GeoPLASMA-CE
Minutes

Compiled by G. Goetzl, K. Zschoke & C. Steiner on January 17th, 2017

Date, Time	01.12.2016, 11:20 – 15:30
Location	German Geothermal Congress 2016, Essen
Concern	D.T2.2.4 Knowledge exchange workshop

Participants

LP – GBA	GOETZL Gregor, STEINER Cornelia	*PP07 – GeoZS*	JANZA Mitja, SOLC Urška
PP02 – BVG	DILGER Gregor DEINHARDT Andre	*PP08 – PGI-NRI*	KOZDROJ Wieslaw RYZYNSKI Gregorz KLONOWSKI Maciej
PP03– geoENERGIE	GRIMM Rüdiger, ZSCHOKE Konstanze	*PP09 – AGH UST*	HAJTO Marek
PP04– LfULG	HOFMANN Karina RIEDEL Peter	*PP10 – GiGA*	GIETZEL Jan GABRIEL Paul
PP05 – CGS	HOLECEK Jan	*Other participants*	See list of participants

Agenda

1. Kick-off presentations: 11:20 – 13:00
2. Panel discussion: 14:00 – 15:30
   - Relevant statements of the workshop
   - Conclusions

Project teams GeoPLASMA-CE and GRETA

Outcomes

1. Kick-off presentations

German Geothermal Congress 2016

Summary

The annual German Geothermal Congress 2016 (DGK 2016) is organized by the German Geothermal Association (Bundesverband Geothermie, http://www.geothermie.de/), which celebrated its 25th anniversary this year. The congress in Essen provided a platform for over 100 contributors to talk about their research results and knowledge and represented an opportunity for inspiring and intense discussions about innovative solutions, developments and practical applications. The GeoPLASMA-CE project was presented by several project partners with a new roll up and leaflets.
GeoPLASMA-CE and GRETA invited experts from the scientific and administrative sector as well as interest groups dealing with planning of shallow geothermal use to a knowledge exchange workshop for D.T2.2.4. The main topic was "Mapping methods for the assessment of potentials and conflicts to the use of shallow geothermal energy in Europe".

First workshop session

Summary

In the first session of the workshop the following projects - all dealing with shallow geothermal utilization - were presented. The talks focused on the mapping strategies of the projects and served as kick-off presentations for the discussion in the second session of the workshop.

Project	*Speaker*
GeoPLASMA-CE	HOFMANN Karina
GRETA	BÖTTCHER Fabian
ReGeoCities	SANNER Burkhard
GeoTrainet	SANNER Burkhard
Thermomap	BERTERMANN David
CHEAP	BERTERMANN David
Transgeotherm	KOZDROJ Wieslaw
GABI	RYZYNSKI Gregorz

2. Panel discussion

Second workshop session

Summary

The second session of the workshop hosted a panel discussion about the main aspects of mapping potentials and risks/conflicts of shallow geothermal use. The key questions, which were discussed in this session were:

- What are the existing approaches and workflows to create potential and risk maps?
- Do the different approaches lead to comparable maps and spatial information?

- Is there a need of harmonization of methods?

The main outputs of the discussion as well as the answers to these questions are summarized in the next relevant statements of the workshop.

"Contents and strategies of mapping strongly depend on the overall objectives"

Summary

The presented projects, all focusing on shallow geothermal utilization, follow different thematic contents and strategies. Relevant factors influencing the methods and workflows as well as the thematic contents are: the different geothermal methods (e.g. horizontal collectors, borehole heat exchangers), the regional environmental constraints and needs (e.g. Alpine regions, urban/non-urban regions), the geographical coverage (whole Europe versus small scale pilot areas) and las but not least the target groups the projects aim at (e.g. transfer of know-how, policy instruments or decision support for actors).

The maps and mapping strategies of the presented projects therefore differ in:

- Geographical scale
- Geographical and depth range
- Map contents

"A clear cutting line between geoscientific and political maps is necessary"

Summary

It is important to consider the differences between geoscientific and political maps. Geoscientific maps cover key values, which support the derivation of potentials and risks of shallow geothermal use. Political maps represent the interpretation of geoscientific maps taking into account legal constraints and policy (e.g. traffic light maps). Political maps may vary between borders, depending on the regional and national boundary conditions. In order to avoid discrepancies on the two opposite sides of a political border, geoscientific maps should be harmonized especially at regional/national borders.

"The addressed end-users determine the content and the scale of maps produced"

Summary

During the preparation of the mapping strategies the focus should remain on the user side. The important questions regarding the aspired content of maps are what kind of information is needed for a certain user group and what its units are (e.g. MWh, W/m). In order to meet the requirements of the users it was proposed to investigate their needs at first. This will be accomplished by the WPT1 survey (A.T1.1 & A.T1.2). In a second step the parameters and information, which can be determined, should be defined.
The amount of information displayed should be sufficient, and especially not too much in order to avoid overburdening the users.
Supra-regional maps are focusing on policy makers, local-regional maps address technicians (experts, public authorities) and other actors (investors, users).

