Neo NL policy framework

Policy framework for the realisation of the first two large scale nuclear power reactors

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1 Introduction

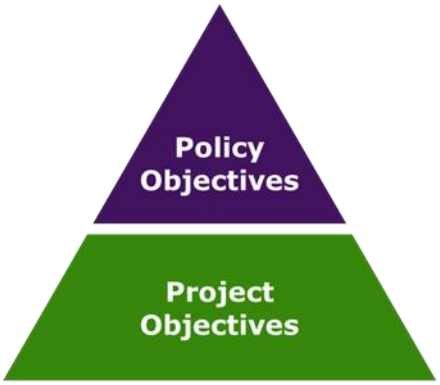
The Netherlands is committed to achieving a climate-neutral energy system by 2050, requiring a reliable, affordable, and sustainable electricity supply. This transition demands a diverse mix of low-carbon technologies to ensure security of supply, minimise environmental impact, and maintain economic viability. Nuclear energy plays a critical role in this mix by providing CO_2-low baseload electricity while also offering a degree of operational flexibility, reducing dependence on other renewable energy sources and the required weather conditions and supporting long-term energy security. Therefore, nuclear energy plays a crucial role in the Dutch energy system.

To deliver this ambition, the Dutch government is preparing for the construction of two new nuclear power reactors as part of its broader energy strategy. Nucleaire Energie Organisatie Nederland B.V. (NEO NL) has been established to lead this effort, acting as the owner/operator responsible for developing, procuring, and delivering the Nuclear New Build (NNB) project. As a state-owned entity, NEO NL must operate in line with the Dutch government's public participation policy (Deelnemingenbeleid Rijksoverheid 2022).

This document provides a structured framework to steer NEO NL's strategy setting and decision making within the project towards objectives that are aligned with national energy policy and public interest. All objectives included in this document should be read within the constraints of applicable law and regulations.

1.1 Policy Framework

The policy framework establishes a clear hierarchy of objectives to ensure that NEO NL's activities directly support the Dutch government's vision for a sustainable and secure energy system. This hierarchy consists of two layers:



1. ***Policy Objectives*** – The policy objectives are national energy system goals set out by the Dutch government, including climate neutrality, reliability, affordability, safety, sustainability, equitability, participation, spatial efficiency, and energy security.
2. ***Project Objectives*** – The project objectives are the translation of the policy objectives to what the NNB project aims for to be successful, such as nuclear safety, economic value, timely delivery, consideration for local communities, the environment and stakeholders, strategic autonomy, strengthening the Dutch nuclear ecosystem and radioactive waste management.

This structured approach provides clear traceability from high-level policy ambitions down to project specific objectives, ensuring that every decision and activity can be aligned with the overarching national objectives. It enables transparent evaluation of trade-offs between competing priorities, such as cost, schedule and strategic autonomy.

2 Policy Objectives

Policy oObjectives set the national priorities for the Dutch energy system and guide all decisions for the NNB project. They aim to deliver a safe, climate-neutral, reliable, and affordable energy system by 2050 while safeguarding public interests such as sustainability and participation. These objectives are set in line with the goals formulated in the 'Nationaal Plan Energiesysteem'[1].

Nuclear energy can support these objectives by providing low-carbon electricity, complementing renewables, and enhancing energy security. Together, these policy objectives form the foundation of the policy framework, linking national energy policy to NEO NL's project objectives and requirements.

Within this project the public interests must be safeguarded. A safe, affordable and economically resilient energy system is essential, with acceptable prices for end-users and the lowest possible societal costs. In addition, the system must be reliable and secure, supported by diversification, flexibility and interchangeability to ensure security of supply. Sustainability is a key consideration, including the preservation of biodiversity and circular and responsible use of raw materials, with due regard for international corporate social responsibility and future generations.

Equitability and participation are also of importance for the development of the energy system. Stakeholders must be able to participate meaningfully, with a fair distribution of benefits and burdens. This includes a strategic contribution to the Dutch knowledge- and innovation landscape. Spatial and environment constraints also play a significant role: land use, environmental quality and the living environment must be protected and, where possible, enhanced. This requires early identification of stakeholder concerns and interests, transparent decision-making where possible and balanced weighing of competing public values. International cooperation strengthens the knowledge base, leads to economies of scale, accelerates the innovation process, and offers economic opportunities. Finally, national security, defined as safeguarding economic security and the continuity of vital (energy) processes – remains of great importance.

