SMR RD&D Waste Treatment And Disposal Challenges From Czech Regulatory Perspective

IGD-TP Exchange Forum

25th November 2025

State Office for Nuclear Safety

SÚJB

- ✓ central administrative (governmental) body
- ✓ independent regulatory body
- ✓ powers and duties comparable to a ministry
- ✓ head of the SÚJB – chairperson
- ✓ authorizing, review&assessment, inspection, regulation-making and enforcement

Nuclear facilities – overview

- ✓ 2 NPPs: Dukovany (4 units VVER-440), Temelín (2 units VVER-1000)
- ✓ 4 research reactors: CVŘ Řež (2) – LVR-15, LR-0; Czech Technical University in Prague – VR-1, VR-2
- ✓ Fresh fuel and interim spent fuel storages (Temelín and Dukovany)
- ✓ 3 radioactive waste repositories: Richard, Dukovany, Bratrství

Planned:

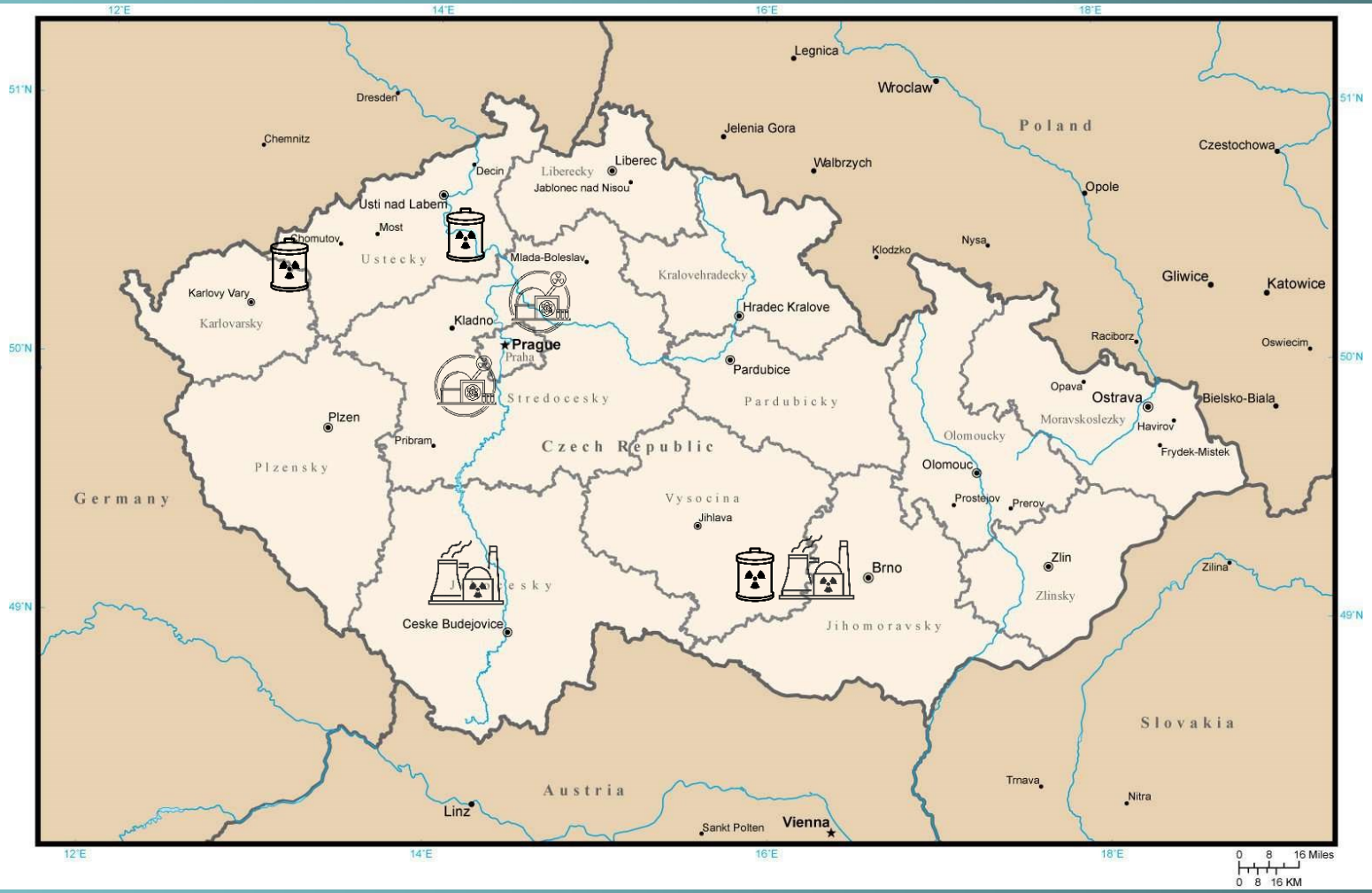
- ✓ 2 new units in Dukovany + 2 new units in Temelín = all APR-1000
- ✓ up to 10 SMRs?
- ✓ Deep geological repository in 2055?

