



WETWINE

WETWINE Project

Rocío Pena (AIMEN)

Vila Real, 28 November 2017

www.wetwine.eu

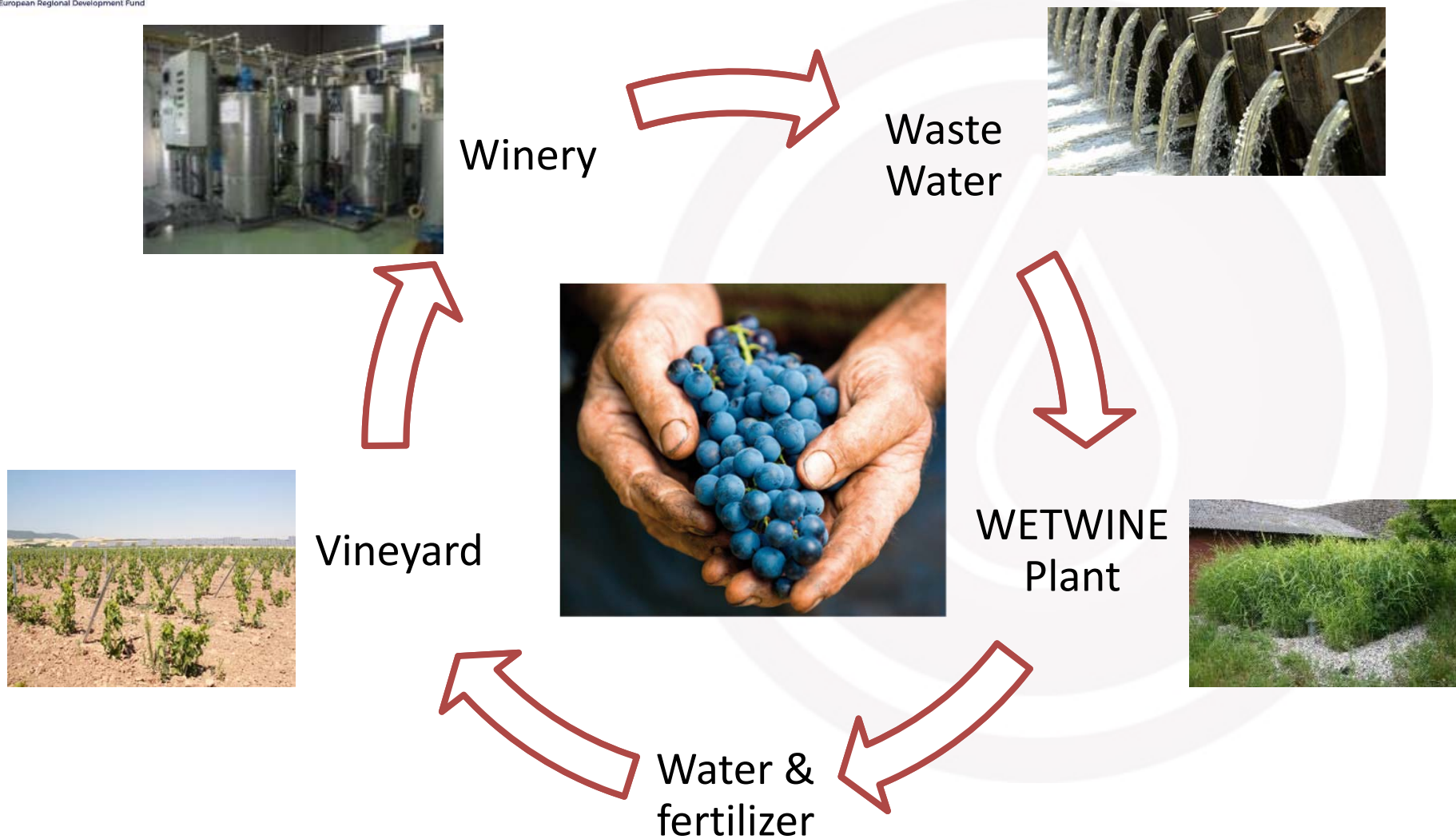


Southwest Europe region accounts for 25% of the European vineyard area.

