

THE SEARCH PROCESS FOR A REPOSITORY SITE FOR HIGHLY RADIOACTIVE NUCLEAR WASTE

BUND'S CRITICISM AND DEMANDS



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INTRODUCTION

For two years, BUND worked constructively and with considerable engagement with the Bundestag's Commission on the Storage of Highly Radioactive Nuclear Waste to amend Germany's current Site Selection Act (Standortauswahlgesetz, StandAG), a piece of legislation that we had criticized strongly. In BUND's view, the commission report presented in late June 2016 contains a number of sound and important suggestions for improving the current site selection process. However, it also contains central, fundamental flaws that prevent us from endorsing it. Crucial points of the future site search process need to be amended to ensure that the necessary confidence is built.

Among the issues BUND criticizes is the lack of clarity with regard to the kind of nuclear waste to be stored. The commission spent more than two years trying to develop

criteria and a process to select a repository site for highly radioactive waste for more than two years. It finally proposed integrating radioactive waste from the Asse repository, from uranium enrichment and other nuclear waste not suitable for storage in the Konrad repository into the process as well, but without proposing appropriate *criteria* or a methodology. BUND also criticizes the lack of legal recourse after the first phase of site selection for above-ground exploration is complete. Furthermore, we consider the commission's inability to agree on giving up the *Gorleben* site to be unacceptable.

With this brochure, we aim to present the site selection process as it would be according to the commission's proposal, as well as the specific points of the proposal that we criticize and in which we see room for improvement.

The timeline depicts events of the site selection process.

The time required to implement the process is difficult to calculate. Therefore, we indicate two different years for most events. The top row is based on the original specifications in the Site Selection Act. The second line is an experience-based calculation that refers to the commission's conservative scenario.



In Phase I, sites are selected for above-ground exploration.

In Phase II, sites are selected for underground exploration.

In Phase III, the site offering the best possible safety is selected.



EVALUATION OF THE COMMISSION'S PROPOSAL:

IMPROVED SEARCH PROCESS – WITH FUNDAMENTAL WEAKNESSES

The report of the Commission on the Storage of Highly Radioactive Nuclear Waste proposes amendments to the existing Site Selection Act and thus the search process. The commission, however, only represents the start of the long road to a nuclear waste repository. The plan to prompt a broad public debate on the future process to select a potential repository site has failed. We therefore still lack the urgently needed public consensus on the site selection process now that the commission's work is complete. In our view, higher standards must be applied to the search process in future to address this shortcoming.

New search criteria:

The commission developed a new proposal for the *criteria* to apply to the search. Its legal mandate was to develop *criteria* that allow a search in salt, clay and crystalline rock. Neither are included in the commission proposal. The commission did not really solve the issue of an equivalent approach for all relevant rock types, but essentially settled on formula compromises.

BUND therefore calls for underground exploration and concept development for granite, clay and various salt structures to be made compulsory in the Site Selection Act.

On the positive side, the commission was ultimately able to agree on an assessment criterion for protective cap rock as well as a “good temperature tolerance” criterion. BUND does not regard this as sufficient, however. The *criteria* must prescribe a second, distinct and independently effective geological protection component as well as clear requirements for the retrievability of nuclear waste. The commission proposal covers neither of these points.

BUND’s main criticisms of the proposed search process:

- **Lack of clarity about the type of nuclear waste for which a repository is being sought**
The commission spent more than two years working on *criteria* and a process to select a repository site for highly radioactive waste. It finally proposed integrating radioactive waste from the Asse repository, from uranium enrichment and other nuclear waste not suitable for storage in the Konrad repository into the process as well, but without being able to specify the necessary *criteria* or a more advanced procedure.
- **Lack of legal recourse following each phase of the process**
The three phases of the site selection process will extend over several decades. The commission proposes that citizens, landowners and territorial authorities of the affected regions be given the option of judicial review of the site selection process following Phase II and at the conclusion of the process. That is a good thing. However, there is still no provision for such recourse after the completion of the first phase of site selection for above-ground exploration. This devalues the new approaches to public participation, as the public has no rights in the first phase, which is so essential to building trust.

- **Gorleben remains a burden on the future process**
The work in the commission has shown that the *Gorleben* site cannot remain in the process without constituting a massive burden. When drafting the *criteria*, the question of what they would mean for the one known location always remained in the background. A clean process involving *Gorleben* is not possible. BUND is of the opinion that the desired public consensus will not be possible with *Gorleben*, and that sticking to this location will delay the search process further.
- **Lack of constitutional protection for the nuclear phase-out**
The phase-out of nuclear power is the cornerstone for the future search process. To provide lasting security in this regard, BUND proposed enshrining the nuclear phase-out in the Constitution of the Federal Republic of Germany. While the commission deemed this possible and permissible, it only went as far as to issue a recommendation for review to the Bundestag.

