



Action C.3: Conclusions & Guidelines

Conclusions & Recommendations of the Project COOP2020

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For: LIFE 13 ENV/ES/1513

Place, Date: Camarles, May 2018



PART I: Conclusions regarding the implementation of Life COOP2020 project.

The main objective of COOP2020 was to demonstrate the economic and environmental viability of a new business model for agricultural cooperatives, integrating energy savings and the generation of renewable energies and biomass production.

The critical output of the project was an illustration of how energy efficiency and resource consumption go hand in hand with economic viability. The target audience, farmers in a rapidly changing environmental, agricultural and economic climate, desperately need the exposure to alternatives. COOP2020 successfully provided this exposure to the Baix Ebre area and beyond by changing the operational structure of Coop. Cambrils, ultimately saving the Cooperativa from bankruptcy. Key actions of the project addressed the following environmental problems:

Organic Waste – Crushed olive pits were used as raw material in energy generation equipment

Resource and Energy Efficiency – Increased energy efficiency through optimization of irrigation practices and substitution of electricity powered water irrigation pumps by hybrid mini windmills

Development and use of Abandoned Land – Restored currently unusable lands resulting from climate change and inadequate agricultural practices by planting energy crops.

The ultimate measure of success is the reduction of the environmental footprint of the Coop Cambrils, with main emphasis is given to the estimation of the environmental benefits obtained by the area.

Reduction in energy usage came from the following initiatives.

Installation of a chiller, powered by the biomass boiler, eliminating air conditioning in the summer months and cooling the storage refrigerators

Installation of Eolic-Solar Hybrid Windmills to power irrigation pumps

Numerous process improvement initiatives throughout Coop Cambrils, such as adjustments to the processing schedule, insulation of pipes, upgrade of lighting fixtures and machinery

In total, 163.7 tons of CO₂ emissions were saved from the elimination of electricity use from the Spanish power grid at Coop Cambrils alone.

Elimination of diesel via the implementation of a biomass boiler resulted in

Elimination of 17,000 L diesel use throughout the project timeline, corresponding to 40t CO₂ emissions saved

In addition, an electric delivery van replaced a diesel one, saving 2.3 t CO₂ total emissions.

Also, approximately 30 tons of olive pits that otherwise would be considered waste was instead utilized as biofuel

Summarized, the COOP2020 project was responsible for a total elimination of 206 t CO₂ from being generated by the Coop Cambrils facility, far exceeding proposed goal of 120t CO₂.

Introduction of energy crops on otherwise abandoned lands has made the unused lands profitable and productive again; the project published the “Informational manual for bioenergy crops cultivation”, compiling case study results as well as instructional materials for farmers wishing to grow energy crops on their own lands.

Environmental impact aside, Coop Cambrils and the associated partners accumulated cost savings from the elimination of diesel purchase both for the van and the boiler, and most recognizably a



cost reduction in energy bills. Coop Cambrils experienced a 20% reduction in their energy bill cost, whereas the participating farmers saw a 10% and 50% decrease in their bills respectively.

Farmers, local community members and interested organizations across the EU were exposed to progressive alternatives to the traditional operational methods and structure inherited for generations; the shift is imperative in this changing climate. Schoolchildren visited the project sites, opening their eyes to the exciting possibilities of renewable energy. The website, social media sites, exposure at conferences and outreach events disseminated news of the project's successes to over 15,000 people, and spread awareness of the opportunities provided by the EU LIFE Program.

Result	Foreseen	Achieved
Cooperativa Cambrils		
Reduce total carbon footprint during project	120 t CO2	206 t CO2
Reduce electricity bill.	20% 281 t CO2 total 70,4 t CO2 - year	20,06% 163,7 t CO2 total 17,2 t – 2015 73,5 t – 2016 73 t -2017
Diesel saved from Energy Generation Equipment	104,4 t CO2 total 26,1 t CO2 - year	5,3 t - 2015 16 t – 2016 18,7 t – 2017
Substituting diesel delivery van with an electric one	21,2 tons CO2 total	2,3 t total
Other Results		
Reduce farmer's electricity bills	50%	52%
Disseminate the project to	500 professionals 10.000 website visitors.	500 + professionals 14.000 website visitors.

PART II: Conclusions regarding on a consultancy among partners and stakeholders about the future opportunities and needs of this new productive model.

Is it socially, economically and environmentally preferable to use the new productive model in Spain vs common cooperative practices?

All answers provided by stakeholders from different sectors and partners indicate that this new productive model is preferable, because it implies an economic, social and environmental improvement. As it is explained below:

- **Economic improvement**, since production costs are reduced by energy efficiency measures implemented, efficient irrigation systems and renewable energy generation systems.



- **Social improvement**, since it generates green jobs and diversifies business opportunities in agricultural sector, due to energy crops cultivation, and also shifts the mindset of farming to one with efficient use of resources as a priority.
- **Environmental improvement** by saving CO₂ emissions generated throughout the productive system, conserving water, and restoring the vitality of arid lands.

