

Forest Biomass

Heating network and boiler in Dosrius



Contracting authority:	Dosrius City Council
Contract:	<p>Installation of a woodchip-fired boiler and a heating network for several municipal buildings and the supply of energy and maintenance services</p> <p>Award date: December 2016</p>
Savings:	<ul style="list-style-type: none"> • 79.7 tonnes CO₂ emissions saved • 0.035 GWh primary energy saved annually • 14,345.67 € saved annually

SUMMARY

- Promotion of local biomass use in the installed boiler to promote sustainable forest management, fire prevention and local employment
- Tender process supported by Barcelona Provincial Council
- Contract awarded for heating network, energy management and maintenance (6 years)
- The total cost, including works, energy and maintenance, amounts to €194,785.96. Awarded to Energruo Bio-Renovables S.L.

Procurement Context

In 2016 Dosrius City Council awarded a contract for the installation of a biomass boiler and heating network for a school and a sports facility, the *Escola Castell de Dosrius* and the *Pavelló de Dosrius*.

The territory of the Dosrius municipality includes a significant area of forest, and, in line with Covenant of Mayors commitments this contract was designed to promote:

- Fire prevention
- Sustainable forest management
- Climate change mitigation
- Local employment opportunities

The technical details of the project for the installation of the biomass heating system and network were prepared by the technical services of the Barcelona Provincial Council, which also funded the project with a subsidy of €80,000 for implementation.



The tender includes the supply and installation of the biomass boiler and the heating network, as well as energy management, preventive and corrective maintenance and a total guarantee during its years of operation.

Support for biomass use from Barcelona Provincial Council

Barcelona Provincial Council (*Diputació de Barcelona*) provides support to local authorities for the promotion of the use of biomass in municipal facilities.

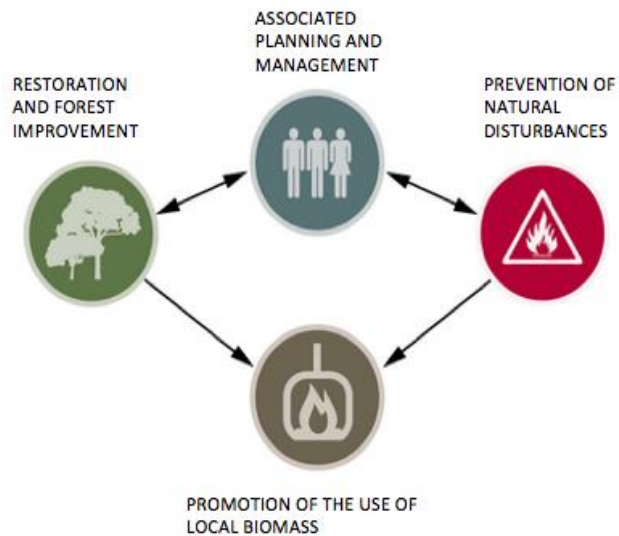
The biomass potential for Catalonia is around 1,100,000 t/year (including 340,000 t/year in the Province of Barcelona). A study of 1690 public buildings in the Province shows a potential demand of 72.11 GWh/year. By the end of 2014, there were 106 biomass systems in public facilities in the Province, with an accumulated power of more than 24 MW.

The *Diputació* provides technical and economic support to municipalities for the installation of biomass boilers and heating networks using forest biomass, including:

- Viability studies and elaboration of executive projects for biomass systems in municipal facilities.
- Drafting of the tendering documents for contracting the fuel supply.

Market participation

Since 1999 Barcelona Provincial Council has collaborated with municipalities, forest protection associations and forest owner associations to promote actions for the restoration and improvement of forestland affected by fires, and which have often been neglected for decades. About 95% of the forests in the Province of Barcelona are private property.



Circular procurement

Activities such as forest improvement and restoration produce a considerable amount of low quality and low economic value wood (in traditional markets). The use of forest biomass for heat production provides a good potential use for these products, and promotes the necessary management of Mediterranean forests. Linking the local production of biomass with projects for the installation of biomass boilers and heating networks in municipalities will help close the natural loop of production and consumption at the local level.

Tender conditions and verification

The tender documents outline the requirements of the biomass-heating network, including the promotion of the use of biomass from the local region. As award criteria, bidders can provide technical improvements to the project, beyond the minimum requirements.

TECHNICAL SPECIFICATIONS

- Woodchips will consist of wood material from the main species found in the forests of the county and neighbouring counties: scots pine (*Pinus sylvestris*), white pine (*Pinus halepensis*), black pine (*Pinus nigra*) and European Beech (*Fagus sylvatica*).
- Woodchips will be sourced locally or will have an average carbon footprint per load from the chipping point to the boiler (and return) lower than 4 kg CO₂ per tonne of supplied woodchips.

AWARD CRITERIA

1. Improvements to the energy monitoring system and the control of the heating system (10

points)

2. Improvements to the energy efficiency of the project (10 points)
3. Improvements to the corrective maintenance (5 point)
4. Improvements to the preventive maintenance (5 points)
5. Economic offer (70 points)

VERIFICATION

- If bidders do not provide evidence for the specific emissions or consumption of their proposed means of transport, the following factors will be applied:
 - emissions factor of 2.61kg CO₂/litre of diesel used during transport
 - average consumption of 0.40 litres/Km

The programme ACOTRAM of the Ministry of Industry will be accepted as a calculation method for fuel consumption and the consumption levels specified in the technical data of vehicles.

The origin of the wood chips supplied can be proven with a delivery note and commercial documents including the provenance, origin, quantities, dates, transport means, travelled kilometres and incidents, or certificates that guarantee traceability.

A regional approach to SPP

Barcelona Provincial Council and the Technology and Forest Centre of Catalonia have collaborated with the Association of Forest Owner Local Authorities (ELFOCAT) and the Catalan Federation of Forest Owners Associations (BOSCAT) in the elaboration of the technical and administrative clauses for their inclusion in call for tenders by municipalities, with the objective to increase the role of municipalities in the promotion of the use of forest biomass and of its associated environmental, social and economic benefits.¹ Dosrius City Council participates in the Maresme Forest Owners Association.

¹ Administrative, economic and technical clauses. Recommendations for the consumption of forest biomass in municipalities produced with the support of the project Biomass Trade Center II, of the Intelligent Energy Europe Programme (in Catalan):
http://www.diba.cat/documents/18158622/37650747/plecs_biomassa_Boscat_diba_cl%C3%A0usules.pdf/8675d83a-5cc0-4182-8b72-3f6eb0eb1307.

Results

Environmental impacts

79.7 tonnes CO₂ will be saved annually through this initiative.

Table 1: Environmental savings

Call for tender	Energy demand (kWh/year)	CO ₂ emissions (tonnes/year)	Primary energy cost (€/year)
Before the tender (non-renewable)	430,525	79.7	0.062
Low carbon solution (biomass tender)	394,977	0	0.031
Savings	35,548	79.7	14,345.67

