIC BRIDGE CRANE SPIDER[™]** FOR MATERIAL HANDLING



(2) **CONTROL SYSTEM** AUTOMATIC 24/7



(3) **BIOFILTER** FOR THE ODOUR PROCESS AIR ABATEMENT



(4) **SCRABBLE[™] BIOCELLS** FOR THE COMPOST MATURATION

FINAL PRODUCT

The output of the process is a high quality compost branded «**Soil for water land**», as it is targeted to be to be used on rice crops and it is entirely sold to farmers.

The use of quality compost in agriculture is considered a best practice with a **high environmental value**, and it is encouraged by the **regional authorities** due to the fact that it enriches the soil with organic matter and contributes to the fight against the greenhouse effect. It also helps to progressively reduce the use of landfills, as requested in the latest European regulation.

USED TECHNOLOGIES

The plant represents the state of the art of Entsorga proprietary technologies: Bee[™], Automatic bridgecrane Spider[™], Cow[™] with semi-dry anaerobic digestion method, Bat Q-Ring[™], Biofilter, Scrabble[™], Eagle Cloud[™], geCO₂[™]

STRENGTHS

- **environmental compliance: no odours, dust, or leachate** are released in the surroundings. All operations take place in **closed areas** operated **under slight negative pressure**
- **reduced operation and labour costs: the complete plant automation** allows reducing need for operators in the waste processing areas, protecting their health and ensuring the operators security
- **low energy consumption** thanks to the use of high efficiency and energy recovery equipment (**bridge crane Spider[™]**)

ANAEROBIC DIGESTION SECTION

Anaerobic Digestion goes alongside composting as its **natural complement**. The two processes are organized in **sets**: in the **first phase** the organic fraction undergoes **mechanical treatment (5)** and a **hot biological degradation in absence of oxygen (6)**. The **anaerobic digestion**, based on a horizontal **“plug-flow”** type digester (piston flow) **(7)**, produces **biogas** and an intermediate solid product, the **digestate**.

In the second phase the digestate turns into **compost**, completing the waste recovery cycle and the **biomethane is extracted from biogas** thanks to the **upgrading system (8)** equipped with the treatment systems necessary for separation.

The line also includes a 500 m³ **gasometer** and an **emergency flare**.

The anaerobic digestion plant strengthen the composting advantages and adds **further strengths**:

- **incredibly high yield in biogas** production
- **no need of water cleaning plant**
- **recycling of plastic scraps** as high quality Solid Recovered Fuel
- **minimal amount of scraps** to be landfilled (<5%)
- **high automation industry 4.0**
- **perfect odour control**
- **limited footprint**

(5) **RECEPTION AND PRE-TREATMENT AREA**



(6) **DIGESTER**



(7) **THE PISTON FLOW**



(8) **UPGRADING SYSTEM**