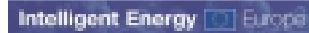


Best-Practice-Projects for Bioenergy utilisation in urban environments



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Project name: Molins Energía S.L.
Location: Molins de Rei (Catalonia, Spain)
Bioenergy Technology: Biomass district heating

Executive Summary:

It is a biomass combustion plant to generate hot water for a heating and domestic hot water distribution network. The plant is located in the municipality of Molins de Rei close to Barcelona. The plant started in 2001 and uses wood waste, pine fruits and fruit shells as biomass source.

CASE DESCRIPTION:

Background:

The plant was conceived and promoted in 1997 by the municipality of Molins de Rei, Entitat Metropolitana de Medi Ambient and ICAEN with the founding of the company Molins Energia, S.L.. This was the first experience carried out in Catalonia of a biomass residential district heating system. The users are private houses and social protection houses.

Description:

The heating and Domestic Hot Water distribution network using biomass started to operate in 2001. This network supplies hot water to the residential area "La Granja" that is located 1 km from the Biomass plant. The network delivers hot water to 695 houses (2000 inhabitants). Now 575 houses (82,7%) are connected to the heating network. Each house is connected to the network through its own heat exchangers.

The hot water and heating service is continuous 24 hours a day. Although the power plant itself works about 12 to 16 hours per day, the hot water storage guarantees a steady supply of water all the time. During the night the plant shuts down and the heat storage system supplies the required heat.

The process begins when trucks take the biomass and put it into a silo, where a screw conveyor system feeds it into a burner. The hot gases generated pass into the boiler and transfer heat to the cooler water coming back from the houses at 80°C. This heat transfer increases its temperature to 90°C and the water return to the houses to deliver the heat.

The biomass plant and the associated distribution network at full capacity saves 730 tons of oil equivalent per year of fossil fuels and 1700 tons of CO₂.

Technical Data (capacity, output, etc.):

- Biomass: pine fruits, fruit shells and wood waste
- Biomass boiler: 2250 kW (Biomass burned at 2 stages: biomass incineration (750°C) and Biomass total combustion, 1200°C, heat recovery in a horizontal pirroturbular boiler with 3 smoke path), Back-up natural gas boiler: 1634 kW (6 boilers).
- Thermal production: 6800 MWh/year at 90°C
- Biomass consumption: 2200 tons/year (540 kg/h maximum per boiler)
- Boiler efficiency: 85%
- Boiler pressure: 4 bar
- Network length (supply and return): 4734 m
- Network volume: 125 m³
- Maximum Flow rate: 275 m³/h
- Network diameter: between 60 and 273 mm with polyurethane insulation
- Biomass storage: 180 m³
- Hot water storage: 200 m³
- Area of the central plant building: 450 m²

Financial Data (investment, subsidies, etc.):

Investment cost (Central plant + network): 1622733 Euro of which 456769 Euros came from subsidies (THERMIE Programme and Spanish and Catalan government)

Which main problems had to be overcome?

Legal factors:

Socio-economic factors:

Economic:

The high cost of the whole project was financed by private and public capital through the subsidies coming from demonstration programs.

Others:

Information flow (which information needed, sources, difficulties, etc)**Lessons learned**

- Collaboration and commitment of both public and private institutions. The company Molins Energia, owner of the plant is participated by public institutions and the company operating the plant.
- The continuous supply of biomass is an important bottleneck for this type of plants.

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Pictures: