

Biomass district heating and cooling networks experience in Catalonia

General concepts and Case study in Olot, La
Garrotxa (Catalonia)

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AIGUASOL : innovative technology, infrastructural planning and engineering, From the concept to the commissioning

WHAT WE OFFER



ENERGY IN BUILDINGS

Design of low energy buildings and energy efficiency.



DISTRICT AND LARGE ENERGY PLANTS

Design of district energy generation systems and renewable energies.



ENERGY POLICY

From local ordinances to national regulations and European sectorial policies.



ENERGY REHABILITATION

Increasing the value of a property and bringing in new stakeholders.



ENERGY MANAGEMENT SYSTEMS

Continuous assessment of energy efficiency in buildings, processes and facilities.



NZEB BUILDINGS AND ENVIRONMENTAL LABELS

Design of Net-Zero Energy Buildings, LEED, Passivhaus certification.



ENERGY INTENSITY IN INDUSTRY

Optimization of industrial processes, process integration and renewables.



OTHER CUSTOMER-ORIENTED SOLUTIONS

We act as a center for energy calculations.



R & D

Research in renewable energies and energy in building.

AIGUASOL : innovative technology, infrastructural planning and engineering, From the concept to the commissioning

The AIGUASOL team capabilities:

- Over the past eighteen years our team accumulated a significant experience in the fields of energy infrastructures, energy efficiency and renewable energy systems
- Equally committed to commercial projects development and implementation, energy planning and policy analysis and R&D&I projects
- Strong background in Thermal Engineering and Urban Infrastructure Planning
- Raises greenfield projects in new markets, such as the internationally recognized District Cooling and Heating developments in Barcelona
- Performs technical studies and projects, infrastructural planning, technological risk analysis and due diligence, project management, commissioning and soft landing
- Assists a wide spectrum of clients, as real state developers, stakeholders, construction companies, ESCO and Investment funds, designers (architects and engineering companies), professional associations, public entities, industries and manufactures,, utilities, and research centres.
- Over 30 District Energy projects mainly in Spain, but also in Southern Europe and Latin America
- *We believe that District Energy is fundamental part of a common mission: to reduce greenhouse emissions under the circular economy paradigm*

AWARDS 2016-17



OUR DHC experience and references EUROPE (AIGUASOL+DEVCCO)

[SSEER=Seasonal System Energy Efficiency Ratio]



MADRID [>10]



BARCELONA [>17]



TARRAGONA [>15]



GRANOLLERS [>15]



AMSTERDAM [>9]



KÖPENHAMN [>7]



HELSINGBORG [>15]



STOCKHOLM [>10]



OLOT [>10]

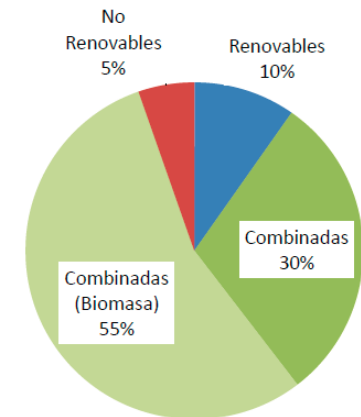
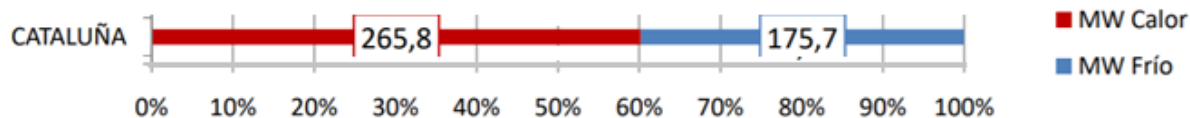
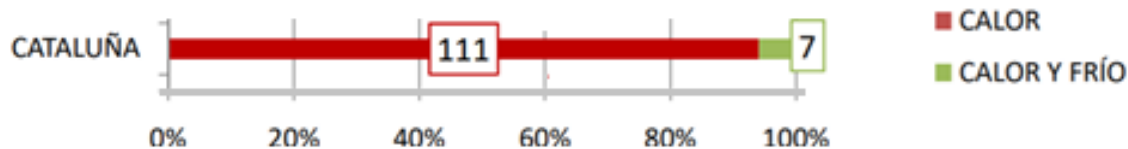


PALMA DE MALLORCA [>10]

DHC networks in Catalonia

In Catalonia there are a total of 118 networks with a total installed power of 442 MW. Of these 118 networks 111 are heating networks while the rest, 7, are heating and cooling networks. The total installed heat and cold power is 265.8 MW and 175.7 MW, respectively.