The wine sector has notable environmental implications, especially related to water:

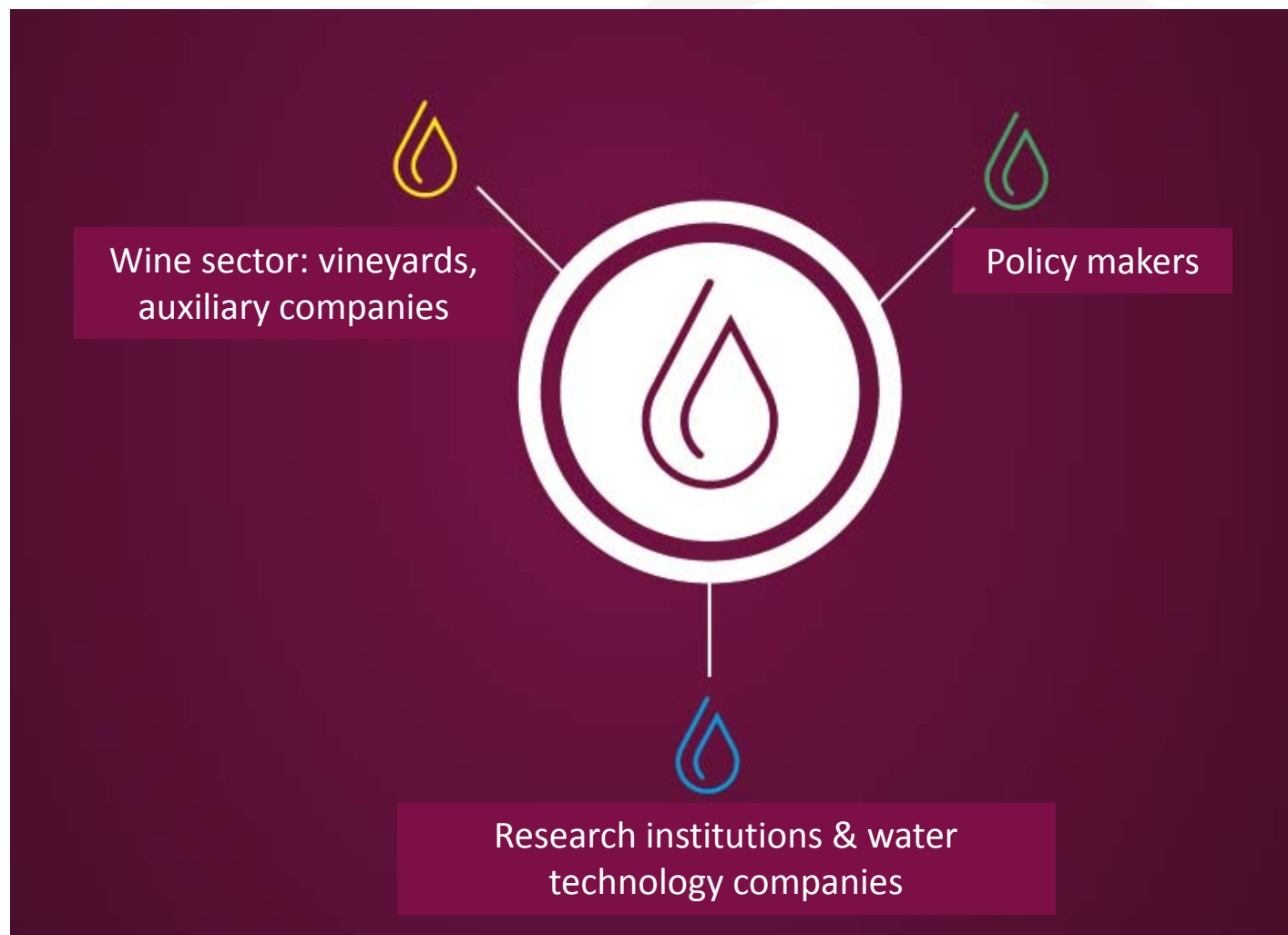
- *Consumption of water in cellars*
- *Production of liquid spills*
- *Use of fertilizers in the vineyards*





WETWINE key agents

Who is it aimed at?



WETWINE Project: 1st Call Interreg-Sudoe 2016 (Axis 5)

Financiación

The Interreg Sudoe Program is part of the European objective of territorial cooperation INTERREG.

Funding by:
European Regional Development Fund (ERDF).

INTERREG SUDOE:

Regional support program for South-West Europe to address common problems in South-West European regions, such as low investment in research and development, low competitiveness of small and medium-sized enterprises and exposure to climate change and environmental risks.



Title: "Transnational cooperation project to promote the natural heritage conservation and protection of wine sector in SUDOE area"

Main objective: To provide solutions to waste treatment problems of wine industry, based on the development of an innovative pilot experience based on water and sludge treatment by anaerobic digestion and constructed wetlands to promote the value and rational use of territory resources (water and wine)



Title: "Transnational cooperation project to promote the natural heritage conservation and protection of wine sector in SUDOE area"

Consortium: 8 partners (General coordinator: INGACAL; Technical coordinator: AIMEN)

