Klima-, Energi- og Forsyningsministeriet

Terms of Reference for an Analysis of New Nuclear Power Technologies

Date
23-01-2026

An analysis shall be initiated to examine the potential and consequences of new nuclear power technologies in Denmark, and what new regulation, competencies, etc. would be required if nuclear facilities were to be established in Denmark.

Background

In recent years, there has been a growing interest in new nuclear power technologies such as Small Modular Reactors (SMRs) in Denmark and in the EU. This should be seen, among other things, in the light of the ongoing development of SMR solutions, increased focus on ensuring balance in a fossil-free energy system with a view to strengthening European energy independence, stable and low energy prices, a stable electricity supply, and growing commercial interest.

SMR is a collective term for approximately 80 different newer types of nuclear power facilities with capacities of up to around 500 MW. SMR solutions are at different stages of development. A few are in operation, while most require further development to become market-ready.

In 1985, the Danish Parliament (the Social Democratic Party, the Social Liberal Party, the Green Left and the Left Socialists) decided that nuclear power should not be included in Danish energy planning. Consequently, the Danish Electricity Supply Act (Elforsyningsloven[1]) contains a prohibition against the establishment of nuclear production facilities for the purpose of electricity generation in Denmark.

In response to an urgent parliamentary question F30 of 14. May 2025 concerning the prohibition of nuclear power in Danish energy planning, the Minister for Climate, Energy and Utilities explained the government's approach to energy politics, including that the government would initiate an analysis of new nuclear power technologies. This analysis is to be presented to the Danish Parliament and the public, so that any subsequent debate on a possible repeal of the prohibition on nuclear power can take place on an informed basis. The following resolution was adopted:

"Green electricity from solar and wind shall continue to form the cornerstone of the Danish energy supply. The Danish Parliament does not consider conventional nuclear power to be relevant in Denmark. The Danish Parliament notes that the government is initiating an analysis to elaborate on the potentials and risks of new nuclear power technologies, as well as the various consequences of repealing the prohibition on nuclear power."

The analysis must also be seen in the light of the geopolitical security situation, including the need to ensure European energy independence, strengthen European

[1] https://www.retsinformation.dk/eli/lta/2023/1248

competitiveness and resilience, secure robust supply chains for, among other things, raw materials and technologies, and protect critical energy infrastructure.

Purpose of the Analysis
The purpose of the analysis is to clarify the immediate potentials and costs associated with the possible introduction of SMR solutions in Denmark, for the purpose of providing a basis for an initial political assessment.

In addition, the analysis aims to examine the following:

- Whether SMR solutions could be integrated into the Danish energy system, including with regard to economic costs and benefits.
- The need for new national regulation, authority structures and competencies relevant to the potential establishment of nuclear facilities in Denmark. The analysis will lay out a concrete roadmap for how and in what chronological order identified needs can be addressed in order to constitute a sufficient basis for the possible establishment of such facilities, and a roadmap for the decisions that would need to be taken if it were politically decided to repeal the prohibition.
- Commercial interests and potentials both for the development and supply of components for SMR solutions, and for large Danish companies as potential off-takers of electricity and/or heat, etc. from SMRs.

The analysis will not in itself initiate new measures aimed at establishing new nuclear power technologies in Denmark but may form the basis for discussions to that effect.

Main Elements of the Analysis
The analysis is divided into three overarching tracks with the following main elements:

1. **Energy system:** Examination of the possibilities and limitations of SMR solutions, including economic aspects related to integration into a future Danish energy system.

2. **Regulation, authority structure and competencies:** Examination of what would be required - and when - if the prohibition on nuclear power for electricity generation were to be repealed in Denmark, including regulation, authority structures and competencies, as well as assessment of risks related to safety management and radioactive waste.

3. **Commercial interest:** Examination of commercial interests and the opportunities and limitations for Danish development, production and possible export of SMR solutions and related components, as well as for large companies as off-takers of electricity and/or heat, etc. from SMRs.

Based on these tracks, the analysis will also address an estimated range of resource requirements, including the need for new full-time positions in government authorities, as well as considerations regarding relevant authority organization across the state.

The analysis will focus on issues relevant to selected advanced SMR solutions in a Danish context.

The analysis does not address issues related to planning and environmental frameworks for any future nuclear facilities, nor the management of neighbor relations. Furthermore, the analysis does not constitute a heat system analysis.

Content of the Analysis
The analysis will cover the following content across the three tracks:

Track 1: Energy System

- Identification and selection of relevant main types of SMR solutions with a view to identifying a set of particularly mature and relevant technologies.
    - Criteria for selection may include maturity, origin, accident risks, safety systems, supply security across all supply chains, plant size, etc.
    - The selection will therefore consider that the development of SMR solutions is highly dependent on global supply chains, which may create dependencies on non-EU/EEA suppliers.
    - In light of the geopolitical situation, the analysis will also examine to what extent SMR solutions may, on the one hand, reduce existing dependencies in the energy sector more broadly, and on the other hand whether they are expected to create new strategic dependencies with regard to components and fuels.
    - The selection will also address SMR solutions as engine power in the shipping industry, as well as the technical possibilities for utilizing surplus heat.
- Mapping and description of the relevance and potential of the selected SMR solutions in terms of development stages, expected time horizon for possible market deployment, technical characteristics and needs, with a view to identifying a number of SMR solutions that may potentially be relevant in a Danish context.
- An energy-technical assessment of whether SMRs could contribute to and operate within the Danish energy system, and under what technical and economic conditions.
    - The analysis will be based on assumptions regarding a Danish energy system in 2035 and 2050, as SMR solutions are expected to potentially be relevant in a Danish commercial context within this time horizon.