To help achieve these objectives, nuclear energy is a valuable addition to the electricity mix. It contributes to diversification of the electricity mix, has a relatively small spatial footprint, decreases the dependency on weather conditions and offers long operational lifetimes. Nuclear power plants (NPPs) provide high-quality, long-term employment and stimulate economic activity. Diversification of the electricity mix also spreads risks by reducing dependence on any single energy source or value chain. An energy system that includes nuclear power requires fewer additional flexibility options, such as large-scale energy storage, hydrogen use, gas-fired power stations for peak production or extensive demand response. The long lifespan of nuclear power plants guarantees clean energy for decades, while requiring relatively limited quantities of scarce materials. They can therefore strengthen energy security in times of geopolitical, economic and social uncertainty. Electricity demand is expected to increase significantly in the future. Regardless of the extent to which nuclear energy is deployed, a substantial expansion of wind and solar energy, batteries, electrolysis and hydrogen storage will remain necessary. In that future scenario, nuclear energy can contribute to the robustness of the energy mix.

Alongside these advantages, nuclear energy – like all energy sources – entails specific risks that must be carefully managed. Neither safety nor security incidents can be entirely ruled out, and the use of nuclear energy generates waste that remains radioactive for many generations. Furthermore, experience in the Western world shows that cost overruns and delays during construction are common, posing a threat to the timely availability of CO2-low electricity and reducing the willingness of private investors to participate in this first phase of development. As a result, large-scale public funding is necessary, translating to significant financial risk for the government. In addition, the Netherlands has currently limited domestic knowledge and expertise for the construction and operation of new nuclear power plants.

Nuclear energy therefore entails different risks than wind and solar energy, relies on a distinct global value chain and depends on specific materials that differ from those used in renewable energy technologies. As such, nuclear energy can contribute to the diversification of risk within the Dutch energy system and help reduce (geo)political dependencies.

In light of this potential contribution, the Dutch government has decided to prepare for the construction of two new nuclear reactors. It is acknowledged that while NEO NL will aim to contribute to and measure

[1] Kamerstukken II 2023–2024, 32 813, nr. 1319

progress against the Policy Objectives, these objectives apply to the energy system as a whole and therefore cannot be fully achieved by NEO NL alone.

2.1 Policy Objectives Table

A summary of the Policy Objectives described above is provided in Table 1.

Table 1 Summary of Policy Objectives

	Policy Objective	Objective Description
	Climate neutrality by 2050	The Dutch energy system aims to achieve net-zero emissions by 2050, requiring timely deployment of low-carbon technologies. Nuclear energy is one of several options that can provide low-carbon electricity to support this transition.
	Safety	The energy system must prioritize safety across all technologies, ensuring compliance with strict regulatory standards. Nuclear safety and radiation protection must meet applicable legislation, regulations and international standards. Furthermore, industrial safety is of utmost importance in any large infrastructual project.
	Reliability	The Dutch energy system must ensure a stable and secure electricity supply by reducing dependence on energy imports and mitigating risks from intermittent sources like wind and solar. Nuclear energy strengthens reliability through its consistent output and long operational lifespan while contributing to overall grid reliability and reducing system-wide risks.
	Affordability & economic robustness	The Dutch energy system must remain economically viable, with acceptable prices for end-users and minimized societal costs.
	Sustainability	The Dutch energy system should minimise environmental impact and ensure responsible resource use, including long-term waste management. Sustainability considerations include circularity, preservation of biodiversity, and embedding ESG principles in the project.
	Equitability	The energy transition must distribute costs and benefits fairly across society. Decisions should be supported by system-level assessments to ensure equitable outcomes and minimize societal costs.
	Participation	Stakeholders – including citizens and local communities, companies, social organizations, knowledge institutes and decentralized governments – must have meaningful involvement in energy projects. This involvement should also strengthen national capabilities, including the expansion of the national knowledge base and involvement of the Dutch industry where possible and in accordance with applicable laws and regulations.
	Spatial planning & environment	The Dutch energy system must optimize land use, protect environmental quality and maintain or improve the living environment wherever possible.
	Energy security	The Dutch energy system must reduce geopolitical dependence and maintain control over critical supply chains. International cooperation combined with a strong innovative domestic industry and a robust and versatile national knowledge base are key to long-term resilience and strategic autonomy.