Total budget: 1.339.515 € - Funding: 940.982 €

Duration: July 2016 – June 2019



GENERAL COORDINATOR

INGACAL. Instituto Gallego de Calidad Agraria. Galicia. España

TECNICAL COORDINATOR

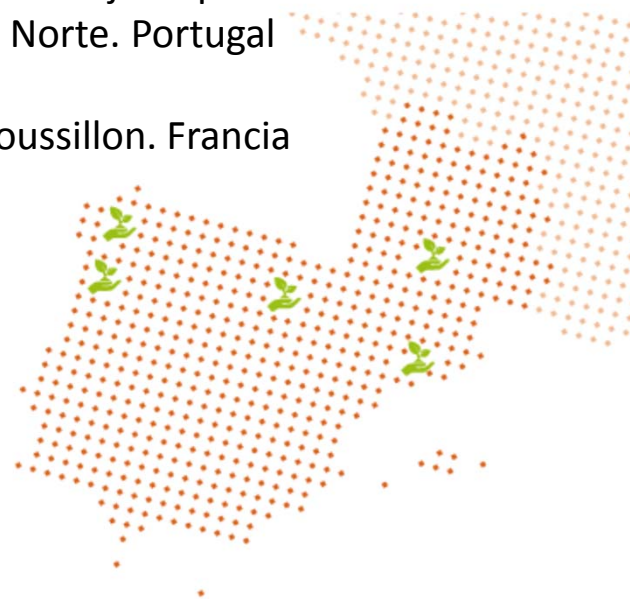
AIMEN. Asociación de Investigación Metalúrgica del Noroeste. Galicia. España

PARTNERS

- UPC. Universitat Politècnica de Catalunya. Cataluña. España
- FEUGA. Fundación Empresa-Universidad Gallega. Galicia. España
- Gobierno de la Rioja. Dirección General de Agricultura y Ganadería. La Rioja. España
- ADVID. Associação para o Desenvolvimento da Viticultura Duriense. Norte. Portugal
- IFV. Institut Français de la Vigne et du Vin. Midi-Pyrénées. Francia
- INRA. Institut National de la Recherche Agronomique. Languedoc-Roussillon. Francia

ASOCIATED PARTNERS

- Bodega Santiago Ruíz (Galicia, España)
- Murças, S.A (Norte, Portugal)
- Real Companhia Vella, S.A. (Norte, Portugal)



Expected results

Short term

- **Natural technology for water and waste treatment and recovery**, low cost and easy to handle, validated for wine sector.
- **Fertilizers** adapted and validated for different soil and grape conditions in SUDOE area.