BUND envisages important improvements over the current law in these points:

- **A new administrative structure to provide clarity and a new state repository authority as the project operator**
The DBE – the authority for the construction and operation of repositories, in which operators of nuclear power plants hold a 75 percent stake and which has been responsible for the *Gorleben* and Schacht Konrad projects to date – would no longer play a role here.

- **Enhanced legal protection**
This would involve introducing judicial review of site selection and repository approval (conclusion of Phase III). The option of judicial review of the selection of sites for underground exploration (conclusion of Phase II) would remain in place. Affected communities, their inhabitants and affected property owners would have the right to sue. What is lacking is the right to take legal action at the conclusion of Phase I (see above).
- **Legal stipulation of a comparative search for the “site offering the best possible safety”**
This would establish that the sites offering the greatest safety benefits would prevail at every stage of the search process.
- **Enhanced transparency**
Information rights in the process would be improved through the introduction of wide-ranging disclosure requirements and a register of information.
- **Enhanced public participation**
Participation would occur earlier than previously provided for by law (statutory written interim report by BGE on relevant sub-areas). The affected regions would play a central role. *Regional conferences* would therefore be introduced as institutions for ongoing participation. The conferences would be granted statutory audit rights and resources.

- **Good procedures for dealing with inconsistent data availability at the beginning of the process**
Knowledge of geological structures varies considerably from region to region. Furthermore, significantly less data is available on clay and crystalline rock, host rocks previously neglected in Germany. It is therefore right and proper that the commission proposes to provide the option to acquire further data during the first phase of the search process. This now depends to a very large extent on the evaluation by BGE as the project operator, however.



FIRST STEP



Starting point: blank map (This image is frequently used to illustrate a theoretical lack of predetermination of a final repository site. In practice, however, some German regions are more suitable than others due to their geological characteristics.)

Goal: identification of potentially suitable sub-areas

Basis: existing data from the geological authorities

⚡ UNCLEAR: The type of waste for which the repository is needed – should nuclear waste from Asse and from uranium enrichment also be stored at the site? BUND calls for clarity and advocates a dedicated search process for the other waste.

⚡ GORLEBEN: BUND has repeatedly called for *Gorleben* to be excluded from the site selection process. A majority could not be reached in the commission in this regard, however.

PUBLIC PARTICIPATION

The *national supervisory committee* is already active and monitoring the process.

SECOND STEP



Starting point: identified sub-areas

Goal: a *BGE* proposal of sites for above-ground exploration

Basis: existing data from the geological authorities

Process: *BGE* provides *BfE* with an interim report containing a proposed selection of sub-areas and establishing the regions in which further exploration will take place

⚡ All possible geological formations (salt, clay, crystalline) in all German states must be part of the search process.

⚡ DATA AVAILABILITY: BUND criticizes the lack of nationwide, comparable geological data. In the view of BUND, no site may be ruled out due to non-existing or insufficient data.

PUBLIC PARTICIPATION

Sub-area conference discusses *BGE* interim report // *national supervisory committee* continues its work

THIRD STEP

Starting point: *BGE* proposal regarding sites for above-ground exploration

Goal: determining sites for above-ground exploration

Basis: existing data from the geological authorities

Process:

- *BGE* provides *BfE* with a proposal for the selection of sites for above-ground exploration and for related exploration programs
- *BfE* initiates *regional conferences* for the selected sites
- *BfE* reviews the *BGE* proposal
- formal public participation takes place with opinions and hearings
- Bundestag decision on regions for above-ground exploration
- *strategic environmental assessment (SEA)*

⚡ BUND calls for the provision of legal recourse options after the completion of each phase of the site selection process. Affected parties would otherwise have to wait too long before they can assert their rights.

⚡ "COUNCIL OF REGIONS" CONFERENCE BUND calls for granting the "*Council of Regions*" conference a statutory right of review. The commission did not concur. This important body thus does not have an independent right of review.

PUBLIC PARTICIPATION

Regional conferences review the results of the phase at the respective sites // The *national supervisory committee* also evaluates the results of Phase I // The "*Council of Regions*" conference convenes after the formation of the *regional conferences*, and is active above all in Phase II and III

»» BUNDESTAG DECISION



Public participation in Phase I





PHASE II


STARTING POINT

Starting point: Bundestag decision on sites for above-ground exploration

Goal: sites for underground exploration

Process:

- above-ground exploration work
- review of the exploration findings
- application of the *criteria* and performance of *safety investigations* at the sites based on the findings
- publication of a *BGE* proposal regarding sites for underground exploration

 When will *Gorleben* be dropped from the process? BUND is convinced that in a fair process, *Gorleben* would not be among the sites for above-ground exploration. But how fair will the process be? We have retained *Gorleben* on the following maps as a warning.



