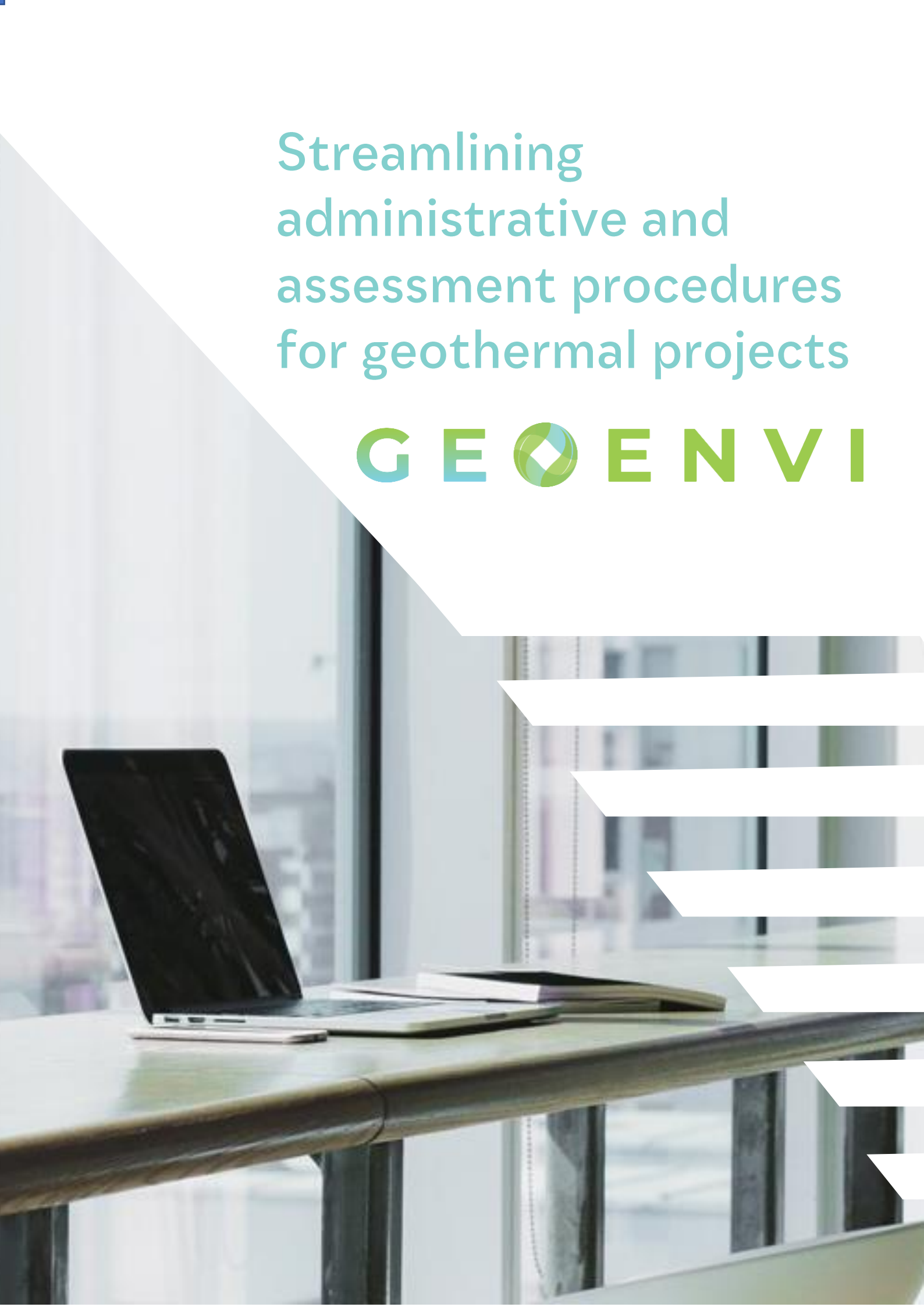


Streamlining administrative and assessment procedures for geothermal projects

GE  ENVI



Published in April 2021

Authors: A. Manzella¹, S. Giamberini¹, G. Montegrossi¹, D. Scrocca¹, C. Chiarabba¹, P. Valkering², S. Delvaux², V. Harcouët-Menou², F. Branchu³, J. Maury³, C. Maurel³, C. Bozkurt⁴, A. Nádor⁵, S.R. Guðjónsdóttir⁶, M. Guðmundsdóttir⁶, G. Ravier⁷, N. Cuenot⁷, D. Bonciani⁸, L. Torsello⁸, M. Luchini⁹, F. Batini¹⁰, P. Dumas¹¹

