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Regional Networks for the development of a Sustainable Market for
Bioenergy in Europe



Case study: Implementation of a municipal wood-chips boiler in Monestier de Clermont



Acknowledgements

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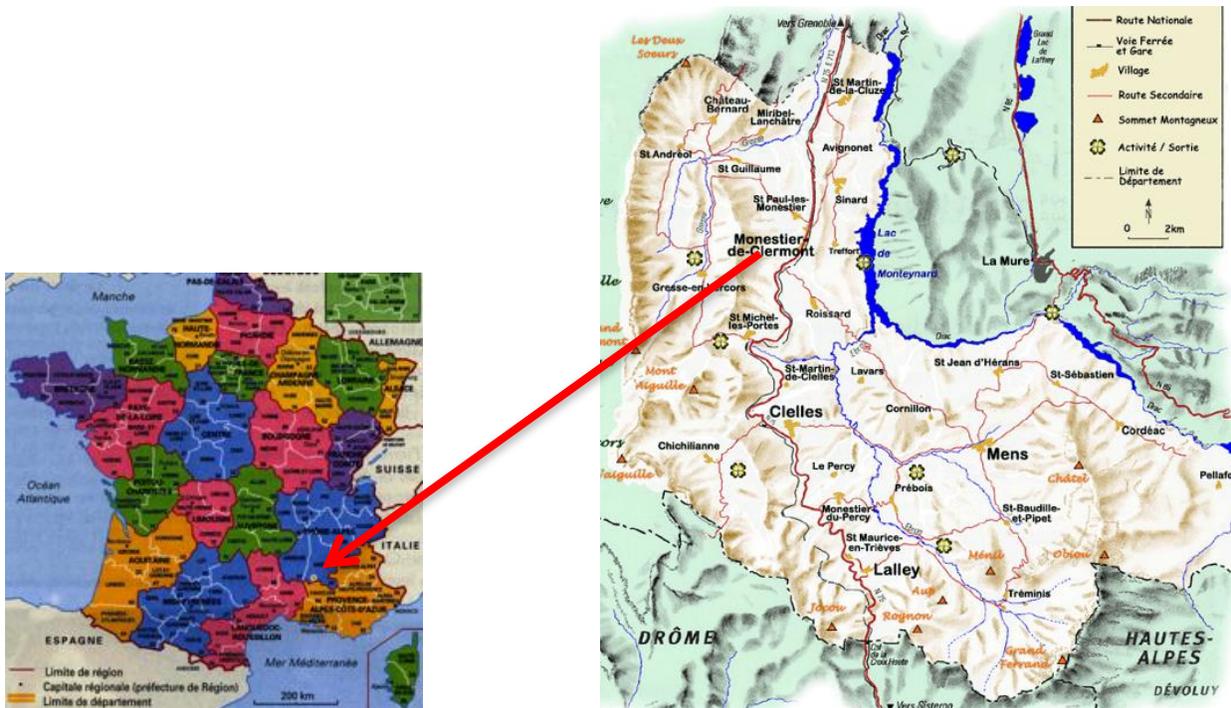
The work for this report has been performed by CDC Trièves.

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Introduction

Monestier de Clermont in Trièves is situated in the French Alps in the Isère-department, in the south east of France.

The Trièves



The Trièves valley is organized in a community of communes (CDC Trièves). The municipality of Monestier de Clermont (802 m NHN) counts today 1,273 habitants and is one of the larger municipalities within the CDC.

Within this document, the setup and financing of a district heating network in Monestier de Clermont, supplied with local wood chips, is described. The aim is to animate other municipalities or CDCs in France and beyond to learn from this successful project how to put a viable renewable energy supply into action.