3 Project Objectives

The main goal of the NNB project is to develop, procure, construct, commission, operate and decommission a large nuclear power plant (NPP) consisting of two reactors, on the designated site in accordance with the NNB project objectives as introduced in this document and applicable laws and regulations.

Building on the policy objectives, specific project objectives have been defined to support successful project delivery. For these objectives the dimensions of Partnership, Process, Product, and People should be considered. These dimensions recognise that a NPP is more than just the reactor technology in a complex and interconnected project that has local, national and international importance, and that requires a long-term licensee operating company. These dimensions therefore should provide perspective for NEO NL when evaluating and balancing objectives.

- **Partnership** – Establishing a strong, long-term relationship between the vendor[2], NEO NL, and key stakeholders to ensure collaboration where possible throughout development, licensing and construction with due consideration given to appropriate support during operations and decommissioning. The partnership should foster a robust safety culture, a high quality and cost-effective life cycle clean energy solution, consider fuel supply and contribute to the Dutch nuclear ecosystem.
- **Process** – Implement a delivery model that ensures compliance with the regulator license condition and a safe, high-quality, timely, and cost-controlled execution of the project. The process must identify and manage risks by enable collaboration with the vendor and (sub)contractors and aligning governance and localisation strategies as much as possible. It must also use effective and robust data management.
- **Product** – Deliver a nuclear power plant, consisting of two proven GenIII+ PWR reactor designs delivering at least 2000 MW combined installed capacity and that meets all the safety and security requirements as applicable throughout the lifecycle under the relevant license conditions. The product should be integrated into the Dutch electricity grid and ensure a stable baseload supply of electricity to the grid while rewarding flexibility for at least 60 years.
- **People** – Develop an organisation that can act as an intelligent customer with in-house knowledge and capability to ensure quality and safety throughout the project. The organization must be eligible to hold the relevant nuclear licenses from the ANVS and meet international standards. It should promote learning from other projects and operators.

Addressing these themes ensures that each objective is assessed not only in isolation but also in terms of its impact on relationships, processes, technical outcomes, and organisational capability.

3.1 Project objectives

Seven main project objectives have been identified, which are further explained below. They are all important, but cannot all be maximized simultaneously as certain trade-offs will arise. As the project progresses, NEO NL will identify and substantiate these trade-offs and present them for decision making. Paragraph 3.3 describes in more detail how these trade-offs are managed.

- Prioritise nuclear safety
- Consider local communities, the surrounding environment and stakeholders
- Minimise project costs and risks
- Deliver as soon as possible and on-time
- Safeguard strategic autonomy and national security
- Strengthen the Dutch nuclear ecosystem

[2] Reference to “the vendor” throughout the document relate to the main technology provider and its consortium of contractors

- Manage the risks of radioactive waste

Prioritise nuclear safety

- What: Ensure that nuclear safety and radiation protection meet all Dutch regulatory standards and applicable international norms. The design and operation of the NPP must be fully licensable and maintain a strong safety culture throughout its lifetime.
- Why: Nuclear safety is an overriding priority. It is of great importance that attention to safety is guaranteed in the implementation of NPPs. The operation of a NPP involves safety risks that, although minimal in probability, could have very serious consequences.

Consider the surrounding environment, local communities and stakeholders

- What: Adress potential negative impacts on local communities and the environment and consider the relevant regional social-economic conditions. The project should build sustainable relations with stakeholders.
- Why: Local support is essential with regard to constructing and operating an NPP. The impact of a new NPP on the local community, the environment and relevant stakeholders is significant. This requires attention to the environment in the area and to maintain a dialogue with stakeholders where possible. At the local level, the public debate will focus on the national-regional package.

