

# **Analysis, Design And Application Of Energy Geostructures From The Building To The City Scale**

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## **Abstract**

This study focuses on the analysis, design and application of energy geostructures for the structural support and the energy supply of built environments, from the building scale to the city scale. The work is based on the results of full-scale in situ tests as well as theoretical analyses addressing fundamental aspects of the multiphysical behaviour of energy geostructures. The analysis and design of energy piles, energy walls and energy tunnels is treated and simplified yet effective design tools for such geostructures are presented. Aspects of primary importance for maximising the energy, geotechnical and structural performance of energy geostructures are presented, and solutions to address this challenge are proposed. Examples of practical analyses and design of energy geostructures from the building to the city scale are described and concluding remarks are highlighted. The goal of this lecture is to increase the confidence of engineers, architects, urban project managers and municipalities on the effectiveness and performance of energy geostructures.