

Report from the WGs

Non technical

1. Policies & regulation

- Need of a levelled playing field at European level so that subsidies and/or taxation do not befog the overall consistency of the vision for geothermal energy in Europe.
- Need of a clear understanding of the specific agenda of the different countries (depending on their own situation), and the common core.
- Need of a dedicated policy for the desired share of low carbon/carbon free technologies in the mix of energies produced.

Associated research topics :

- **P&R 1: Developing a welfare analysis of the increase of deep geothermal energy in the energy mix through a comprehensive assessment of the impact of geothermal energy on economic growth, social welfare, employment, environmental benefits, trade balancing, ..**
- **P&R 2: Screening and mapping EU policies and regulation relevant for RD&I in deep geothermal energy.**

2- Public acceptance (environmental concerns assumed to be addressed by Environmental workshop)

- Benefits and concerns for the communities (at all scales)
- Creating a desired information platform for the local population clarifying issues such as:
 - What will happen?
 - When will it happen?
 - What has happened?
 - What are the risks?
 - How are they mitigated?
 - What are the concerns of the population?
 - What are the benefits they can expect?

Associated research topic:

- **PA: Sociological analysis of expectations and fears regarding energies, and specifically geothermal energy, in order to identify technological RD&I able to bring effective answers to the concerns and expectations identified (deepening of LCE 21- 2017)**

3- Competitiveness

- Beyond LCOE: cost of intermittency, value of flexibility, full life-cycle costs, life-cycle green-house gas emissions, ...
- Use value of geothermal according to different purposes (alternative business models)
- Heat produced to be set equal to electricity, because of higher efficiency in resource use
- Heat to be included in calculations of levelized cost.
- Market models.

Associated research topics:

- **C 1: Research of alternative criteria to LCOE, more representative of the value for the energy consumer, enabling a level playing comparison of renewable energies.**
- **C 2: Research on the impact of existing sustainable market model designs for renewable energy on geothermal energy (enabling a legitimate return on investments in a context of zero or next to zero marginal costs energy, while ensuring cost efficiency for the consumers)**

4- Risk management

- Harmonization of evaluation standards.
- Integration of exploration costs in the business model: portfolio management model versus insurance scheme.
- Addressing the moral hazard issue in an insurance scheme.
- Creation of a risk sharing facility over the borders (Pan-European)

Associated research topics:

- **R&M 1: Development of a specific resource assessment standard. Shared resource assessment methodologies exist in oil & gas business. They facilitate the dialogue between companies and financial institutions (*may be addressed by WG 1*)**
- **R&M 2: Survey of exploration or pre-cost risk in other industries (notably hydrocarbons but not only) and how cost@risk are managed and integrated in the overall business model. Benefits/drawbacks analysis of portfolio vs insurance schemes. Analysis of the specific issue of moral hazard in insurance schemes.**

5. Financing

- Risk threshold for acceptability of funding by banks or private investors.
- Degree of uncertainty/certainty on resource evaluation versus Final Investment Decision.
- Bankability of geothermal projects along the development time.
- How to enable low cost financing for the development?

Associated research topics:

- **F: Look-back survey of the post FID development of geothermal projects in order to assess the nature and level of remaining uncertainties that can impact the profitability of investments.**

6- Legal and regulatory

- Position of geothermal energy in the different codes (Mining, Environment, Water, ...)
- Introduction of a unifying process for geothermal projects (one address for all ministries)
- License granting processes (FCFS, license rounds, competition window, ...)
- Works authorization processes.

Although this category of issues may have a significant impact on the development of geothermal energy, they do not seem to require or generate needs for R&D actions.

7- Information

- Availability of geological information. How to enable the exploitation of data created by Oil&Gas exploration and operation?
- Possibility to make unused data publicly available.
- Consistent statistical data.
- European portal for geological and geothermal data?

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8- Skills, human and material resources

- Science, education, training.
- Industry branch development in a context of decreasing Oil & Gas investments.
- Communication & Dissemination and Public awareness on geothermal energy.

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