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Promoting Energy efficiency to Local Organisations
through dissemination Partnerships in Europe
Best Actions for Collaboration in Countries
for a High efficient Use of energy in Structural funds

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Biomass central heating in Cu llar (Segovia) -

Segovia - Spain

This project consisted in the installation of a biomass central heating plant with capacity to supply heat and domestic hot water (DHW) to a neighbourhood composed by approximately 1,000 inhabitants including a school, a cultural centre and a municipal sports centre.

Target Groups	Sector	Field
<ul style="list-style-type: none"> - Local authority - Decision makers - Domestic consumers 	<ul style="list-style-type: none"> - Energy supply - Buildings (including municipal properties) 	<ul style="list-style-type: none"> - Renewable energy - Information

ANALYSIS

CONTEXT

This initiative takes place in a neighbourhood built up in the Seventies, which comprises several blocks of flats, a school with 600 students, a covered sports centre and a cultural centre. Before the project implementation, all these structures were fed by natural gas and also suffered some important heat losses.

This project suggested the solution to a problem, which had not been perceived by users, and therefore consequent reluctance had to be overcome explaining the improvements that could be achieved in the building conditions and the environmental and social benefits associated to this action. The Town Council got involved in the project permanently, assuring the operation of the whole system and encouraging the participation of neighbours.

PROJECT DESCRIPTION

Technical difficulties had to be overcome in the development of the project due to the novel engineering plan applied and also because this plant represents the first experience of this type carried out in Spain. Although there already were other wood supplied boilers in the country, they do not have such an institutional character and did not serve this large number of citizens.

The centralised heating system provides energy directly to the user avoiding single-house fuel stock. The system is made up of three main elements, which are the thermal plant, the distribution pipelines with their related interconnections and the final users' heating elements. The system is completed by the necessary controlling devices that ensure the supply and monitoring conditions. There are two water-tubular boilers operating alternatively. The big one (4500 mcal/h) works in winter to provide domestic hot water (DHW) and heat; the small one (600 mcal/h) is activated during the summer season to supply DHW solely. An additional deposit can store up to 30 tons of biomass.

The system proved to be efficient, uses several types of biomass and supplies heat and DHW to 200 families, approximately 1,000 inhabitants, distributed in 13 dwellings, 5 neighbours co-operatives, a Municipal Sports Centre, a Cultural Centre and a School.

COST AND BENEFITS

EVALUATION IN TERMS OF COST AND BENEFITS

The biomass central heating system cost was approximately 1,202,024 Euro, counting on outstanding advantages as it is detailed below.

Its main technical benefits are related to the fact that it is an innovative project developed with the most advanced technologies, which is a reference for other district heating plants to be installed in Spain in municipal or industrial areas.

In the chapter of environmental benefits, the most outstanding one is that biomass used as a substitute of oil and its derivatives reduces substantially CO₂ and NO_x emissions. Moreover the plant does not contribute to acid rain nor to the greenhouse effect because the CO₂ emissions in the phase of combustion are offset by the absorption of this component during the lifetime of the plants used as biomass.

Finally, it is worth mentioning that biomass harvesting also contributes to avoid plagues and fires in forests.

Calculations about its economic benefits showed that in the short term it is more profitable than the systems fed by oil and natural gas, while in terms of comfort benefits it reduces to a minimum the installations' maintenance because it is centralised.

Some social benefits have also been detected by the creation of direct and indirect jobs, related to the forests clean-up and wood recollection and transportation to the plant.

PARTNERSHIP

MAIN STAKEHOLDERS, COMMUNICATION STRUCTURES AND NETWORKS

Cuellar Town Council is in charge of the management and maintenance of the biomass central heating plant and will be the owner of the installation for twenty years. IDAE (National energy agency) and EREN (Energy Regional Entity of Castilla y Leon) have financed the project through a third party financing mechanism. The University of Valladolid has also provided technical support and it was in charge of the start-up phase and optimisation of the plant performance

The project was object of an important promotional campaign through the most important media (radio, TV and several press articles) and this effort largely contributed to disseminate the main results of the initiative and to encourage other Council to adopt similar solutions.

The regional Government is also closely following the development of the project in order to extend it to other geographical areas of the region (Tierras de Campo) where some energy crops have been developed.

The educational sector was also very interested to the initiative and many visits have been organised and carried out that explain the technical and environmental characteristics of the installation.

The effective and targeted spreading of information created a very positive attitude towards the project and an important multiplier effect is expected in the next future: this is also demonstrated by an active technology research activity (related mainly to biomass optimised harvesting) which is being developed in other Spanish regions interested in the application of similar experiences.

RECOMMENDATIONS

As a consequence of the biomass plant installed in Cu llar, several other projects are being studied in order to valorise the energy potential of forest residues.

One of the main lessons and a key element of the success of this initiative is related to the strong involvement of public entities in the planning, financing and promoting of the installation. The Town Council is involved in the management of the plant, its fuel supply and payment. The consumers pay an energy bill according to their consumption and this is used to pay back loan obtained, in a period of 20 years.

In fact it is very difficult that a private company could assume the high initial costs of the plant, with the additional risk of offering a non - standardised product (biomass heating and DHW, in this case). Therefore, not many building contractors are open to adopt this kind of installations and choose more conventional systems.

Within this project, the opportunities offered by the third party financing accomplished by IDAE and EREN have made possible the implementation of an innovative domestic heating concept which has already influenced similar initiative at local or regional level, specially in places where biomass fuel collection conditions could be met.

This clear public commitment (specially at Town Council level) provokes also a very high multiplier effect in terms of impact of citizens attitude towards environmental/energy saving issues.

The collection of bark, pine cones and other elements from the wood are the second positive element since biomass is assured during the whole year. The town area counts on 16,000 hectares of forests, which are managed and also on other sub-products or industrial wood residues collected from carpentry, saw mills and others. In this way, the feeding and functioning of the plant is guaranteed.

TO KNOW MORE

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