

## Deliverable D 6.7

### Evaluation of performance in virtual demo cases of buildings and districts

#### WP 6

Grant Agreement number	657982
Project acronym	Cheap-GSHPs
Project full title	<b>C</b> heap and <b>E</b> fficient <b>A</b> pplication of reliable <b>G</b> round <b>S</b> ource <b>H</b> eat Exchangers and <b>P</b> umps
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#### Dissemination Level

PU	Public	
CO	Confidential, only for members of the consortium (including the Commission Services)	X
CI	Classified, as referred to in Commission Decision 2001/844/EC	

## **Publishable summary**

*The contents of the Deliverable D 6.7 regard the results of the Task 6.7 "Modelling of virtual demonstration cases and creation of a European scenario". In particular, the energy analysis of a set of 10 virtual case studies have been investigated in order to obtain a wide overview of the applicability of the GSHP systems. The buildings chosen for this aim are old, historical and relatively new. The different properties of the building envelope affect their thermal behaviour from the energy point of view. For this reason, the building envelopes were deeply investigated and a preliminary action was done to collect the thermal and physical properties of the materials and at the same time the architectural details of the structures. In detail, an old or historical building usually has a dominant heating load profile when the climate of the location is cold. On the other hand, a well thermal insulated building usually presents a balance thermal load or a cooling load profile, especially when the final use is not for residential application because of the high values of internal gains. All the case studies have been supposed to be equipped with a GSHP systems coupled with the new coaxial borehole heat exchangers developed in the project. The analysis and the design of the BHEs fields have been carried out using the Cheap- GSHP simulation tool. In particular, the final results show an overview of the applicability of the shallow geothermal solution for the air-conditioning of different types of buildings in different climatic contexts. The main aim of the study was the creation of a European Scenario of possible use of boreholes heat exchangers coupled with heat pumps. A simple cost analysis has been carried out for each virtual case study considering the costs for the new coaxial heat exchangers including the installation and the end user costs for the purchase of the heat pump. The costs for the coaxial probes have gathered from the Deliverable 3.4.*