# RECENT DEVELOPMENTS IN GERMANY IN RADIOACTIVE WASTE DISPOSAL

Dr. Enrique Biurrun
DBE TECHNOLOGY GmbH



#### — Historical Outline =

# **Repository Development**

- Morsleben: Operational Waste (1980's until 1998)
- Konrad: Non heat-generating waste, under construction
- Gorleben: Heat-generating waste, underground survey starts 1990's
- Asse mine used only as URL since 1978, currently under decommissioning





### — Agreement on Lifetime Extension

# In 2009 energy supply and climate protection concerns prompt NPP service life extension discussions

- After controversial debates the Federal Government grants
   NPP lifetime extensions between 8 to 12 years
- But after phase out of the plants there was no intention to replace them with new built nuclear
- Nuclear power is declared only a transitional technology
- The final goal is electricity supply based on renewables
- Rapid wind, solar, and bio-gas build-up highly subsidized (paid by electricity consumers)



#### Effect of the TEPCO Fukushima Daichi Incident

# The TEPCO Fukushima Daichi NPP incident changed completely the view of nuclear power in Germany

- The incident received very high coverage in all media
- Media usually refer not to the Great Easter Japan Earthquake and Tsunami but to the Fukushima Catastrophe
- Thereafter ALL PARTIES vowed to abandon nuclear power
  - Eight NPPs were immediately ordered to stop
  - For the remaining 9 NPPs fixed phase out dates were ordered (the 3 last ones in 2022)



### — Repository Projects in Germany —

- 1. Morsleben deep LILW repository, awaiting the license for decommissioning
- 2. Konrad deep repository for non-heat-generating waste, fully licensed, under construction
- 3. Gorleben exploration mine and prospective repository for heat-generating waste
- 4. Asse experimental mine, under decommissioning



# \_\_\_ Morsleben Repository \_\_\_\_\_

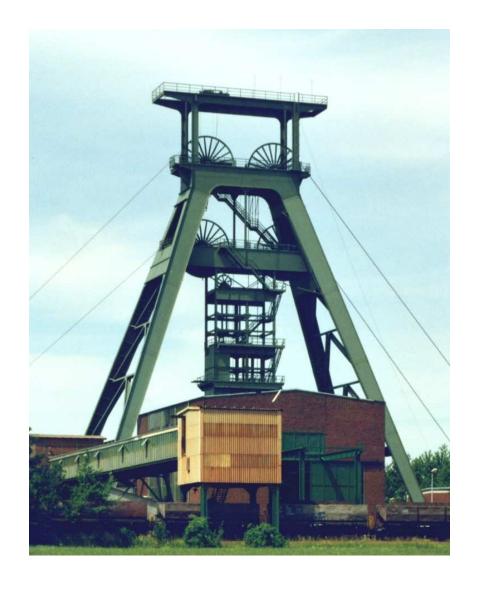


1970	Bartensleben mine selected as repository
1971	Start of trial disposal (LLW)
1974	Approval of repository construction
1981 / 1986	1st and 2nd permanent operation licenses
10 / 1990	Morsleben repository a Federal Facility under BfS, operated by DBE
1991	Disposal stop, refurbishment
1994	Disposal restarted
09 / 1998	Waste acceptance interrupted
05 / 1999	Waste disposal terminated Licensing procedure only for closure
11 / 2000	Advanced backfilling - repository closure to follow
2011	Public hearing

License for closure



# — Konrad Repository ———



1965 – 1976	Iron ore production approx. 7 mil. t; Deposit: ~ 1.4 billion t
1975	Preliminary survey as candidate site
1982	<b>Site Suitability statement and License Application submitted</b>
09/92 - 03/93	Public hearing (75 hearing days)
14.06.00 /	Consensus Agreement
17.07.01	<ul><li>Finishing licensing procedure</li><li>Withdrawal immediate enforcement</li></ul>
01.08.01	Radiation Protection Ordinance amendment
	License application amendment
05.06.02	LICENSE GRANTED
2002-2008	Litigation
2008-2010	<b>Start of Repository Construction</b>
2013/2014	First Planned DISPOSAL START
2019	<b>Currently Likely Disposal Start</b>



### Gorleben Exploration Mine —



22.02.1977 Site designation Gorleben (Nukleares Entsorgungszentrum/NEZ)

April 1979 Start of surface site characterization

1980/1981 Four deep boreholes (1002 / 1003 / 1004 / 1005)

Mai 1983 Comprehensive suitability statement (PTB)

Sept. 1986 Ground-breaking for Shaft 1

Oct. 1996 Communication between Shaft Gorleben 1

and Gorleben 2 (840-m-Sohle) established:

Thereafter excavation of infrastructure area

and characterization of Exploration Area 1

01.10.2000 Site characterization interrupted. Thereafter

stand-by operation only

03.03.2010 Germany announces to the IAEA Board of

Governors that site exploration will continue

01.10.2010 Politically motivated Moratorium to the

exploration of the Gorleben site ends



# \_\_\_ Gorleben Site =