Nuclear Facilities

Repository

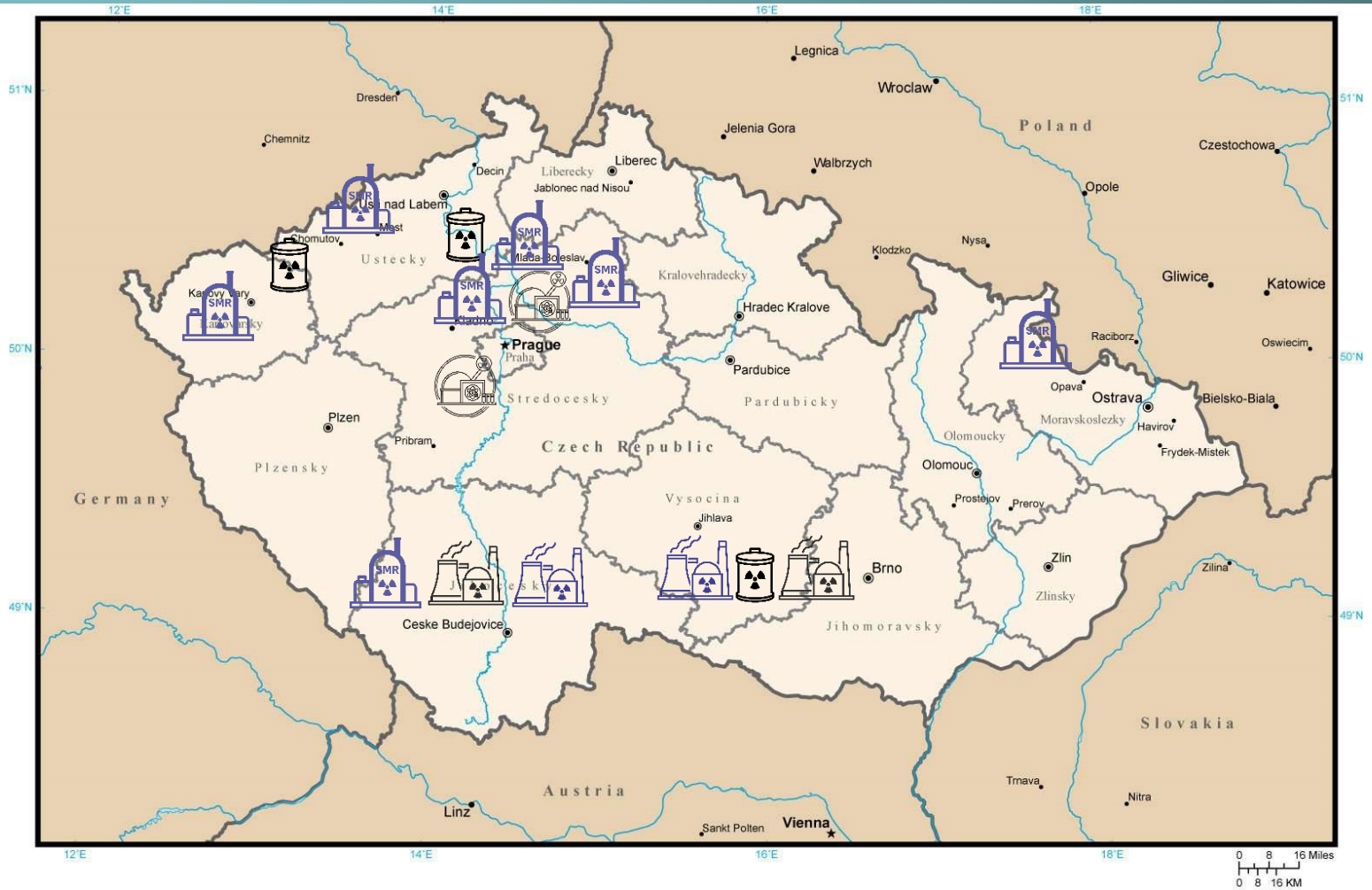
Research Fac.

NPP



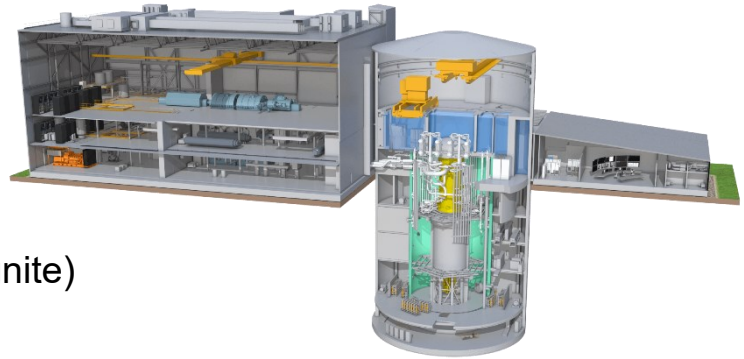
Planned Facilities

- Repository
- Research Fac.
- NPP
- APR-1000
- RR + BWRX



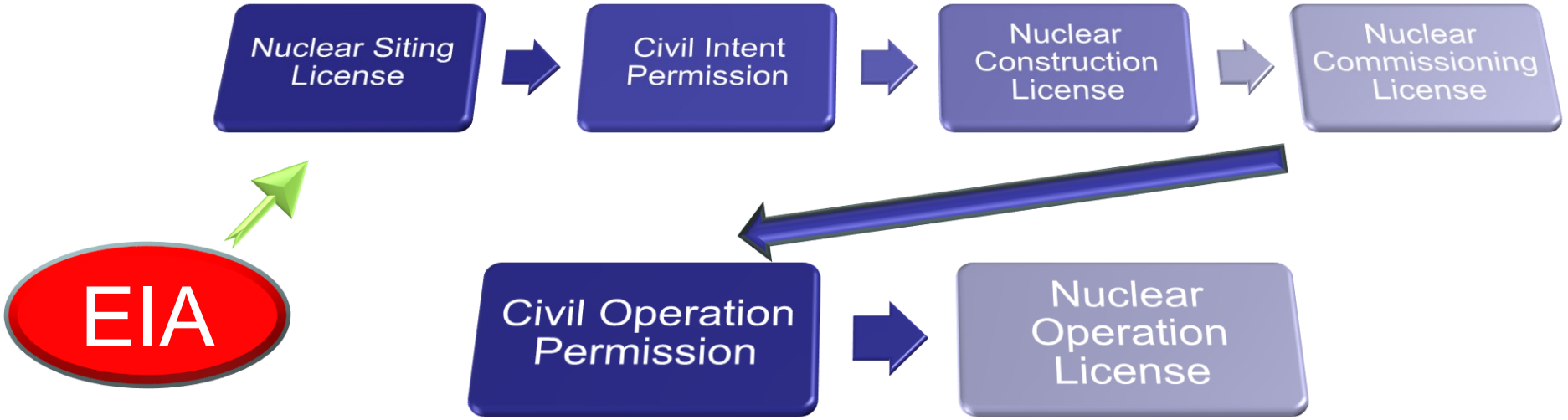
SMRs - Current Status

- 3 possible investors:
  - ČEZ, a.s.
    - Up to 10 units till mid 40ies(?)
    - **Rolls Royce SMR design was pre-selected**
    - Plans not only to build RR-SMR in CZ but a partnership with RR-SMR to develop and possibly deploy the reactors together
  - UNIPETROL (ORLEN) - **OSGE**
    - Chemical industry operator
    - SMRs partially for own needs – chemical plants
    - GE-Hitachi BWRX-300 design – preferred
  - SOUAS, a.s.
    - Operator of thermal power plants + former mining company (lignite)
    - SMR as a replacement for existing thermal power plants
    - Design not chosen yet, all options relevant, preferably PWRs
    - Involved in the PHOENIX programme of the U.S. government for site evaluations
- General timeframe for deployment – the **mid 30s+** (construction 2029 – 2034?)



How to Deploy SMRs?

State Energy Policy + Action Plan for Nuclear Builds + Strategy for RAW and SNF Management



Challenges to Solve

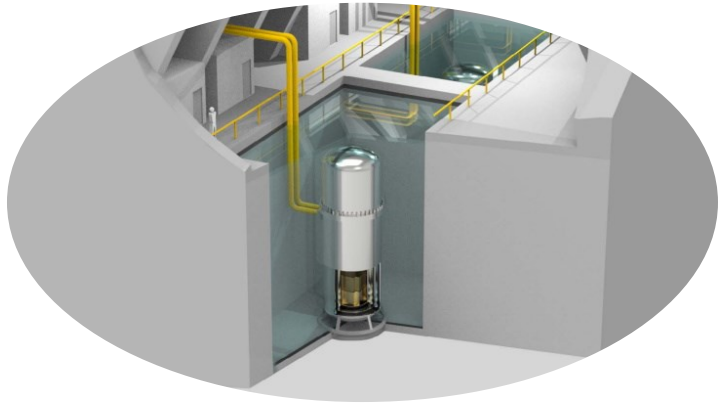
- Organizational
  - Where to find experts and expertize?
  - How to manage processes running in parallel?
  - Are national strategies robust enough?
  - What is the timeline and how realistic it is?
  - How to provide information to regulators?