PUBLIC PARTICIPATION


Regional conferences monitor the process from site perspective //
 The *"Council of Regions"* conference monitors the process from the supra-regional perspective //
 The *national supervisory committee* remains active

RESULT

Process following publication

Report by BGE:

- *BGE* provides report to *BfE*
- *BfE* reviews the proposal
- *strategic environmental assessment (SEA)*
- *BfE* responds to review orders, opinions and hearings
- legal recourse
- Bundestag decision on sites for underground exploration

 The process is now going into the decisive phase. However, is the nuclear phase-out still being realized? Has it been enshrined in Germany's Constitution after all?

PUBLIC PARTICIPATION

The regions affected by the *BGE* proposal review it within the framework of the *regional conferences* and may each issue a review order //
 The *"Council of Regions"* conference monitors the process from the supra-regional perspective //
 The *national supervisory committee* is active

»» BUNDESTAG DECISION

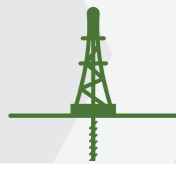


Public participation in Phase II



Public participation in Phase II





PHASE III

STARTING POINT

Starting point: Bundestag decision on selection of sites for underground exploration

Goal: selecting the site offering the best possible safety

Process:

- underground exploration work
- review of the exploration findings
- performance of safety analyses for the explored sites based on the findings
- comparison of sites by BGE

⚡ BUND calls for underground exploration and concept development for granite, clay and various salt structures to be made compulsory in the Site Selection Act.

PUBLIC PARTICIPATION

Regional conferences monitor the process from site perspective //
 The "Council of Regions" conference monitors the process from the supra-regional perspective //
 The national supervisory committee remains active



RESULT

Process following conclusion of Phase III:

- BGE writes report and provides it to BfE
- BfE reviews the proposal
- environmental impact assessment of the proposed site
- BfE submits proposal to the federal government
- legal recourse

⚡ Will the federal government stick to its plan to build a receiving storage facility for at least 500 CASTOR dry casks at the designated site before the final approval of the repository?

PUBLIC PARTICIPATION

As only a single site remains, only one regional conference monitors the process //
 The "Council of Regions" conference monitors the process from the supra-regional perspective //
 The national supervisory committee remains active

»» BUNDESTAG DECISION



»» BEST POSSIBLE SITE FOR A NUCLEAR WASTE REPOSITORY



Public participation in Phase III

- National supervisory committee
- Regional conferences
- "Council of Regions" conference

Public participation in Phase III

- National supervisory committee
- Regional conferences
- "Council of Regions" conference

GLOSSARY



PHASE I above-ground exploration



PHASE II underground exploration



PHASE III site selection

BfE (Bundesamt für kerntechnische Entsorgungssicherheit, federal office for nuclear waste safety) This federal government office is the regulatory authority and organizer of public participation in the site selection process. The BfE is responsible for setting up the regional and sub-area conferences.

BGE (Bundesgesellschaft für Endlagerung, federal repository authority) This 100% state-owned company is responsible for the project.

“Council of Regions” conference The task of this body is to review the findings of the BGE and BfE and compare the processes of the regional conferences. The focus here is on the supra-regional perspective. The body is made up of representatives of the regional conferences.

Criteria The commission has proposed criteria for excluding regions (due to risks such as volcanic activity or earthquakes), minimum requirements for all potential sites and weighing the unique properties of each site and between sites.

Effective containment zone (ECZ) The criteria for selecting a site focus primarily on finding an area within salt, clay or granite geological formations. The site conditions must ensure that nuclear waste can be completely and safely sealed away for 1,000,000 years. This effective containment zone does not have natural boundaries, but must be predicted mathematically.

Environmental impact assessment A precautionary environmental policy instrument designed to assess the possible negative effects of projects on the environment prior to their approval.

Gorleben Underground exploration had already been performed on the controversial salt dome and a preliminary safety analysis (vorläufige Sicherheitsanalyse, VSG) had been started. The exploration was ended by the Site Selection Act and the VSG cancelled without results. Nevertheless, more is known about Gorleben than about any other potential site in Germany.

National supervisory committee The role of this body is to monitor and supervise the site selection process for the common good. Building and maintaining trust between the actors plays a central role in this regard. The committee examines proposals by the BGE and BfE during the site selection procedure and may develop its own proposals. The national supervisory committee is made up of citizens and public figures.

Regional conferences These will be set up in all of the proposed regions as continuous institutions. Regional conferences monitor the process steps in their respective regions, and they have the right to demand one BGE review during each phase of the process. This is designed to strengthen the influence of the affected parties at the sites.

