



# LIFE ZERO WASTE WATER PROJECT



With the contribution of the European Union  
LIFE programme LIFE19 ENV/ES/000631

## Positive energy waste water treatment plant for combined treatment of waste water and bio-waste in populations < 50.000 I.E.



### Project Description

The main objective of the project is to revolutionize the conventional water treatment processes in wastewater treatment plants (WWTP). ZWW will study the feasibility of a joint treatment system for wastewater (WW) and the organic fraction of urban solid waste (OFMSW) as an innovative solution, with positive energy balance and economically profitable in populations of less than 50,000 inhab-eq.

For this, a waste collection and management strategy will be established at the municipal level, which will include awareness campaigns and the adoption of commitments with the neighbourhood and waste producers of the Valdebebas residential area (Madrid, Spain). The existing regulatory barriers for the collection

of the OFMSW will be considered as well as onsite treatment (i.e. grinding) and disposal into the sewer system for the transport of the mixed waste stream (OFMSW + WW).

The solution of the ZWW project will consist of a treatment train composed of three modules that will jointly treat the organic fraction of urban solid waste and urban wastewater that reaches the Valdebebas WWTP:

- Anaerobic Membrane Bioreactor (AnMBR)
- AQU-ELAN® Partial Denitritation-Anammox System (PN/AMX)
- Nutrient Extraction & Recovery Unit (from P and surplus biosolids)

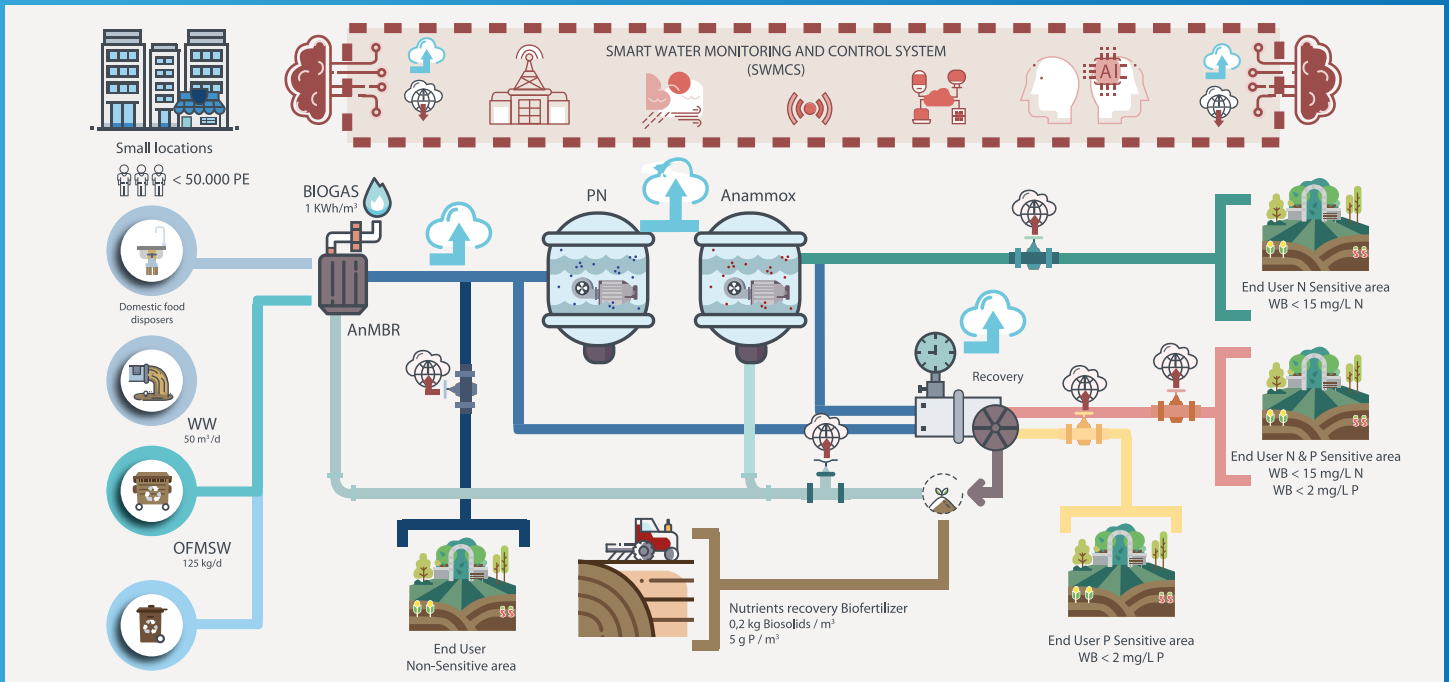
All three systems will be integrated in a compact solution with synergic results and minimal requirements in terms of energy and surface.



**Location:** EDAR Valdebebas (Madrid)

**Duration:** From the 1<sup>st</sup> of September 2020 to the 31<sup>th</sup> of August 2024

**Total Budget in Euro:** 2,454,512 € **Aqualia:** 1,099,639 €



The project will also be equipped with a smart water monitoring and control system (SWMC) which will allow obtaining different types of water quality depending on the legal requirement and the needs of the end user.

The implementation of new bioprocesses in the Valdebebas WWTP facilities represents a step forward in the paradigm shift of the purification concept.

- Collection of 125 kg/day of OFMSW – 45 tons during the project
- Treatment capacity of 50 m³/day

- 50% reduction in biosolid, up to 0.2 Kg SS/Kg COD removed.
- 95% recovery of “pathogen free” water to be used for fertigation or environmental purposes.
- Recovery of 5 g P/m³. Obtaining 0.2 Kg of soil fertilizer/m³
- Production of 0.3 Nm³CH<sub>4</sub> (biomethane)/m³ in AnMBR – 3kWh/m³
- Positive energy balance 1.0 kWh/m³ between the produced energy in the AnMBR and the consumed energy in the operation of the WWTP.
- N<sub>2</sub>O Emissions: 7,2 g N<sub>2</sub>O/Kg N removed.

**PROJECT PARTICIPANTS (leader)**

- Aqualia (Coordinator, Spain)
- Canal de Isabel II (Spain)
- Simbiente – Engenharia e Gestão Ambiental (Portugal)
- Universidade de Santiago de Compostela (Spain)
- Universitat de València (Spain)
- VWMS Vienna Water Monitoring Solutions (Austria)



**DETAILS OF FUNDING**

- Funding:** LIFE Environment and Resource Efficiency.
- Organism:** European Commission (EC).
- Project:** LIFE19 ENV/ES/000631
- Grant:** Subsidy of 55% of budget.

**Funding Received:**  
**Total:** 1,349,978 €  
**Aqualia:** 604,801 €