- Technological
  - When the designs will be finished?
  - How to deal with new design features, fuels, types of RAW?
  - Which codes will be used?
  - How to apply „old“ reqs onto „new“ approaches?
  - Capacity of storage facilities + their numbers and sites?
  - Capacity of disposal facilities – DGR?
  - New approaches to transport?

- Practical
  - How robust is suppliers‘ chain?
  - What about public and its involvement?
  - Is the regulatory framework flexible enough?

Forewarned is Forearmed

- International cooperation – to build capacities
  - NUWARD
  - Rolls Royce SMR GDA
  - BWRX-300 pre-licensing discussions
  - LDR-50 joint pre-licensing joint review
  - Involvement in various WG of SMR RF, NHSI, NEA/OECD, WENRA, TF ENSREG
  - NEXT + SPRING programmes
- Preparation for upcoming administrative procedures
  - Strenghtening of regulatory basis
    - Experience with Licensing of operation/LTO and siting of large units and research facilities
    - Adapted regulatory framework
    - Established criterial base for review and assessment
  - Early consultations with vendors + utilities
  - R&D activities
    - Programmes for analyzing new design and safety features of SMRs
    - Developing of criteria for DGR and RAW+SNF management



Efforts focused on the most realistic SMR designs – Rolls Royce + BWRX-300!

WWW.SUJB.GOV.CZ

STEPAN.KOCHANEK@SUJB.GOV.CZ