

Centrale solaire de Balma France

Responsible organizations

City of Balma, contact : Isabelle COLSON – local authority

OPPIDEA, contact : Florence WILLM – urban planning and development

COFELY, contact : Patrick NIGON and Bertrand GUILLOT – DH operator

HOLISUD, contact: Christian FORTUNE – energy concept development, design and planning

SAED contact : Olivier ROINSON - solar system manufacturer and supplier

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Model description

Balma eco-district was designed in 2010; several energy concepts had been studied by Holisud and COFELY together who proposed a solar district heating.

Now, the eco-district is under construction, the DH is finished and fed by heat from the wood boiler and the gas boiler; a solar field is under construction.

COFELY, as DH operator proposed a solution to reach expectation of the stakeholders, good economical balance and innovative project.

For local authorities, the goal was to develop sustainable urban planning, to make environmental policy a reality, to respect Agenda 21 and regional road map (SCRAE and PCET) commitment.

For urban planner and developer, the aim was to build an innovative eco-district, to push renewable energy use, to support a “social and sustainable” energetic approach.

For builders and property developer, the goal was to get low energy consumption building labels (RT2012 BBC), to take the benefit of public incentives (Fonds Chaleur/ADEME), to propose a competitive energy solution to their client.

DH is a local public utility in France, and cities are generally responsible for this service. But private initiatives are possible. The project here is private: the city of Balma only gave the authorization to implement the grid, but is not responsible for the service and will not control it.

Technical part: the DH provides energy to a 104 hectares urban district near Toulouse (France). Heat is produced by a wood-pellet boiler, solar thermal energy and gas boiler as back-up.

The SDH is not different from common heating networks, working with common temperatures between 55 °C to 105 °C. The solar plant is made from 4 968 vacuum tubes and heat pipes, based on two solar loops, for a nominal power of 300 kW. That solar collector field can produce up to 475 MWh / year.

Regarding the financial part, building developers signed a contract beforehand with COFELY engaging themselves to connect their buildings to the future district heating network. This engagement was necessary to obtain the Ministry approval for the bonus given to low carbon emitting DH (bonus that allows in this case developers to design buildings with 30% higher heat demand than the 2012 building code requirements, making the connection a profitable option for them). The billing consists of a fixed fee proportional to the surface of the apartment connected and a variable fee depending on its heat consumption. Prices are revised each year based on contractual independent index to reflect the evolution of maintenance cost and the price of energy.

COFELY builds, owns and operates the district heating network and the heat production plant.

Roles of the different actors

The involved stakeholders are:

- City of Balma and Communauté d'Agglomération du Grand Toulouse: local authorities
- OPPIDEA: urban planning and development
- COFELY: DH operator
- HOLISUD: energy concept development, design and planning
- SAED: solar system manufacturer and supplier

Local authorities push a low-energy consumption district construction.

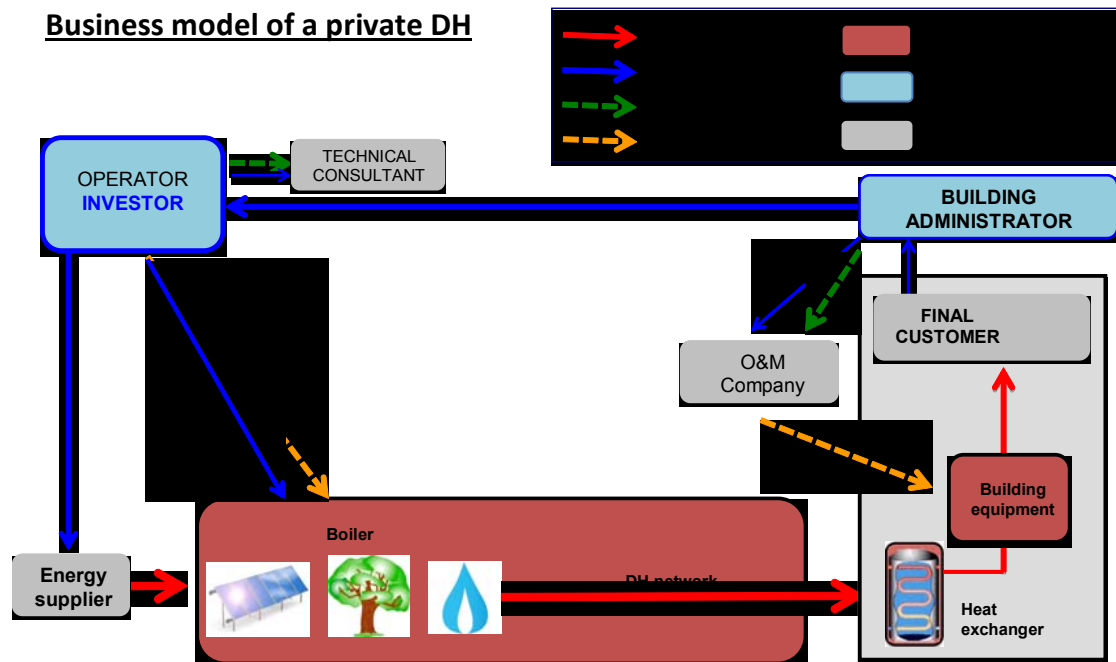
At the beginning, a district heating & cooling public delegation was foreseen between the urban planner (OPPIDEA) and the city of Balma. Though environmentally efficient, this model did not succeed because the feasibility study concluded that this solution would be too costly.