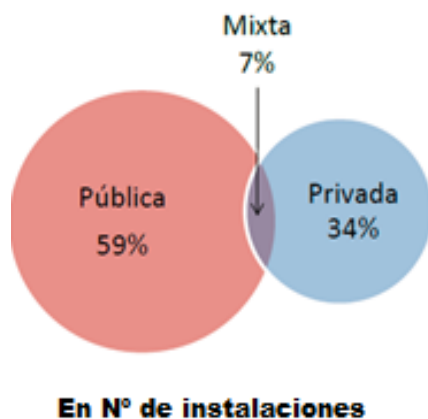
Of the networks installed in Catalonia, 95% have, at least, a source of renewable energy. 85% of total networks use renewable energy sources combined with other sources of energy. Within this last group, especially, networks that use biomass, represent 55% of the total installed networks.



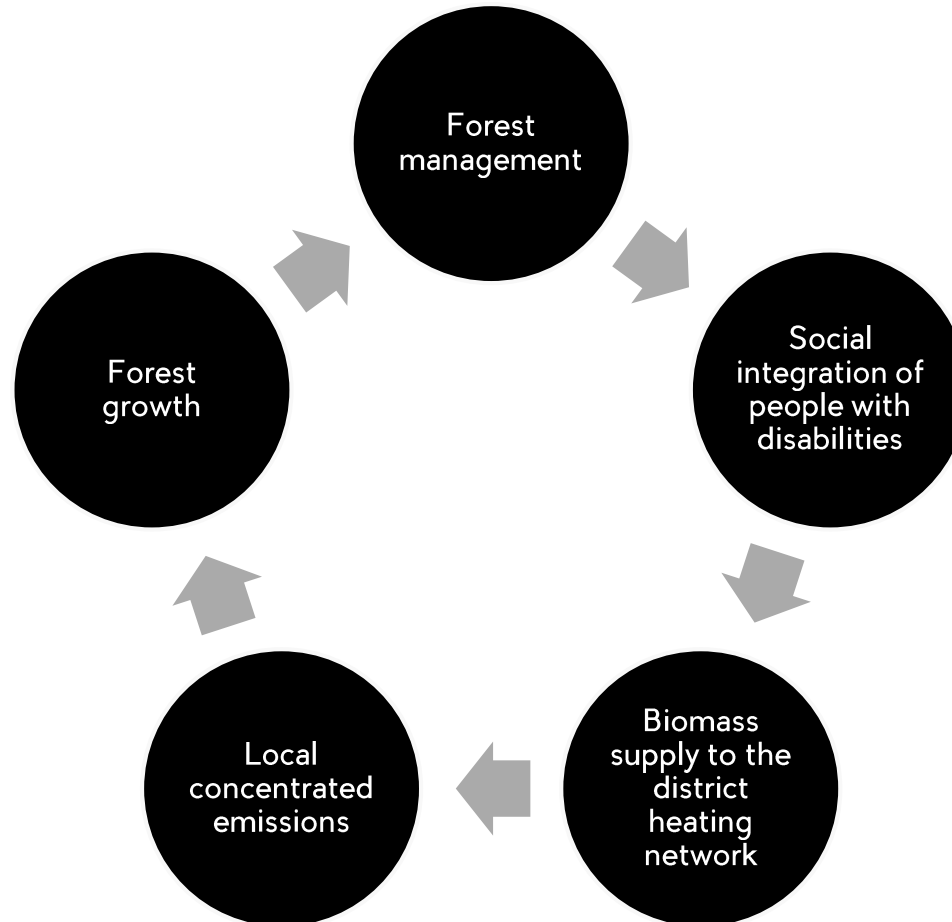
Ownership and business models

In terms of the ownership of these networks, 59% of the networks registered in 2016 in Catalonia are publicly owned, representing, in terms of installed capacity, 8.6%. 34% of the networks belonging to private entities - equivalent to 3.8% of the installed capacity - and the remaining 7% of the networks are of mixed ownership. However, the latter represent large-scale projects, with 87.6% of the total installed capacity.