How could this new productive model be improved? The goal is to encounter more ways of energy savings, increase the amount of the energy generated and make the new productive model available to a larger public. This eventually leads to more sustainable and diversified cooperative and the creation of green jobs.

Different ideas were identified to improve this productive model, which are:

- Increasing public incentives to assist with initial costs; these expenses pose a challenge for already struggling farmers to overcome even when the long term benefits are recognized
- Including the study and the implementation of efficient irrigation systems to maximize the benefits of renewable energy generation devices. In fact, although the irrigation study was outside of the project's scope, some outside resources were used to conduct it.
- Including the pelletization process for energy crops in order to get a more valuable product. Currently raw energy crops products have good heating power value but they can not be used in most industrial biomass boilers. Therefore, the pelletization process (transform energy crops to pellet) will produce an attractive product for consumers while also creating a lucrative product for farmers to sell.
- Integrate the concept of "Land Stewardship" to recover abandoned lands with energy crops by people who are unemployed or in a risk of social exclusion.
- Including an automatic closing system for mini wind mills in case of winds above the maximum useful speed to avoid breakdowns in the windmills.

What benefits would additional financial incentives to apply the efficient irrigation system provide to farmers? What incentives are introduced by getting involved with the providing of energy for the rural smart grid?

During the Life COOP2020 project, some extra efforts and economic resources were used to contract a consultancy with extensive experience in efficient irrigation systems, called Neurona Ingenieros. This consultancy conducted an analysis of current situation of each plot (Renewable 1, 2 and 3) and developed an efficient irrigation project for each of them, including best available techniques and methodologies to reduce water consumption.

This projects were delivered to the owners of the plots and it is expected that will be implemented in the following months. Although farmers are well aware of the long term financial and environmental benefit of applying this efficient irrigation system, and are fortunate to have the plan supplied to them, the implementation investment is a challenge to absorb.



Hence, the regional and national government must support at financial level to apply efficient irrigation system and also to provide renewable energy. The alternative to providing subsidies would be to provide the ability and ultimately compensation for consumers returning excess electricity to the grid. In a system where consumers are compensated for their contribution to the electric grid, this compensation can be the economic boost farmers need to continue to implement resource saving measures and ultimately grow their business. This ability is a crucial incentive to continued implementation of renewables.

Could Spanish governmental institutions, on local, regional or national institution improve their policy on the outcome of this research?

Yes, they could. In general, the project has shown that the development of projects such as COOP2020 are feasible and desirable. This should help governments and local authorities to promote this type of model, which is less dependent on subsidies, more self-sufficient and more environmentally friendly.

This model should be understood as a tool to reduce the economic dependency of agricultural cooperatives and their partners on the subsidies offered by the government. Therefore, Spanish government, regional and local authorities must promote the replication of this project in order to facilitate the transition into this new model.

Are these means of the new productive model applicable in other cooperatives outside Spain? Is this economically feasible in other countries?

The project has been focused for agricultural cooperatives in rural and Mediterranean areas, because these areas are more vulnerable to the effects of climate change. For this reason, some efforts have been made to ensure enough water for irrigation system by using self-generated renewable energy (hybrid eolic-devices). Also, different types of energy crops have been developed in order to find the most productive species in the study area and thus recover abandoned lands, avoiding soil erosion and desertification processes that threaten the useful soil, especially in Mediterranean areas.

Therefore, other Mediterranean countries should replicate the model considering the particularities of the soil and climatic variations, to identify best energy crops.

Other rural areas in European countries can replicate the model too, because agricultural cooperatives must be modernized and diversified (through new products and services offered) in order to ensure their survival without European subsidies, and to become a key element in rural agricultural economies and green jobs creation. However, these countries should use other energy crops to be pelletized, depending on the weather conditions.

SWOT Analysis

Strengths

Weakness



<ul style="list-style-type: none"> - Increasing environmental awareness for using renewable energy sources in agricultural sector. - Increasing number of kWh generate by renewable energy. - Increasing energy savings. - Product diversification offered by Coop. Cambrils due to energy crops and organic waste (olive pits). - Creating new business model for agricultural cooperatives less dependent on EU subsidies. 	<ul style="list-style-type: none"> - Windmill and solar panels installations are initially expensive for owners. - Optimal utilization of the mini-windmill irrigation system requires an efficient irrigation plan. This often requires a renovation of the entire irrigation system, which can be expensive. - Current market for energy crops is not strong enough to motivate farmers to specialize in such crops.
Opportunities	Threats
<ul style="list-style-type: none"> - Replication of the project in other agricultural regions and countries. - Reduce organic waste production. - Reduce CO2 emissions (carbon footprint). - Create green jobs. - Reduce soil erosion. - Reduce energy consumption. - Reduce the dependency on EU subsidies for agricultural cooperatives. - Ability to return excess energy to the grid should regulations allow and incentivize 	<ul style="list-style-type: none"> - “The sun Tax” of Spanish regulation (RD 990/2015) makes difficult the replication of this model in Spain. - The lack of aid to invest in renewable energy. - The lack of awareness/reliance of the benefits produced by this new model.