A2A Calore e Servizi e Euroheat & Power /DHC+

TEMPO PROJECT

Thursday 7th November 2019

Brescia District Heating network and its demo site

Ilaria Marini
AGENDA

01
Brescia DH Network
- Main characteristics
- Pipe characteristics
- Year of installation
- Type of customers

02
Brescia demo site
- Choice of the site
- Mixing station
- Installation works
- Customers involvement
- Next steps

03
Site visits
Brescia DH system:

- 670 km long (trench length);

- Supplies heat to more than 21,000 customers (more than 70% of municipal area connections);

- Yearly average of supplied heat: 1,000 GWh;

- Mainly is a single system, i.e. hydraulically cannot be divided;

- Small DC network supplies cold a hospital and university;

- Supply pipe temperature: 90°C ÷ 130°C;

- Return pipe temperature: 60°C;

- Maximum operative pressure: 16 bar;

- Start of the system: 1972.
BRESCIA DH SYSTEM

Pipe characteristics

Pipe systems have been evolving since the first installation:

- Traditional system (1972 – 1979);
- Wanit system (1979 – 1985);
BRESCIA DH SYSTEM
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- Wanit system (1979 – 1985);
BRESCIA DH SYSTEM

Years of installation

Works in Brescia 2, early 70s.
BRESCIA DH SYSTEM

Years of installation

Network development in the historic centre (via delle Grazie), 80s.

<table>
<thead>
<tr>
<th>Year of installation</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>Orange</td>
</tr>
<tr>
<td>1972-1979</td>
<td>Red</td>
</tr>
<tr>
<td>1980-1989</td>
<td>Blue</td>
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</tbody>
</table>
BRESCIA DH SYSTEM

Years of installation

Works in via Turati, early 90s.
BRESCIA DH SYSTEM

Years of installation

Year of installation
- Known
- 1972-1979
- 1980-1989
- 1996-1999
- 2000-2009

BRESCIA DH SYSTEM

Years of installation

Installation of DN800 near railway station, 2016.
130,000 inhabitants use DH (around 66%); Brescia has a population of more than 198,000 people.

The system supplies heat to 42 MLN mc.

Heat storages:
- **North Plant**: 2 tanks of 2200 mc each; heat storage capacity = 190 MWh.
  
  In service: end 2020.
- **Lamarmora Plant**: 1 tank of 5200 mc; heat storage capacity = 224 MWh.
  
  In service: end 2019.

*Ori Martin is a steel plant. A2A recovers its waste heat 10 MW, at peaks.*
BRESCIA DH SYSTEM

Customer types

Brescia DH system supplies heat to more than 21,000 customers.

- Single family houses: around 66% of consumers
- Others: around 34% of consumers

Heat consumption:
- Contractual flow ≤3 mc/h: 49%
- Contractual flow >3 mc/h: 51%

Numbers of contracts:
- 10%
BRESCIA DH SYSTEM

Customer types - Substations

Single family houses = independent substation

Block of apartments/offices/PA = centralised
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TEMPO project started the 01/10/2017 and it finishes the 30/09/2021.

Main goal: collect data and performances of DH networks supplying heat at low temperature, applying technological innovation implemented specifically for this project.

3 demo site were chosen:
- Hamburg area (new urban area), Germany;
- Nurnberg area (new rural area), Germany;
- Brescia area (existing urban area), Italy.

Implementation steps for Brescia demo site:
- Choice of the site;
- City Council support;
- Design of the mixing station and its installation;
- Commitment of involved customers;
- Installation of monitoring tools;
- Monitoring of the system at high temperature (as is);
- Monitoring of the system at low temperature;
- Optimisation of the performances and their monitoring.
BRESCIA DEMO SITE
Choice of the demo site
Characteristics required to the site:

- Presence of both single family houses AND block of apartments;
- Possibility to create hydraulically a subnetwork;
- Available area where to install the necessary instrumentations.

Identified locations:
- **Badia village**;
- Fornaci area;
- San Polino.
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BRESCIA DEMO SITE

Choice of the demo site

Chosen location:
**Fornaci area**

Motivations:
- Block of apartments (43 flats) and more than 30 single family houses in a small area;
- Installation of around 100 m of new pipes to create a subnetwork;
- Nearby available area where to install the mixing station;
- This area was characterised by the presence of 2 heat boilers not in used owned by A2A Calore e Servizi authorised in 1997 by Brescia City Council;
- The former authorisation of these boilers facilitated the authorisation process for the mixing station.
BRESCIA DEMO SITE
Choice of the demo site
BRESCIA DEMO SITE
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BRESCIA DEMO SITE
Mixing station – Installation new pipes
BRESCIA DEMO SITE

Mixing station
BRESCIA DEMO SITE
Mixing station
BRESGIA DEMO SITE

Mixing station
- Public assembly organised with the support of Brescia City Council;
- Collection of acceptances from customers;
- Distribution of monitoring kits.
Next steps

Data collection from:

- *Strumentation installed in the MS;*

- *Customers heat meters;*

- *Temperature sensors (indoor and outdoor).*

Monitoring of system performances.

Evaluation of additional margin for temperature optimisation.
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Thanks to
SITE VISITS

Visitors for the CHP plant ‘Lamarmora’
Look for the panel with this image and wait for your guide

Visitors for the WTE plant ‘Termovalorizzatore’
Look for the panel with this image, collect the helmets and wait for your guide
THANK YOU!

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