Objectives of the project

Beside the aim of the general development of the wood branch, the objectives follow the three pillars of **sustainable development**:

- Environment
 - Preserving the environment by fostering the sustainable development of the local wood branch
 - Wood as bioenergy reduces the use of fossil energy and the dependency on it
 - Wood is considered as CO₂ neutral as the CO₂ ejected by burning wood has before been captured in the plant when growing up
- Economy
 - Creating new local employment in the local wood and energy sectors
 - Valorizing wooden by-products and residues from saw-mills
 - Creating a local wood cycle: from the forest to the Pôle Bois (regional biomass trading centre), valorization of the local wood by drying, and finally usage of the remainders for energy.
 - Reducing heat costs for public and private buildings
 - Stabilizing heat costs, as the bioenergy price is more stable and less increasing than the price of fossil energy. Additionally, in France the VAT for this kind of energy is only 5.5%.
 - Thanks to the low energy prices, the public customers could optimize their costs and work more efficiently in providing their services.
- Social
 - Social connection of actors from different branches in the wood sector
 - Reducing heat costs of public and private buildings connected to the grid
 - Creating new employments

Timeline of the project

The project idea was born in 2006. After a short break and new elections in 2008, the project took course again and finished in 2011.

Description of the local conditions

The Trièves is a very rural area and thus has no gas grid to connect to. Thus, before the erection of the wood chips boiler, most of the subscribers used oil furnaces or inefficient and old log wood boilers.

However, there was and is a strong awareness of the strong wood potential in Trièves. Thus, in 2006 the municipality and the precursor of the CDC (called SAT = Syndicat d'Aménagement du Trièves) decided to foster the mobilization of the local wood. The construction of a wood-chips boiler in Monestier de Clermont with a district heating network perfectly fits into this development scheme.

The boiler is located in the centre of Monestier, has a total power capacity of 1,130 kW and supplies eight customers (mostly public) with environmentally friendly district heating.

Core data of the project



The boiler house with wood chips storage (top left)

Woodchips boiler Monestier de Clermont (2011):

Number of boilers	3 (1 biomass, two oil)
Power of wood chips boiler (Hertz)	500 kW
Number of connected stations on DHS	8
Number of subscribers	8
Total power of the plant	1,130 kW (909 kW subscribed)
Length of heating network	700 m
Climate conditions (degrees day)	2948 (i.e. 8.1°C average)
Power of the 2 fuel boilers	130 kW and 500 kW
Emission filter threshold (multi cyclone)	150mg/Nm ³
Storage for wood chips	150 m ³

The eight public and private costumers comprise:

- 1) School Collège Cuyrat (whose DHS is also supplying the village hall nearby)
- 2) Primary School
- 3) Gymnasium 1
- 4) Public swimming pool
- 5) Gymnasium 2
- 6) Kindergarten
- 7) Youth and association center
- 8) Camping place

Implementation of the project

In the mid-2000s the CDC Trièves decided to support the municipalities of the region in changing their public energy supply to renewable sources. This would alleviate three serious problems at once: the lasting rise in fuel prices (by utilizing cheap wood chips), the emission of fine particulate matter (by replacing old with modern boilers) and the emission of greenhouse gases (by using only carbon-neutral wood fuels). In 2006, the municipality of Monestier was chosen for a pilot project: the district heating supply of public buildings with locally sourced wood chips from forestry remainder.

Then, in a concerted action between CDC and municipality, the energy demand in Monestier was analyzed, the plans for the installation of an adequate boiler developed and the financing of the project calculated.

The supply of biomass for energy purposes in the Trièves is centrally organized by the so-called Pôle Bois, a regional biomass trading centre. Forest companies, saw mills and municipalities cooperate within this project to ensure a sustainable long-term supply of high-quality timber and forestry remainders to the region.

The implementation of the boiler project was carried out by five actors:

- The state of France (providing subsidies via the PER program (see below))
- The “Rhône-Alpes” region (providing subsidies via the renewable energy development program)
- The Isère department and the department council (CG38, providing subsidies via the general territorial subsidy program)
- The Community of Communes Trièves (effectively carrying out the project)
- The technology provider and operator Veolia

Financing of the project

After a first estimate of the costs (final sum: 761,000 Euro) it was evident that the municipality could not finance it from own sources alone. Thus, a search for apt grants and financing schemes was performed.