- **Tool** (software) to be handled by the end users (cellars) and other interested agents, with the objective of realizing a personalized pre-design of the WETWINE valorization system based on different parameters.

Expected results

Long term

- **Increased natural heritage conservation and protection**, limiting discharges to the environment by the wine sector, contributing to the economic development of the territory and activities linked to the green economy.
- **Mitigation of the risks produced by man in the wine sector**, which has a marked rurality and value in order to contribute to local development in a sustainable way.

Objectives

Activities

Specific objective	Activities
1. To validate at the pilot scale a waste recovery system for SUDOE wineries.	<ul style="list-style-type: none">• Design, construction WETWINE recovery system based on anaerobic systems and constructed wetlands (GT1).• Operation, optimization and validation WETWINE system (GT2).

Winery wastewater

Waste water characteristics

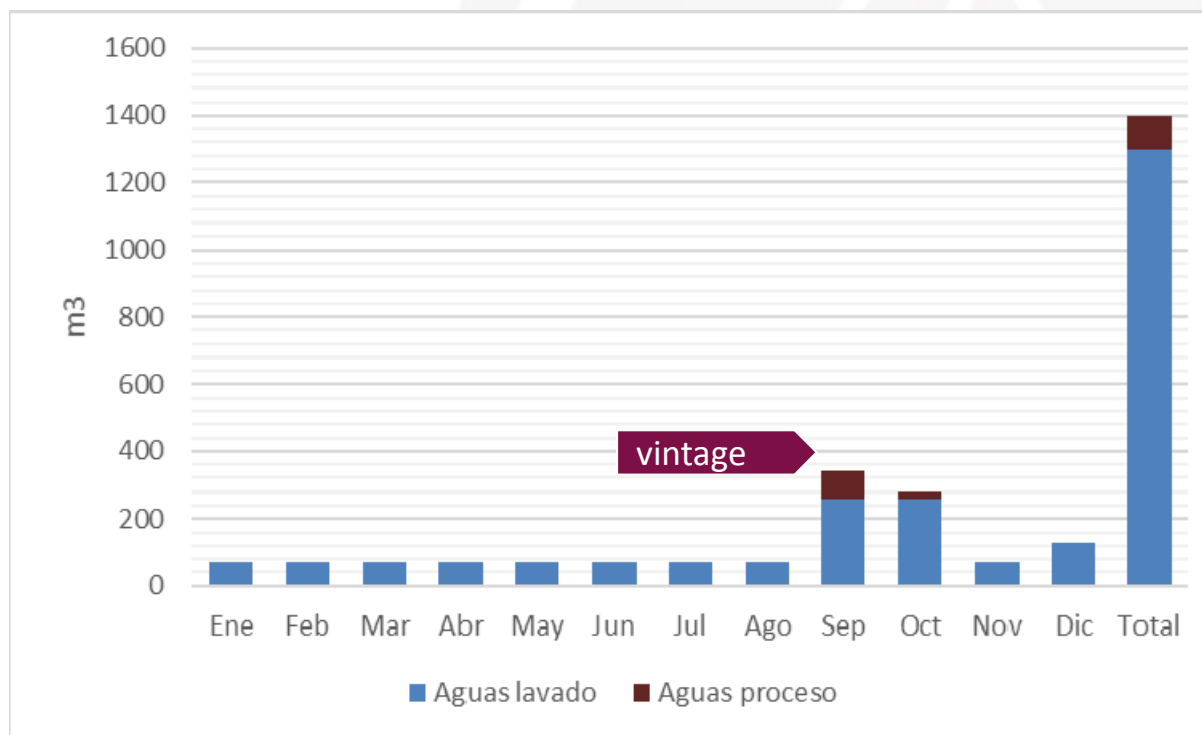
- **Composition and flow** highly depend on process and products.
- **So variable along the year.**

