NUCLEAR ENERGY FOCUS GROUP
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Position Paper on the Nuclear Illustrative Programme (PINC)

Achieving climate neutrality by 2050 requires a profound transformation of Europe's energy system. While electricity is already largely decarbonised, nearly 70% of total energy consumption still relies on fossil fuels, most of them imported. In 2024 alone, the European Union spent €375 billion on energy imports.

Electrification, clean industrial heat, hydrogen, and system stability will be decisive in the next phase of decarbonisation. In this context, nuclear energy is not optional. It is strategic.

With **101 nuclear reactors in 13 Member States**, and with many others planning new build or life extensions, nuclear energy is already a backbone of Europe's energy security. Its contribution benefits not only nuclear countries but the entire Union.

In this context, the Commission's **Nuclear Illustrative Programme (PINC)** is a long-overdue and highly strategic document.

The Nuclear Energy Focus group welcomes the publication of the 8th PINC, as requested in its October 16, 2024 statement setting out its priorities. However, the European Parliament is not formally consulted under the Euratom Treaty. It is therefore essential for the Nuclear Energy Focus Group to provide a **political, forward-looking position** so that MEPs have a say on this important issue.

The work of the **European Economic and Social Committee (EESC),** whose opinion was adopted on 4 December, has significantly influenced this paper. Close cooperation with the co-rapporteurs has helped build a strong, balanced, and ambitious approach.

1. Recognising nuclear as a decarbonised and baseload energy source

The draft PINC represents a welcome and overdue shift in the EU's energy policy narrative. It clearly acknowledges that nuclear energy is a **low-carbon, dispatchable, and reliable** energy source, essential to meeting the Union's 2030 and 2050 climate targets.

The PINC must further recognise that nuclear energy provides **system-wide benefits** that extend far beyond the borders of nuclear-operating Member States. Except for two countries — Malta and Cyprus (due to their geographical remoteness) — the 25 other Member States have used nuclear electricity produced domestically or by their neighbours (through import mechanisms). Nuclear power supports the resilience of the entire European electricity grid by providing inertia, frequency stability, predictable production and lower exposure to volatile gas markets. These advantages reduce the need for grid reinforcements, large-scale energy storage and reserve capacity mechanisms.

It is essential that nuclear energy be treated **on an equal footing** with other clean technologies across all EU legislation and funding instruments. For the post-2030 framework, we therefore call on the Commission to consider decarbonization targets based on reducing carbon intensity rather than technology-specific targets in the revision of the Energy Union Governance Regulation, expected at the end of 2026.

The PINC should send a clear political signal that nuclear energy is a long-term strategic component of Europe's decarbonised energy system.

To ensure effective delivery of this objective, the PINC should be accompanied by an **Action plan** aimed at facilitating and scaling up nuclear investment at EU level. The action plan should set out a coherent package of measures to establish the appropriate framework conditions, provide long-term visibility and policy predictability, support increased convergence of regulatory approaches, and enable Member States to deliver resilient, future-proof nuclear infrastructure while reinforcing a competitive and sustainable European nuclear value chain.

2. Raising the reference scenario in line with Member State ambition

The Commission's baseline projection of **109 GW of nuclear capacity by 2050** is insufficient and does not reflect the actual level of ambition expressed by Member States. The scenario underestimates the pace of planned lifetime extensions and fails to add up the number of new large reactors with the projected installed capacity of Small Modular Reactors (SMRs) currently planned by Member states. Thus it misses the chance to provide a clear overview of all new nuclear capacities currently under development for deployment before 2050.

When the targets and project pipelines announced in the National Energy and Climate Plans (NECPs) are aggregated, they indicate **150 GW of nuclear capacity by 2050**. This level of ambition must form the core of the PINC modelling, rather than a conservative scenario disconnected from national strategies. **The PINC does not set targets, but it must reflect the current momentum of the nuclear energy sector.**

Moreover, **SMRs and Advanced Modular Reactor (AMRs) must be fully included in the scenario-building**. Even if individual projects are still at the feasibility or licensing stage, the scale of industrial mobilisation and the number of Member States planning for SMR deployment make their inclusion indispensable.

The Nuclear Energy Focus Group consider also that the PINC must evolve into a **dynamic and regularly updated tool** and then call the Commission to publish it at least every two years with the State of the Energy Union, to reflect technological progress, new investment decisions and updated national strategies.

