JEK2 Project Schedule: Key Milestones Toward the Final Investment Decision

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ABSTRACT

This paper presents the current timeline of the Krško Nuclear Power Plant 2 (JEK2) project until the Final Investment Decision (FID), planned for 2028. The analysis is based on the main project components: permits, nuclear licensing, supplier selection, organizational development, and financing, along with the business model. The schedule is treated as one integrated project timeline. This helps connect all activities, identify the critical path, and understand how risks can affect the timeline. Special attention is given to how the different project phases depend on one another, as well as to key milestones such as approval of the national spatial plan (NSP), preparation of safety documents for nuclear licensing, setting up the organization, selecting the supplier, and arranging project financing. The results show that achieving the FID in 2028 is possible, but it depends on effective risk management, stakeholder coordination, and realistic planning.

Keywords: *Krško Nuclear Power Plant 2 (JEK2), Project Schedule, Site Safety Analysis Report (SSAR), National Spatial Plan (NSP), Supplier Selection, Financing, Final Investment Decision (FID)*

1 INTRODUCTION

The JEK2 project is one of the most important strategic investments of the Republic of Slovenia. Its goal is to ensure long-term energy security, reduce CO_2 emissions, and support the transition to a low-carbon energy system. As the share of renewable energy sources increases and fossil fuels are gradually reduced, nuclear energy provides a stable, low-carbon, and reliable source of electricity, helping to balance the power system.

This paper presents the current timeline of the JEK2 project through the Final Investment Decision (FID), planned for 2028, and the main activities required to reach this milestone. The analysis focuses on four key parts of the project: permits, nuclear licensing, supplier selection, and the financial and business model.

The full project timeline spans from 2025 to the planned start of commercial operation around 2040. In this phase, the schedule is developing from a general concept into a detailed project plan. This is supported by software tools that connect activities, identify the critical path, and allow continuous updates of the plan as the project develops.

2 JEK2 PROJECT TIMELINE

The timeline of the JEK2 project includes several interconnected phases: spatial planning, permitting, supplier selection, financing, preparatory works, construction, and the transition to trial and commercial operation. These phases do not happen only one after another. Many of them overlap and influence each other. This means the timeline is not linear, but a complex network of technical, regulatory, and organizational processes.

A special feature of nuclear projects is the high level of dependency between phases. Progress in one phase often depends on the results of another. This creates a system-wide critical path, which includes not only construction but also regulatory procedures, documentation, and decision-making processes. As a result, delays in early phases, such as spatial planning or safety analysis, can cascade across the entire project.

An important milestone is the decision to start preparing the national spatial plan (NSP), adopted on February 17, 2026. This marks the transition from the preparation phase to a more intensive spatial planning phase. It has a significant impact on the timeline, enabling the further development of key studies and initiating activities for later project phases.

The success of the timeline depends on an effective legal framework, either through a special law or improvements to existing legislation. It also depends on the smooth, timely execution of all key procedures, including spatial planning, permits and approvals, and construction preparation. The timeline is based on proven NOAK (nth-of-a-kind) technology, which offers greater predictability than new FOAK (first-of-a-kind) technologies. However, even with proven technology, the timeline still depends on external factors such as regulatory processes, the predictability of the legal and regulatory environment, and effective coordination between key stakeholders.. This highlights the importance of systematic risk management.

In this context, the JEK2 timeline is not just a technical document. It is a key management tool that supports coordination, ensures transparency of progress, and serves as a basis for strategic decision-making throughout the project [1].

The Figure 1 presents the timeline of the JEK2 project from the present day to the Final Investment Decision (FID) and the signing of the contract.

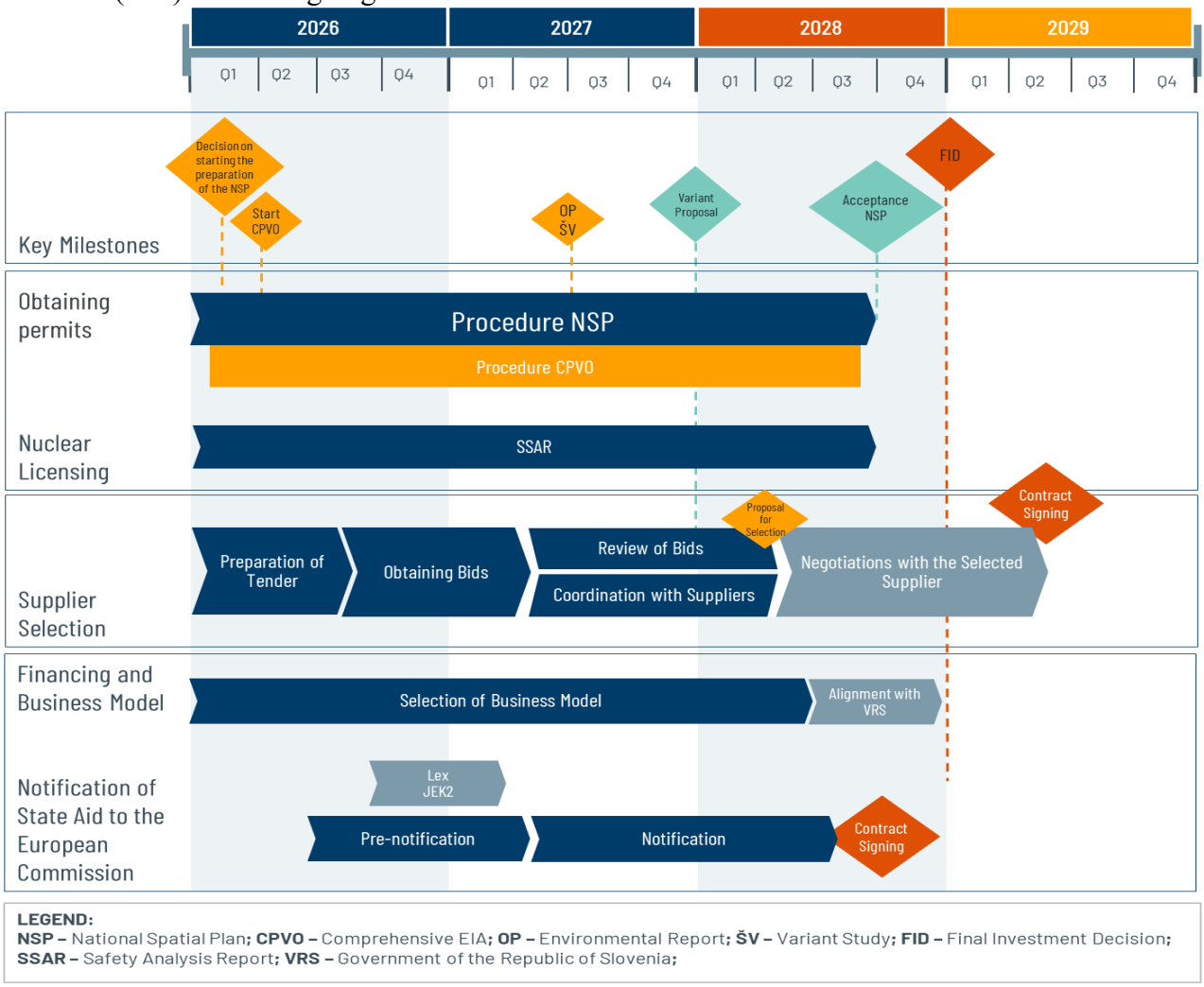

Figure 1: Timeline of the JEK2 Project from 2026 to FID

3 SPATIAL PLANNING AND ENVIRONMENTAL PROCEDURES

Spatial planning is the starting phase of the JEK2 project and one of the most important. It defines the legal, environmental, and spatial basis for project implementation. This process includes not only technical aspects, but also institutional, social, and environmental factors. Because of this, it is a key part of the overall project timeline.

The spatial planning process began with the submission of the NSP initiative and formally commenced on July 1, 2025, with its publication in the Spatial Information System (PIS). This marked the start of the official national-level planning process.

In 2025, guidelines from relevant authorities were collected, and the public was involved. This phase was completed at the end of October 2025. After that, the guidelines were analyzed and coordinated, an important step in defining subsequent studies and spatial limitations. A key milestone is again the decision to start preparing the NSP, adopted on February 17, 2026. This marks the shift from preparation to the operational phase of spatial planning and allows the preparation of more detailed expert studies. At the same time, this milestone significantly affects the project timeline by triggering activities in later phases, including environmental procedures and project documentation. The next steps include preparing expert studies, the variant study, and the environmental report. These form the basis for the NSP proposal. The variant study compares different spatial and technical solutions, while the environmental report evaluates the project's environmental impact and supports the decision on whether the project is acceptable. The process also includes public consultations and cross-border environmental impact assessment, in line with international obligations. These activities increase transparency and legitimacy but also add time and complexity.