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Olot case

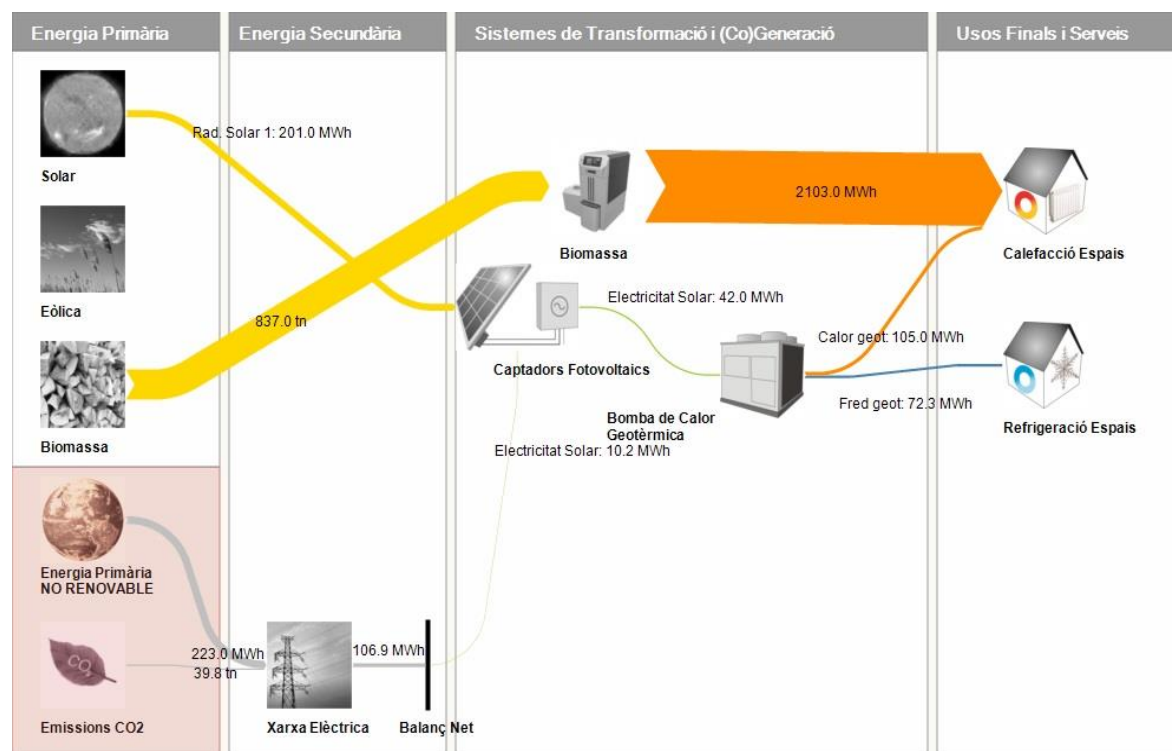


Olot case

Nom model	Característica 1	Característica 2
2 Calderes biomassa Herz	1 x Firematic 151 1 x Biomatic 500	Potència tèrmica nominal: 150 kW+ 450 kW Rendiment 151 93.5% Rendiment 500 93.3%
Bombes de calor geotèrmiques Nibe	F1345-60	Potència tèrmica nominal 3 x 60 Kw COP 4,55 / EER 4,33
Sistema solar fotovoltaic	REC 240/ ZIGOR 5 Kw	Potència fotovoltaica: 28,44 kWp Potència onduladors 25 kW
Sistema suport	1 caldera de gas natural Adisa 750	Potència tèrmica útil a BT: 750 Kw



