

Deliverable D7.1

Report on LCC Analysis

WP7

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Project acronym	GEO4CIVHIC
Project full title	Most Easy, Efficient and Low Cost Geothermal Systems for Retrofitting Civil and Historical Buildings
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Lead beneficiary	Centre for Renewable Energy Sources and Saving (CRES)
Authors	D. Mendrinos (CRES), I. Chaldezos (CRES)

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	

Abstract

Deliverable D7.1 is a confidential document describing the life cycle cost analyses (LCCA) performed in each of the 12 virtual and the 4 real case studies of the GEO4CIVHIC project. Virtual cases correspond to real buildings, which can be retrofitted with the GEO4CIVHIC technology. The building heating, domestic hot water (DHW), cooling needs and the resulting performance of the GEO4CIVHIC GSHP system are simulated and the corresponding costs estimated. The real cases are real buildings where the GEO4CIVHIC technology has been installed during the project for demonstration.

In each case, prior to installing the heating and cooling system, planned or implemented energy saving interventions in the building envelope, lights and energy management are considered and financially evaluated in terms of IRR.

The levelized cost of energy (LCOE) delivered by the GEO4CIVHIC ground source heat pump (GSHP) system considered is calculated and compared to the LCOE of a base system consisting of a gas boiler and an air source chiller. The following items are included in the calculations: initial investment (borehole heat exchanger, heat pump, equipment, indoor heating/cooling supply system), energy costs (fuel and electricity), maintenance costs, residual cost values, cost of money (discount factors), as well as the value of the CO₂ emissions.