



Supplement of

Management of high-level radioactive waste in Germany: roads from storage towards disposal – need and options for action

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Management of high level radioactive waste in Germany: Roads from storage towards disposal

Results of the research project WERA

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Content

- Aims of the research project WERA
- Steps on the road towards disposal
- Developing Scenarios for each step
- Combination of steps: Scenarios of disposal roads
- Scenario analysis
- Some results

Aims of the research project WERA

- The recent situation in Germany
 - Spent fuel and reprocessing waste are held in 16 interim storage facilities
 - Ongoing site selection process for a final repository
- Aims of WERA:
 - Display the road from interim storage to final disposal in a sealed geological repository
 - Identify need for action and options for action along that road
 - Highlight tasks and objectives for future action

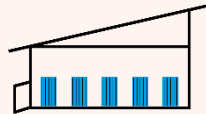
Steps on the disposal road

- Steps on the german road towards final disposal:

- Interim Storage



- Receptional storage



- Waste conditioning



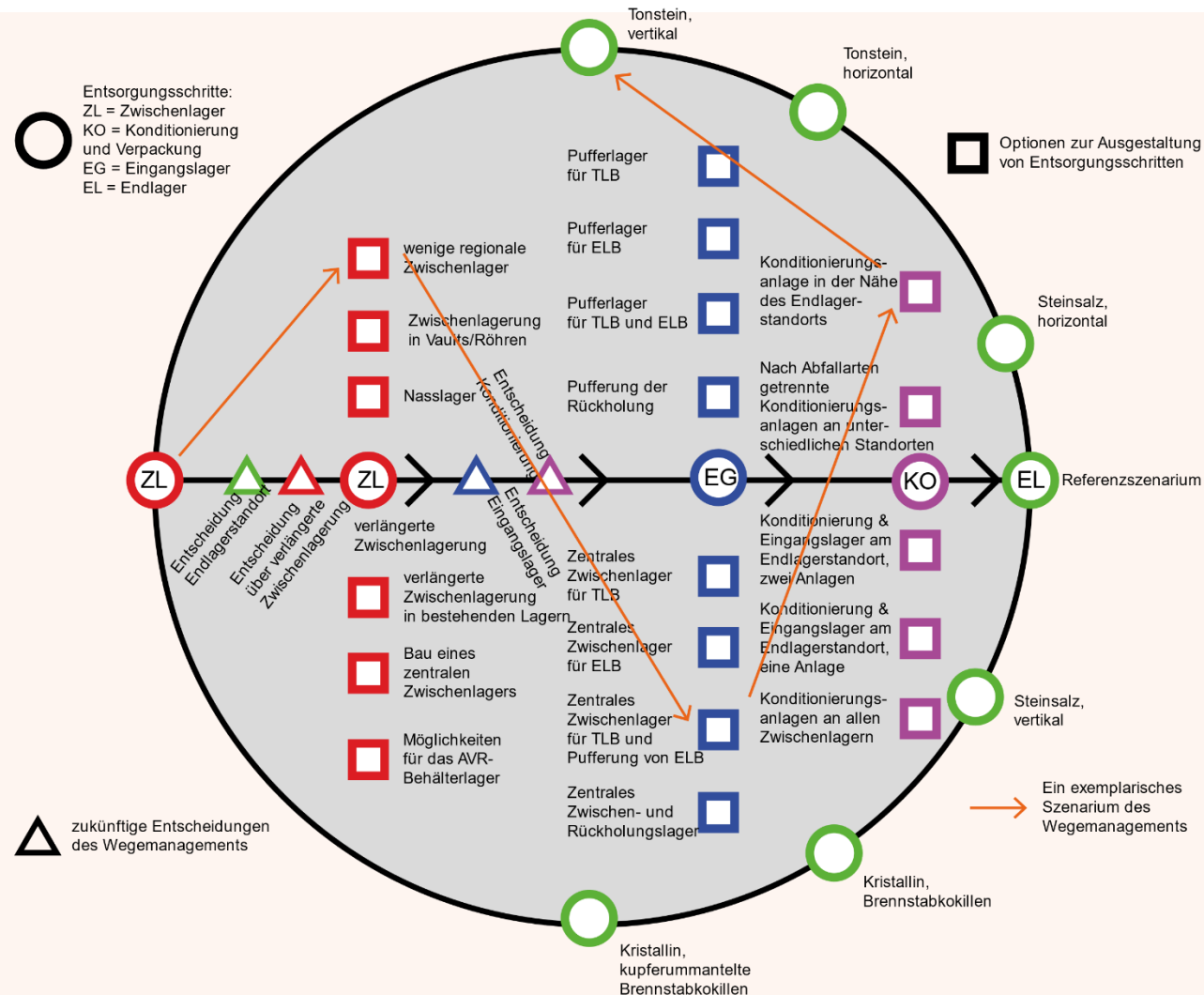
- Final disposal



Scenarios of disposal steps

- E. g. Interim storage:
 - Extended interim storage on existing sites
 - Construction of a central interim storage facility
 - Concentration on (and maybe construction of) a few central interim storage facilities (e.g. north, middle, south)
- E. g. final disposal:
 - Final disposal in rock salt
 - vertical boreholes, non shielding containers
 - horizontal disposal, shielding containers
 - Final disposal in claystone
 - ...
 - Final disposal in crystalline rock