- Assessment of the expected costs of a potential introduction of SMRs and comparison with other technologies (e.g. solar and wind).
- Analysis and calculation of possible impacts on the energy system if SMRs are included in a future Danish electricity market, including impacts on electricity prices, consequences for existing technologies (e.g. solar and wind) and market participants, as well as effects on security of electricity supply (including capacity adequacy and grid adequacy—that is, how SMR solutions function in relation to peak-load challenges).
    - The analysis will be based on SMRs connected to the collective grid in order to assess operating patterns, interaction with renewable energy, and capacity adequacy.

Track 2: Regulation, Authority Structure and Competencies

- Overall mapping and identification of existing relevant national regulation, authority structures and competencies. The mapping will address:
    - Rules relating to placement, construction, establishment, operation and decommissioning of facilities, including from a radiation protection perspective.
    - Management of safety, insurance/liability, emergency preparedness, as well as interim storage and disposal of radioactive waste and the process prior to disposal, including whether there are specific risks related to the physical security and cybersecurity of SMR solutions that should be considered when establishing nuclear power technologies in Denmark.
    - The role of educational and research institutions in supporting the build-up of knowledge and experience regarding nuclear technologies and safety.
    - Obligations under EU law, international agreements and conventions.
- On this basis, a needs analysis will be carried out assessing what regulation etc., would be necessary to amend, establish, manage and develop if the prohibition on nuclear power were repealed and SMRs were to be developed, tested and potentially established, operated, decommissioned and waste managed in Denmark.
    - As part of the needs analysis, a comparison will be made with relevant countries working on the implementation of new nuclear power technologies.
- Preparation of a concrete roadmap outlining the chronological sequence and time horizons for the necessary new regulation, authority structures and competencies that would need to be in place if SMRs are to be developed, tested and potentially established in Denmark, as well as the decisions that would need to be taken if it is politically decided to repeal the prohibition.

Track 3: Commercial Interest

- Mapping of commercial interests and potentials, as well as opportunities and limitations, including:
    - Potential business and export opportunities within the development and supply of components for SMR solutions based on potentially relaxed regulation for nuclear power in Denmark.
    - Interest from large companies in Denmark as potential off-takers of electricity and/or heat, etc. from SMRs.
- The commercial analysis will assess whether additional measures are required beyond those necessary to handle SMRs within the collective supply system, for example with regard to:
    - Development, testing, scaling and possible export of SMR solutions and related components regardless of potential use in Denmark.
    - Overall opportunities and consequences of SMRs as a contribution to companies' own consumption, including, for example, via a direct line.
    - Opportunities and consequences of SMRs as engine power in the shipping industry and any regulatory barriers.

Resource Estimation and Authority Organisation
The analysis will also include an initial estimation of the expected range of resource requirements, as well as considerations regarding authority organization and division of responsibilities across the state administrative apparatus in the event of a repeal of the prohibition and the development, testing and establishment of SMRs in Denmark. This will also include an initial estimate of the need for new full-time equivalents in government authorities. The estimation of resources must be comparable with the needs and results identified in the other tracks.

Organization

Track 1 – Energy system is anchored in the Ministry of Climate, Energy and Utilities, with involvement from the Ministry of Finance and the Ministry of Industry, Business and Financial Affairs, and will primarily be based on input from external energy consultants. The external analytical report will be summarized and contextualized in a synthesis report for Track 1.

Track 2 – Regulation, authority structure and competencies is anchored in an interministerial steering group, consisting of deputy permanent secretaries, led by the Ministry of Climate, Energy and Utilities. The steering group will include the Ministry of the Interior and Health, the Ministry of Resilience and Preparedness, the Ministry of Higher Education and Science, the Ministry of Foreign Affairs, the Ministry of Industry, Business and Financial Affairs, and the Ministry of Finance. Analyses in Track 2 will be carried out by the responsible ministries.

Track 3 – Commercial interest is carried out by the Ministry of Industry, Business and Financial Affairs, the Ministry of Foreign Affairs, and the Ministry of Climate, Energy and Utilities.

The estimation of resource demand and organization of authorites across the state administrative apparatus is anchored in the interministerial, consisting of deputy permanent secretaries, steering group and carried out by the responsible ministries. Selected relevant experts and stakeholders will be involved during the course of the work.

Timeline
The preliminary work on the analysis has been initiated, and the analysis is expected to be completed in the second quarter of 2026.