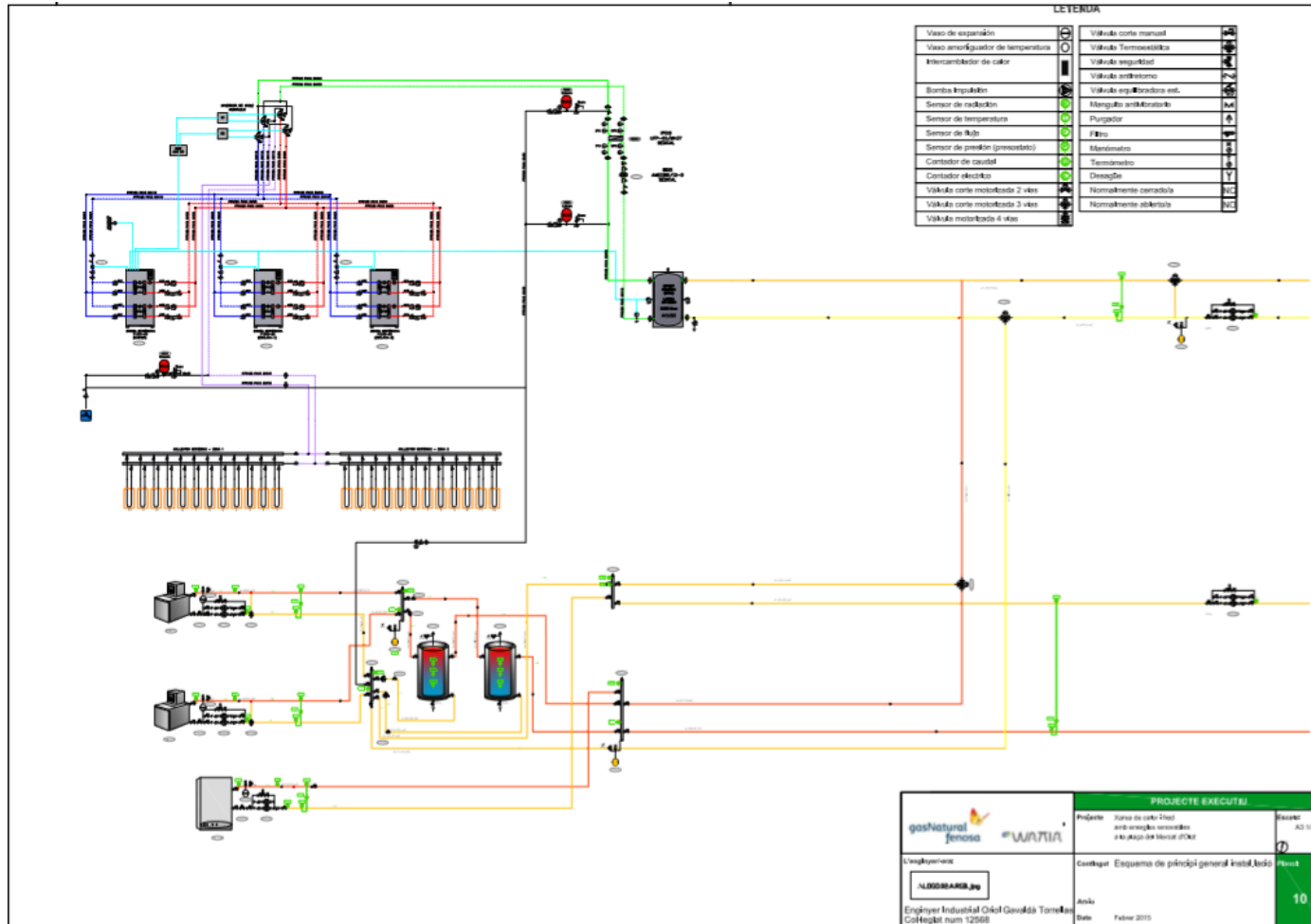
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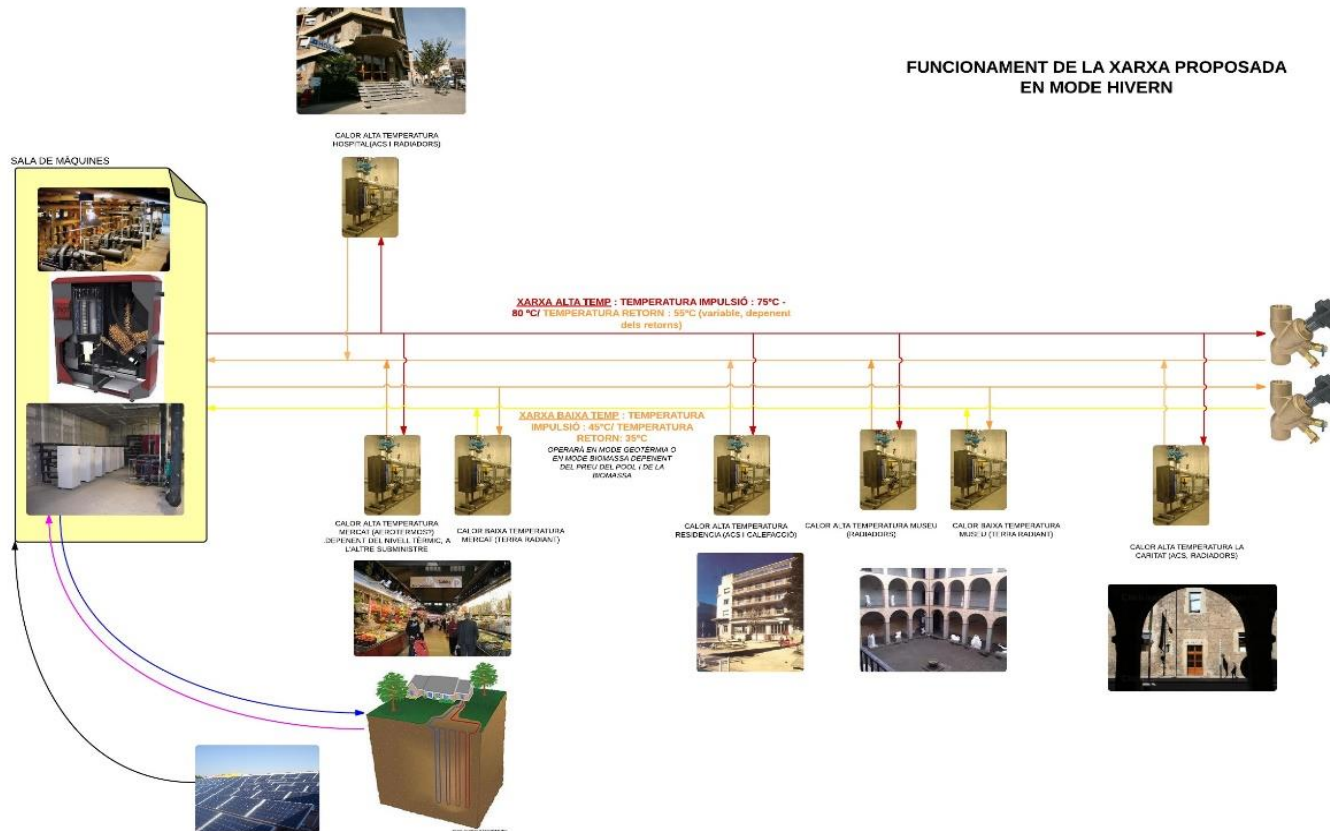
Olot case



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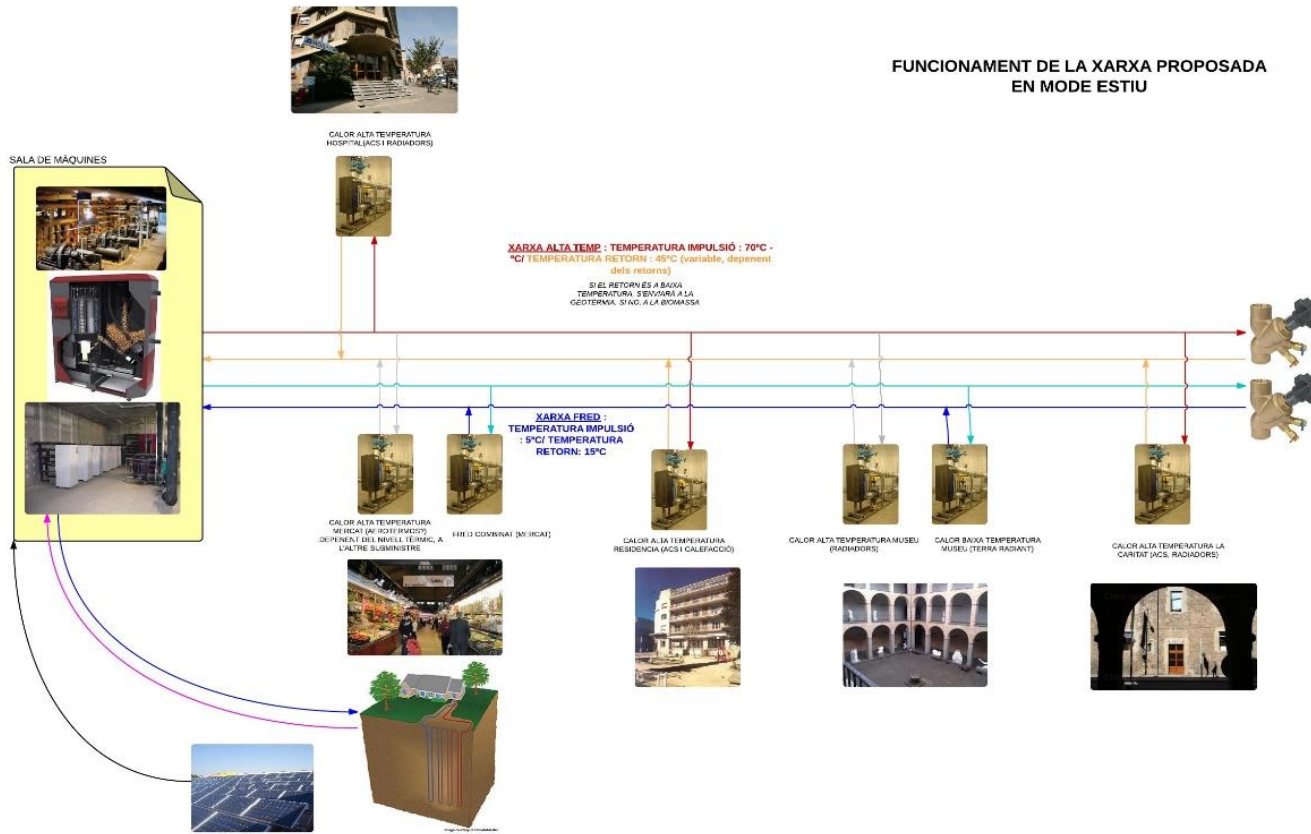
Olot case



Olot case



FUNCIONAMENT DE LA XARXA PROPOSADA EN MODE ESTIU



Key factors operation biomass DHC

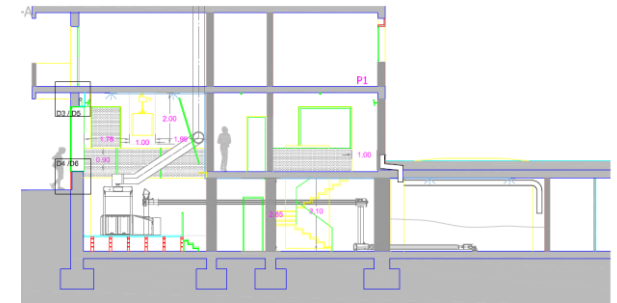


- Investment

- Important investment cost fo refurbishment and structure
- High positive impact in the community

- Operation

- Too high use of the gas boiler
 - Biomass internal transportation System
 - Biomass quality
 - Boiler cleaning
- Feeling of trustworthiness
 - Residences have eliminated the gas boilers (they kept them in case it didn't work)
 - Increase of 50% demand for new users (implies higher use of natural gas boiler)

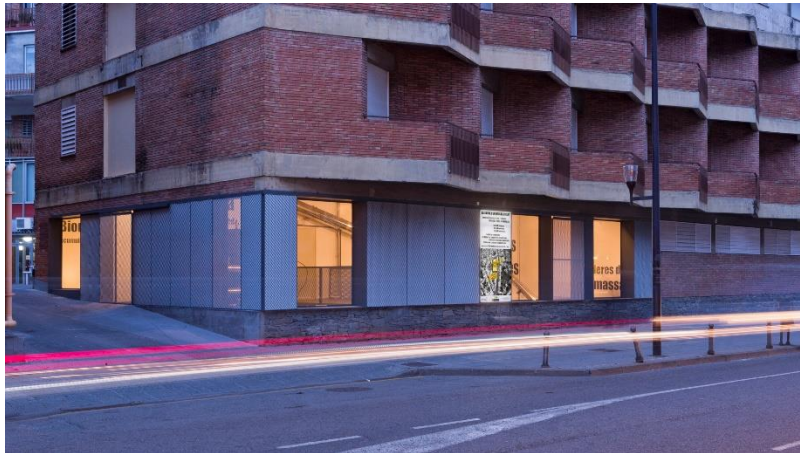


Business opportunities that have been aroused



- Forest management
 - Integration of people with disabilities (successful business)
- Operation
 - Development of a local installer to manage the whole network
 - Local installer Building DHC substations, with successful results
 - A local company is part of the ESCO managing the plant
 - A local company is the control

Pictures Olot DHC

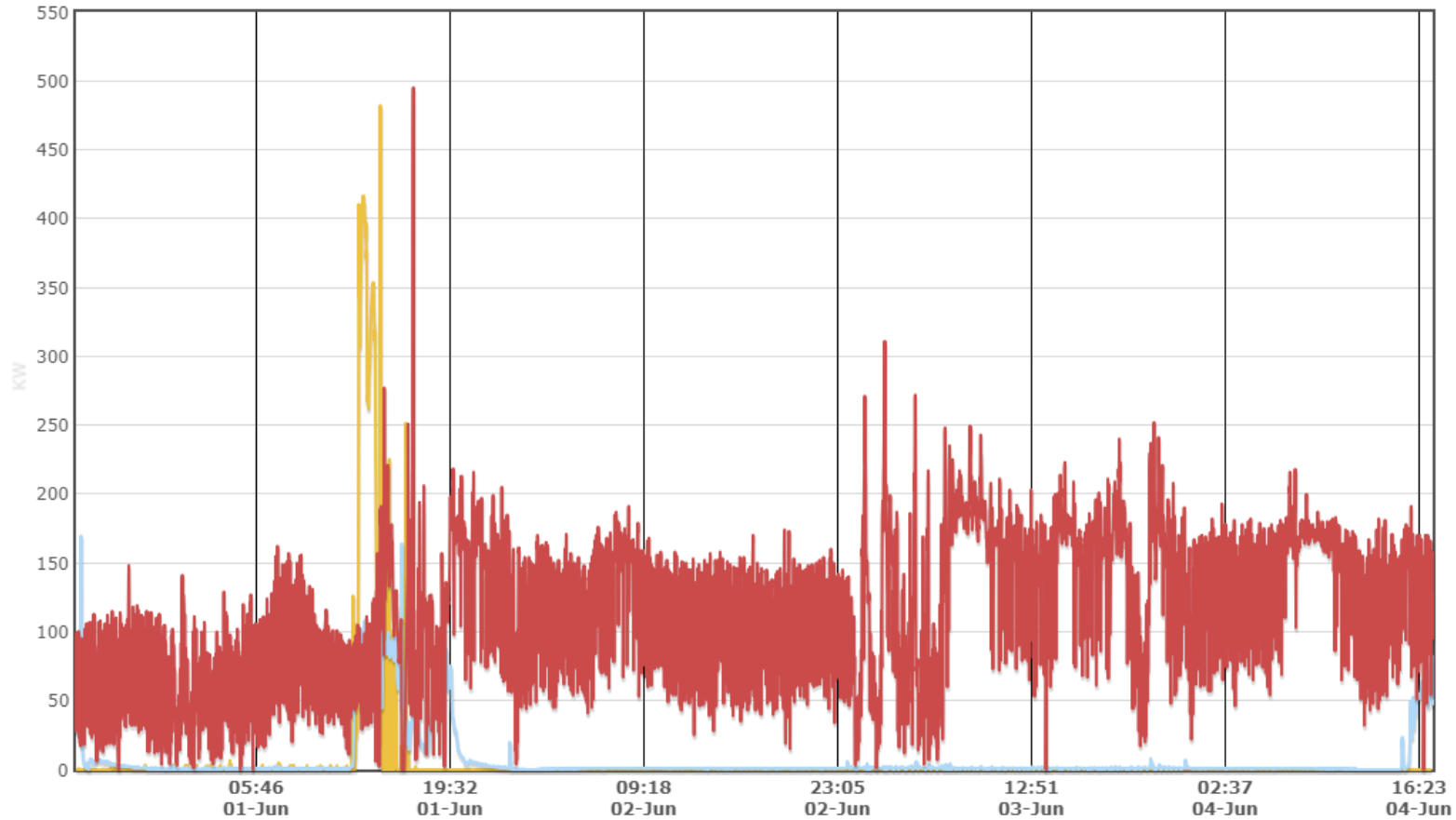


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Operation DHC



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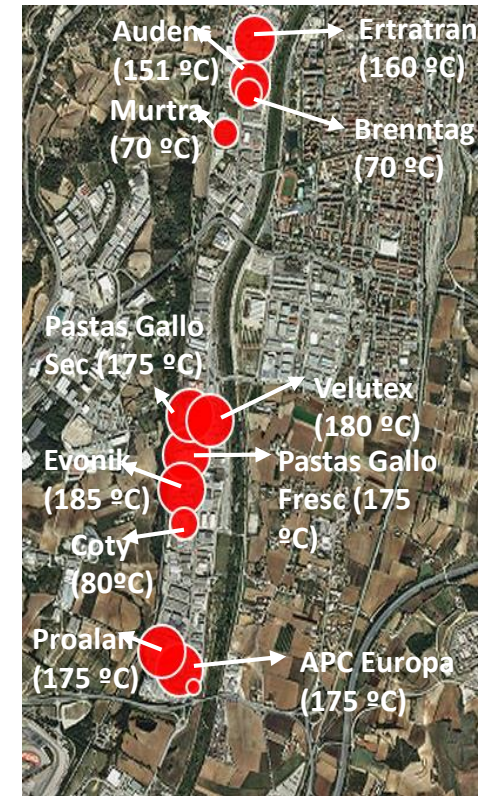
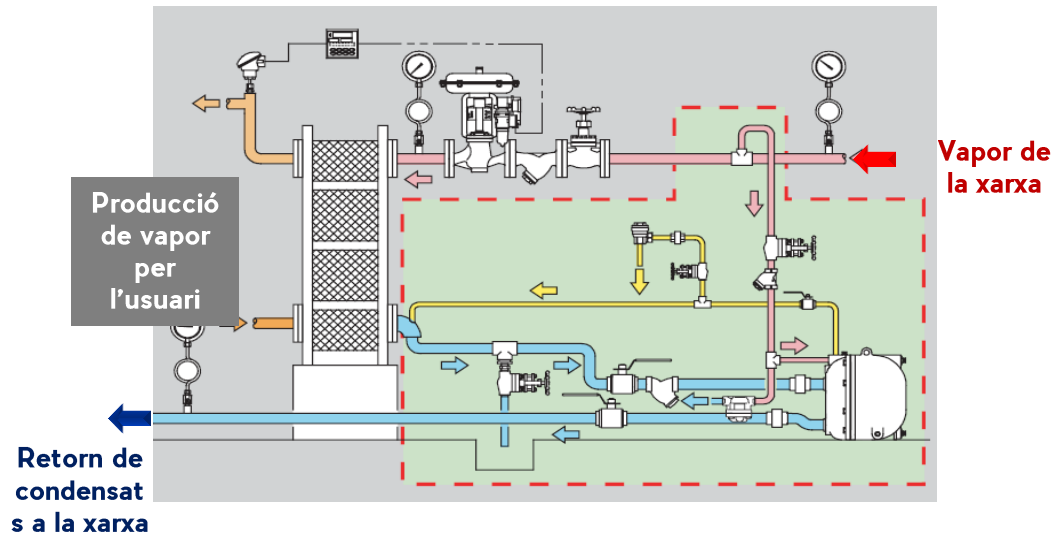


- (C01 Biomassa 500) Potencia = 0.00 [KW]
- (C02 Biomassa 150) Potencia = 0.16 [KW]
- (C41 CircuitAlta) Potencia = 60.73 [KW]

Other DHC in operation / planning



- ◆ Planning:
 - ◆ Granollers: biomass steam district heating for an industrial area.



Other DHC in operation / planning



DH2 (8 MWt)
 Vapor/Condensats
DN150/DN50
10,3 t/h, $\Delta p=0,8$ bar

600 m.

DH3 (sense generació)
 Interconnectarà amb DH1 i DH2

1.600 m.

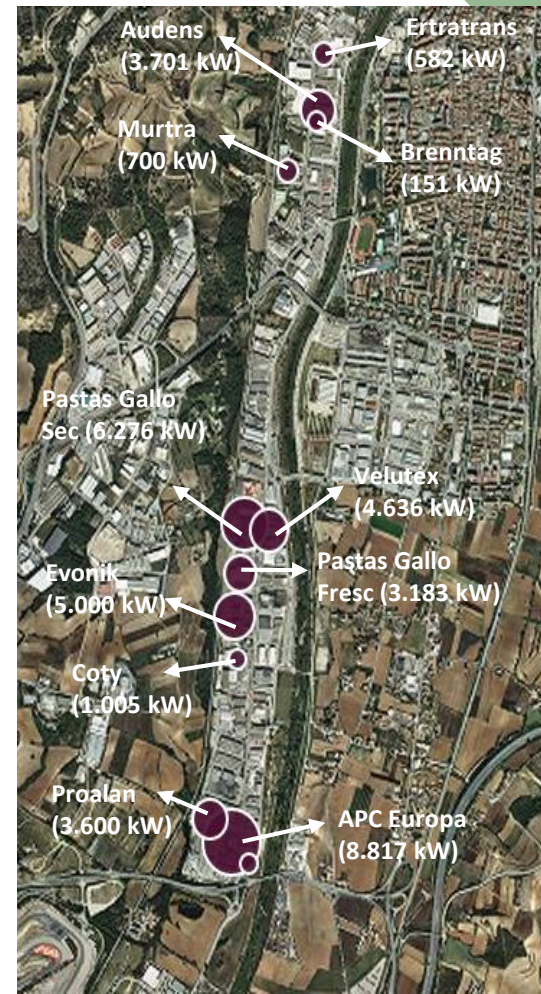
Futura xarxa de DH de Baixa Temperatura

DH1 (14 MWt)
 Vapor/Condensats
DN200/DN80
18,1 t/h, $\Delta p=1,4$ bar

1.400 m.

DH0 (18 MWt d'APC)
 Vapor/Condensats **DN200/DN80**
23,2 t/h, $\Delta p=0,1$ bar
 i **Generació (32 MWt)**
 Vapor/Condensats **DN300/DN125**
41.3 t/h, $\Delta p=0,1$ bar

Distribució de potència mitjana





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