

○ Regulatory framework and recommendations

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November 27th, 2020



ETIP-DG

European Technology & Innovation
Platform on Deep Geothermal

ETIP DG's Annual General Meeting

Friday 27th November 2020

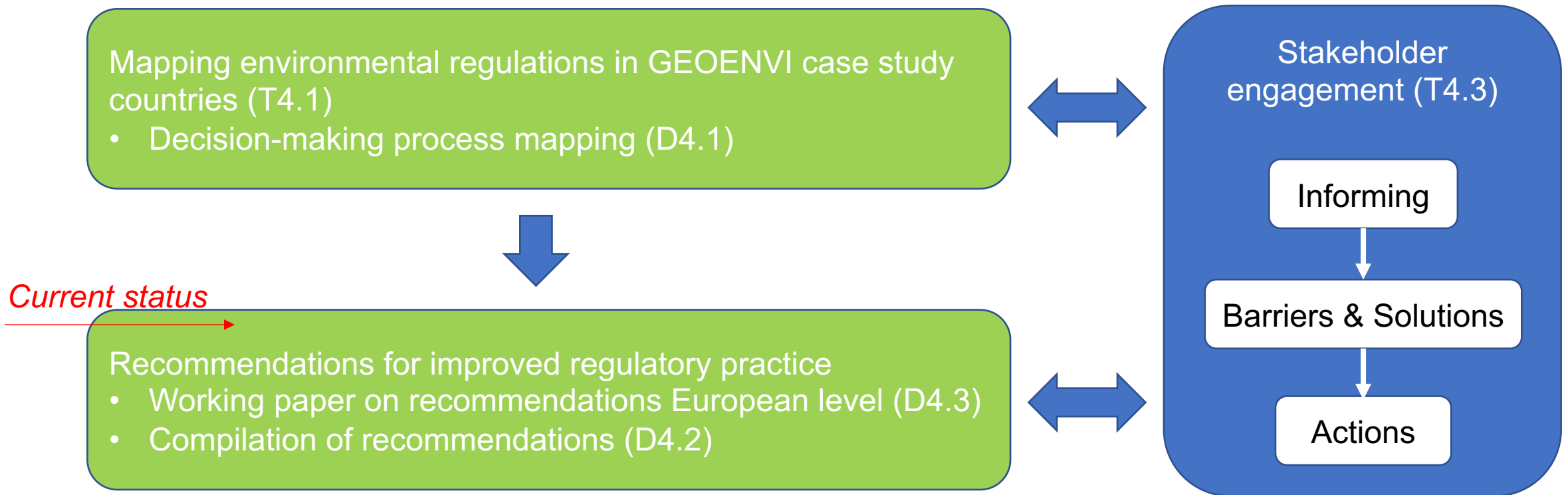
14h00 to 17h00 (CET)



○ Ambition

- Map and analyze the current status of environmental regulations and practices for deep geothermal energy development
- Develop recommendations for establishing a European frame for environmental regulations of deep geothermal
- Engage with stakeholders and decision-makers to develop recommendations to improve environmental regulatory practice

○ Work package structure



○ Mapping environmental regulations

Content [Deliverable 4.1](#)

- Provide the basis for the formulation of recommendations on environmental regulations
- 6 country reports and comparative analysis
- Overview
 - General data on deep geothermal
 - Institutional context
 - Policies and policy visions
- Regulation mapping
 - Definition, classification, and resource ownership
 - Licensing and authorizations
 - 11 specific environmental impacts and risks: International, EU and national level

Stakeholder engagement: Policy workshops

1st round completed

- Policy, Industry, Research
- Flexible, but common format
- Plenary discussions, focus groups, survey



	City	Date	Organiser	Participants
Italy	Rome	17 april 2019	COSVIG+CNR+ ENEL GP + RG + CSGI	70
Belgium	Brussels	5 feb 2020	VITO	14
Hungary	Interviews Budapest	nov/dec 2019 26 feb 2020	MFBSZ	12
France	Paris	16 oct 2019	BRGM + ESG + ARMINES	14
Turkey	Izmir	15 oct 2019	JESDER+DEU	21
Iceland	Reykjavik	21 jan 2020	OS+ISOR+GEO RG	23

First insights in:

- Key impacts
- Regulatory challenges

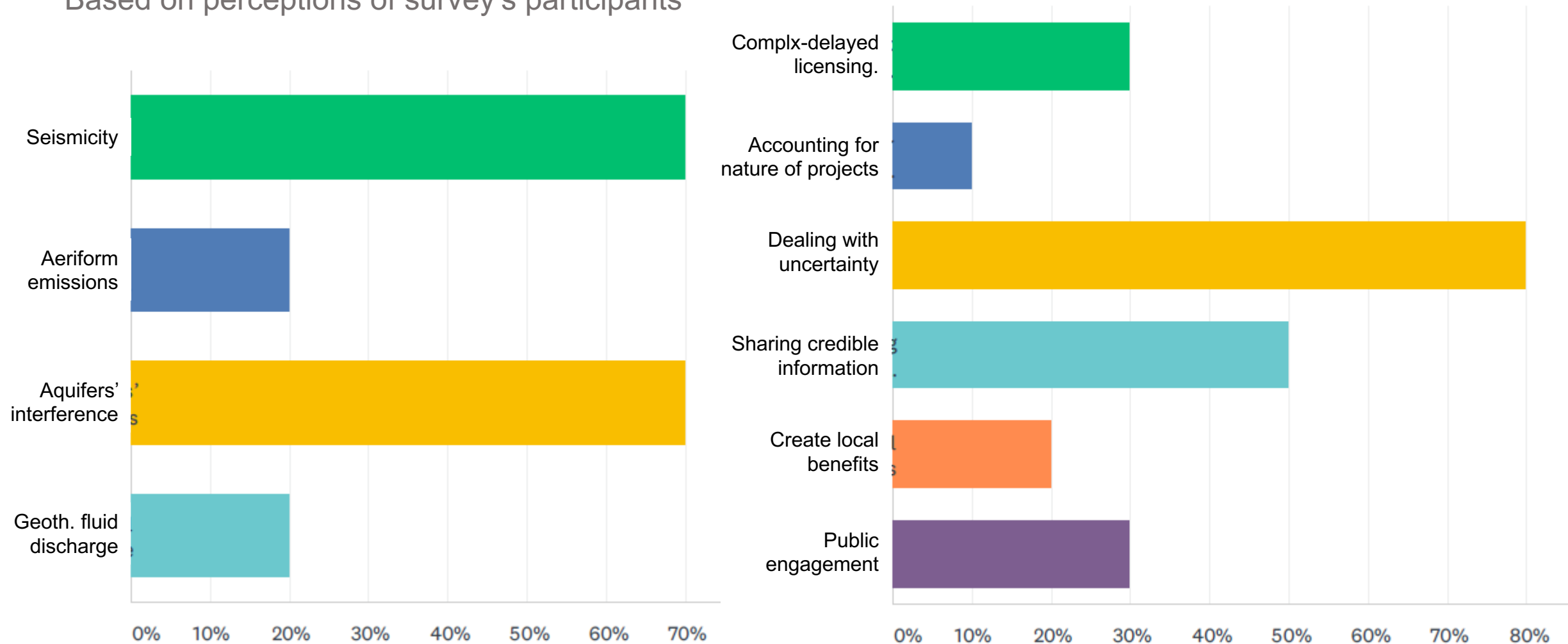
○ Intermediate conclusions

See our [Brochure](https://www.geoenvi.eu/publications/environmental-regulations-for-deep-geothermal-energy/) (<https://www.geoenvi.eu/publications/environmental-regulations-for-deep-geothermal-energy/>)

- Challenging to gain a full overview covering different levels (EU, national, regional, local)
- Environmental impacts and risks appear generally well covered by:
 - Specific legislations and guidelines
 - Covered in Environmental Impacts Assessments and permitting processes
 - Good practice among project developers and operators
- Main regulatory challenges and issues of social acceptance remain:
 - Technical and process topics
 - Harmonizing environmental regulations at the European level

○ Priority topics

Based on perceptions of survey's participants



○ Harmonizing environmental regulations at the European level

GEOENVI deliverable 4.3: Aim & approach

- Present a set of recommendations for establishing a European frame for environmental regulations of deep geothermal
- Building on environmental regulations mapping (D4.1) and other GEOENVI reports
- See: <https://www.geoenvi.eu/publications/recommendations-for-european-harmonisation-of-geothermal-environmental-regulations-in-the-eu>

A top down approach: In the European Union, harmonization of law is the process of adopting regulations with common standards across the internal market. Harmonization aims at having the same rules to apply to market actors that operate in more than one member state. It allows to avoid that the actors in one Member state do not obtain an economic advantage over those in another as a result of different rules.