"Uncertainties should be considered in mapping strategies and derived maps"

Summary

The workshop showed different strategies followed with respect to certainties. There are approaches which include all (scale-independent) datasets for mapping. Other ones favor a scale and data quality dependent pre-selection of datasets. However, it was pointed out, that maps or

datasets transferred to the public should contain indications of data uncertainties, at least with respect to the spatial data density available.

"Explanatory notes are a crucial annex to maps"

Summary

The same emphasize put on the elaboration of maps (both geoscientific as well as political) should be dedicated to the elaboration of explanatory notes. Despite of subsidiary information to the contents shown in maps, these notes may also describe the uncertainty of the map delivered. Only both, a map and its explanatory notes, may enable a profound transfer of knowledge to users.

"The post-project sustainability of the produced maps has to be enabled"

Summary

Many past projects face the challenge to preserve established web-based interfaces (maps, data-sets and decision support systems) after expiration of funding in the post-project phase. For example, the European Geothermal Energy Council (http://www.egec.org/) founded the initiative "The Heat under your Feet", which also guarantees the post-project availability of the results of Thermomap and ReGeoCities. It was pointed out, that an umbrella platform is needed for post-project servicing of project outputs. In that context the infrastructure of the EuroGeoSurveys (http://www.eurogeosurveys.org/) could play an important role for GeoPLASMA-CE in the future.

"Harmonizing mapping strategies should focus on the potential of use"

Summary

The relevant data needed for estimating environmental and technical risks are quite clear. New aspects treated concern conflicts to underground infrastructures (e.g. tunnels, addressed in ReGeoCities). However, harmonized mapping strategies are not so clear for the evaluation of potential of use. For all shallow geothermal applications the potential of use not only depends on the geoscientific boundary conditions alone, but also includes operational settings (e.g. operational hours per year or energy extracted/injected to the subsurface). Therefore, characteristic values describing the potentials vary (e.g. heat transfer rate, thermal capacity or material parameters). Other aspects, investigated in a few projects, also cover economic constraints, such as the "drillability" (project CHEAP).

What are the existing approaches and workflows to create potential and risk maps?

Summary

Concerning the questions posed at the beginning of the workshop, the following conclusions have been drawn from the workshop discussion.

The projects presented at the workshop are compared in the table below.

It was identified of great importance to assess existing approaches and compile them for comparing and identification of best practices.

Project	Shallow geothermal systems investigated	Main focus of project	Target groups	Scale
Thermomap	Vertical/horizontal and special forms of vertical heat collectors	mapping the very shallow geothermal energy potentials in Europe	public, planners and engineers, public bodies and scientists	whole Europe and pilot areas
CHEAP	Coaxial and basket GSHPs	develop more efficient and safe shallow geothermal systems and reduce installation costs	public, planners and installers	municipal level
Transgeotherm	borehole heat exchangers	maps of heat conductivity and planning strategies for shallow geothermal systems	public, planners and installers, public bodies	project area: 650 km²

Do the different approaches lead to comparable maps and spatial information?

Summary

On the level of pure geoscientific key data, the parameters relevant to map are well harmonized. Differences in results are mostly depending on the needed scale (supra-regional to local) and the shallow geothermal methods addresses (e.g. horizontal collectors, borehole heat exchangers). In contrast, interpreted maps for stakeholders (political maps) may strongly differ as they are depending on the individual legal and political constraints in different regions. There cannot be a demand on harmonized political maps as long as the political framework is not harmonized.
However, it was agreed, that calibration of maps and data-models is a crucial task to perform and only validated results should be transferred to the public, if possible. The calibration should be done at least during or, in the best case, also periodically after the project. The later also guarantees an update of maps or data-models.

Is there a need of harmonization of methods?

Summary

The harmonization of methods is limited to parameters and approaches producing geoscientific key values. If available, mapping should include recognized datasets like the EGDI data-infrastructure of the EuroGeoSurveys organization. Considering the publishing of datasets the INSPIRE regulations have to be followed, if applicable.
Another important aspect, not questioned in advance of the workshop, addresses the sustainability of datasets. It was agreed by the participants, that a joint, umbrella infrastructure is needed to compile and service individual project results after the end of funding. This guarantees the sustainability and long-term transferability of achieved outputs. The EuroGeoSurveys organization can play an important future role in solving this problem.
Finally it was also agreed, that there is a need for inter-project discussion on joint thematic aspects. The next knowledge exchange workshop, organized by GeoPLASMA-CE and GRETA, is

scheduled for 2017 during the GRETA midterm conference. The workshop will focus on legal implications of shallow geothermal use.