Czech national plan for the development of SMR technologies

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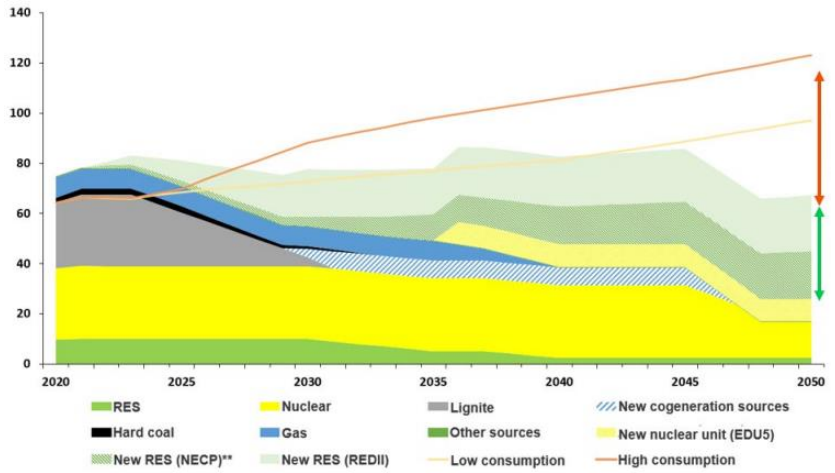
Basic framework for the development of SMRs

- Fulfillment of decarbonization goals (SES based on RES + nuclear)
- Increasing electricity consumption 84 TWh => 120 TWh
- Coal phase-out => transformation of electricity & heat generation sector (- 10 GW of installed capacity)
- Gas as a transition source (security of supply + environmental issues)
- Depeloped nuclear regulatory framework (6 units in operation 4x510 MW + 2x1125 MW)
- Experienced nuclear industry
- Robust nuc. education and research syst.



Activities on the government level

- First activities in the SMR field launched at the end of 2021
  - Establishemt of the interministerial working group coordinated by MIT
- Elaboration of the Czech SMR Roadmap – the first strategic document concerning SMRs
  - Complex assessment of the potential of the Czech Republic for the deployment of SMR projects
  - Descriptive document identifying requirements for implementation of SMR technologies from safety, security, technical, legal, regulatory, financial, investment, economy, siting, supply chain, HR, and research perspectives
- Action plan
  - Update of the legislation – simplification of the permitting procedure
  - Preparation of tools for public support
  - Ensuring SMR sites – territorial development policy plan
  - International cooperation
- No ambition to select the concrete SMR technology on the government level

Activities on the regulatory level

Domestic level

- Czech legislation based on RU VVER tech. – descriptive approach hinder development of SMRs => goal-oriented approach to nuclear safety is needed
- Update of the Atomic Act (end of 2023) and related Regulations (end of 2024)
- Automatic acceptance of licenses from the country of origin is not expected => simplified licensing procedure possible in case of application of “fleet approach” of technologies really based on modular construction

International level

- State Office for Nuclear Safety (SÚJB) active on the European platform – coordinated approach to the licensing procedure
- SÚJB open to cooperation on NRAs level on pre-assessment of SMR designs

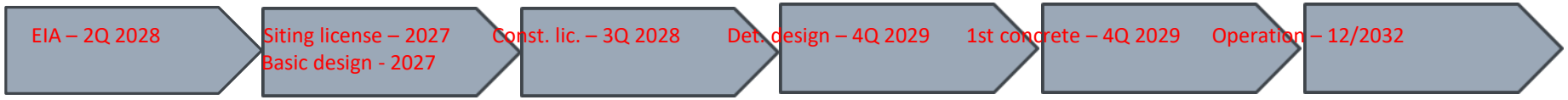
Activities on the commercial level

Activities of the ČEZ company

- Majority share of state
- Owner of both current CZ nuclear sites
- Owner of nuclear operation know-how
- Owner of other potential sites for SMRs
- 1st CZ SMR pilot project at NPP Temelín 2032
- Other brownfield projects in 2035-2037