A bottom-up approach: Each EU member state has primary responsibility for the regulation of most matters within their jurisdiction, and consequently each has its own laws. A mutual recognition of national regulations can also lead to a common European framework, if it is done together with the establishment of minimum standard at EU level.

○ Harmonizing environmental regulations at the European level

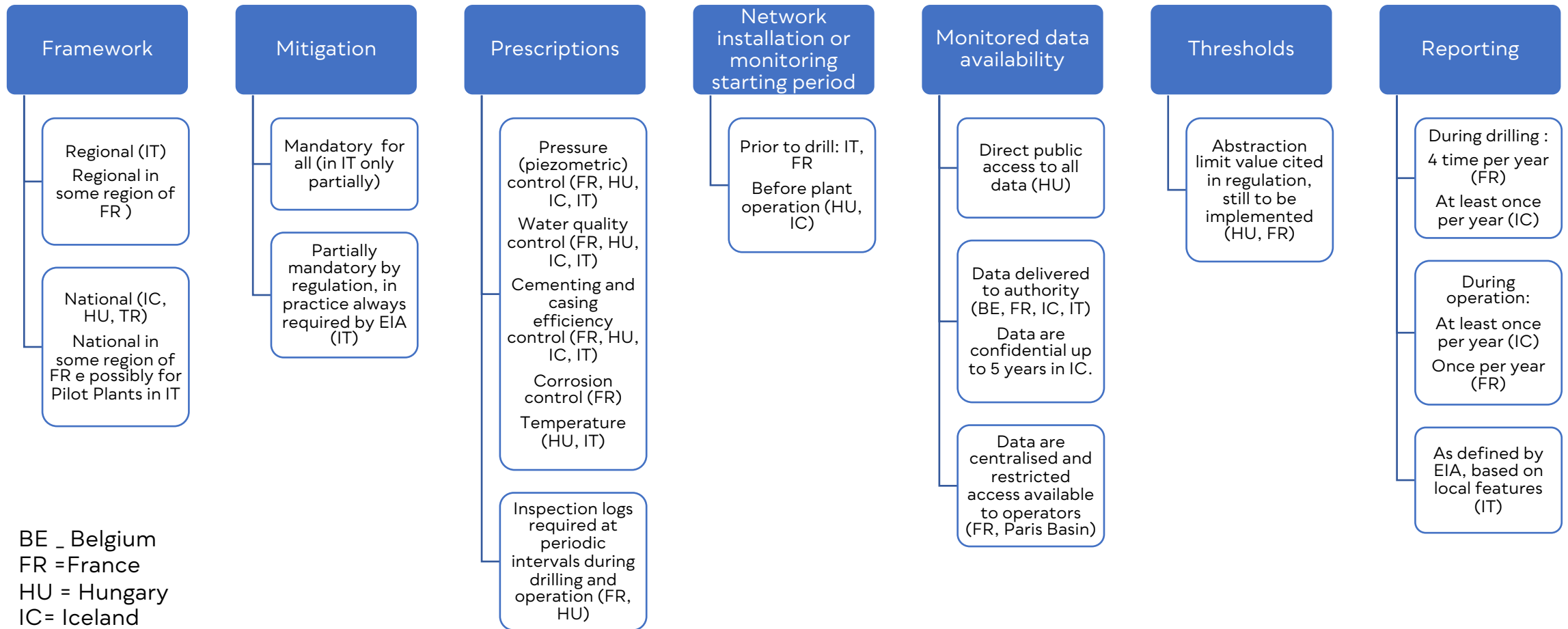
GEOENVI deliverable 4.3: Key recommendations

- A consistent implementation of the Renewable Energy Directive definition of geothermal energy
- A simplified and transparent application of the rules for the licensing of geothermal to simplify the process, to improve community engagement and create trust between citizens and geothermal developers
- A streamlined framework to enable geothermal energy development, notably regarding:
 - Well integrity: European code of good practices for deep geothermal wells
 - European code of good practices for seismicity monitoring
 - Enable environmentally friendly production of strategic minerals
- Apply GEOENVI LCA approach for geothermal environmental impact assessment, including the valuation of the impact of natural emission in the lifecycle of a project:
 - Simplified tools
 - Basis for comparability of projects
 - Provide transparency and confidence to authorities and local communities

