

## Deliverable D5.5

### Performance evaluation in real demonstration site No 2: Angel's Gate, Ferrara (Italy)

#### WP5

Grant Agreement number	792355
Project acronym	GEO4CIVHIC
Project full title	Most Easy, Efficient and Low Cost <b>Geothermal</b> Systems <b>for</b> Retrofitting <b>Civil</b> and <b>Historical</b> Buildings
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Lead beneficiary	The UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANISATION (UNESCO) - Regional Bureau for Science and Culture in Europe
Other authors	UNESCO: Francesca Bampa, Iuliia Kozlova, Jonathan Baker RED: Luc Pockelé, Giulia Mezzasalma, Giuseppe Emmi CNR-ISAC: Adriana Bernardi, Gianluca Cadelano, Shabnam Javanshir UNIPD: Michele De Carli, Antonio Galgaro

#### **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

Deliverable D5.5 is a confidential document delivered in the context of WP5, task 5.3 and subtask 5.3.2: “Real case No.2 Historical Building in Ferrara (ITALY)” developed as part of the GEO4CIVHIC project.

The deliverable describes the GEO4CIVHIC project solutions as implemented at the premises of the real site Angel’s Gate in the World Heritage property of Ferrara, City of the Renaissance, and its Po Delta (Italy) located in the geographical purview of the UNESCO Regional Bureau for Science and Culture in Europe.

The demonstration site, Angel’s Gate, is equipped with an old and inadequate heating system without any active cooling system, which will be replaced by a new geothermal heating and cooling system. This system will be composed of four co-axial geothermal heat exchangers drilled at about 100 m depth, a geothermal hybrid dual source high temperature heat pump (35 kWth), a technical room hosting the heat pump and the monitoring system. All geothermal heat exchangers will be installed with a traditional drilling method with water, using a double rotating head as requested by the ARPAE Italian authorities. The monitoring system flow has been designed and needs to be finalized and installed.

All design and engineering work has been completed. The heat exchangers have been produced and are ready to be installed. The heat pump has been designed, manufactured and tested in the development laboratory. Contracts for executing the civil, mechanical, electrical and drilling works are been finalised.

The project involved at this stage a range of stakeholders that helped to overcome conservational constraints and barriers to geothermal power application in historical buildings through an inclusive working scheme involving conservational and management authorities of the site along with local and international technical experts.

A complete evaluation of the performance in the demo site is not yet feasible since the installations could not be done in time due to the COVID-19 pandemic and delays in getting the approvals of the public authorities.

A further update to this deliverable will be provided once the system installation is completed and the system is operating and monitored over a full heating and cooling season.