3. Financing: assessing real needs and system-level benefits

While the PINC estimates **€241 billion** of investment needs for new reactors and lifetime extensions, this figure is incomplete and underestimates the true scale of investment required for a robust and sovereign European nuclear ecosystem.

Key financial elements are missing, including:

- **Fuel cycle investments,** from extraction to radioactive waste management, are essential to reduce Europe's dependence on non-EU nuclear materials imports and to secure the autonomy of supply. In the previous PINC published in 2017, the total estimated investments between 2015 and 2050 were projected to be between €660 and 770 billion, including the fuel cycle. We call on the Commission to update these figures as regards the new 2050 scenario and the need to phase out Russian nuclear fuels imports. We also advocate **financial support** to accompany the forthcoming proposal to **end Russian nuclear imports**. This support is essential to develop and strengthen a European nuclear supply chain, including fuel manufacturing capabilities, as market forces alone will not deliver the required diversification. Significant upfront investments in enrichment, reprocessing and advanced fuel technologies must be made well before new reactors become operational, and therefore require targeted public backing.

- **Investments related to grids** linked to nuclear development, to be combined with renewable and other energy needs.

- **Funding needs for SMR and AMR deployment**, including demonstration units, licensing support, supply-chain development, manufacturing capacity, and financial support for the construction of small research reactors involved in the production of radiopharmaceuticals.

- **Skills development, research and innovation**, which will require substantial and sustained funding in order to train tens of thousands of workers and bring new technologies to market. To ensure the success of new nuclear projects, including SMRs and AMRs, the EU must launch dedicated, large-scale skills initiatives such as *Skills4Nuclear*, the *NZIA Academy*, and a new network of *European Nuclear Valleys*. The need is urgent: the European nuclear sector alone will require between 100,000 and 240,000 new qualified workers over the next decade. Without a coordinated European skills strategy, Europe will not be able to deploy its nuclear ambitions at scale.

- **Waste management:** in line with circular economy principles, the Commission should encourage the development of a new fuel (MOX) with measures supporting processing and recycling of spent fuel. MOX is strategic for both energy production, for reducing radiotoxicity as well as the final volume of ultimate waste. This will strengthen European security of supply by closing the entire cycle.

In addition, the PINC must quantify the **system-level economic benefits** of nuclear energy. Nuclear deployment reduces the EU's reliance on imported fossil fuels, contributes to the massive development of electrification in Europe, limits exposure to volatile markets, reduces the need for extensive grid reinforcement, and lowers the overall cost of the electricity system. These avoided costs are significant and must be integrated into the analysis.

A comprehensive financial assessment is necessary to properly reflect nuclear energy's contribution to competitiveness, security of supply and long-term price stability for European industry.

4. Unlocking investments: EU financing tools and regulatory enablers

A genuine nuclear revival in the EU requires a stable, predictable and investment-friendly framework. Today, nuclear energy suffers from **unequal access** to EU funding instruments compared to renewable technologies.

Develop stable revenue models

As outlined in the Electricity Market Design, long-term power purchase agreements (PPAs) and contracts for difference (CfDs) must be encouraged to de-risk revenues.

We call also to promote **public–private co-financing models**, with Member States covering part of the risk. These could be part of **tripartite agreements** between Member State authorities, nuclear energy suppliers and energy-consuming industries.

Mobilise the European Investment Bank (EIB)

The Nuclear Energy Focus group welcomes the recent €400 million financing granted by the EIB on March 10, 2025 to Orano's enrichment plant in Tricastin. However, the EIB presents itself as the "EU Climate Bank", but it is still reluctant to further finance nuclear projects. This must change.

The **EIB pilot programme for corporate PPAs** must be open to the purchase of nuclear electricity generation. In line with the approach in the Electricity Market Design, the Commission must engage with the EIB to promote PPAs in a technologically neutral way.

Low interest loans provided by the EIB or Member States could also be implemented to reduce the overall cost of nuclear projects.

Include nuclear in the upcoming Clean Energy Investment Strategy (CEIS)

The upcoming Clean Energy Investment Strategy will address systemic barriers to investments in clean energy technologies, infrastructure, storage and energy efficiency, and outline actions to unlock private capital and better leverage public funding.

The CEIS must fully integrate nuclear energy, including large reactors, SMRs/AMRs and the entire fuel cycle, as part of Europe's future clean energy strategy. Excluding nuclear would undermine the EU's decarbonisation goals and weaken European competitiveness.