Minimise project costs and risks

- What: Deliver the project at minimal costs and risks, ensuring value for money throughout the project.
- Why: The nuclear new build project will be largely funded by the Dutch government. This objective reflects the need for long-term value for the Dutch government. Value for money is obtained by finding the best balance with the other project objectives. In addition to bringing long term value for The Netherlands, the project should have a substantiated business case to continuously justifying the State's investment. This also means that NEO NL should ultimately generate an acceptable return to ensure financial continuity in line with the Dutch government's public participation policy.

Deliver as soon as possible and on-time

- What: Achieve a realistic and reliable schedule for commercial operation, aiming for delivery as soon as possible.
- Why: It is very important to the State that the NNB project is delivered on-time. Timely completion is critical to meet national energy and climate objectives. Setting a realistic and achievable commercial operation date, with delivery at the projected date, is preferred over proposing an 'as soon as possible' COD and facing time-overruns.

Safeguard strategic autonomy and national security

- What: Safeguarding economic and national security and the continuity of critical processes by operating, maintaining and securing the plant as independently as possible within the applicable laws and regulations.
- Why: This objective aims to enhance resilience against geopolitical risks and secure long-term energy independence. Strategic autonomy in the nuclear field primarily relates to the mitigation of strategic dependencies with respect to the supply chain and the fuel cycle, not only during the construction phase, but especially during the operation phase of the plant.

Strengthen the Dutch nuclear ecosystem

- What: Facilitate participation of stakeholders within the Dutch nuclear ecosystem, including supply chain, knowledge, innovation, and human capital where possible and in accordance with applicable laws and regulations to build domestic expertise.

- Why: Participation of stakeholders, including supply chain, knowledge, innovation and human capital across the nuclear ecosystem, where possible and in accordance with applicable laws and regulations, strengthens domestic expertise and strategic autonomy. Engagement of Dutch companies, institutions and professionals in the NNB project can contribute to a resilient nuclear sector in the Netherlands.

Manage the risks of radioactive waste

- What: Manage the risks of radioactive waste to people and the environment by aiming to minimise the amount of radioactive waste and ensure that all radioactive waste is managed throughout its entire lifecycle in accordance with applicable laws and regulations and applicable internationally recognized safety standards.
- Why: With each nuclear activity, there is an extra amount of radioactive waste that needs to be processed. It is important that the amount of radioactive waste is minimised and can be processed in an appropriate manner. All radioactive waste and spent fuel anticipated to arise from a NPP throughout its lifetime must be managed and disposed of in a safe and commercially acceptable way, which means radioactive waste management needs to be considered and assessed throughout the lifecycle phases of the plant.

3.2 Project Objectives table

Table 2 sets out indicators linked to each Project Objective. They are explicit benchmarks that guide decision-making and vendor evaluation. They also form the basis on which successful delivery will be measured as guiding principles to what the project aims to achieve once delivered and operated.

Table 2. Summary of NEO NL's Project Objectives

Project Objective	Objective Description	Objective indicators
Prioritise nuclear safety	Ensure that nuclear safety and radiation protection meet all applicable legal requirements and regulatory standards and applicable international standards. The design and operation of the NPP must be developed and maintained fully licensable and maintain a strong safety culture throughout its lifetime. Nuclear safety is an overriding priority.	• Compliance with applicable laws and regulations and international standards for nuclear safety and radiation protection • Ensure defence-in-depth by establishing multiple levels of protection to prevent accidents and mitigate their consequences • Integrate safeguards-by-design to enable nuclear material accountancy and verification throughout the NPP lifecycle • Nuclear security ensured through a graded, risk-informed approach to protect against theft, sabotage, and unauthorized access • Licensable design and robust safety case for all project phases • Implementation of a strong nuclear safety culture across the lifetime of the plant • Facilitate effective and efficient implementation of IAEA safeguards throughout its lifecycle in coordination with Euratom and the competent safeguards authorities. • Continuous interface with the regulator and timely submission of reporting • Delivery model that identifies, manages and mitigates safety risks effectively
Consider the surrounding environment and local communities	Adress potential negative impacts on local communities and the environment and consider the relevant regional social-	• Measures build sustainable relations with stakeholders and strengthen national capabilities. • Implement public communication and community benefits strategy

