

**Euroheat & Power 34<sup>th</sup> Congress**  
**Climate talks, climate action**

# **The Lisbon DHC: a Model for Southern Europe**

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Venice



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## **Brief History**

- 1992:** Lisbon has been chosen to host the last world exposition of the 20<sup>th</sup> century.
- 1994:** The Expo'98 development plan has been approved, including the first Portuguese district heating and cooling scheme.
- 1995:** Climaespaço won the international tender to design, build, finance and operate the DHC for a period of 25 years.
- 1996:** Construction of the DHC started.
- 1998:** Operation of the DHC started.



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# The Site



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## **Key Figures of the Site**

- 330 hectares.
- 5 km of riverfront.
- 2.500.000 m<sup>2</sup> of construction area\*.
- 21.000 people living in the area\*.
- 22.500 people working in the area\*.

*\*By the end of the project*

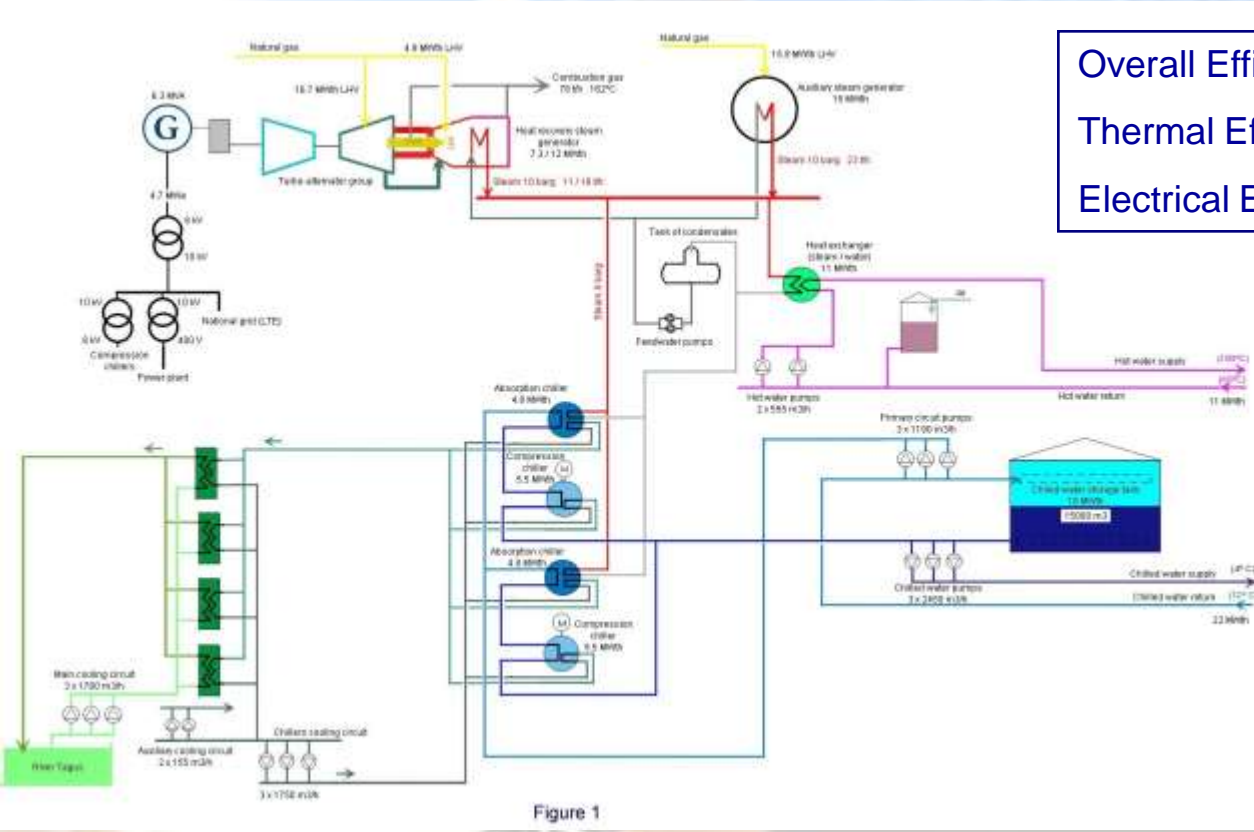
## **Key Figures of the DHC\***

- 1 Trigeneration Plant.
  - Cooling capacity: 28 MW*
  - Heating capacity: 22 MW*
  - Electrical Capacity: 5 MW*
- 1 storage tank (15.000 m<sup>3</sup>).
- 60 km of pipes (4 x 15 km).
- 130 buildings connected.
- 30 big customers.
- 3.000 small customers.
- Subscribed power:
  - 71 MW in cooling*
  - 74 MW in heating*

