



Ministry for the Environment,  
Energy, Building and Climate Protection  
of the State of Lower Saxony

# Management of non-energy spent fuel and radioactive waste in Lower Saxony

Dr. Hilke Hattermann

Ministry for the Environment, Energy, Building and Climate Protection  
of the State of Lower Saxony, Germany

SAMIRA Workshop  
Brussels, 13 November 2019



# Outline

- Disposal of radioactive waste in Germany
- Responsibilities for predisposal waste management
  - Research reactors
  - Radioactive waste from other non-energy use
- State collecting facilities

Example: state collecting facility of Lower Saxony



# Disposal of radioactive waste in Germany

Origin of spent fuel and radioactive waste in Germany:

- in operation: 7 nuclear power plants, 2 fuel cycle facilities, **7 research reactors**
- decommissioning: nuclear power plants, fuel cycle facilities, **research and test reactors**
- **waste from medicine, industry and research**

**Spent fuel and radioactive waste from non-energy use:**

Small percentage of total volume of waste, but activity of some nuclides can be significant

National strategy for all types of radioactive waste: disposal in deep geological formations



## Konrad repository

The federal state is responsible for establishing repositories.

For non-heat generating waste (i. e. low and middle active waste):  
The Konrad repository is under construction.

Expected beginning  
of operation: 2027





## Site selection process

For heat-generating waste (i. e. spent fuel and waste from reprocessing):

Site selection process for a repository has been started.

Currently: dry storage in interim storage facilities



Source: BGZ Gesellschaft für Zwischenlagerung mbH  
([www.bgz.de](http://www.bgz.de))



# Responsibilities for predisposal waste management

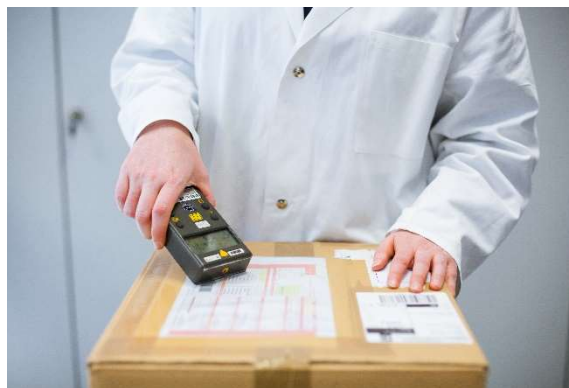
## Spent fuel and radioactive waste from research reactors

- licensed according to the German Atomic Energy Act
- Licensee is responsible for the predisposal management of the spent fuel and radioactive waste until it is called up for disposal.
- Competent authority may grant an exception, e. g. in the case of small research reactors.



## Radioactive waste from other non-energy use: medicine, industry, research

- licensed according to the German Radiation Protection Act
- Licensee/waste generator has to hand in the radioactive waste to a state collecting facility.
- Sometimes clearance of waste or further use of radioactive sources are possible.



Source: GNS Gesellschaft für Nuklear-Service mbH  
([www.gns.de](http://www.gns.de))



## State collecting facilities

*The states shall establish state collecting facilities for the storage of the radioactive waste originating in their territories [...].*

*To fulfil their obligations, the states may avail themselves of the services of third parties [...].* (German Atomic Energy Act, § 9a (3))

- Each state can decide on how to establish the state collecting facility, e. g. whether the facility is run by the state itself or by a third party. → different models in use
- Cooperation of two or more states is possible.  
→ 11 state collecting facilities for 16 states  
(+ 1 central collecting point of the German Federal Armed Forces)
- working group on state collecting facilities: representatives of the states and of the federal state





## Example: state collecting facility of Lower Saxony

- Operation of the state collecting facility by a private company since 2002:

GNS Gesellschaft für Nuklear-Service mbH



- GNS is responsible for
  - collection of waste
  - treatment/conditioning and packaging
  - interim storage (together with another private company)
  - transport to the repository (in the future)
- The waste generators are charged a fee depending on the type of waste, activity and volume or mass of waste.  
The fee covers the costs for treatment and packaging of the waste, interim storage, transport and disposal.



## Conditioning of waste

Conditioning of waste necessary for interim storage and for disposal:

- sorting
- drying
- compacting
- incineration (at other facilities)
- packaging

System of product control to ensure that the acceptance criteria of the Konrad repository are met.



Source: GNS Gesellschaft für Nuklear-Service mbH  
([www.gns.de](http://www.gns.de))



## Interim storage



Interim storage of conditioned  
waste in Leese, Lower  
Saxony





## Treatment of old radioactive waste

- interim storage for several decades: aging of packages
- qualification difficult due to sparse documentation
- federal state has to cover the costs



Aging drum with  
radioactive waste  
from 1981

Examined in 2016





## Summary

- German national strategy for radioactive waste: disposal in deep geological formations  
Non-heat generating waste → Konrad repository under construction  
Heat generating waste → site selection process for a repository
- Research reactors: licensee is responsible for the interim storage of the spent fuel and radioactive waste  
Radioactive waste from other non-energy uses: waste generator has to hand in the radioactive waste to state collecting facility
- The states are responsible for the installation of state collecting facilities, where further treatment and interim storage of the radioactive waste take place.