

SPAIN

Water use efficiency

Location

Estadilla

Programming period

2014 – 2020

Priority

P5 – Resource efficiency & climate

Measure

M04 – Investments in physical assets

Funding (EUR)

Total budget 529 902.21

EAFRD 127 729.58

National/Region. 113 269.63

Private 288 903.00

Project duration

2017 – 2018

Project promoter

Irrigation user cooperative de Estadilla

Contact

comriegosestadilla@gmail.com

Website

n/a

Expanding a water reservoir and installing a solar farm to reduce the energy costs of irrigation.

Summary

In order to reduce high energy costs, the irrigation cooperative Nuestra Señora de la Carrodilla de Estadilla - based on the results of an energy audit undertaken in 2013 - carried out two investments using RDP support. These were the expansion of a reservoir in order to have more water available for irrigation during the periods when electricity tariffs are lower (night hours and weekends), and the installation of a photovoltaic solar farm to produce cheap energy for the reservoir's water pump.



Results

Energy savings will be up to 40% of the current electricity bill.

There are environmental benefits due to the use of solar energy, which means a reduction of CO2 emissions into the atmosphere. It is foreseen that the solar energy will represent around 30% of the total energy used by the irrigation cooperative (around 193 Mwh/year).

Access to alternative energy sources will mean less vulnerability to fluctuations in energy prices.

It is expected that the economic performance of the cooperative will be improved due to their reduced electricity costs.

Lessons & Recommendations

- ❑ Energy audits represent good practice for all irrigation cooperatives since energy costs are a very important factor impacting the profitability of agrarian production.
- ❑ It would be very helpful if irrigation cooperatives could have two different energy tariffs per year: a lower one for the “rainy season” and general one for the “dry season”.
- ❑ Only part of the energy generated by the solar photovoltaic farm is used to pump water. Thus, it would be very convenient to have the possibility of selling excess energy back to the energy company.

Context

The irrigation cooperative Nuestra Señora de la Carrodilla de Estadilla has 172 members and covers an area of 455 hectares. The main crops produced by its members are maize, barley and wheat, but alfalfa, grapes and pears are also grown.

In 2005, the cooperative supported by the 2000-2006 RDP of Aragon, National and Regional funds undertook a major investment in irrigation. The project – which involved the conversion of an old flood irrigation system into an efficient, modern, drip and sprinkler system – sought to maximize the use of irrigation water and reduce waste.

In 2005, the energy companies offered a special tariff in order to support the agrarian sector. However, in 2008 this agrarian electricity tariff was withdrawn, thus obliging all producers to return to paying general prices, which are subject to frequent and dramatic increases. Overall, the electricity costs of the irrigation cooperative have risen around by 50% over the last ten years.

In 2013, in response to this situation, the cooperative did an energy audit in order to see how they could reduce costs. It was through this that the framework for the current project emerged.

Objectives

The overall objective was to reduce electricity costs, which have been increasing alarmingly since 2008. In order to achieve this, the project sought to:

- improve the reservoir's water storage capacity.
- reduce the number of hours of electrical energy used during the high-cost period (daytime hours).
- introduce the use of solar energy for pumping water during the day.

Activities

In order to achieve the general objective, the investment has been carried out in two stages:

1. the water reservoir was extended in order to increase its storage capacity from 35 000m³ to 48 000m³ (35% above its initial capacity). It is therefore now possible to store more water pumped during low-cost electricity hours (night-time and weekends).

2. a photovoltaic solar farm was created in order to pump water into the reservoir during the high-cost electricity hours (daytime during the week). This reduces the number of hours of electricity consumption which are charged at the electricity company's increasingly high tariffs. The photovoltaic solar farm consists of 792 solar panels which have 310 wp nominal power per panel. Finally, the pump is also new and has an engine of 150kw at 1 450 r.p.m (rounds per minute) and is able to elevate 730m³/hour to a 58 metre water pillar (mwp).



Main Results

These investments are expected to save around 40% of the irrigation user community's current electricity bill.

Moreover, this project has environmental benefits due to the use of solar energy, which means a reduction in CO₂ emissions into the atmosphere. Solar energy is expected to represent around 30% of the total energy used by the cooperative, which means 193 Mwh/year.

Additionally, the irrigation cooperative of Nuestra Señora de la Carrodilla de Estadilla, will be less vulnerable to future changes in energy prices.

Finally, it is expected that the economic performance of the cooperative will be improved due to the reduction of electricity costs, which will stimulate the agrarian sector.

Key lessons

First of all, energy audits represent good practice for all irrigation cooperatives since energy costs are a very important factor impacting the profitability of agrarian production.

The beneficiaries also highlighted two aspects related to energy policy that would make the work of irrigation cooperatives easier, and therefore support the agrarian sector generally:

- Firstly, the energy company charges a fixed tariff all year round for the cooperative's electricity consumption. There are, however, two distinct periods in the year, where the energy needs of crop irrigation alter

dramatically. For six months of the year, rainwater can be relied upon to cover the crops' water requirements entirely, so it would be of enormous help to irrigation cooperatives if they could have two different energy tariffs per year: a lower one for the "rainy season" and a general one for the "dry season".

- Secondly, only part of the energy generated by the solar photovoltaic farm is used to pump water. Thus, it would be very convenient to have the possibility of selling excess energy back to the energy company. This sort of arrangement is not currently allowed, but it would support the agrarian sector by providing an extra-income and, at the same time, have environmental benefits due to reduced CO2 emissions.

"The sustainability of irrigation involves the efficiency and viability of the agrarian production, the basis of food and social welfare"

Purificación Domínguez - RDP management unit
programme

Additional sources of information

n/a