Project Objective	Objective Description	Objective indicators
	economic conditions. The project should build sustainable relations with stakeholders.	• Integration of ESG principles into the project • Good-neighbour approach for local governments and inhabitants • Robust and continuous collaboration with local and regional authorities where possible
Minimise project costs and risks	Deliver the project at minimal costs and risks, ensuring value for money throughout the project. This objective reflects the need for long-term value for the Dutch government.	• Selection of vendors and contractors based on for the Dutch State relevant aspects, including insights in clear upfront costs and (un)discounted risks through proper and acceptable risk allocation • Strong financial governance and proper cost assurance systems, ensuring the generation of a sufficient return on investment • Vendor liability and acceptable risk allocation in construction contracts to manage financial risks of the Dutch State and NEO NL • Collaboration with all partners (including state, authorities and supply chain) of the project, during construction and operation phases, where possible and in accordance with applicable laws and regulations • Governance aligned with relevant partners to provide assurance and control on project delivery • High availability rate of the NPP
Deliver as soon as possible and on-time	Achieve a realistic and reliable schedule for commercial operation, aiming for delivery as soon as possible. Timely completion is critical to meet national energy and climate objectives.	• Realistic COD avoiding time overruns • Integrated milestone planning and critical path identification • Vendor commitment and involvement during development and construction phases, as well as the possibility to support operations and maintenance activities • Alignment of process to budget and timeline • Shared vision, values, behaviours and goals between NEO NL and vendor • Robust governance and aligned decision-making structures throughout the partnership • Integrated project management systems and tools
Safeguard strategic autonomy and national security	Safeguarding economic and national security and the continuity of critical processes by operating, maintaining and securing the plant as independently as possible within the applicable laws and regulations.	• Prevent and reduce risky strategic dependencies • Ensure secure procurement and tendering procedures including security of knowledge of screening of investments for potential risks • Control – where possible – over essential parts of the nuclear supply chain and manage or mitigate risks on strategic dependencies in the fuel cycle • Robust partnership with relevant partners to withstand geopolitical risks • Securing long-term fuel supply for operations • Diversify fuel supply chain • Diversify fuel use (input: plant can operate on different types of fuel) • Create possibility to reprocess spent nuclear fuel (output: the plant fuel waste can be processed to be re-used) • NPP intelligences including design data, maintenance strategies, digital configurations,

Project Objective	Objective Description	Objective indicators
		supplier information and SSC (structures, systems and components) documentation • Ensure secure procurement and tendering, investment-screening measures and protection of sensitive knowledge and operating systems
Strengthen the Dutch nuclear ecosystem	Facilitate participation of stakeholders within the Dutch nuclear ecosystem, including supply chain, knowledge, innovation, and human capital where possible and in accordance with applicable laws and regulations to build domestic expertise.	• Localisation framework focused on both short-term and long-term value creation, including industrial participation, supply chain and workforce development, where possible and in accordance with applicable laws and regulations • High-quality employment opportunities in the Netherlands • Partnerships with knowledge and educational institutes for skills development and knowledge dissemination anchored in the existing knowledge infrastructure • Contribution to the broader Dutch nuclear ecosystem, international cooperation and Government-to-Government ties
Manage the risks of radioactive waste	Manage the risks of radioactive waste to people and the environment by minimising the amount of radioactive waste and ensure that all radioactive waste is managed throughout its entire lifecycle in compliance with applicable laws and regulations and with applicable internationally recognized safety standards.	• Manage Radioactive waste in line with the Nederlands Programma Radioactief Afval (NPRA) and in consultation with COVRA N.V. • Develop an initial decommissioning plan and associated financial provisions. Consider options for reprocessing spent nuclear fuel

3.3 Trade-Off Considerations

All seven project objectives are critical to the success of the NNB project. However, in practice, they cannot all be maximized simultaneously. Certain trade-offs are inevitable and must be explicitly identified and carefully balanced for decision-making. For example, higher costs may be acceptable if they strengthen strategic autonomy.

However, nuclear safety remains an overriding priority and is non-negotiable. It must be achieved in full, even if this impacts other objectives such as schedule, cost, or autonomy. Figure 1 illustrates safety as the central element that cannot be compromised. Figure 1 shows two fictional options where each of the project objectives have been weighed up, with nuclear safety as top priority for both.

Figure 1. Project objectives weighed for two fictional options