From a timeline perspective, spatial planning is part of the critical path. Many later activities—especially licensing, design, and construction—depend directly on the NSP approval. The adoption of the NSP is planned for the end of 2028 and is one of the key conditions for moving to the FID and further project implementation. Due to uncertainties regarding regulations, stakeholder involvement, and environmental requirements, effective management of this process is essential to keep the project on schedule. In this context, spatial planning is not just a formal procedure, but a strategic element that strongly influences the overall dynamics and feasibility of the JEK2 project [2] [3].

4 SAFETY DOCUMENTATION AND NUCLEAR LICENSING

The preparation of safety documentation is one of the key conditions for implementing the JEK2 project. It ensures compliance with nuclear safety standards, national legislation, and international recommendations. It also supports the process of obtaining permits from the Slovenian Nuclear Safety Administration, known as nuclear licensing. Safety documentation is not only a regulatory requirement. It is also a key input to the plant design, as it defines the boundary conditions the selected technology must meet.

The process started in 2024 with the initial version of the Site Safety Analysis Report (SSAR). This is the first step in a series of safety reports leading to the final Safety Analysis Report (SAR) for the JEK2 nuclear power plant. The SSAR plays an important role in the early phase of the project. It systematically analyzes all relevant natural and human-related characteristics of the JEK2 site and their possible interaction with the planned nuclear facility. The SSAR includes analysis of key site characteristics, such as geographic and population data, nearby industrial facilities, and climate, hydrology, geology, and radiological conditions. These analyses define the design inputs, which serve as the basis for subsequent design phases and technology selection.

After the NSP process is completed, the SSAR results will be used during the construction permit phase as input to the Preliminary Safety Analysis Report (PSAR). This phase comes after the NSP and the FID.

The SSAR also affects the preparation of technical specifications and tender documentation, as well as coordination with the selected supplier. It defines the requirements that the technology must meet based on site-specific conditions. In this sense, the SSAR is not only a regulatory document but also a key element that connects spatial planning, supplier selection, and design phases. Because it defines project parameters, it directly impacts the project timeline, especially activities on the critical path.

In later phases, more advanced safety documentation is prepared, mainly the Preliminary Safety Analysis Report (PSAR) and the Final Safety Analysis Report (FSAR). These are required to obtain construction and operating permits. They are based on the SSAR and include more detailed information about the selected technology and design solutions.

The licensing process is closely linked to other project areas and is a key element of the project's critical path. Due to strict regulatory requirements and the need to coordinate with the national regulator, effective management of safety documentation is essential to keeping the JEK2 project on schedule [2] [4].

5 SUPPLIER SELECTION

Supplier selection is one of the key strategic steps of the JEK2 project. It directly affects the technical design, project schedule, and overall financial structure. This process is not only about choosing a technology, but also about defining the contract model, allocating risks, and establishing a long-term partnership with the selected supplier.

The Technical Feasibility Study (TFS), completed in 2025, provides the basis for preparing the tender documentation and defining the main technical, safety, and operational requirements. The results of expert studies and the SSAR are also important, as they define the project boundary conditions and influence the requirements for potential suppliers.

A two-phase supplier selection process is planned for the JEK2 project. The purpose of this approach is to reduce project risks, coordinate the preparation of key documentation, and support the timely adoption of the Final Investment Decision (FID). This approach allows the gradual development of technical, economic, and contractual elements of the project and improves the management of the project schedule.

In the first phase, which takes place before the Pre-FID period, a preliminary tender process and an initial comparison of potential suppliers are carried out. The goal of this phase is to select the preferred supplier.

In the second phase, activities continue with the preferred supplier, mainly through the preparation of technical solutions, contractual alignment, and the investment programme, with the goal of achieving a sufficient level of project maturity for the FID by the end of 2028.

One of the key features of the JEK2 project is the use of proven NOAK (nth-of-a-kind) technology. This means that preference is given to technologies with existing references and operational experience. This approach reduces technological and execution risks and improves the predictability of the project schedule and costs.