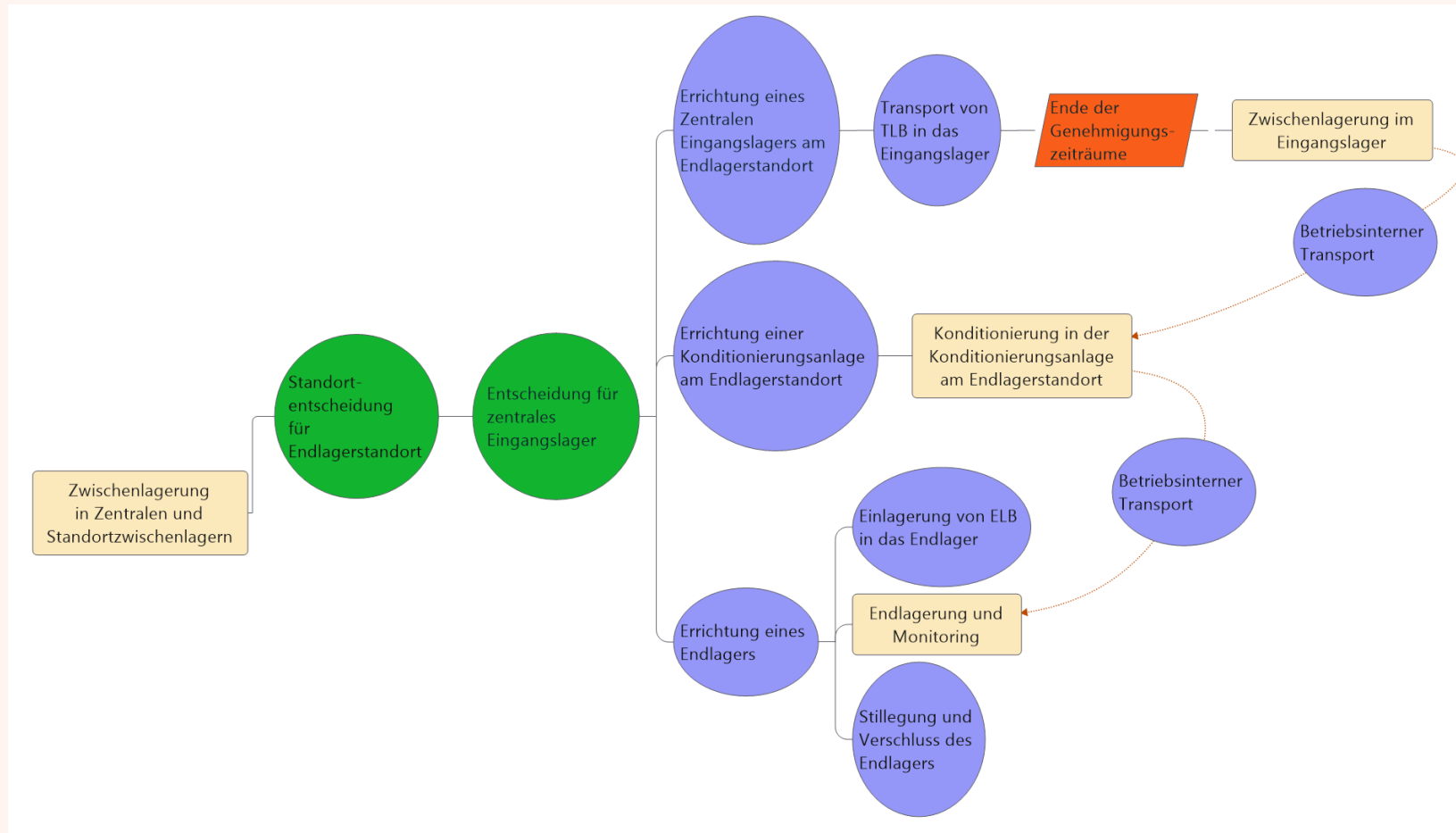
Roads towards disposal



Scenarios of disposal roads

- Use of Mind Mapping for display and analysis of scenarios
- Reference Scenario and alternative scenarios
- Scenario analysis leads to the identification of
 - dependencies between disposal steps
 - need for decisions to be made
 - action to be taken
 - consequences for the public, politics and science

Mind-Mapping the reference scenario



Some results (1)

- The site-selection is key to most upstream decisions and processes
- Extended interim storage will take place. There is an urgent need for development of a concept of extended interim storage, including requirements, a time frame etc.
- A concept for maintenance and repair of dry storage casks has to be developed and affordable installations need to be constructed
- Due to the foreseeable extended interim storage there will be a need for technical installations to deal with damaged spent fuel elements in any conditioning facility
- Receptional storage is subject to the same risks, actions, incidents and need for action as interim storage or long-term interim storage facilities

Some results (2)

- Using an on-site receptional storage building for all high level radioactive waste might open up a chance to deal with the need for extended interim storage
- There are a number of technical, societal and political arguments supporting the construction of a centralised facility for extended interim storage/receptional storage
- Conditioning and packing of high level waste into disposal containers well in advance of the operation or even the site selection of a deep geological repository might be a way to deal with a number of risks arising from extended interim storage
- The development of, maybe modular, storage casks for the use in any host rock might speed up conditioning and final disposal

Thank you for your attention!



Do you have any questions?