	Vintage	Out campaign	
pH (a 21,5 °C)	4,57	6,61	ud pH
Conductivity (a 25°C)	311	129,9	µS/cm
SST	57,0	74,0	mg/L
SSV	n.d.	6,0	mg/L
COD	978,0	57,0	mg O ₂ /L
BOD5	500,0	24,0	mg O ₂ /L
Total Nitrogen	13	18	mg N/L
Total Phosphorus	2,4	0,71	mg P/L
Ratio COD/SST	17,16	0,77	

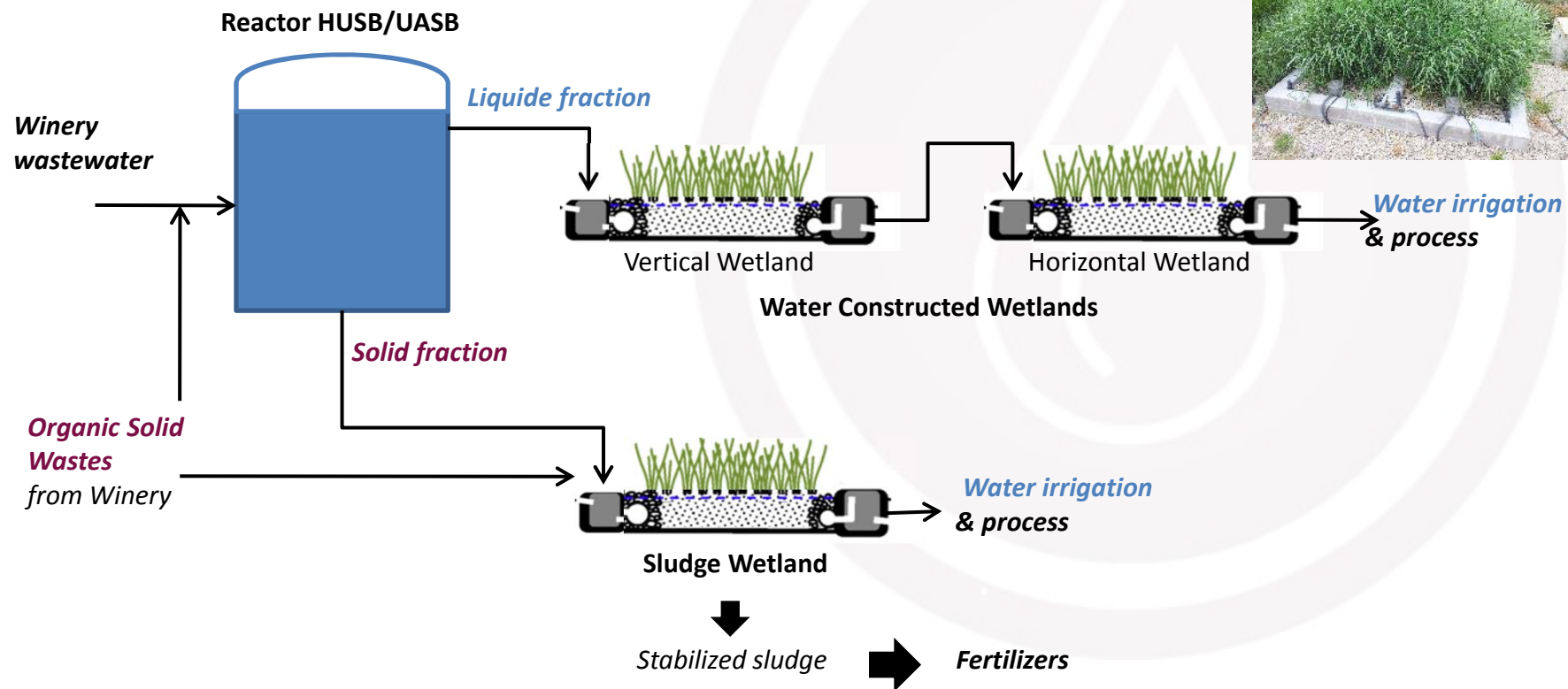
Winery wastewater

Waste water characteristics

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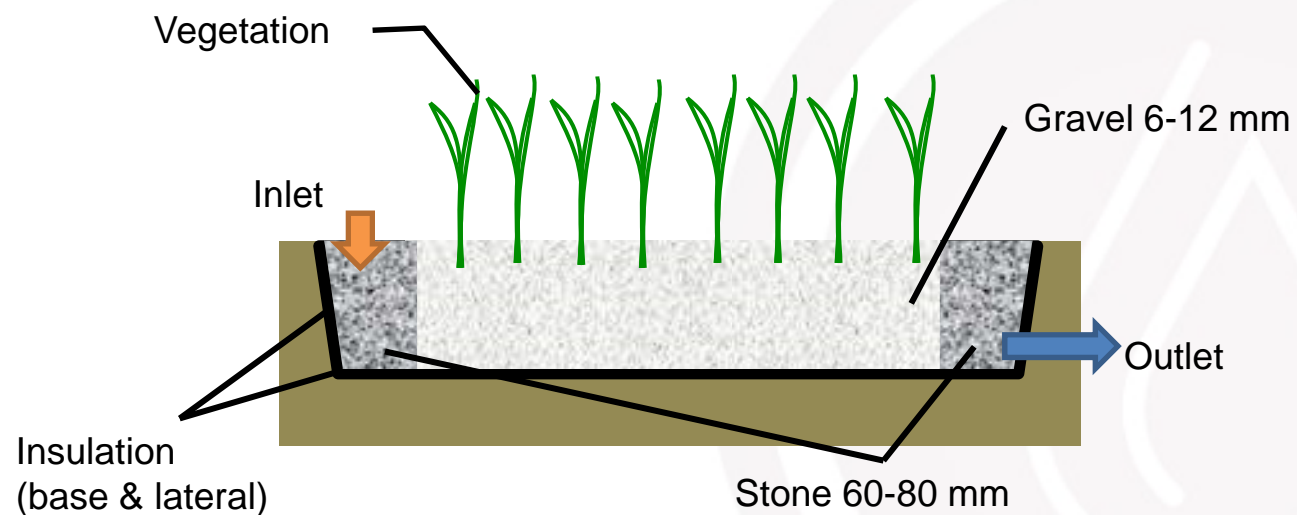


