GEOSUSTAINED

GEOTERMIA SUPERFICIAL

**Perspetivas de aplicação em contexto urbano**

# Apresentação do Projeto

Ana Vieira, Cláudia Pinto

6 DEZEMBRO 2022

PARCEIROS

LABORATÓRIO NACIONAL DE ENGENHARIA CIVIL

LISBOA CÂMARA MUNICIPAL

universidade de aveiro

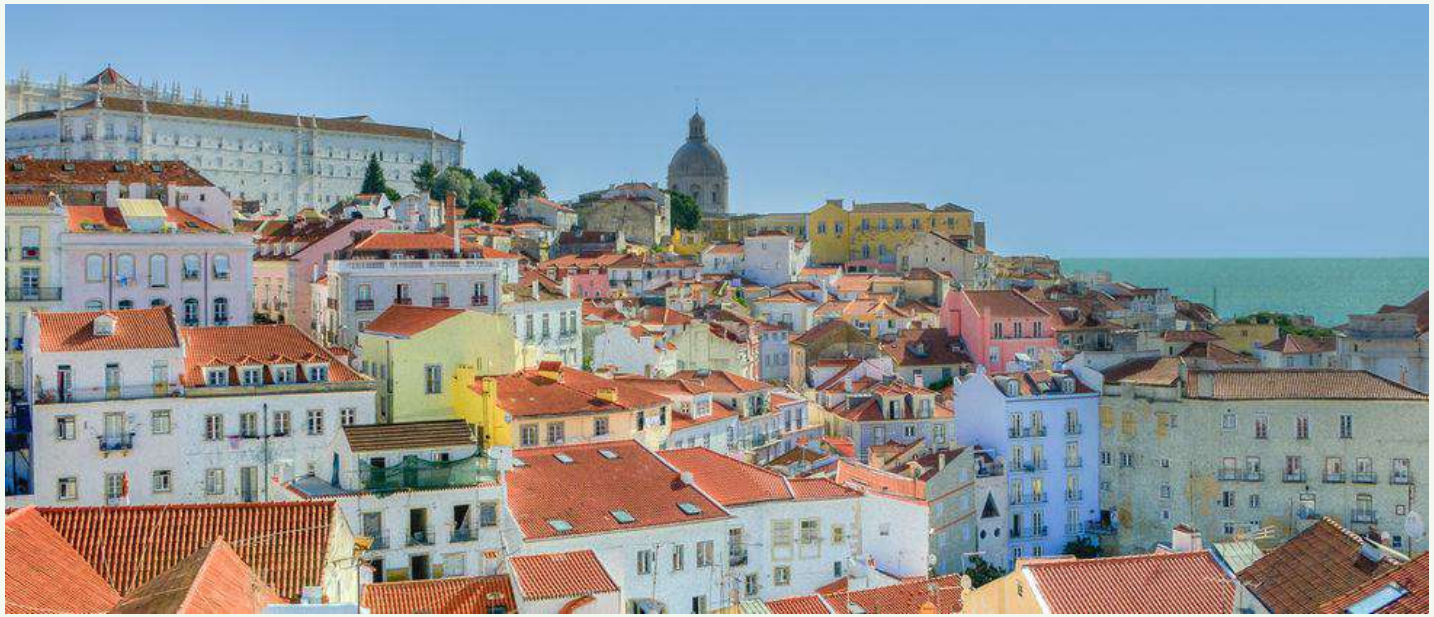
LISBOA e·nova

APOIO

Sociedade Portuguesa de Geotecnia

CPGA Comissão Portuguesa de Geotecnia Ambiental

# Avaliação da sustentabilidade de sistemas geotérmicos superficiais para Lisboa. Estudos de caracterização do comportamento térmico e termomecânico dos solos da cidade



Investigação aplicada e fundamental para apoio ao planeamento sustentável, com relevante interesse para a sociedade, e na adaptação às alterações climáticas.

Financiamento

- FCT (Ref. PTDC/ECM-GEO/0728/2021)

Parceiros

- LNEC, CML, UA, Lisboa E-Nova

Consultores

- Alice di Donna - Université Grenoble Alpes
- Isabel Moitinho, Faculdade de Ciências da Universidade de Lisboa
- Paul Christodoulides - Cyprus University of Technology

- Duração
  - 2022-2024/25

6 DEZEMBRO 2022

# ESTRUTURA DO PROJETO GEOSUSTAINED

- Preselection and preparation of pilot sites location
- Boreholes drilling and soil sampling
- Installation of the thermal sensors and acquisition system
- Data analysis on the short and long term

## TASK 1

**Fieldwork. Soil sampling and temperature profile monitoring system installation**

**Laboratory activities.**
**Lisbon soils thermos and thermo-mechanical properties evaluation**

## TASK 2

- Laboratory tests on intact samples
- Semi-empirical modelling based on soil physical properties and on lithological type
- Triaxial tests on non-isothermal conditions

- Thermal and thermo-mechanical simulation of the laboratory tests
- Formulation of advanced soil thermomechanical constitutive models
- Extension of a subloading viscous model to non-isothermal conditions
- Effect of temperature on geotechnical works

## TASK 3

**Numerical simulation of thermomechanical tests. Advanced constitutive models for soils**

**Compilation of geological, geotechnical and thermal characterization and thermal modelling at different scales**

## TASK 4

- Systematization and update of geological and geotechnical information of Lisbon soils
- Update of the asset register on thermo-hydraulic properties with the pilot site locations and other data
- Mapping and spatial modelling of thermal properties at different scales

