



Exploring the bearing of subjective preferences on site selection processes

Martin Navarro, Stephan Hotzel, Ute Maurer-Rurack, Gerd Frieling, and Torben Weyand

Federal Office for the Safety of Nuclear Waste Management (BASE), Wegelystr. 8, 10623 Berlin, Germany

Correspondence: Martin Navarro (martin.navarro@base.bund.de)

Received: 6 April 2023 – Accepted: 24 May 2023 – Published: 6 September 2023

Abstract. The German site selection process aims to find a site for a deep geological repository that is characterized by the best possible safety (Deutscher Bundestag, 2020). This search involves successive decisions regarding the exclusion or preference of subareas, siting regions, and sites. Although founding such decisions on purely objective grounds would be preferable, the influence of subjective values and preferences on decisions cannot be neglected. In decision theory, goal setting as well as the choice and aggregation of the criteria used to achieve the goal are known to depend on subjective values and preferences (Laux et al., 2012). From a subjectivist perspective, normative propositions (which state how things *ought* to be) are propositions about subjective preferences (Kutschera, 1982). Site selection is guided by normative and, therefore, subjectively influenced statements on how “best possible safety” *ought* to be understood, which safety criteria *ought* to be regarded as suitable, and how criteria *ought* to be aggregated and evaluated. Therefore, subjective preferences have the potential to influence the outcome of the site selection process. However, does that mean that the site selection process can take an arbitrary course? In contrast, do regulations sufficiently limit the latitude for subjective preferences in the decision process?

The presentation will discuss these questions based on interim results of the METIENS (Methoden, Bewertungskriterien und transparente Entscheidungsprozesse zur Identifikation eines Endlagerstandortes mit bestmöglicher Sicherheit) research project, which is carried out by the Federal Office for the Safety of Nuclear Waste Management (BASE). Since January 2022, METIENS has investigated the fundamental challenges of a site selection process that is characterized by high variability with respect to host rocks, safety concepts, and repository concepts, as in the German case. The project identifies possible ways to evaluate and compare the safety of potential repository sites, and it investigates the objective or subjective grounds on which they can be justified. The project follows the decision-theoretic structure of the problem of site selection by clarifying “best possible safety” and identifying operational and compatible target systems and safety indicators for this goal. The presentation will provide examples of unavoidable subjective decisions in the evaluation of safety. It will point out why subjectivity does not necessarily imply arbitrariness. Moreover, the possibility of acceptable subjective preferences and the specific role of regulations are discussed.

References

- Deutscher Bundestag (BT): Gesetz zur Suche und Auswahl eines Standortes für ein Endlager für hochradioaktive Abfälle, Standortauswahlgesetz – StandAG (BGBl. I, 26), 7 December 2020.
- Laux, H., Gillenkirch, R. M., and Schenk-Mathes, H. Y.: Entscheidungstheorie, 8th edn., Springer, Berlin Heidelberg, 54 pp., 2012.
- Kutschera, F. V.: Grundlagen der Ethik, de Gruyter, Berlin, New York, p. VIII, 371 pp., 1982.