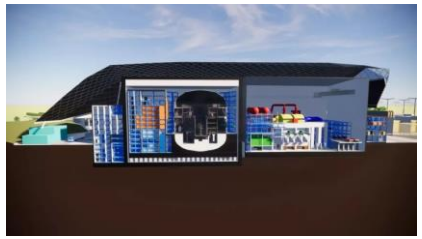
Activities of the private sector

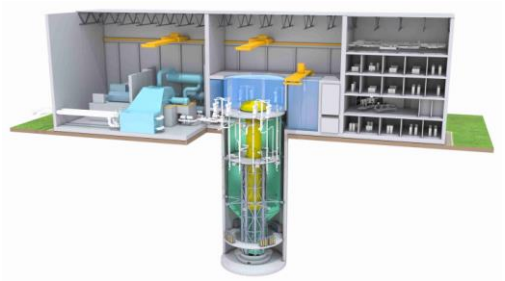
- Participation of professional unions and associations in the work of MIT WG
- Individual negotiations with SMR technology vendors
- Need to cover own electricity consumption
- Large industrial or energy entities
- Zero experience from the nuclear sector

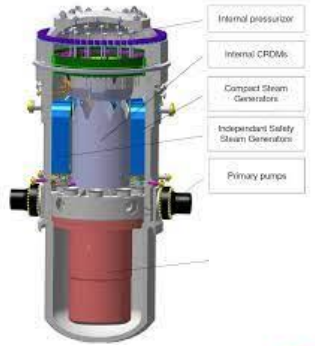


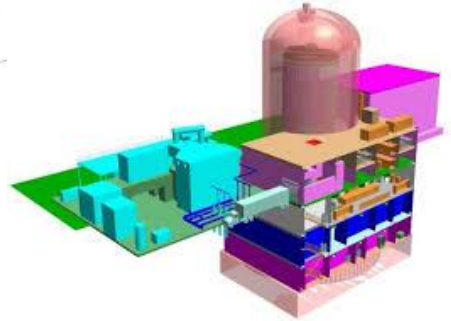
Available SMR technologies

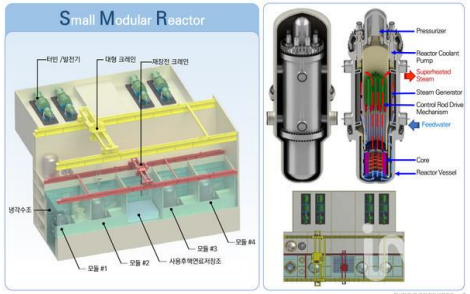
- NDA signed with 7 SMR technology vendors
  - BWRX-300 (GE-Hitachi, USA) – BWR, 300 MWe
  - Nuscale (Nuscale, USA) – PWR, 77 MWe x 4-12
  - Nuward (EDF, France) – PWR, 2x 170 MWe
  - SMART/iSMR (KHNP, Korea) – PWR, 110=>170 MWe x 4
  - SMR-160 (Holtec, USA) – PWR, 160 MWe
  - UK SMR (Roll-Royce, UK) – PWR, 470 MWe
  - WEC SMR (Westinghouse, USA) – PWR, 300 MWe











Opportunities & challenges

Opportunities

- Fast implementation of relyable base-load low-carbon sources
- Lower investment costs in comparison with large-scale nuclear projects
- Great potential for generation of heat and H2
- Inclusion of the Czech industry in the supply chain of global SMR technology vendors
- Creation of an entirely new sector of the economy with high-added value
- Cooperation with SMR technology vendors on the operation of SMR facilities abroad
- Related development of research and education system

Challenges

- Sufficient maturity and availability of the design
- Economic feasibility and ability to be built on time and budget – first-of-kind problems
- Transportability of large-scale modules
- Transformation of non-nuclear sites into nuclear ones within the EU regulatory framework
- Nuclear damage liability
- Spent nuclear fuel management & storage
- Ensuring the physical security of the nuclear facilities

Thank you for your attention

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