WETWINE valorization system



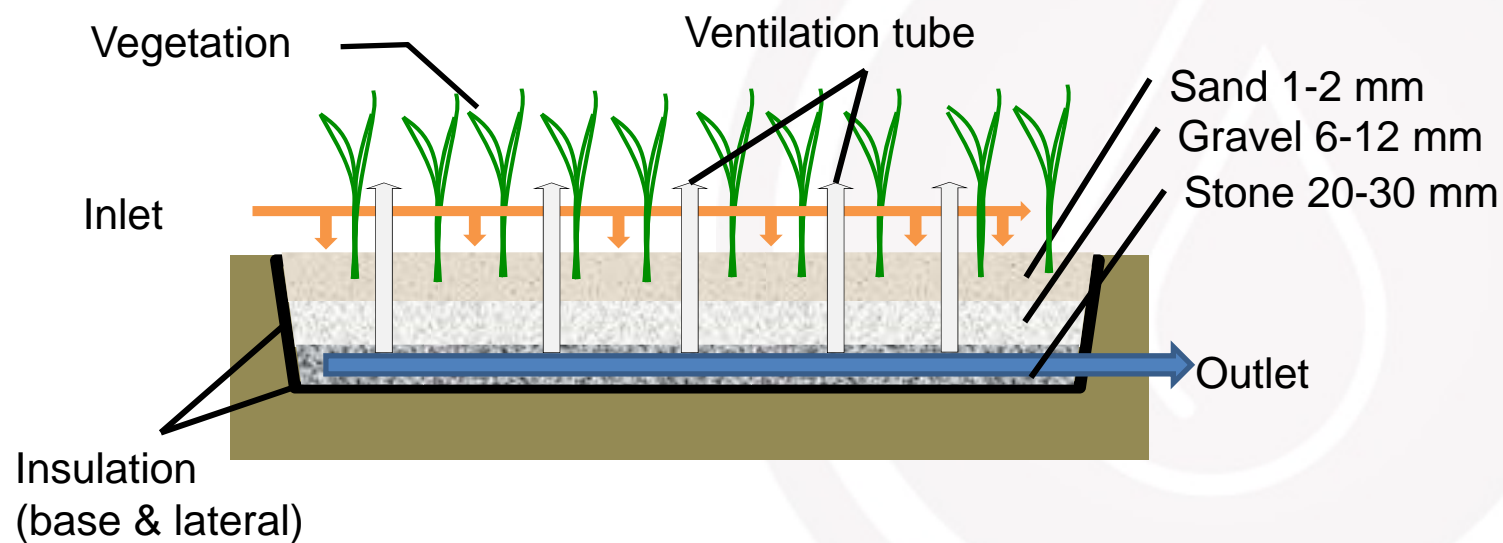
WETWINE valorization system

Horizontal Subsurface Constructed Wetland



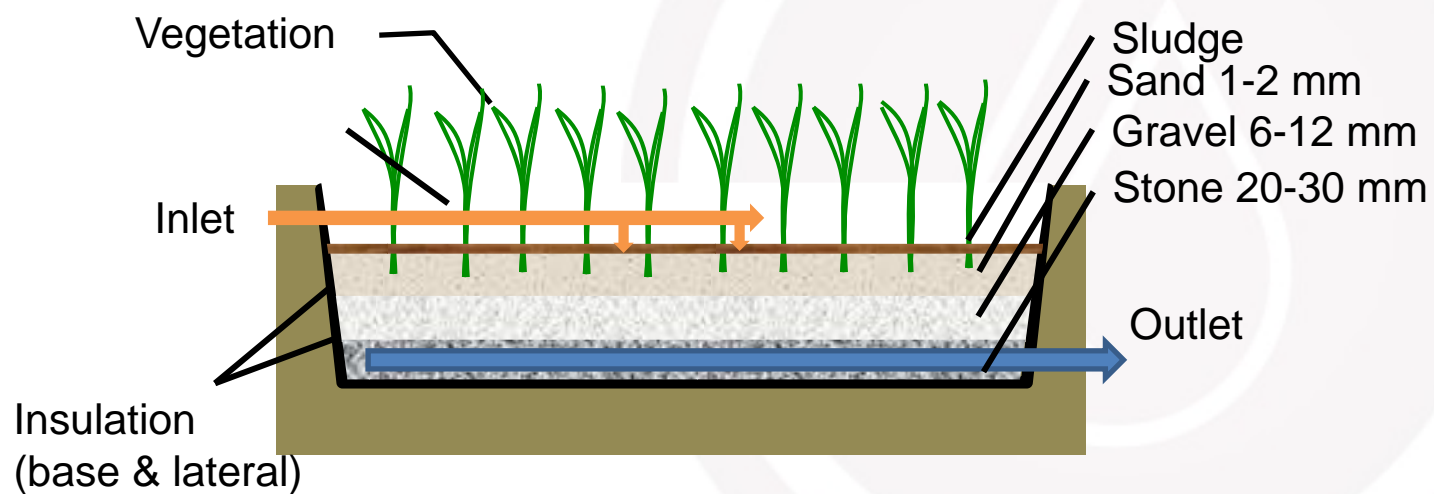
WETWINE valorization system

Vertical Subsurface Constructed Wetland



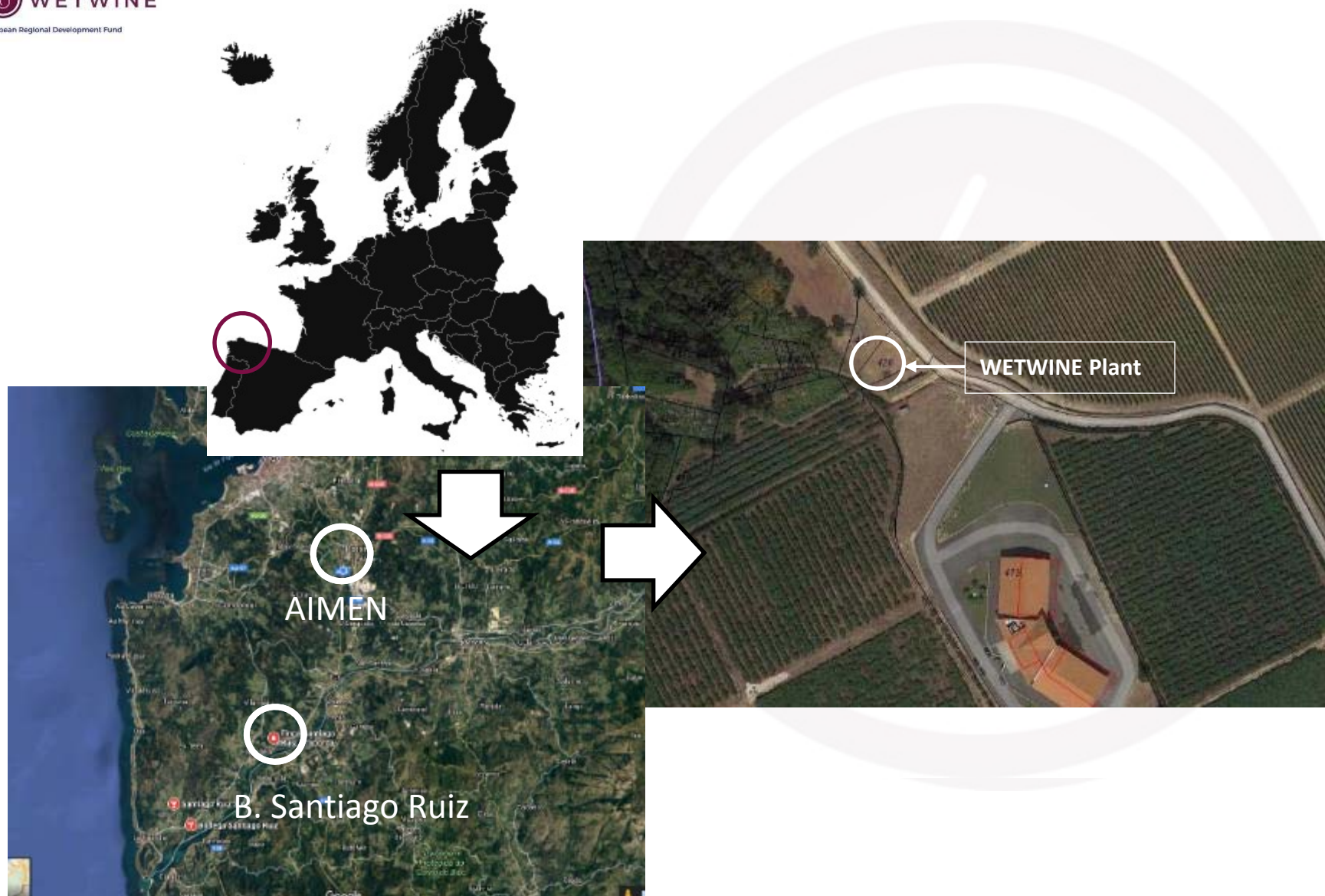
WETWINE valorization system

Sludge Constructed Wetland



WETWINE valorization system

Pilot plant location









WETWINE valorization system

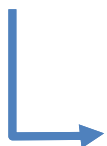
In operation



- Operation started on **May 2017**.
- During summer (out of campaign) **high evapotranspiration and small wastewater flow**.
- Some problems with **dry vegetation** due hot weather.
- **Sludge CWs feed** with anaerobic sludge from **other cellar**

- **Vintage has started on August 2017, and continues by now.**
- **Organic load:** 100-200 mg COD/L m² CW (maximum 500 mg COD/L m²)
- **Higher inlet organic load** (5000 mg COD/L) than expected
- **Low pH (4):** problems in HUSB operation
- **Low concentration nutrients** in inlet (N&P)

- **Removal efficiency higher than 90%** in COD & almost 100% solids, nutrients



- **POSIBLE USE IN AGRICULTURE IRRIGATION**

Spanish legislation: REAL DECRETO 1620/2007

- Low production of sludge in HUSB



- **LOW PRODUCTION OF FERTILIZER**

Objectives

Activities

Specific objective	Activities
2. Obtain a high quality agronomic fertilizer for the vineyards of SUDOE area from WETWINE valorization system.	Elaboration (formulation and composition) of the fertilizer, development of agronomic trials in SUDOE area and compare with other fertilizers (GT3). Tests in 15 DO.

Agronomic assays

Vineyard fertilizer



Agronomic assays in:

- Portugal
- South France
- Galicia (Spain)
- La Rioja (Spain)



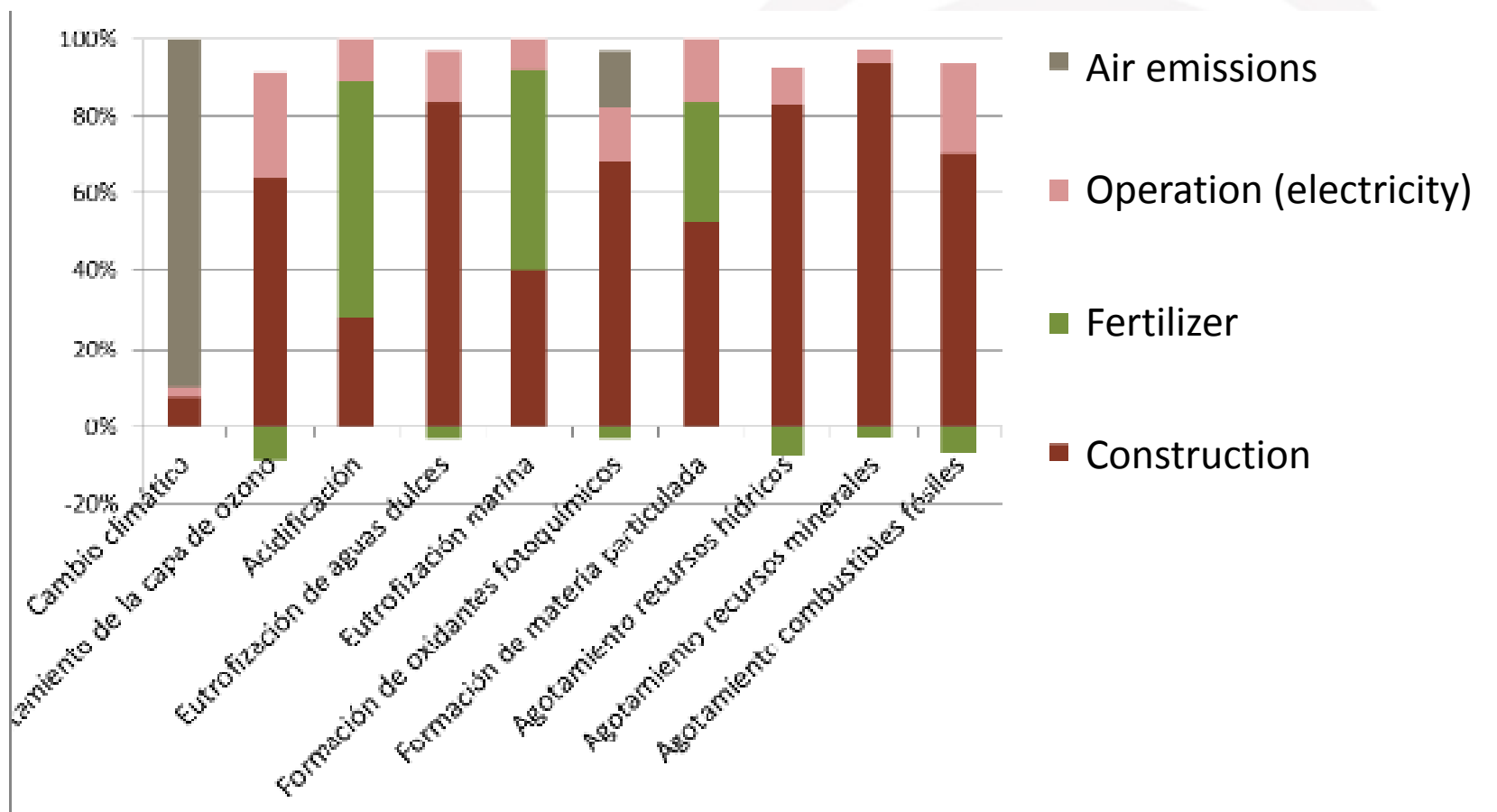
Objectives

Activities

Specific objective	Activities
3. Transfer and diffusion of technology developed to the largest number of wineries in the SUDOE area and awareness of the environmental impact of their activities.	<ul style="list-style-type: none"> • Carrying out the environmental impact analysis to wineries with and without WETWINE system (GT4). • Manual of good practices in wineries (GT4). • Guide for public policies modification of environment and rural development (GT4). • Development and dissemination of a tool for the application of the WETWINE system in warehouses (GT5).

WETWINE environmental impact assessment

LCA method



Specific objective	Activities
3. Transfer and diffusion of technology developed to the largest number of wineries in the SUDOE area and awareness of the environmental impact of their activities	<ul style="list-style-type: none">• Workshops to disseminate WETWINE results (GT5 and GTT2).• Annual environmental wine sector journal (GTT2).• Assistance to fairs and congresses (GTT2).

Work plan

Activities

GT1 - Design, construction and implementation of the recovery system

GT2 - Operation, optimization and validation of the recovery system

GT3. Fertilizer elaboration, experimental and agronomic tests and validation in SUDOE area

GT4. Wastewater impact analysis on natural heritage and improvement of waste management practices in the sector based on WETWINE system results

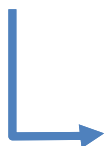
GT5. Transfer of good practices to the wine sector for the conservation of the natural heritage in SUDOE area

GTT1. Project management

GTT2. Project communication

GTT3. Project control & evaluation

- **WETWINE valorization system fits wine cellars treatment requirements**



- **POSIBLE USE IN AGRICULTURE IRRIGATION**

Spanish legislation: REAL DECRETO 1620/2007

- Stabilized sludge obtained **could be used as fertilizer in vineyards**
- **Environmental impact is positive compare conventional treatments**



WETWINE

Thank you for your attention

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