Reform the EU Taxonomy

Nuclear energy must be reclassified as a **fully sustainable activity**, not merely a transitional one. The entire nuclear fuel cycle, from upstream to downstream, must be included through a delegated act. This would give a positive signal to investors and strengthen EU independence.

We urge on the European Commission to incorporate this when reviewing the EU taxonomy in 2026.

Make nuclear eligible to all major EU funds

The Nuclear Energy Focus Group calls for opening all relevant EU funds to civil nuclear technologies, such as cohesion funds, the Innovation Fund, the Just Transition Fund, and the future Competitiveness Fund. Excluding nuclear technologies from these instruments contradicts the technology neutrality principle and prevents the EU from achieving its stated objectives of strategic autonomy and affordable decarbonisation.

Launch a nuclear IPCEI

A **Nuclear Important Project of Common European Interest (IPCEI)** would unlock major private investment by allowing flexible state aid rules. As each euro of public investment in an IPCEI generates two euros of private capital, this is the most effective mechanism to accelerate deployment. EU budget support will be essential for Member States with limited national resources. The Commission must launch this IPCEI in 2026.

Faster state-aid procedure

The CISAF merely states that "the Commission will conduct a timely assessment of State aid cases for nuclear energy generation, including for small and advanced modular reactors." However, in the absence of dedicated State aid guidelines for nuclear energy, all projects are currently assessed under standard procedures, requiring a full demonstration of each compatibility criterion on a case-by-case basis. We therefore call for a more efficient and predictable State aid framework for nuclear, including for SMRs and AMRs, enabling the Commission to build on existing case law and past decisions to streamline the assessment of recurring elements in financing schemes, while preserving individual notifications where necessary. This is essential to reduce delays, increase legal certainty and accelerate project deployment.

5. Supporting the European supply chain and European technologies

Europe possesses some of the world's most advanced scientific and industrial expertise in nuclear energy, from reactor design to engineering, safety, and the fuel cycle. What Europe lacks today is not knowledge, but a favorable environment for scaling up European nuclear technologies. The EU must ensure that its energy policy promotes European technologies, European intellectual property, and value creation in Europe, while respecting the right of Member States to cooperate with reliable global partners. A nuclear renaissance built solely on massive imports of non-European designs would undermine European sovereignty and deliver no long-term industrial benefit. Global partnerships should involve the domestic supply chain, joint ventures with European partners, and patent deposits in Europe.

The recent EU–US energy agreement, including €300 billion earmarked for US nuclear, should be a wake-up call to increase the financial and political support for nuclear in the EU. The US Phoenix Fund already finances feasibility studies in several Member States to deploy American SMRs, something Europe does not yet offer to its own industry. To match this, the EU should allow the use of European funds such as the Innovation Fund, ERDF and the Just Transition Fund to support feasibility studies for nuclear capacity deployment, including the conversion of coal sites and the supply of low-carbon power to data centres and industrial clusters.

To reduce its strategic dependencies, the EU must secure its own supply of uranium, including by diversifying suppliers, expediting permitting processes and strengthening domestic extraction and processing capacity, and by defining uranium as a critical raw material under the Critical Raw Materials Act.

6. Beyond electricity: maximising nuclear's full system value

Nuclear energy's contribution to Europe extends far beyond electricity production. The PINC must emphasise the full spectrum of nuclear applications that support industrial decarbonisation, healthcare and innovation.

Industrial and district heat

Currently, nearly 90% of industrial heat in Europe is still produced from fossil fuels. Nuclear reactors, including SMRs and AMRs, can provide co-generation and high-temperature heat for energy-intensive industries such as chemicals, steel, paper and hydrogen. They can also supply district heating networks and contribute to their decarbonization

The Nuclear Energy Focus group calls on the Commission to include all nuclear technologies, particularly SMR and AMR, in its Heating and Cooling Strategy foreseen in Q1 2026.

Low-carbon hydrogen

Nuclear energy can produce stable, affordable low-carbon hydrogen via existing reactors and advanced high-temperature technologies. Recognising nuclear-derived hydrogen as a key asset for industrial decarbonisation is essential.

We welcome the opening of the European Hydrogen Bank to low-carbon electrolytic hydrogen, in line with the Low-Carbon Delegated Act.

