



FIRM

OVERVIEW

ECONWARD

TECH

# ◀ CORPORATE PROFILE

**ECONWARD TECH** is a global technology company with expertise in developing innovative, efficient, and sustainable solutions for the treatment, recycling, and recovery of biowaste. The company operates from its offices and laboratory located in Madrid, Spain, as well as in Santa Monica, California, reflecting its commitment to addressing waste management challenges on a global scale.

ECONWARD is a forward-thinking company deeply committed to the principles of the circular economy. It aims to bridge the gap between the waste sector and the renewable energy sector, striving to create business models that deliver triple impact benefits encompassing social, environmental, and economic advantages.

Founded in 2009 and reinvigorated in 2018 through an acquisition by a seasoned investment group with over eight decades of experience in the energy sector, ECONWARD has invested more than €60 million, with a substantial portion dedicated to research, development, and innovation (R+D+i).

Since 2018, the company has significantly strengthened its management, technical, and scientific

teams. It also ventured into the North American market through NOWON, LLC, established as a distributor of ECONWARD technology. During this period, the company has continuously refined its technology, achieving a highly efficient and optimized version while exploring various research avenues for harnessing the potential of biowaste in both energy and material forms.

ECONWARD boasts a team of highly qualified professionals and maintains an ongoing commitment to R+D+i, with patent development forming a core component of its operations. In 2020 alone, the company filed four new patents. As recognition of its outstanding research efforts, ECONWARD was honored in 2022 with the National Energy Award by the Spanish government, presented by the Ministry for the Ecological Transition and the Demographic Challenge (MITERD).



# BIOMAK<sup>®</sup> TECHNOLOGY

## A UNIQUE TREATMENT

ECONWARD's groundbreaking technology, trademarked as BIOMAK<sup>®</sup>, is globally patented and stands as a one-of-a-kind innovation. BIOMAK<sup>®</sup> involves a **thermal hydrolysis** treatment of municipal solid waste that contains a substantial organic component. This technology can continuously process up to **8 tons of waste per hour**, with treatment sequences lasting just 20 minutes each.

The process unfolds within an autoclave system where the waste is subjected to precise conditions of pressure, temperature, residence time, and mechanical agitation. This carefully controlled environment leads to the decomposition of even the most complex molecules, resulting in the thorough homogenization and sanitization of the entire organic fraction within municipal solid waste.

The significance of BIOMAK<sup>®</sup> lies in its ability to **capture the organic portion** of municipal waste that typically ends up in landfills. Instead of being wasted, this organic material can be converted into renewable energy. In terms of decarbonization, a single BIOMAK<sup>®</sup> module can reduce carbon emissions by a remarkable 10,000 tons annually. This reduction is equivalent to the environmental benefit of preserving 750 hectares of forest.

# BIOMAK<sup>®</sup>

# BIOMAK® TECHNOLOGY

THE APPLICATIONS OF BIOMAK® ARE MAINLY THREE:

### Biogas production:

The biomass resulting from the process carried out by BIOMAK® is the ideal substrate for its valorization in the form of biogas and biomethane through anaerobic digestion. In this way, it is possible to at least double the production of biogas compared to a conventional plant.

### Co-digestion with sewage sludge:

Sanitized biomass acts as an additive that enhances the production of biogas in wastewater treatment plants (WWTP) allowing them to achieve energy self-consumption.

### Green Chemistry:

(biorefinery): Given the physical and chemical characteristics of sanitized biomass, which give it great versatility, it is possible to develop new lines of research to obtain new products with high added value.



# NOWON SYSTEM

## A COMPREHENSIVE SOLUTION

ECONWARD's innovative technology is designed to seamlessly integrate with municipal waste treatment plants, significantly enhancing their operational efficiency. This integration enables the recovery of nearly all the organic matter that enters the plant, effectively diverting it from landfills and facilitating its optimal reuse.

Through strategic partnerships with engineering firms, EPC (Engineering, Procurement, and Construction) specialists, industry technologists, and financial institutions, the ECONWARD group offers its clients a comprehensive solution. Known as the **NOWON system**, this solution encompasses the design, construction, operation, and maintenance of complete waste management facilities. The NOWON system features a cutting-edge waste plant equipped with ECONWARD's technology as a central and indispensable component.

