

Small modular reactors and the Czech Republic

Dreaming about small modular reactors as the future of nuclear power has found fertile ground among Czech politicians. However, the CVVM's first public opinion poll on small modular reactors in June 2020 showed that the public support is not great at the moment. See:

<https://cvvm.soc.cas.cz/cz/tiskove-zpravy/ostatni/ekologie/5335-verejnost-o-malych-modularnich-reaktorech-cerven-2020>. Only a little over a quarter (28%) of the respondents would consider construction of a small nuclear reactor within 10 km of their place of residence acceptable; over one half (55%) would consider it unacceptable and 29% actually “definitely unacceptable”.

The ÚJV Řež is collaborating with its partners on the study “[Applicability of small and medium nuclear reactors in Czechia's energy system](#)”, but its results will only be available after 2022. The main objective is to assess the applicability of small and medium nuclear reactors in Czechia for electricity and heat generation from both the technical-economic and the legislative point of view.

The utility company ČEZ says that it is considering the use of small modular reactors at Temelín as well as on new sites: Blahutovice in North Moravia and sites of disused coal power plants in Northwest Bohemia. Bear in mind, though, that these are more likely medium reactors with an output up to 470 MWe (Rolls-Royce). ČEZ has made **Memorandums of Understanding** in the area of small modular reactors with the companies NuScale, GE Hitachi and Rolls-Royce about sharing of technical knowledge and assessment of applicability of these nuclear facilities in the Czech Republic.

The Řež Research Centre, which belongs to the ČEZ Group, is developing its own concept for a small modular reactor (SMR) named **Energy Well**. It should be a salt-cooled (mixture of lithium and beryllium fluorides) reactor of so-called 4th generation with a thermal output around 20 MWt and up to 8 MW of electricity. A presentation on this reactor in English is enclosed. The project team is currently working on the construction of an experimental unit, to use for verification of the basic physical properties of the device, which should be fully functional within ten years, if financial support is arranged successfully.

The ÚJV Group is also developing another small reactor prototype named **HeFASTo**. It should be a helium-cooled fast reactor, designed as high-temperature: the output temperature from the active zone should be 900°C. The total thermal output should be 200 MWt. A search for a strategic partner for its development is in progress, with a vision of start of commercial operation by 2040.

Among other things, the current status of both projects was presented at ÚJV Řež webinar on 27 May 2021 “Small modular reactors 2021”; find a recording in Czech at:

<https://www.youtube.com/watch?v=jsDqjzVaN7k>.

Great publicity has been given to the small reactor concept designed specifically for the heating sector, presented by CTU and University of West Bohemia scientists and named **Teplator**, which should utilize residual energy from spent nuclear fuel, but could use fresh fuel as well. Its output could be chosen from 50 to 200 MWt. The extremely self-confident authors are talking about searching for a site for which they could design the first functional prototype to be commissioned in 2029. On the other hand, even President of the SONS Dana Drábová is distinctively sceptical about the project. More about the project in English at: <https://www.teplator.cz/>.

Surprisingly, late 2021 brought information about Czechatom developing another purely Czech-made pressurized-water SMR with support from the Witkowitz engineering group. No more detailed information about the reactor is known, only its name **David** and an impressive visualization and some copy at <https://czechatom.com/>. Further doubts about the project being realistic are raised by

the company spokesman's claims about a prototype being ready in 2022 and first live operation in 2027.

The State Office for Nuclear Safety also presents a more sceptical view of the optimism regarding SMR in Czechia at: <https://www.sujb.cz/aktualne/detail/male-modularni-reaktory-jak-je-vidi-sujb>.

Edvard Sequens, Calla, January 2022