Author'(s) affiliation: ¹CNR, ²VITO, ³BRGM, ⁴JESDER, ⁵MBFSZ, ⁶Orkustofnun, ⁷ES-Géothermie, ⁸COSVIG, ⁹Enel Green Power, ¹⁰Rete Geotermica, ¹¹EGEC

The sole responsibility of this publication lies with the authors. The European Union is not responsible for any use that may be made of the information contained therein. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No [818242 — GEOENVI]



Streamlining administrative and assessment procedures for geothermal projects

Harvesting geothermal energy requires licensing. There are different approaches for licensing applied in the selected countries (see the Annex of the GEOENVI report D4.2 “Compilation of Recommendations on environmental regulations”¹ for collected data). In general, licenses are provided in two phases as exploration and exploitation by related state authorities.

Exploration license presents approval for feasibility studies to understand the existence and dimensions of the geothermal resource. The duration of this license is (i) 5 to 7 years in Belgium (5 for Flanders, 7 for Wallonia); (ii) 3 to 5 years in France; (iii) 4+2 years in Italy; and, (iv) 3+1 years in Turkey. Hungary provides a water license up to 2,500 meters and a concession for resources deeper than 2,500 meters.



¹ https://www.geoenvi.eu/wp-content/uploads/2021/04/D4.2-Recommendations-on-environmental-regulations-GEOENVI_300421.pdf



Licensing methodology in Iceland is quite unique compared to other countries. Research, prospection, and utilisation of the resource is defined under Resource Act, and power generation is the topic of the Electricity Act. The duration of provided licenses varies up to 65 years.

Exploitation license presents approval to harvest the discovered resources. There is no specific exploitation license provided in Iceland. Belgium and France offer an open duration, which is monitored in line with compliance of activities from the environmental point of view. This duration is 30 years in Italy and 30 + 10 years in Turkey.

With the exception of Iceland, where licensing is under the responsibility of a single actor, there are too many actors involved in licensing processes. These actors create complexity and slow down the work process by increased bureaucracy.

All countries require an environmental permit to grant any type of license.

Granted licenses define the frame on how to explore and/or exploit a geothermal resource. In Hungary there is a specific permit for heating plants.

In Turkey, since the geothermal law is power generation dominated, there are no specific conditions for direct use applications (heating and cooling for instance). There is a Heat Law under discussion within the Ministry of Energy that might fill such a gap and provide responsive legislation.

A challenge to overcome in selected countries is the required time to have a license granted. Especially EIA approval takes the most of the authorization time in all countries. Specifically, in France receiving a drilling permit can take up to 18 months.

The term 'license trade' sets another challenge for developers. Apart from Italy, there is no criterion on financial capabilities requested by authorities. For instance, in Turkey any legal entity or individual person can apply for an exploration license without questioning the capabilities of performing exploration activities.

Below a list of challenges is presented within the investigated countries:

- The investigated countries, except Iceland, are facing challenges due to the lack of centralized management. Such challenges are mainly caused by missing responsive communication between different permitting process actors that slow down the procedures.
- In some cases, EIA process may take too long (France, Iceland, Italy).



- Various issues should be solved in Turkey: the “license trade” during the early years of power generation development created a handover. Furthermore, its legislation is conceived for power generation only, and a frame for direct use applications is missing. Moreover, Turkey faces acceptance challenges for power generation due to some improper management of a few plants in the past.



Recommendations

1. Organising the permitting process as a “one-stop-shop”

Following the example of Iceland, where Orkustofnun represents the single actor- central manager of the processes, this recommendation refers to how a unique permitting process, including licensing the exploration, utilization, and power plant operation phases, helps to avoid complexity and delays.