The qualification, bidding, and negotiation processes will take place between 2026 and 2028. Their progress is closely connected with other project areas, especially the development of safety documentation and the financial model. The Final Investment Decision (FID) is planned for the end of 2028. By that time, the project must achieve a sufficient level of technical, financial, and contractual maturity.

The contract with the selected supplier is planned to be signed in 2029. This marks the transition from the development phase to the implementation phase of the project. At this point, key risks move into the execution phase, and activities such as detailed design, preparatory works, and construction organization begin.

From a schedule perspective, supplier selection is an important part of the project critical path. Delays in the selection or negotiation process may delay the entire project. Therefore,

effective management of this process is essential for achieving the FID milestone and ensuring the successful implementation of the JEK2project [2] [5].

6 FINANCING AND BUSINESS MODEL

The financing of the JEK2 project represents one of the key elements of its feasibility, as it determines the investment structure, the allocation of risks, and the long-term economic sustainability of the project. Given the size of the investment and the long project timeline, financing is complex. It requires the gradual development of a suitable business and financial model.

Different financing approaches are being considered. These may include a mix of equity and debt, as well as cooperation between different stakeholders. In addition to GEN as the project leader, other important participants may include state institutions such as the Slovenian Sovereign Holding and the Ministry of Finance, as well as international financial institutions, such as export credit agencies and commercial banks.

The Report on Financing Models for the JEK2 Project, prepared by a dedicated working group, evaluates different financing structures. These include market-based and regulated models, public-private partnerships, and specific support instruments at the EU and national level (for example, tools supporting large strategic investments). This report serves as a reference for developing the financial model, which must align with the project's technical, regulatory, and market conditions.

The financial model includes estimates of investment costs, investment timing, financing costs, and expected project revenues. It allows testing of different financing scenarios, which is important for evaluating financial sustainability under different economic conditions. The model must be based on realistic assumptions, using updated project data, including technology specifications, cost estimates, and the project schedule.

Alignment with the European regulatory framework is also important, especially regarding state aid approval by the European Commission. These procedures can influence the financing structure and conditions for investors, so they must be considered in both financial planning and timeline management.

Financial aspects are closely linked with other parts of the project, especially supplier selection and definition of investment parameters. The costs of technology, the contract structure, and the risk allocation between investors and suppliers can strongly influence financing conditions and how financial institutions assess project risks.

In this context, the FID is a key milestone. It shows that the technical, regulatory, and financial aspects of the project are developed enough to allow a final decision. Reaching FID depends on the financial model's readiness, including identified financing sources and investor commitments.

From a timeline perspective, financing can affect the critical path. Regulatory approvals and finalization of the financial model are necessary before the investment decision. Delays in these areas could affect the overall project schedule.

However, JEK2's financial and business model is still under development. It remains open to further discussion, additional technical and financial analysis, and political and institutional decisions.

At this stage, the financial model mainly serves as a framework for evaluating financing options, supporting strategic decisions, and coordinating stakeholders, rather than being a final solution [2] [6] [7].

7 CONCLUSION

The JEK2 project timeline provides a structured and coordinated framework for implementing one of the most complex infrastructure investments in Slovenia.

Its success depends on the coordinated progress of all key project areas and effective management of their interdependencies, which are more complex than in most other energy projects. The project is currently moving from conceptual planning to integrated schedule management, supported by software tools (Primavera P6). This approach enables the creation of a fully integrated timeline that connects all activities, identifies the critical path, and analyzes the impact of risks. In this way, the timeline becomes a key management tool rather than just a list of planned activities.

The analysis shows that reaching the FID in 2028 is possible. However, this depends on effective management of key uncertainties, especially in regulatory processes, financing, supply chains, and stakeholder coordination.

The JEK2 project clearly shows that the success of large infrastructure projects depends not only on technical readiness but also on the ability to manage complex systems in a coordinated way. Successful implementation will require timely, coordinated decision-making, the use of advanced planning tools (Primavera P6), and a realistic approach to risk and scheduling. Only with this combination will it be possible to move to the implementation phase on time and achieve the goal of starting commercial operation in 2040 or 2041.

The JEK2 project can also serve as a broader example of good practice, demonstrating how integrating project management, regulatory requirements, and advanced risk management approaches can improve the success of large energy infrastructure projects.

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