

SUPSI

Electricity from drinking water: a potential resource to exploit in Ticino

Axis 2 – Energy systems

Interview with Linda Soma, Head of the project



Tell us briefly about the project, starting with the problem tackled.

Electricity from drinking water: a potential resource to exploit in Ticino.

This project, concluded in Spring 2017, explored the potential of small hydroelectric systems that can be installed onto aqueducts, calculating the potential increase in energy resulting from a particularly sustainable water resource exploitation method. The analysis conducted in Canton Ticino was divided into two main research phases: in phase one, theoretical cases were studied and production estimates were calculated, while in phase two on-site inspections were conducted in order to evaluate the actual potential of each case, first from the technical aspect, and then in financial terms.

What initial results have been obtained?

Based on 300 theoretical cases, it was possible to study 54 in greater depth, totalling approximately 700 kW in overall power. The cost of electrical energy production was calculated for these sites. In addition

to providing a state-of-the-art overview of existing aqueducts and their complexity, the research also made it possible to identify the main barriers to technical-economic feasibility, which are principally the condition of the pipes and the absence of the electricity network. Finally, it outlined the current most promising sites for potential energy exploitation, responding to the measures of the Cantonal Energy Plan (Piano Energetico Cantonale - PEC).

What are the strong points of the project? And the problems

Calculating the potential still possible from drinking water utilisation in Canton Ticino means providing an answer to an energy question: can we exploit water that is already used for drinking purposes

in order to extract electrical energy from it at the same time? And where exactly can these resources be found? This is also one of the queries specified on the P.I.5 form. Mapping of aqueduct potential, specified in the PEC. The strong points lie in providing an overview of the present-day situation in Canton Ticino, of the pronounced differences between various aqueduct systems, and also in managing to identify the main limiting factors to technical and economic feasibility of an installation. The problems are definitely dictated by the fact that when you work over such vast and diverse areas, it is utopian to think that the data will be homogeneous, so you work with the information available, well aware of the limitations imposed by the system.



Do you remember anything interesting, amusing or unusual that occurred during the project?

I have always found it to be extremely stimulating to work in and for the territory. It allows you to view the world with new eyes. It allows you to get to know people and places, and to truly appreciate the difficulties that can arise every day in fundamental activities, such as aqueduct installation management. Without having to think about it too much, from the many interesting episodes the ones that spring to mind are the race against time to carry out the inspections before the snow arrived (mission accomplished!), and the inspection in Gambar-

ogno conducted in the fog and rain, and the very nice municipal secretary who called me by my first name, saying "I'm sorry if I take the liberty of calling you by your first name, but my daughter has the same name!" One magical memory is the dawn from Gola di Lago.

Could other projects develop from this one?

Project execution, and presenting the results at public events have made it possible to understand the local situations, and to discuss potential future projects. Thanks to the excellent collaboration relationship established with the partners, plans are materialising for a new project aimed at potential energy saving as a result of optimising the lifting pumps used in the drinking water sector.

Apart from you, who else was on the project team?

The following people participated in the project: Eng. Nerio Cereghetti, senior researcher and head of the ISAAC Energy and Territory Sector; CSD Ingegneri: Luca Solcà, director of the Lugano branch, together with Eng. Camilla Santicoli and Eng. Roberto Rossi; and the regional director of SSIGA, Eng. Raffaele Domeniconi.



Project type: National project

Financing body/ies: Renewable Energies Fund (Fondo per le Energie Rinnovabili - FER) of Canton Ticino and the Federal Energy Office (Ufficio Federale dell'Energia)

Project partner: CSD Ingegneri (www.csd.ch/it) SSIGA, Società Svizzera dell'Industria del gas e delle Acque (www.svgw.ch)