2. Setting up a Best Practices Guide

Of use for the national and local authorities and administrations, the project developers, and financial institutions, such a guide is meant to improve knowledge and information exchange among all the actors involved.

3. Ensuring competent authorities possess the necessary knowledge, skills and training

The importance of adequate competences to assess the license and permit applications is underlined, to allow for sound guidance and evaluation and an efficient process.

4. Controlling the technical and financial capability of license applicants

Licensing of geothermal resources exploitation brought the creation of a “license trade”. When individuals or organizations acquire licenses, they should prove their commitment to respect law enforcement. To ensure the full execution of the projects, a certification of financial capacity and the payment of a guarantee or deposit should be requested.

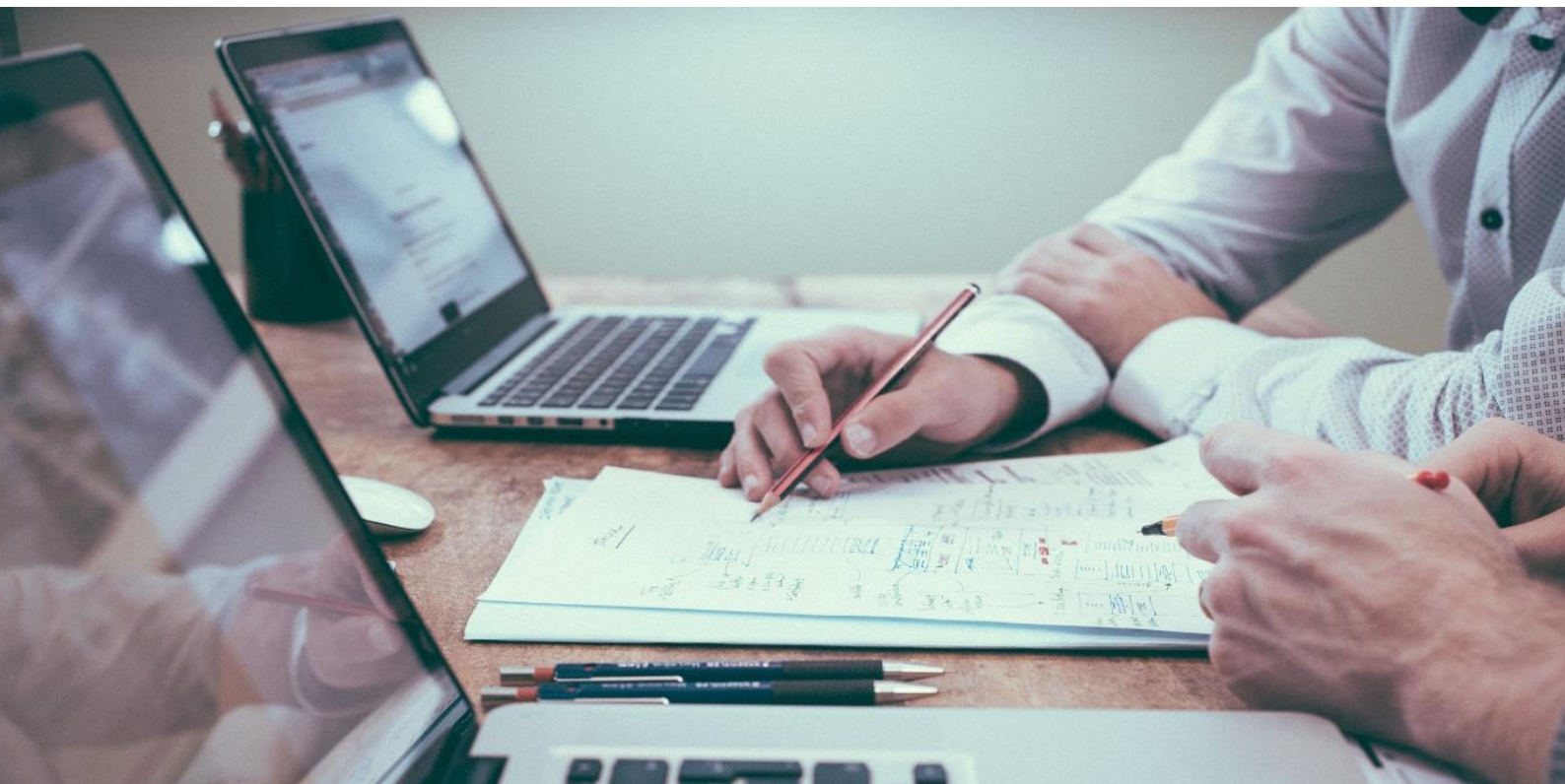
Environmental Impact Assessment

Environmental Impact Assessment (EIA), as defined under Directive 2011/92/EU (then amended by Directive 2014/52/EU), is a key element of the EU legislation dealing with the environmental impacts of projects. EIA is implemented in each GEOENVI country, although



the way it is incorporated in the overall permitting procedure differs (deliverable 4.1²). A particular challenge emerging from the GEOENVI workshop discussion is matching a generic regulatory framework and EIA procedures with the specific nature of individual deep geothermal projects and the specific types of environmental impacts and risks that may apply. The analysis therefore focussed on the questions: are 'sectorial', i.e., deep geothermal EIA guidelines necessary? How to design them so that they are clear and transparent in terms of requirements and expectations, yet efficient and flexible in accounting for differences among deep geothermal projects and avoiding unnecessary burdens for applicants?

Information was collected from different GEOENVI countries on how the EIA procedures for deep geothermal energy are implemented and to what extent specific guidelines, predefined thresholds, and mitigation measures for the geothermal sector are defined (see the Annex of D4.2 for details).



A main message is that EIA guidance remains rather general. The EIA procedure is quite similar across the studied countries, following the EU legislation regarding the elements the

² <https://www.geoenvi.eu/publications/decision-making-process-mapping/>



EIA must include³ (Table 4). In some cases, national guidelines are available to the operator (Belgium, France, Italy), but they are generally not tailored to deep geothermal specificities (only France includes elements concerning geothermal drilling). The scope of the EIA is defined in the general regulation on the EIA, and a standard list of impacts must be followed by the developer.

However, the developer can assess the importance of the impacts in the report due according to art. 4 and 5 of the Directive, and then analyse in deeper detail the most important ones. All the countries have thresholds defined by general regulations and laws. In most countries, no mitigation measures are imposed by law before the EIA procedures (France, Italy, Hungary), although they must be described in the EIA (Belgium, Italy, France).

The EU directive provides the possibility to be exempted from a full EIA (only for exploration and drilling projects) based on an Environmental Preliminary Study (EPS) or 'EIA screening', and similar procedures also apply to non-EU countries. However, a variety of exemptions criteria may be granted, such as the list of activities subject to an EIA, the type of permits concerned, and the depth of drilling. Even if some exemption of EIA can be granted (Belgium, France, Italy), in practice a full EIA is carried out by the developers. One reason is that requesting an exemption leads to a similar effort compared to going through the entire EIA process.

Viewpoints on how EIA procedures could be improved were collected from the GEOENVI consortium and further discussed with the stakeholders of the national and trans-national fora. Besides the need for dedicated guidelines, this revealed the need for more flexibility in the EIA procedure, accounting for the possibility to update EIAs as new information becomes available, and to take into account the individual nature of deep geothermal projects, avoiding posing unnecessary burden for applicants to report on environmental impacts of lesser relevance. The need for appropriate skills at the side of authorities was highlighted, too.

³ See the general EU guidance on EIA here: <https://ec.europa.eu/environment/eia/eia-support.htm>



Table 1: Guidance on EIA in different countries

Country	EIA guideline	Specifics for DGE	Scope: Environmental impacts to consider	Thresholds	Mitigation measures
Belgium	Yes	No, it is a generic guideline	The list of impact is defined by the developer. Generic guidelines included in the EIA office portal for some EIs.	Included in the regulation. The guidelines per discipline include thresholds (regulated), generic for all sectors	There is a handbook with general mitigation measures
France	Yes	Yes, for geothermal drilling	Standard list of impacts included in the general EIA require examination for DG	No, but defined in the regulation	The EIA guideline doesn't provide prescription for the mitigation of EI.
Hungary	No	No, not specifics for DG	No, but defined in the regulation	No, but defined in the regulation	N/A
Italy	No, only recommendations to avoid EI&R	No, not specifics for DG	Standard list of impacts included in the general EIA; the developer declares what does not apply	In Tuscany included in the EIA regulation.	Not in EIA regulation, prescriptions are given in the EIA decision.

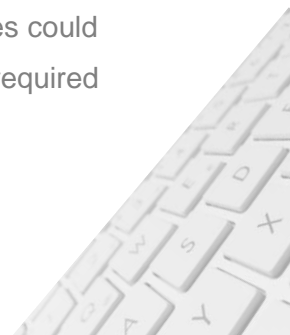


Recommendations

1. Drafting simple EIA guidelines dedicated to deep geothermal

Dedicated and simple EIA guidelines for deep geothermal development, listing the specific environmental effects to be evaluated, would provide added value on at least three main aspects. First, it is important that the developers and authorities together tailor the scope of the EIA to the specific characteristics of the project and of the geological context, and the guideline should give directions on how this flexibility can be implemented.

Second, dedicated guidelines would provide clarity on the EIA process. The guidelines could take the form of a Table of Contents and clarify what documents and information are required



for each part. This would facilitate the EIA procedures, as would reduce the requests for integration and the duplication of data in different documents.

Third, it would provide clarity and harmonization of the procedures for EIA exemption so that the overall burden of EIA – if the nature of the project allows it – can be reduced.

It is suggested to include also an estimation of environmental benefits, like avoided GHG emissions and the contribution to renewable energy targets of the member states.

2. Providing more flexibility in the process from exploration to implementation

The process could be more flexible by introducing the possibility to update previous full EIAs to a new situation. Two cases are considered: 1) the modification of an already existing environmental permit for which already a full EIA was submitted, 2) an update for the EIA as more information becomes available, for example, after the exploration phase. The latter would account for uncertainty, as impacts and risk are not entirely known at the start of the exploration. A point of attention, however, is to avoid that too rigid consecutive update requirements become a source of delays. A full EIA (covering both drilling and plant operation), to be updated after the drilling results are available, would help in this view.

3. Ensuring appropriate competences and skills at the side of authorities

Finally, the importance of adequate competences on the side of the authorities is underlined to allow for good guidance and evaluation and an efficient process.

4. Defining Best Available Technologies for deep geothermal

As for other industrial sectors, a list of Best Available Technologies would be an important reference for the EIA.

Case studies and good practice

In developing dedicated guidance for the deep geothermal EIA, the following current good practices provide a starting point:

- The generic EIA guidance documents³.
- The Italian guidelines on mitigation measures for deep geothermal energy (only available in Italian)⁴ (considered by Italian stakeholders a starting point for more detailed guidelines).

⁴ <https://unmig.mise.gov.it/images/docs/linee-guida-geotermia.pdf>



- Regional (Tuscany, Italy) decree establishing “Guidelines for limiting atmospheric emissions from geothermal power plants”, which indicates the prescriptions to be used for the EIA and is the reference for aeriform emissions and related BAT.
- The Good Practice Guide for lessons learned from Deep Geothermal Drilling, prepared in France^{Error! Bookmark not defined.}
- The Handbook for the Best Practices for Geothermal Drilling⁵, prepared in the U.S.A. in 2010.

⁵ <https://www1.eere.energy.gov/geothermal/pdfs/drillinghandbook.pdf>



Contact: Fausto Batini, Magma Energy Italia,
fausto.batini@magmaenergyitalia.it

Coordinated by: EGEC, com@egec.org

GEOENVI website: www.geoenvi.eu



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

This document is part of a series conducted in the framework of the GEOENVI project. Its aim is to respond to the need for harmonisation of environmental regulations and to address concerns about potential environmental effects of geothermal projects in Europe.

GEOENVI strives to facilitate the incorporation of geothermal energy in Europe's energy transition, while respecting sustainability and creating a robust strategy to answer environmental concerns. The project developed a unique Life Cycle Assessment methodology for evaluating geothermal projects.