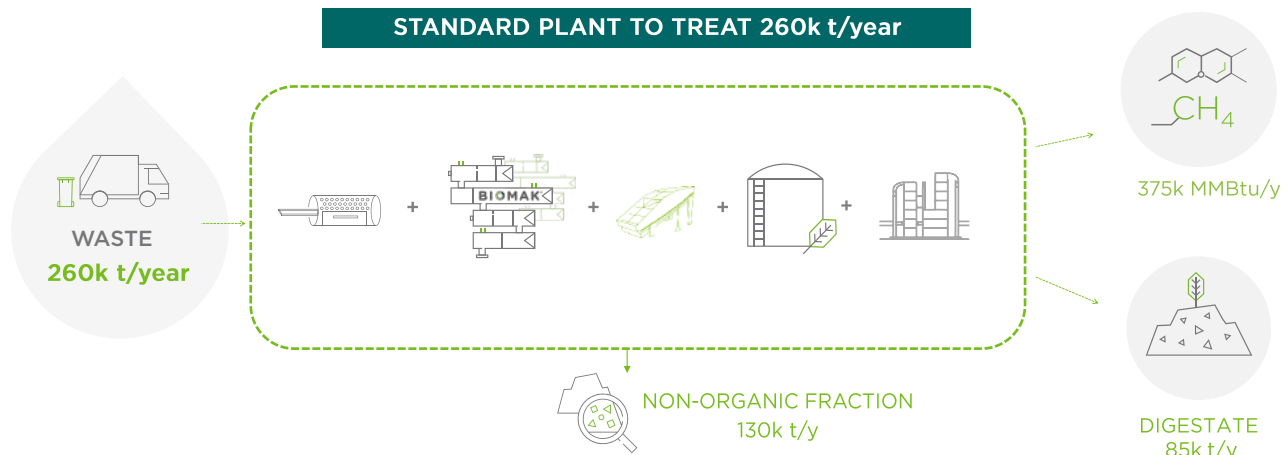


The NOWON system represents an unprecedented advance over conventional waste treatment plants, since it allows the recovery of organic matter, but also most of the materials that are currently

reaching the landfill, and allow their recycling or recovery.

For a NOWON system of 260,000 tons/year, the results are as follows:

# NOWON SYSTEM



## THE NOWON SYSTEM CONSISTS OF:

- ▶ A pre-treatment to ensure adequate particle size for entry into BIOMAK®.
- ▶ The BIOMAK®, heart of the NOWON system that performs thermal hydrolysis, optimizing the recovery of organic matter and the subsequent production of biogas.
- ▶ Mechanical aftertreatment of separation of improper, to obtain a substrate of between 95% and 98% in organic matter.
- ▶ Anaerobic digestion. Thanks to the above thermal hydrolysis, the treatment capacity of a NOWON system type plant is superior to that of a standard plant, since the TRH required for optimal biogas production is reduced (from 25 days on average to 18 days).
- ▶ Upgrading system, to inject the biomethane produced into the gas network.

# REFERENCES

## Madrid, Spain

RIVAS VACIAMADRID (MADRID, SPAIN).

**ECONWARD** has an industrial-scale plant in Rivas Vaciamadrid with a capacity of up to **65,000 tons per year**, operating since 2020.

In this plant, different types of waste are processed: organic fraction of municipal solid waste (OFMSW), selective collection of biowaste (SSO) and rejections of treatment plants with high organic matter content (TMBs).

The plant is integrated with a subsequent mechanical separation of improper. It is a vibratory screen that allows an effective separation by different particle sizes of the hydrolyzed biomass. This separation efficiency is optimized with the gross biomass that comes from BIOMAK®.

The product of this plant is a clean thermohydrolyzed biomass, with high organic content, which is used for different projects on an industrial scale:

- ▶ **ANAEROBIC DIGESTION**

which increases the specific production of biogas and increases its quality by methane concentration. Likewise, a high quality digestate is obtained, which allows its agronomic application.

- ▶ **CO-DIGESTION WITH SLUDGE**

- ▶ from wastewater treatment plants (WWTP), which allows increasing biogas production yields. ECONWARD develops this project together with the multinational company SACYR



The logo features the word "ECONWARD" in white, bold, uppercase letters on a dark grey rectangular background. To the right of "ECONWARD", the word "TECH" is written vertically in green, uppercase letters on a smaller, lighter grey rectangular background.

**ECONWARD** TECH

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