Deliverable D3.5

Optimized GSHE test in field

WP3

Grant Agreement number	657982
Project acronym	Cheap-GSHPs
Project full title	**Ch**eap and **E**fficient **Ap**plication of reliable **G**round **S**ource **H**eat Exchangers and **P**ump**s**
Due date of deliverable	31/01/2017 (M20)
Lead beneficiary	Michele Bernini - HYDRA
Other authors	Luc Pockelé (RED)
	Giulia Mezzasalma (RED)
	Antonio Galgaro (UNIPD-DG)
	Matteo Cultrera (UNIPD-DG)
	Michele De Carli (UNIPD-IE)
	Giuseppe Emmi (UNIPD-IE)
	Angelo Zarrella (UNIPD-IE)
	Jacques Vercruysse (Geo-Green)

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 deliverable “Optimized GSHE test in field” is a confidential document delivered in the context of Work Package 3, Task 3.5, with regards to piling coaxial stainless steel ground source heat exchangers.

First, the deliverable summarizes the results obtained in the previous tasks within the work package 3. More specifically these are the machine tool developments and the design improvements of the coaxial GSHEs based on simulations. Also the reference cost basis of the state of art solutions was reviewed as reference basis for cost comparisons later in the deliverable.

Both the new machine and GSHE developments have been validated in the field by installing two newly designed coaxial GSHEs out of stainless steel using the new machine developments.

The experiences gained in those tests are very promising and the learnings were very useful to improve the installation methodology further for the future installations in the demonstration cases.

The installation cost improvements have been determined based on the parameters from the field tests showing encouraging progress towards the project objectives.

Thermal response tests has also been performed to validate the heat exchanger yield. Results were not conclusive with respect to the heat exchange flow but the lower borehole resistance of these type of GSHEs was confirmed. TRT tests are designed to determine in the first place the thermal conductivity of the soil to be used in the sizing of the geothermal field. The yield differences of these GSHEs with conventional double-U GSHEs will be determined via monitoring under real load conditions in the demonstration cases.