SMRs and AMRs will also be essential enablers of clean hydrogen. Coupled with high-temperature or conventional electrolysers, they could deliver continuous, low-carbon hydrogen for energy-intensive sectors such as chemicals, refining, steel, and fertilisers. A multi-SMR plant of 300–600 MW could supply the hydrogen demand of an ammonium production facility or a refinery. Such potential could help Europe closing the gap between its current output and future needs.

To unlock these projects, technology neutrality and **nuclear PPAs must be fully recognised** in the EU's methodology for defining low-carbon hydrogen. Without this inclusion, such investments will not be viable. The Commission must propose this new methodology by June 2026.

Digital Growth

Nuclear energy, particularly SMRs and AMRs, is essential for Europe's digital ambitions and the scaling up of AI and cloud infrastructure. Hyperscale data centres cannot rely on variable renewables and batteries alone. Continuous, local, carbon-free power is indispensable and this need has been emphasised by major technology operators. SMRs and AMRs provide compact, modular, and reliable power that stabilises grids and meets the rapidly growing electricity demand generated by digital expansion.

Without nuclear energy, Europe cannot scale AI and cloud infrastructure competitively or avoid increasing dependence on external sources.

We call on the Commission to acknowledge the essential role of SMRs and AMRs in supporting Europe's digital growth in the forthcoming EU SMR Strategy, expected in the first half of 2026, and provide financial instruments for project coupling nuclear capacity with AI deployment.

Nuclear medical use

Radioisotopes remain a strategic nuclear activity, and the EU is a global market leader. Radioisotopes are indispensable for diagnosis of diseases, such as cancer, cardiac, pulmonary and neurological ones, and they are increasingly important for cancer therapy.

Better synergies between **Horizon Europe** and **Euratom** are necessary to end the regulatory ambiguity that currently weakens the sector of nuclear medicine. Investments in production, research and supply-chain resilience must be prioritized.

To keep its leadership and keep providing quality treatment to people, the EU and the Member States must invest substantial amounts for domestic supply of HALEU (supply of high-assay low enriched uranium) with development of production facilities in the EU.

We call on the Commission to publish in 2026 **a proposal for a European Radioisotopes Valley Initiative (ERVI)** to secure EU supply of medical radioisotopes, including adequate financial support for dedicated projects.

7. Fusion energy

Europe is losing ground in the global fusion race. According to Fusion for Energy (F4E), European companies have invested €712 million since 2020 while American and Chinese private sectors respectively invested €6.9 billion and €4.4 billion.

A dedicated **European Fusion Strategy** must be swiftly adopted, with concrete instruments for investment, public-private partnerships, and support for private fusion companies, especially SMEs and start-ups. It should also provide a clear and stable regulatory framework distinct from nuclear fission, with a European-level legal architecture, rather than 27 fragmented ones. ITER must remain the scientific foundation and continued support must be guaranteed, including adequate EU's financial contribution but Europe must also establish a broader innovation ecosystem in the field of fusion, from research to commercialization, building on a wider range of technological solutions

The Nuclear Energy Focus Group calls on the Commission to release an ambitious EU Fusion Strategy in early 2026.

8. Safety regulation and public acceptance

Strong and independent national regulatory authorities are instrumental in achieving high levels of nuclear safety. We encourage national regulatory authorities to further cooperate as well with ENSREG and WENRA. The EU must continue to apply the highest international safety standards while updating its regulatory framework to reflect SMRs and AMRs specificities without blocking innovation.

Besides, Europe should not rely on technologies from jurisdictions where the independence of the safety authority is not fully guaranteed, and foreign licensing cannot replace a full European assessment. This is essential to maintain public trust, protect strategic autonomy, and uphold Europe's leadership in nuclear safety.

The Nuclear Energy Focus group insists that public acceptance and citizen engagement are key to the success of any nuclear project. Nuclear projects are long-term and closely linked to safety, health, and territorial development, which means they cannot be imposed from the top down. Early, transparent and continuous dialogue with local communities, workers and civil society is essential to build trust, address concerns and ensure democratic legitimacy.

Conclusion

The PINC must be the **starting point** of a genuine European nuclear strategy, not merely a snapshot. The upcoming decisions on the **2028–2034 MFF**, on the EU's industrial agenda, and on the Union Energy governance must align with **strong and coherent clean energy strategy**.

The Nuclear Energy Focus Group remains at the disposal of the Commission and the Council to open discussions on best ways to go forward with the PINC and other legislations.