○ The process

An example for **Aquifer interference**

Mapping how it is managed at national level



BE _ Belgium
FR = France
HU = Hungary
IC= Iceland
IT= Italy
TR = Turkey

○ Definition, comparison

Aquifers' interference covers legal framework to mitigate **potential** connection of aquifers via the wellbore, disturbance of non-targeted aquifers, modifications of reservoirs' physical status

Similarities

- A plan for excluding interference with non-targeted aquifers during drilling is required in all countries except Turkey, where aquifers are only mapped
- Pressure and groundwater quality control and cementation inspection are required in FR, HU, IC, IT
- Very detailed prescription in FR, HU, IC
- A code of good practice for drilling is available in BE, FR, IT.

Differences

- BE has prescription only for the drilling phase
- Corrosion control is required only in FR, and Temperature control is required only in HU and IT
- The concept of “abstraction limit value” is present in HU and France
- Data are: public in HU, confidential in BE, FR, IC, IT, centralised and restricted access available to operators in FR, Paris Basin.
- Reporting frequency is very variable

○ Case studies and search for useful guidelines and best practice

France (Guidelines edited by the BRGM in association with ADEME and in consultation with professionals from the sector: <http://infoterre.brgm.fr/rapports/RP-65443-FR.pdf>)

Well completion (data sheet 21)

- Overview of main parameters used for the well completion design and recommendations to ensure the well integrity.
- A technical protective casing is installed in the first hundreds of meter (300-400m)
- Deeper protected aquifers are secured by means of double casing

Cement logging (data sheet 72)

- Overview of available tools for cement logging, their limits and conditions for a proper cement logging interpretation.

Casing logging (data sheet 73)

- Information about available logging tools for steel and composite casing control.
- A method is proposed to quantify damage from casing logging measurements.
- Regular casing inspection due to mechanical damage, corrosion or bacteria is recommended.
- Recommended frequency of inspection:
 - every 3 years for injection well
 - every 5 to 6 years for production wells.

○ Comments and recommendations

Discussed in national workshops and survey

Comments

- Almost all issues, being related to water protection, are covered by the Water Act and its national implementations, including minimization of wastewater amount.

Preliminary recommendations *Please define what refers to guidelines and what to regulation*

Regarding interference with not-targeted and protected aquifers

- Harmonise best practice for monitoring and well design and control, following e.g. guidelines used in France (Paris Basin)
- Provide evidence of monitoring and control (aggregate and evaluated by expert) available to the public, e.g. by national observatories, geological surveys (*see data sharing*)
- *For discussion: how to deal with suspected responsibility of interference with respect to changes of the status of shallow aquifers*

Regarding sustainable use of geothermal reservoirs:

- Evaluate the medium and long-term behaviour of the geothermal reservoir status (using modelling tools)

○ A full set of recommendation

for all chosen topics

- Seismicity control
 - Potential modification of seismic activity
- Aquifers' interference:
 - Potential connection of aquifers via the wellbore, disturbance of non-targeted aquifers, modifications of reservoirs' physical status
- Aeriform emissions:
 - Potential geothermal fluid aeriform emissions during drilling and operation
- Discharge of geothermal fluids:
 - Potential chemical and temperature effects due to both discharge of geothermal wastewater and drilling fluids onto and into surface/underground water bodies and reinjection of geothermal fluids after production
- Complex licensing and delays
 - Involvement of multiple organizations in the licensing process, the need for multiple licenses etc.
- EIA and accounting for nature of individual projects
 - Towards dedicated guidelines?
- Dealing with uncertainty and R&D
 - Environmental risk (financial risk covered in GEO-RISK)
 - Cross-cutting topic
- Communication and social acceptance
 - Information sharing
 - Creating local benefits
- Organizing public participation

○ A full set of recommendation

for all chosen topics

Please help us to strengthen our work by participating to the survey at link
<https://forms.gle/mtAHJG1Pc1YNuu5y9>





GEOENVI

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [818242 — GEOENVI]

