



Vineyard pruning valorisation for energy purposes as local strategy to promote circular economy (Vilafranca del Penedès, Spain)

The concept:

Vilafranca del Penedès Town Council is located in one of the most important winemaking regions in Catalonia (Spain). Winegrowing in the Penedès region produces 30,000 tonnes of vine pruning waste annually (vine shoots) (Figure 1). This material is usually burned in the vineyards, which does not allow for energy harnessing and causes pollution. Vine pruning waste can easily be transformed into a source of biofuel that has high energy potential.

The new value chain involves all actors of the biomass value chain, which is key to successfully develop it. The project consortium included the town council of Vilafranca as the coordinator of the project, COVIDES cooperative in charge of the biomass supply, NOU VERD in charge of the biomass management, and INNOVI addressing biomass consumer engagement and promotion. After the project has ended, new actors were involved to further develop the value chain. More precisely, the value chain actors currently involve the Celler Cooperativa La Granada and EM-AVSA, although the municipality is still contributing to further promote the innovative practice. In general bases the main actors involved are the municipality a biomass supplier and a service company involved in the boiler operation and district heating maintenance.

A centralized heating system run on biomass in La Girada has replaced heating systems and domestic hot water (DHW) that were produced using natural gas and/or electricity. Fossil-based energy sources have not been eliminated, but they are nowadays only used as back-up. The installation of the boiler (Heizomat RHK-AK 500) was carried out as part of the LIFE Project and supplied thermal energy to four buildings (Dolors Piera primary school, an educational resource centre, parquet pre-school and alt Penedès Regional Archive). Heat supply began in January 2016. Taking into account the results achieved during the project lifetime, a new building (Ricard Fortuny Sociosanitary Centre) was connected to the Girada district heating network.

EMAVSA, a service company, is in charge of the boiler operation and its maintenance. Additionally, EMAVSA and alongside the cooperative La Granada are in charge of organising the biomass supply to run the boiler. The town council established a cooperation with a different cooperative (COVIDES) during the project lifetime and involved a different cooperative, but in all cases always looking at local actors from the surrounding area devoting their activity to vineyards.

Feasibility:

The main steps of the value chain include:

Biomass collection and transport to the storage site
Biomass management: crushing pre-treatment, storage and supply

Energy production (combustion and ash management)
The technology and equipment currently used along the whole value chain is already commercial (TRL 9).

Therefore, actors involved in these steps are key to achieve a successful implementation and operation. The main role of the cooperative is to collect the raw material and agree with the service company the logistic of the biomass supplied. The service company focus its effort on the operation of the boiler and maintenance of the system.

Contribution to regional bioeconomy:

The deployment of the district heating network calculated during the project revealed an energy reduction of around 153,000 kWh of natural gas and 12,653 kWh of electricity per year. Additionally, the overall reduction of greenhouse gases emissions associated was around 241 tCO₂eq.

The feasibility of this value chain requires to optimize the logistic of the raw material and will be affected by the biofuel selling price increase which in turn can decrease its price due to different reasons.

In any case, a significant effort was allocated by the municipality during and after the project to raise awareness among the general public concerning the potential of this type of biomass, replication potential in other areas with large amount of vineyard fields and heat consumption and of course contribution to promote the circular economy in the region.

Vineyard pruning valorisation for energy purposes as local strategy to promote circular economy (Vilafranca del Penedès, Spain)

<p><u>Key Partnerships</u></p> <ul style="list-style-type: none"> • Vilafranca del Penedès town council • Cooperative that supplies the vineyard pruning and is in charge of the logistic • Technology provider: Heizomat (biomass boiler) • EMAVSA, the service company, in charge of the boiler operation and its maintenance, and commercialization of heat 	<p><u>Key Activities</u></p> <ul style="list-style-type: none"> • Previous to the implementation, and to assure that the new service will perform correctly: <ol style="list-style-type: none"> a) Field test to test collecting machineries and compile field data (yield, time required, etc.) b) Tecno-economic feasibility study c) Agreement with the cooperative that will supply the biofuel d) Search for biomass boiler /technology providers able to work with this kind of biomass e) Campaign to citizens for acceptance • Establishing the formula to sell the heat (in this case by widening the scope and attributions of the public company EMAVSA. To also be able to sell heat) Assuring the heat consumption from a minimum part of buildings in the area • Boiler and district heating operation and maintenance • Raise awareness of the local population (goodness of solution; low impact in air emissions) 	<p><u>Value Propositions</u></p> <ul style="list-style-type: none"> • Local biomass used • Valorisation of a biomass that used to be considered as a residue • Thermal energy provided to the public equipments to the citizens from a renewable source • Contribution or support of the town council to promote circular economy in the region • Contribution to reduce climate change (CO₂ eq. emissions reduced) • Savings in respect previous heat supply • Simplicity (pay for heat, not anymore to take care of maintaining own boiler) • Price stability 	<p><u>Customer Relationships</u></p> <ul style="list-style-type: none"> • The owner of the facility (council) hires both the service company to operate and maintain the district heating and boiler but also is in charge of finding and ensuring a biomass provider (vineyard pruning) • Contracts are established both with the service company and in turn this one with the biomass suppliers • On the other hand the citizens can benefit in the different buildings connected to the district heating (Dolors Piera primary school, an educational resource centre, parquet pre-school, alt Penedès Regional Archive and Ricard Fortuny Sociosanitary Centre) 	<p><u>Customer Segments</u></p> <ul style="list-style-type: none"> • Public equipments • The citizens in the municipality • But it is also creating upstream value for the vineyard cooperatives that can expand their business model to include the biomass supply (vineyard pruning)
	<p><u>Key Resources</u></p> <ul style="list-style-type: none"> • Biomass (vineyard pruning) sufficient supply • Boiler/district heating • Financial instrument to finance the installation partially at least (LIFE Project financed the boiler) and the coordination of the whole new value chain • Contracts with the biomass supplier and service company that operated and maintains the district heating 		<p><u>Channels</u></p> <ul style="list-style-type: none"> • Local radio, TV and journals • City council page and channels • Tender (to hire the service company) • Social media and participation in events to address the citizens and general public • Participation in a financed project to work together with other entities to carry out the resource assessment, trial in the fields, assess different technologies and technology providers, etc. which also included strong dissemination campaigns and communication actions 	

Cost Structure

- The investment required for the district heating (boiler, pipes, etc.). In this case, the installation of the boiler (Heizomat RHK-AK 500) was carried out by the City Council, with a small share of subsidies from LIFE Project Vineyards4heat.
- The biomass cost, which fluctuate and can change for different reasons (if the operational costs increase (collection or chipping) due for instance to a fuel price increase consequently the vineyard pruning selling price might as well increase or if for instance, for climate reasons, the yield of vineyard pruning decrease and a different biomass needs to be purchased such as forest biomass which selling price can be significantly higher
- Operation and maintenance of the facilities
- Media and testing to keep a good image of the initiative

Revenue Streams

- Heat energy bills paid by consumers to EMAVSA (includes municipal buildings, but also other private users)
- Partial funding: the installation of the boiler (Heizomat RHK-AK 500) was carried out as part of the LIFE Project and supplied thermal energy to four buildings.

THE PARTNERSHIP



ABOUT BRANCHES

BRANCHES is a H2020 “Coordination Support Action” project, that brings together 12 partners from 5 different countries. The overall objective of BRANCHES is to foster knowledge transfer and innovation in rural areas (agriculture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management.

COORDINATOR: Johanna Routa (Luke) johanna.routa@luke.fi;

DISSEMINATION: itabia@mclink.it

www.branchesproject.eu



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 101000375