**Sustainability of geothermal systems for Lisbon soil and climate conditions**

- Dynamic integrated analysis (building and geothermal system)
- LCA and other sustainability analysis

## TASK 5

## TASK 6

**Communication and dissemination**

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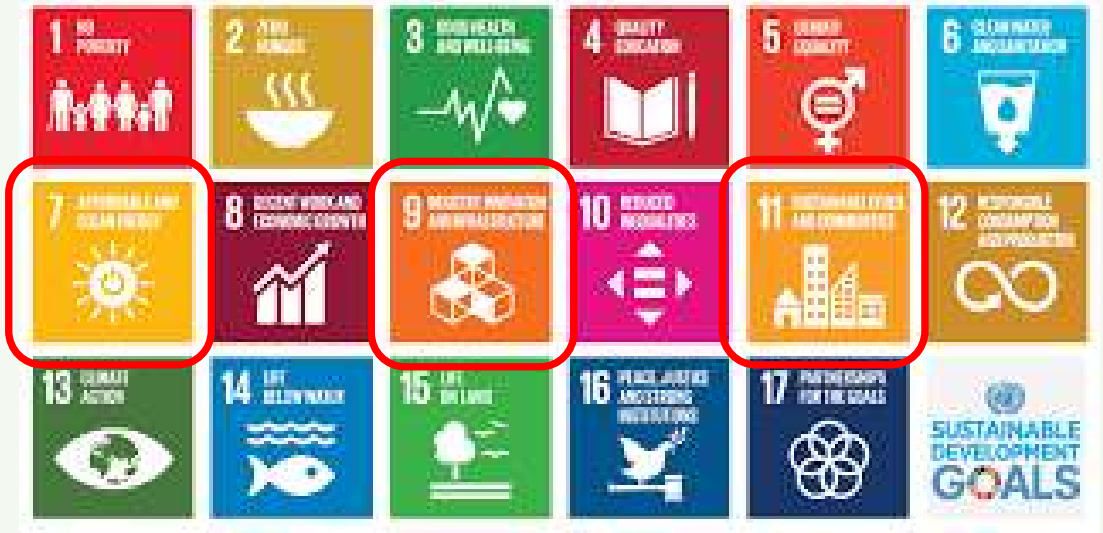
# objetivos de desenvolvimento sustentável da ONU para 2030

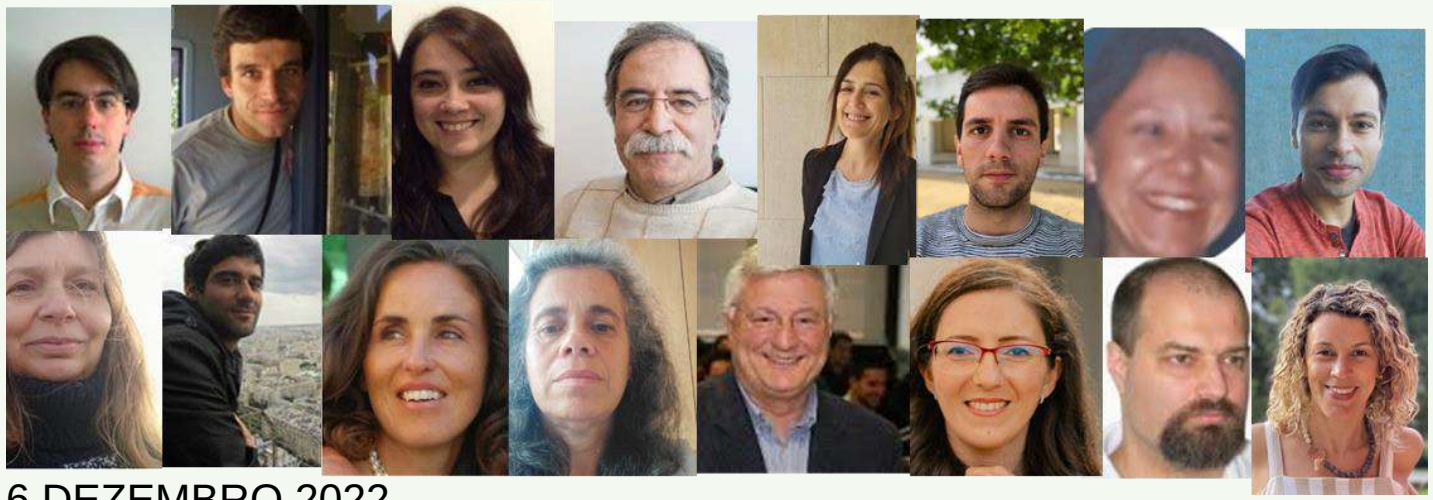
Objetivo 7 - Garantir o acesso a fontes de energia fiáveis, sustentáveis e modernas para todos

Objetivo 9 - Construir infraestruturas resilientes, promover a industrialização inclusiva e sustentável e fomentar a inovação

Objetivo 13 - Adotar medidas urgentes para combater as alterações climáticas e os seus impactos




## Equipa



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https://informacoeseservicos.lisboa.pt/prevencao/resiliencia-urbana/projetos/geosustained

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MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR