



The importance of social science research in nuclear waste management shown by three projects on public participation

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Received: 12 April 2023 – Revised: 16 June 2023 – Accepted: 21 June 2023 – Published: 6 September 2023

Abstract. The disposal of nuclear waste is not only a technical challenge but also a sensitive socio-political issue. Especially in Germany, the search for a final repository for highly radioactive waste is complicated by past and present societal conflicts surrounding the use of nuclear energy. Hence, safe nuclear waste management requires social science research that examines the nuclear waste problem in its social context. We illustrate this claim by presenting the results of three contract research projects dealing with public participation, commissioned by Germany's Federal Office for the Safety of Nuclear Waste Management (BASE).

Public participation is central to the safety of nuclear waste management. First, the safety of disposal practices is often improved by the general public's critical input. Second, public participation may increase the acceptability of nuclear waste disposal in a particular region, which is important to ensure the successful implementation of waste management strategies. Third, public participation serves to preserve knowledge and maintain competence, since it keeps the topic of nuclear waste present in people's minds. Therefore, social science research that improves public participation measures makes a significant contribution to the safety of nuclear waste management. This contribution presents three projects that illustrate how social science can improve public participation. The first project surveyed the German population regarding the search for a final repository for highly radioactive waste. The second examined the utility of digital participation tools. The third project dealt with the legal, political, and cultural challenges of cross-border public participation.

The first project surveyed a representative sample of the German population. Survey participants answered questions pertaining to the structure and current state of Germany's search for a final repository, their main concerns in relation to this search, and their desire to participate in the search. Results show that Germans are most concerned about safety issues and currently have little desire to actively participate in the search, but instead demand to be well informed. The results of this project allow BASE to adapt its public participation strategy to the German population's needs, thereby increasing its effectiveness.

The second project examined the utility of digital participation tools in the context of the search for a final repository. Past events implemented by BASE were marked by the underrepresentation of young people, women, and also people with lower educational attainment and migrant backgrounds. First, the project team carried out a literature review that showed that the use of digital tools does not solve issues of underrepresentation. The team then used focus groups to demonstrate the importance of schools, appealing designs, and gamification when addressing young people. The project ended with a workshop wherein experts discussed the project's results and developed prototypes of digital tools to support BASE's efforts to engage young people. Reaching young people is crucial to preserving knowledge and increasing the acceptability of nuclear waste disposal, since today's younger generations will be affected by and responsible for the final repository.

The third project dealt with the legal, political, and cultural challenges of implementing public participation across borders. BASE will have to facilitate public participation in multiple countries if the proposed site for the final repository is in close proximity to Germany's border. The project team first conducted a literature review to analyze the challenges of cross-border public participation. The second part consisted of in-depth case studies

of three different planning procedures, conducted in Switzerland, Germany, and the Czech Republic. Finally, researchers conducted five regional case studies, covering regions in Denmark, the Netherlands, the Czech Republic and Poland, Austria, and France. The project resulted in a sketch of a model cross-border participation process, ensuring that BASE will be able to successfully implement such a process.

These projects show that social science research can improve the quality of public participation measures. Since public participation is crucial to the safety of nuclear waste management, so are the social sciences.