MUSE - MANAGING URBAN SHALLOW GEOTHERMAL ENERGY

A GeoERA Geo-Energy project

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ABSTRACT

The MUSE project is one of 15 awarded project proposals under the H2020 GeoERA program that will be implemented from July 2018 to June 2021. GeoERA (Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe) is the largest European research program in the field of geoscience, co-funded by the European Commission via ERA-NET Co-fund action in the scope of Horizon 2020. The MUSE project itself focuses on shallow geothermal energy (SGE) in European urban areas. A group of 16 geological survey organizations from the EU member states and associated countries are involved in the project. MUSE addresses the investigation of resources and possible conflicts of use and will deliver key geoscientific subsurface data to stakeholders via a user-friendly web based GeoERA Information Platform Project (GIP-P).

AIMS AND OBJECTIVES

- MUSE investigates **resources and possible conflicts of use associated with shallow geothermal energy** (SGE) in **European urban areas** and delivers key geoscientific subsurface data to stakeholders via a user-friendly web based GeoERA information platform.
- MUSE will lead to the development of **management strategies** considering both efficient **planning** and **monitoring** of environmental impacts to feed into general framework strategies of cities like SEAP's.
- The developed methods and approaches will be tested and evaluated together with input from local stakeholders in **14 urban pilot areas across Europe** representative for different conditions.
- The outcomes of the project represent a comprehensive collection of methods, approaches and tools, which **can be transferred to other urban regions in Europe** and be adopted by other organizations.

METHODOLOGY AND WORK PACKAGES

MUSE will pool knowledge on managing the efficient and sustainable use of shallow geothermal energy in European cities. The project activities consists of the following main stages (Fig.2):

- Stage 1 covers compilation of methods and workflows for providing key geoscientific data and creating strategies for efficient and sustainable SGE use.
- Stage 2 will focus on the implementation of joint methods and workflows in 14 pilot areas across Europe.
- Stage 3, will cover a feedback round from the pilot areas to the initially compiled catalogues of methods, workflows and concepts.

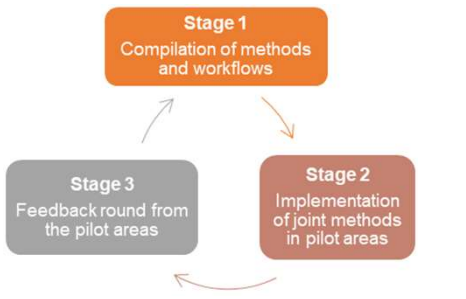

Figure 2. Main stages of MUSE project.

The project is organized in 6 work packages (WP) (Fig.3).

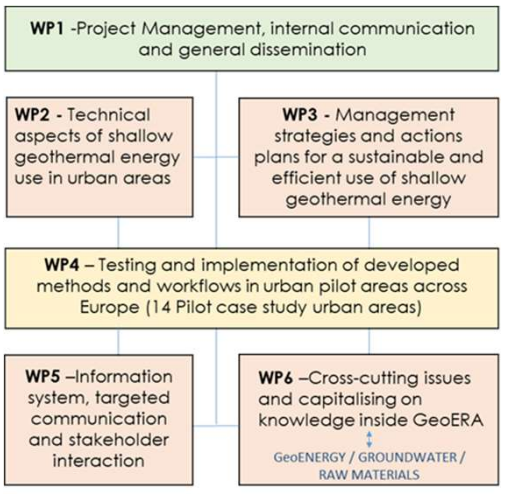

Figure 3. Work packages scheme of MUSE project.

PARTNERS

In total, 16 geological survey organizations from across 15 European countries (Fig.1)

Figure 1 Participating geological survey organizations of MUSE.

PILOT AREAS

- MUSE has 14 pilot areas (Fig.4) located in 12 EU countries, where methodologies and approaches will be applied.
- The pilot areas represent a great variety of settings: geological, thermo-hydrogeological, climatic, environmental, legal contexts, and the degree of SGE use which represents different levels of deployment or maturity across pilot areas considered (e.g. the climatic conditions between the 14 pilot areas present a diverse range of Heating and Cooling Degree Days (HDD and CDD), a proxy for the heating and cooling energy demand and loads for buildings).

