EFENERVI – Energy Efficiency in the Wine Sector

Summary

The assessment and performance of pilot tests in the EFENERVI project is essential to optimising strategies for implementing hybrid renewable energy sources and improving winery operations in order to maximise energy efficiency in wine and cava production processes.

Objectives

The objectives of the project were:

1. Assess the technology hybridisation based on renewable energies and high-performance equipment to cover the energy demand of the production process in its wine and cava production.
2. Demonstrate experimentally the economic and energy viability of the solutions studied in the pilot facilities.
3. Promote innovation and sustainability in the wine sector.
4. Increase the energy efficiency of wineries, promoting self-consumption.
5. Produce good practice guides and dissemination mechanisms to replicate energy-saving strategies in Catalonia's wineries.

Description of the actions carried out in the project

Action 1 - Analysing the energy status of the wineries, studying the energy infrastructure currently available at each of the pilot plants, the operating model in the wineries and the production and maintenance processes for different types of equipment. A detailed analysis of the data was then carried out to diagnose the energy efficiency of the production process at these pilot plants and study the impact of meteorological and production conditions on the overall consumption of the plant.

Action 2 - Study of strategies for improving energy efficiency in wineries. To do this, an analysis of new technologies to replace existing energy facilities was carried out. The specific actions involved are:

- Studying the high-efficiency technologies available on the market.
- Studying the most suitable renewable energies with regard to climate conditions and constraints in the facility surface area.
- Studying high-performance hybrid equipment configurations.
- Developing and implementing advanced control strategies focused on the optimisation of the energy resources of the facilities in warehouses.

Action 3 - Assessing the impacts of the newly defined equipment configurations applied to winery operating conditions and current infrastructure.

Action 4 - Analysis of the optimal pilot plant energy equipment operation to determine the energy, economic and environmental impact obtained by applying intelligent control strategies.

Action 5 - The same analysis was carried out by extrapolating the experimental data to the rest of the wineries in Catalonia, to obtain representative information and promoting innovation and sustainability in the wine sector.

Final results and practical recommendations

The results obtained from the EFENERVI project are:

- A clear overview of new technologies for the wine sector.
- Improved production and overall energy consumption methodologies.

- Establishing the potential energy, economic and environmental impact from applying intelligent control strategies.
- A thorough analysis in other wineries in Catalonia to observe the accuracy of the EFENERVI study.

Conclusions

As part of the EFENERVI project, a decision-making tool was developed to analyse solutions aimed at improving energy infrastructure by using highly efficient energy production equipment with renewable energies and implementing control strategies to determine the optimal operation of the equipment based on a variety of indicators, thereby promoting innovation and sustainability in the wine sector.
It should be noted that the tool serves as an initial estimate of possible solutions that could be installed and the alternatives to consider for a wine and cava production company, based on user-selected optimisation criteria and constraints. It should also be noted that users do not need specialised knowledge on energy or control to use the tool; they just need to enter a series of easily accessible data for the different companies (energy demands and consumption processes). In addition, the tool identifies the optimal energy infrastructure for wineries based on their characteristics as well as operational alternatives to optimise their energy consumption and use.
It is difficult to establish replicable or adaptable solutions for other wineries based on the results obtained from the data of the participating companies during the course of the project. This is because the results depend directly on the data from each winery as well as the indicators and limitations defined in each of the scenarios assessed, as these are individualised solutions that depend on the renewable resources they can access, the type of high-efficiency equipment they want to work with, the type of production process and the planning and operation of the winery being studied.

Leader of the Operational Group

ORGANISATION: CODORNÍU, SA

Coordinator of the Operational Group

ORGANISATION: INNOVI Association of Innovative Companies

Other members of the Operational Group (grant recipients)

ORGANISATION: JUVÉ & CAMPS
ORGANISATION: UNIÓ ORIGEN, SCCL

Subject area(s) of application

- ☐ Agricultural production system
- ☐ Agricultural practice
- ☐ Agricultural equipment and machinery
- ☐ Livestock farming and animal welfare
- ☐ Vegetable production and horticulture
- ☐ Landscape / Territorial management
- ☐ Pest and disease control
- ☐ Fertilisation and nutrient management
- ☐ Soil management
- ☐ Genetic resources
- ☐ Forestry

☐	Water management
☐	Climate and Climate Change
☐	Energy management
☒	Waste and by-product management
☒	Biodiversity and environmental management
☐	Food quality/processing and nutrition
☐	Supply chain, marketing and consumption
☐	Competitiveness and agricultural and forestry diversification
☐	General

Geographical area(s) of application

PROVINCE(S)	REGION(S)
Barcelona, Girona, Lleida, Tarragona	All

Dissemination of the project (publications, conferences, multimedia, etc.)

New stories have been produced for the INNOVI.cat website in relation to the progress of the project, disseminated over the social media of INNOVI and the cluster partners.
Project web section on the INNOVI website

Project website

www.innovi.cat/efenervi

More information on the project

PROJECT DATES	TOTAL BUDGET
Start date (month-year): September 2020	Total budget: €210.808,39
Completion date (month-year): August 2022	DARP funding: €86.153,01
Current status: Completed	EU funding: €64.992,63
	Own funding: €59,662.75

With funding from:

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Order ARP/133/2017 of 21 June, approving the regulatory bases for grants for cooperation for innovation by promoting the creation of European Association for Innovation operational groups in the areas of agricultural productivity and sustainability and the execution of innovative pilot projects by those groups, and Resolution ARP/1531/2019, of 28 May, announcing the call for the grant.

Generalitat de Catalunya
Departament d'Agricultura, Ramaderia, Pesca i Alimentació

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