Then the project was continued as a private operation lead by COFELY backed by the municipality; COFELY proposed a SDH solution including a centralised solar heating plant, wood and gas. This solution was able to combine the need for solar water heating found with green building while improving the economic feasibility of the district heating scheme.

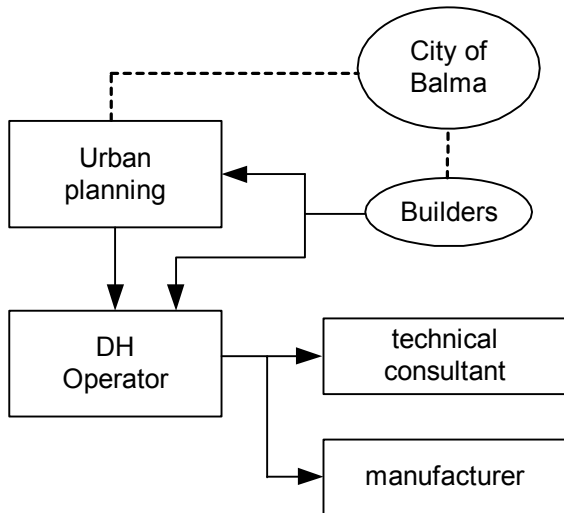
COFELY leads the SDH project in collaboration with HOLISUD (global energetic concept) and SAED (technical solution for the solar field).

The energetic concept aims at finding an economical and technical solution with low carbon emission and which can reach the objectives of the French Building Regulation (RT2012).

The generic scheme of this business model is the following.



The specific scheme of Balma model is the following.



The specific relations between the consultant, the builders, the operator and the Ministry, which where necessary to have a correct recognition of this installation as an efficient heating device in the building code, are not drawn here.

In a more common scheme, the operator would run the DH under the control of the city, responsible for the heat distribution public service. The DH operator is chosen by the city, and they sign a long term contract (up to 24 years) to define the DH perimeter, energy mix, tariff, etc. The equipment belongs to the city, but the investment is made by the operator, which is responsible to run the service through the contract period.

Private projects such as Balma's tend to develop in areas where local authorities do not wish to be involved in DH.

Swot analysis

Strengths	The model is quite simple with a few stakeholders involved. The model is reproducible, in particular for new eco district. A district heating scheme based on the specific needs of building developers through an integrated design process (not possible within a public tender)
Weaknesses	No control of local authorities on the SDH, especially on the price of the heat. Needs to contract with every single building developers (this point is specific to new DH using solar: it is due to the Ministry responsible for the building code and should be avoided). Financing costs affected by high risk taken by a private operator. Overall competitiveness of the district heating network is linked to the ability of the operator to negotiate lower prices of fuel and operate biomass and natural gas boilers at low cost, this advantage is less prevalent with higher solar fraction where cost of capital is the key factor.
Opportunities	The operator has now an experience in the development of a SDH and knows the real costs and therefore it would be easier for other projects. The building regulation is quite favourable for low emission DH.
Threats	The economical feasibility of this model is conditioned by public subsidies (including public subsidies on competing technologies) and primary energy prices. Future national energy labels for building needs to take into account solar district heating.
Improvements/recommendations/lessons learned	Solar district heating should be better included in building codes/labels. With this scheme, education of final users has to be taken into account, since a confusion can appear between energy label showed in primary energy where solar does not appear and billing for final energy consumed.

Replication potential of the model

This project is quite replicable.

The key requirements are the amount of subsidies and the wish of the property developers to choose to be connected to DH and to install solar collectors connected to a DH and not solar panel connected to the only building.

The involvement of the city would give the project a stronger local basis and would provide end users a public supervision on tariff evolutions. It could also be an asset in the still necessary discussions with the ministry in charge of the building code.

Links to web site and/or documents for more detailed information

http://www.cofelyservices-gdfsuez.fr/fr/presse/communiqués-de-presse/communiqués-de-presse/?comm_id=176

<http://www.environnement-magazine.fr/presse/environnement/actualites/2256/energies-renouvelables/un-reseau-de-chaleur-qui-mixe-solaire-et-biomasse>

<http://www.cete-ouest.developpement-durable.gouv.fr/reseau-solaire-bois-de-l-eco-a889.html>