What role for DHC in the current Italian energy policy?

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Current situation of DHC in Italy

- 200 DHC systems
- space heating $302\ \text{Mm}^3 \rightarrow 1,120,000$ equiv. flats

Source: AIRU – Annual Review 2014
Current situation of DHC in Italy

- District heated volume growth

1st system in operation: Brescia (1972)

Source: AIRU – Annual Review 2014
Current situation of DHC in Italy

- DHC Market
  - Competition based on price and quality of service
  - DH is competitor of the dominant operator gas in the residential heating sector
  - DH Sales prices defined on the basis of the total cost of the traditional heating locally dominant operator
  - No obligation to connect to DHC
Undeployed Potential for DHC

- Heated Volume potential increase: 1,100 Mm3 (+360%)

- Primary Energy Saving potential: 1,064 kTOE (+196%)

- Avoided CO2 increasing potential: 5,343 kt (+300%)
First results from STRATEGO project

Heat demand mapping

Waste heat sources mapping

STRATEGO project website:
www.stratego-project.eu
PETA: Pan European Thermal Atlas for Italy
http://maps.heatroadmap.eu/maps/30661?preview=true
Main ongoing developments: Milan

DH market potential in Milan: > 4.5 TWh (50% of total Italian DHC)

<table>
<thead>
<tr>
<th>Heat demand</th>
<th>MWh</th>
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<tbody>
<tr>
<td>Northwest</td>
<td>1,238,691</td>
</tr>
<tr>
<td>Southwest</td>
<td>888,319</td>
</tr>
<tr>
<td>North</td>
<td>551,793</td>
</tr>
<tr>
<td>East</td>
<td>1,830,361</td>
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<tr>
<td>Total</td>
<td>4,509,123</td>
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Three main DH systems under development in the city

<table>
<thead>
<tr>
<th>2013A</th>
<th>2019F</th>
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<tbody>
<tr>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>38</td>
<td>68</td>
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<tr>
<td>110</td>
<td>180</td>
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<tr>
<td>129</td>
<td>152</td>
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<td>5</td>
<td>8</td>
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Avoided CO2 (kton): 110 180
Avoided Nox (ton): 129 152
Avoided PM10 (ton): 5 8
Ideas for further developments

- Several huge **power plants** (CCGT) less than 40 km from city centre
- Technical feasibility of a **heat transport network** 35 km long
- **Coherence** with regional energy and urban planning
- **Checking political willingness**, resource availability and business plan
The National Energy Strategy (SEN) – March 2013

- Towards a more competitive and sustainable energy.

- **Growth** is a priority for Italy. Growth means both economical and sustainable growth. Growth means job creation to assure more social equity and resources to reduce the amount of public debt.

- **Growth** need improved competitiveness of the companies and of the economical system.

- Energy sector is a key factor in economical **growth**: cheap energy with limited environmental impact and is a crucial conditions for development.
National Energy Strategy - 4 Tasks

- **Competitiveness**: -9 b€ bill cost reduction for costumers (2020 Vs 2012)

- **Environment**: do better than 20-20-20 goals

<table>
<thead>
<tr>
<th></th>
<th>2005 level</th>
<th>2020 goal</th>
<th>SEN goal</th>
<th>2010 level</th>
<th>2020 goal</th>
<th>SEN goal</th>
<th>2020 BAU</th>
<th>2020 goal</th>
<th>SEN goal</th>
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<tbody>
<tr>
<td>CO2 Mton</td>
<td>575</td>
<td>472</td>
<td>455</td>
<td>10</td>
<td>17</td>
<td>19-20</td>
<td>209</td>
<td>167</td>
<td>158</td>
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<tr>
<td>RES %</td>
<td></td>
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<tr>
<td>Efficiency MTOE</td>
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National Energy Strategy - 4 Tasks

Safety: reinforce security of supply and reduce dependence on imports

Growth: Expected investments in energy efficiency (60 b€), renewable energy (70 b€) within 2020 will amount to 130 b€: more than 70% of the total investments expected in the energy sector.
Heating Sector according to SEN

- SEN recognise that:
  - Heating use is the most important energy use, both in the civil and industrial sector (around 45% of the total final energy use).
  - Thermal RES are in general more efficient than the electrical ones and their incentivation is less expensive in a cost/benefit perspective (€/tCO2 avoided, €/TOE saved).
  - In the last years thermal RES development was not bad (5.4 MTOE at 2010), but without a stable and dedicated incentivation framework able to lead the market to the best practice.
  - RES development mainly used the incentivation framework of the «energy efficiency» (fiscal bonus and white certificates).
  - The industry sector of thermal RES is quite developed in Italy, even in high technology segment, especially in the biomass field.
Interventions for the Heating Sector

- Thermal Account for renewable small size (about 900 million euro a year dedicated)

- Strengthening White Certificates mechanism

- Activation of a guarantee fund for DHC.
Thermal account

- Incentivate the substitution of old and unefficient heating and cooling systems.
- Apply to small installations (< 1 MW)
- It can be hardly applied to DHC, except for small systems, mainly using biomass, in the Alps region.
“White Certificates” market

**Demand side:** electricity and gas distributor has to reach every year specific energy efficiency goals fixed by Authority (6.6 MTOE in 2015). They can do interventions by themselves or buy “energy efficiency titles” (white certificates) from the market.

**Offer side:** ESCO can get white certificates from the Market Authority (GSE) for energy efficiency projects of different kinds.

**DHC companies** can get white certificates when connecting new costumers to the network and substituting less efficient costumer’s heating system with a more efficient DHC supply.

A white certificates corresponds to a primary energy saving of 1 TOE. Its market value is currently around **90 – 100 €/TOE**.

Special bonus are foreseen for “**Large Energy Efficiency Projects**” (saving more than 35.000 TOE/year) linked to infrastructure developments and further bonus (up to 150%) is foreseen if the project has positive effect on air quality in urban areas.
Guarantee fund

Decree n. 28/2011 established a Guarantee Fund for development of DHC networks, financed by a part of the bill paid by gas customers (roughly 50 M\(\text{€}/\text{y}\)). The fund was financed but never started its operation.

EED Implementation Decree (Decree 102/2014) moved the financial resources of the Guarantee Fund to a more general National Energy Efficiency Fund (NEEF).

NEEF could be financed also with resources coming from voluntary contributions from public entities and from European Structural Funds.

NEEF is no more a fund dedicated to DHC but also to other kinds of project, like: improving energy efficiency in Public Buildings or social housing, public lighting, energy efficiency in industry.

NEEF doesn’t start its operation so far (waiting for operative rules from Government).
After 2020 – SEN long term scenario

Applications to Italy of European Roadmap 2050

- Energy Efficiency: -26% vs 2010
- RES: 60% of total final use
- Electrification: +200% consumptions
- Gas: Key factor in energy transition (at least to 2035)
- R&D: Development of new low carbon technologies.
STRATEGO long term scenario (2050)

DH should be expanded up to a level of approximately 40% to 70% of the heat demand
Conclusions

- Italian DHC: small, but growing reality. It can play a significative role in achieving the national climate goals.
- SEN recognised that the Heating Sector represents the most important energy use and defined incentivation instruments to foster the development of the sector.
- Unfortunately the implementation of these instruments has been carried out in a contradictory way and has introduced uncertainties for investments of the DHC operators.
- Risk not to fully exploit the potential of the DHC sector, just at the moment in which the new European Commission is defining a new European Strategy on heat where DHC can play a significative role.