Safety investigations These investigations assess the geological suitability of the sites (effective containment zone and overall geological situation) and how the repository mine can be safely constructed, operated, monitored and sealed. Retrievability must be ensured during the facility's operation; the waste must remain recoverable 500 years after operation ceases. To this end, concepts specific to the individual rock types and suitable containers must be developed during the process that can then be gradually finalized for the individual sites.

Strategic environmental assessment A systematic procedure stipulated by an EC directive to examine environmental aspects of strategic planning and the design of programs.

Sub-area conference The purpose of this body is to discuss the BGE's interim report following Phase I, Step 2 of the site selection process. Unlike the later regional conferences, the sub-area conference will take action early and at the supra-regional level. The body will consist of representatives of the sub-areas identified in Phase I Step 2.



THERE IS PLENTY MORE NUCLEAR WASTE

Nuclear waste is being stored throughout Germany

The impression frequently arises that dealing with highly radioactive nuclear waste over the long term is the sole issue we face. Yet there are countless acute problems and hazards throughout the country. The issues include conflicts over nuclear waste in municipal landfills and the dismantling of nuclear power plants, the safety problems of interim storage facilities, the cancellation of the Brunsbüttel interim storage facility's permit, and difficulties associated with the recovery of nuclear waste from the Asse repository. Anyone promising the safe long-term management of nuclear waste must first demonstrate that everything is being done to minimize current acute dangers. That is certainly not the case today.

Risky interim storage

CASTOR casks containing highly radioactive nuclear waste are kept in central interim storage facilities in *Gorleben*, *Ahaus* and *Lubmin*. Since the ban on transporting spent nuclear fuel to reprocessing facilities in France and the UK was put in place, local interim storage facilities have been set up near the nuclear power plants. None of the interim storage facilities provide adequate protection. Furthermore, the local interim storage facilities are only authorized for 40 years, after which the nuclear waste is supposed to be transported to a safer repository. Whether such a repository will exist by then is highly doubtful. The issue is compounded by the greater safety risk of an even longer interim storage in aging CASTOR casks.

Release

In Germany, it is possible for materials and waste with very low levels of radioactivity to be "released" from the authority of the Atomic Energy Act and Radiological Protection Ordinance and treated as conventional waste. This means that materials from a nuclear power plant that is being dismantled can be put in a normal household landfill or reused as recyclable material following a "release measurement". Because of the currently pending simultaneous closure of eight reactors, the volume of released material could be so great as to jeopardize compliance with radiological protection objectives for the population. BUND rejects the undeclared release of radioactive materials, as this contradicts the goals of radiological protection. Furthermore, the justification of release thresholds is technically indefensible.

Trust does not arise from promises, but from verifiable, transparent action. BUND therefore calls for all radioactive materials and the issue of interim storage to be integrated into a comprehensive approach for dealing with nuclear waste.



BUND'S DEMANDS

BUND calls on the members of the German Bundestag and the federal government to quickly begin the urgently needed revision of the Site Selection Act and to incorporate as many proposals of the commission, and above all BUND's further demands, as possible:

BUND calls for underground exploration and concept development for granite, clay and various salt structures to be made compulsory.

BUND calls for the German government to legislate a general ban on the export of spent fuel as proposed by the commission.

BUND calls for the assessment of all safety requirements with respect to the repository, the storage concept, the container concept and radiological protection for the public and facility staff to be based on a ten to twenty-fold higher radiation risk than previously.

BUND calls for options for legal recourse after the completion of each phase of the site selection process. In the event of a dispute, this is essential to ensuring that the procedure and public participation in it follows the provisions of the law in each phase of the long process.

BUND calls for a broad public process to clarify the future of interim storage, the necessity of upgrades, and whether new buildings are needed to replace the old storage facilities.

BUND is of the opinion that the desired public consensus will not be possible with *Gorleben* and that sticking to this location will delay the search process further.

BUND calls for a second, distinct and independently effective geological protection component as a minimum requirement in the *criteria*.

BUND calls for members of the Bundestag to approve the review order developed by the commission. We furthermore call on them to initiate an amendment of the Constitution to secure the phase-out of nuclear energy parallel to the amendment of the Site Selection Act.



THE EARTH NEEDS ALL THE FRIENDS IT CAN GET

BUND – Friends of the Earth Germany – is an organization for anyone who wants to protect nature and preserve our planet for future generations. Join us in shaping the future by protecting animals, plants and rivers, promoting consumer advocacy and, of course, taking action for the climate – locally, nationally and internationally.

We invite you to take action!

Support our work for an environmentally sound transition to decentral, clean energy – away from coal and nuclear and toward renewables.

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