A national call for proposals named PER (Pole d’Excellence Rural, i.e. “rural pole of excellence” to foster the development of rural regions) was chosen, and a project called “The wood sector: a new economical dynamic for Trièves’ future” was handed in.

The PER-program especially supports projects focusing on renewable energy activities in relation with public-private-partnership funding.

As in the global project for Trièves’ wood branch the public (communes and communities of communes) and private (saw-mill cooperation, private forest association, craftsmen) cooperation was given, the PER-subsidies were accorded.

It was elected and received national subsidies adding up to 680,000 Euro. This sum was split between eight actions whose targets were to mobilize the local wood branch and to create employment. The total sum from the PER program for this project was 75,154 Euro.

Aside from the PER program, applications for funding were also handed in to the Regional Council (positive, with a sum of 150,400 Euro), to the Department Council (positive, with a sum of 280,000 Euro).

Apart from public funding, two other strains of financing were persecuted: bank credit and private investment. The industrial company Veolia (which took over possession of the boiler and the district heating network for a limited time of 20 years) invested 20% of the total costs (152,200 Euro).

Finally, a bank credit was taken to cover the rest of the costs (103,246 Euro).

Having secured the necessary funding, the boiler with the attached network was constructed and started operation in 2011.

A detailed analysis of the financial viability can be found in the following section.

Financial evaluation of the project

			Without subsidy	With subsidy	
Capital costs	Investment costs		761.000		EUR
	Subsidy	Amount	0	505.554	EUR
		Ratio	0	66	%
	Loan	Amount	608.800	103.246	EUR
		Interest	6		%
		Payback time	15	5	years
Own funds		152.200	152.200	EUR	
O&M costs	Annual biomass purchase costs		10.690		EUR
	Annual biomass transport		6.100		EUR
	Annual payroll costs		11.200		EUR
	Annual fuel costs		3.610		EUR
	Annual maintainance		5.000		EUR
	Other annual costs		8.872		EUR
Income	Annual heat sale		73.420		EUR
Evaluation criteria	Net present value	NPV	-541.421,34	339.095,43	EUR
	Internal rate of return	IRR	-1,7	26,6	%
	Year of implementation		2011		-
	Lifetime (evaluation)		19		years
	Discount		8		%

The table above shows that the project is viable only in case of public funding. Aside from the economical benefits, the municipality also profits from the following advantages:

- As a municipal project the earnings will be beneficial for all citizens (and not only the investors)
- The emerging wood branch is supported in order to stimulate the local economy, employment and sustainable management.
- The use of local wood chips for energy production secures more solid energy costs than does the dependency on fossil oil. Fossil oil is the only alternative as the Trièves is not supplied by the national gas grid.

Conclusions

After all, the municipality seems to have made a wise choice in implanting the described district heating project. First, the project was implemented well by the involved companies. Second, all objectives of sustainable development were met. Third, the energy bill of the subscribers to the network will be cheaper on a long-term basis than the ones that would have occurred with oil boilers. As most of the supplied buildings are municipally owned this is a direct benefit for the municipality and thus all people.

The fostering effects on the local wood market by stabilizing the established value chains should not be underestimated. Especially now, as in recent months the Pôle Bois has stopped its activities almost completely due to political problems. As of now, there is no simple solution to start services again at the same site. However, new providers of wood chips do emerge in the region, filling this gap and supplying the Trièves with wood chips – thus the positive effects of the municipal district heating system prevail.

Despite all these benefits, it can clearly be seen that the project is not viable without public grants. This leads to the conclusion that the establishment of local energy supply systems based on local biomass sources still requires strong public funding until these systems can support themselves. It needs to be noted that the ratio of subsidies was higher than could be expected because of the initial participation of the CDC.

However, with the current development in fossil fuel prices and the rapid improvement of technologies, it can be assumed that the turning point is not anymore far away in the future.

Impressions of the boiler house

Wood chips storage



Wood chips boiler



Chimney



5 m3 tank/container, pumps and departure in DHS



Fuel boilers

