

INNOVATION FUND

Driving clean innovative technologies towards the market

Waga 4 World (W4W): biomethane production from landfill gas

The Innovation Fund is 100% funded by the EU Emissions Trading System



Project summary

The Waga 4 World (W4W) project aims at producing cost competitive and grid-compliant biomethane from landfill gas using the WAGABOX® technology, developed by Waga Energy. The objective is to implement an upgraded version of the WAGABOX® unit the Can Mata landfill, one of the largest landfills in Spain, operated by PreZero España. The biomethane production will be injected into the grid of the Spanish operator Nedgia, part of Naturgy Group. The expected biomethane production will be 70 GWh/y, the equivalent to the annual gas consumption of 14 000 Spanish households or a fleet of 200 lorries. The project will avoid the emission of 17 000 tonnes of eqCO₂ per year by substituting natural gas with renewable biogas.

COORDINATOR

Waga Energy

LOCATION

Spain

SECTOR

Biofuels and bio-refineries

AMOUNT OF INNOVATION FUND GRANT

EUR 2 452 401

RELEVANT COSTS

EUR 7 357 202

STARTING DATE

01 January 2022

PLANNED DATE OF ENTRY INTO OPERATION

December 2022

A project to reduce GHG emissions and replace common fossil natural gas

When landfilled, organic matters degrade and spontaneously generates a gas mainly made of methane. Landfill gas represents a significant source of greenhouse gas (GHG) emissions since methane is a very powerful GHG. Waste management is responsible for about 5% of global GHG emissions worldwide.

Many landfills in the world still release their gas into the atmosphere. Some of them collect the gas and flare it to avoid the direct emissions of methane. In some cases, landfill gas is burned in a Combine Heat and Power engine but the energy yield is low and these equipment are not profitable without governmental subsidies.

The WAGABOX® unit is a breakthrough technology for landfill gas upgrading. It offers significant technological and economic advantages, enabling the production of cost-competitive biomethane and making it more attractive also in countries where governmental subsidies (such as feed-in tariffs) do not exist.

The solution has a double impact to fight climate change: it incentivizes landfill operators to recover their gas, which contributes to significantly reduce fugitive methane emissions; and it produces clean, local renewable gas to substitute common fossil natural gas. The project W4W will avoid about 170 000 tonnes of CO₂e emissions from conventional fossil natural gas during the first ten years of operation.

A suitable project for many landfills around the world

The project has significant potential for replication in other locations and further expansion in Europe and across the world. Waga Energy's business plan targets 100 signed WAGABOX® units across the world by the end of 2026.

The technology could also have applications in transportation through bioGNV production and in carbon capture, enabling the creation of new value chains.

Project overview

WAGABOX®: a breakthrough technology to upgrade landfill gas into biomethane

There are about 20 000 landfills worldwide and fewer than 70 of them upgrade their gas into biomethane. Indeed, it is extremely difficult to recover the methane generated by the breakdown of organic matters as it is mixed up with various other components, including carbon dioxide (CO₂), oxygen (O₂), nitrogen (N₂) and volatile organic compounds. Plus landfill gas composition and flow rate are highly variable and unpredictable, depending on various parameters, such as the type and quantity of waste and weather conditions.

The WAGABOX® technology overcomes all the challenges that have previously hindered the use of landfill gas as a substitute for fossil natural gas. It delivers grid-compliant biomethane whatever the landfill gas composition and flow rate, thanks to a new, advanced cryo-condenser high recovery module. The unit with this module: (1) guarantees high-quality biomethane regardless of air gas concentration; (2) adapts to all gas variations; and, (3) ensures the final product meets the standards needed for its injection in the Spanish gas distribution grid. With this evolution, Waga Energy significantly improves the operational features of the WAGABOX®, either enhancing the recovery of biomethane or improving biomethane quality to meet more restrictive grid injection specifications.