*\*In May 2009*

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# The Trigeneration Plant



**Overall Efficiency: 82%**  
**Thermal Efficiency: 50%**  
**Electrical Efficiency: 32%**

Figure 1



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# The Trigeneration Plant



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# The Network

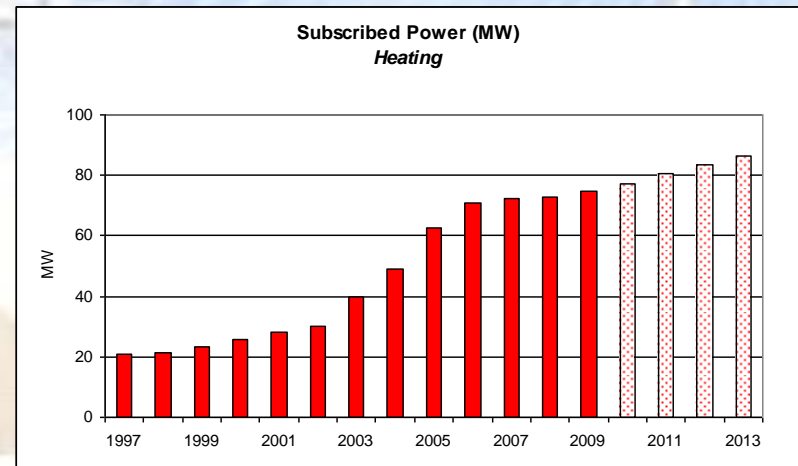
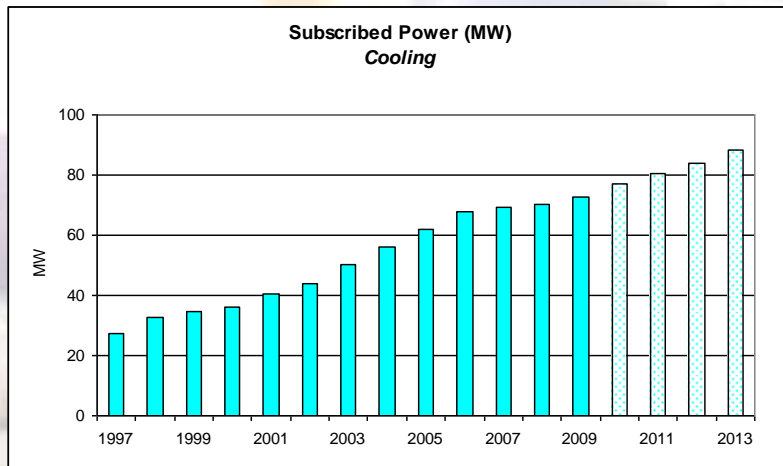




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# Subscribed Power



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# Some of the Customers

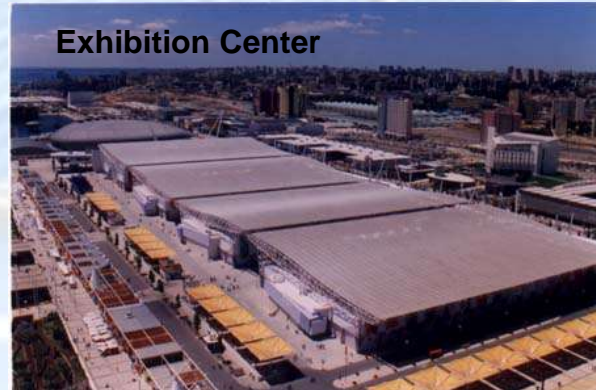
**Aquarium**



**Sports Arena**



**Exhibition Center**



**Casino**



**Shopping Center**



**Hospital**



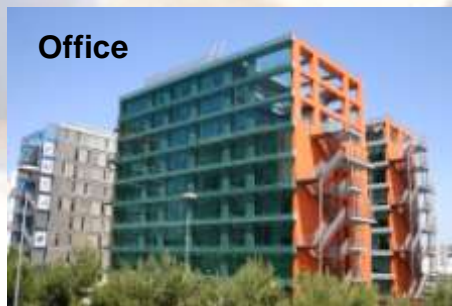
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### Some of the Customers



## Major Benefits of the DHC

- Lower primary energy consumption.
- Lower CO<sub>2</sub> emissions (-40%).
- No visual impact.
- Increased safety (no gas in the buildings).
- No sanitary risks (legionella).
- Higher reliability.
- No noise.
- Less space needed in the buildings.



## **A Challenging Path...**

- Heavy infrastructure investment (65 M€).
- The first – and still the only – DHC in Portugal.
- Permanent need to increase efficiency, availability and reliability.
- Strong competition with conventional solutions, despite legal protection.
- Increasing gas price, while electricity tariffs remain relatively stable (due to political intervention).
- **Fiscal distortion of the market: 20% VAT for DHC**  
**5% VAT for electricity and gas**

## **Conclusion**

Since the demand for thermal comfort is rapidly increasing in Southern Europe, DHC becomes an interesting tool to reduce energy consumption and CO<sub>2</sub> emissions.



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