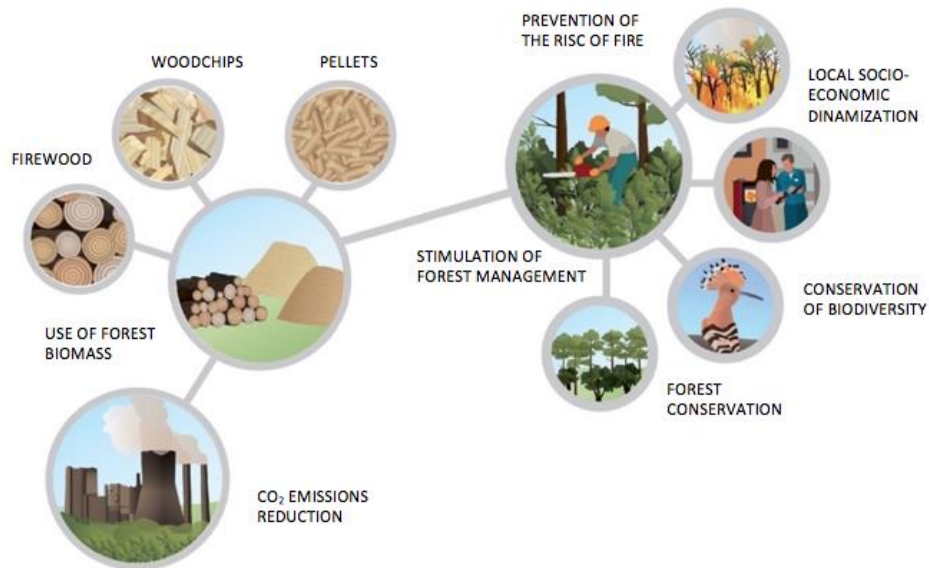
CALCULATION BASIS

- An energy analysis of the action was carried out as part of the project.
- Expected monthly consumption has been estimated based on an unfavourable scenario, with a low energy yield by mass unit.
- It has been assumed that the CO₂ balance of biomass is neutral and the savings will be equal to the reduction of fossil fuel consumption.
- For the calculations, the Guia pràctica per al càlcul d'emissions de gasos d'efecte hivernacle (GEH) Edició 2016 by the Catalan Office on Climate Change has been used.

Economic and social impacts

Beyond the reduced CO₂ emissions achieved, using primary forest biomass as a fuel generates significant social and economic environmental benefits:

- Incentive for sustainable forest management and job creation
- Reduction of energy dependence



According to data from the Technical Office of Municipal Prevention of Forest Fires of the Barcelona Provincial Council, the average cost of producing one tonne of wood chippings in forest improvement works is about €100. According to a study by the Technologic and Forest Centre of Catalonia, the production of 10,000 tonnes of forest biomass generates 23 jobs (11 direct and 12 indirect).

Market response

Three bids were submitted. All bidders offered technical improvements. The winning bidder included a series of cost-free improvements for the City Council, such as the extension of the corrective maintenance periods (48 additional months), improvements to the monitoring and control system, to the heating system of the school and the sports facility, improvements in the technical elements of the system (remote management, temperature probes, sensors and accessories), and energy efficiency improvements that reduce the maintenance costs and management of both the building and its biomass boiler and heating network.

The contract has a duration of six years and an annual price of €26,494.29, excluding VAT, which includes the amortization of the biomass boiler, the energy supply and its maintenance.

Lessons learned and future challenges

The collaboration between the actors involved (the provincial administration, research centres, private and public forest owners) provided Dosrius with the kind of technical and economic support required by small town councils to implement biomass facilities.

Having technical tender specifications that are commonly used in tenders for biomass and heating networks simplifies the drafting of projects, and gives a clear signal to the market about the environmental and energy characteristics of the installations.

From a technical point of view, the lessons learned are the following:

- A good maintenance space is required in the biomass boiler rooms
- The quality of the biomass is important, since it influences the performance of the boiler.
- It is important to consider how the biomass feed system will be refilled by the truck.
- The secondary circuits must be thoroughly evaluated, if they exist. This can avoid problems when distributing energy between all circuits.

Furthermore, some other lessons around what should and should not be done include:

- A first study before the implementation of a biomass system in existing facilities should be conducted to ensure a good overall operation. This is especially important when including several buildings. It is recommended to have a monitoring system to evaluate the real needs of the system.
- Another important aspect is the design of the chimney, which can avoid problems with smoke, especially during episodes of high atmospheric pressure.
- In a future the installation of a pneumatic feeding system could prevent the visual and noise impact of a loading system with external motors.

CONTACTE

Marc Bosch de Doria (Alcalde de Dosrius)

dosrius@dosrius.cat

Ajuntament de Dosrius

tel. +34 937 918 014

www.dosrius.cat



About SPP Regions

SPP Regions is promoting the creation and expansion of 7 European regional networks of municipalities working together on sustainable public procurement (SPP) and public procurement of innovation (PPI).

The regional networks are collaborating directly on tendering for eco-innovative solutions, whilst building capacities and transferring skills and knowledge through their SPP and PPI activities. The 42 tenders within the project will achieve 54.3 GWh/year primary energy savings and trigger 45 GWh/year renewable energy.

SPP REGIONS PARTNERS



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 649718. The sole responsibility for any error or omissions lies with the editor. The content does not necessarily reflect the opinion of the European Commission. The European Commission is also not responsible for any use that may be made of the information contained herein.