Pilot area	HDD	CDD
Linköping, Sweden	4682	-
Bratislava, Slovakia	3152	-
Glasgow, Scotland	3054	-
Warsaw, Poland	3054	-
Prague, Czech Rep.	2985	53
Aarhus, Denmark	2722	-
Ljubljana, Slovenia	2551	218
Vienna, Austria	2468	213
Brussels, Belgium	2440	17
Zagreb, Croatia	2396	196
Cardiff, Wales	2275	5
Cork, Ireland	2083	2
Zaragoza, Spain	1749	283
Girona, Catalonia	1733	228

Table 1. Preliminary Heating and Cooling Degree Days estimation (HDD and CDD) for each pilot area for 2017 (source: Eurostat)

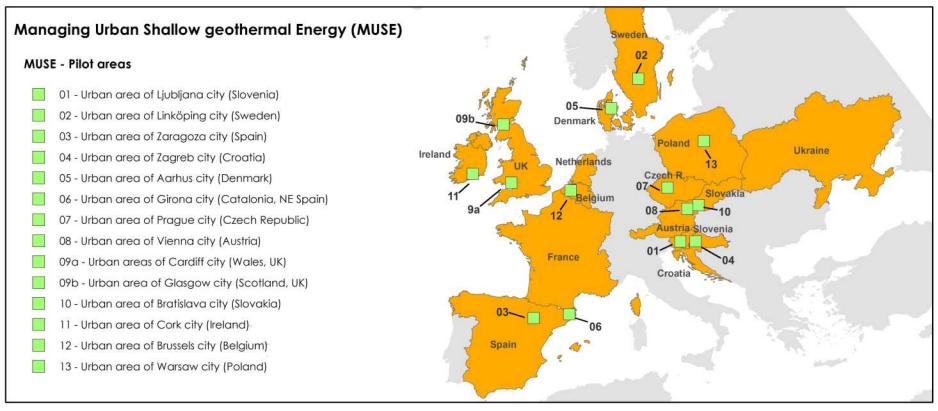

Figure 4. Participating countries and the project pilot areas of MUSE.

EXPECTED RESULTS

- The outcomes of the project will be a comprehensive collection of methods, approaches and tools, which can be transferred to other urban regions in Europe and adapted by other organizations.

  CATALOGUES of the evaluated methods / GUIDELINES on exploration, assessment, technical monitoring, the integration of management of SGE use in urban areas / FACTSHEETS of characterized SGE concepts and related to the pilots (Fig.5) / REPORTS on the current legal frameworks, procedures and policies on SGE use in the selected European pilots / THEMATIC OUTPUT DATASETS to the GIP-Project.

Figure 5. Factsheets of the Pilot areas.

DISSEMINATION

MUSE project will disseminate and communicate the results through:

- Web services presenting output datasets at the pilot areas and all related geographical information outcomes through the GeoERA Information Platform Project: http://geoera.eu/projects/muse/
- MUSE will be presented at conferences and workshops will be held to connect with national stakeholders and scientific community. Here leaflets (Fig.6) and factsheets (Fig.5) are distributed.

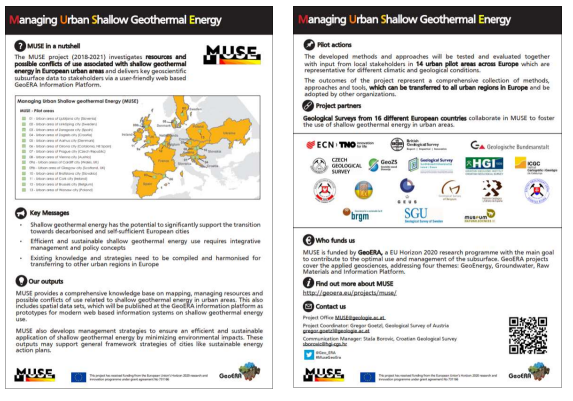

Figure 6. Leaflet available at MUSE website.