nuclearеurope

Unleashing the power of nuclear

A PLAN FOR ACTION

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Europe is at a decisive energy crossroads. To stay competitive, resilient and on track for climate neutrality, we must take tough decisions. Fast.

The challenge is clear: decarbonise, secure our energy supply, protect industrial competitiveness and keep energy affordable.

Security of supply has become a strategic issue. High energy prices, due in part to our dependence on energy imports, are eroding our competitiveness. Climate goals demand rapid emission cuts. And a more electrified, interconnected economy needs a stronger and more resilient energy system.

For more than 70 years, nuclear has delivered stable, clean power across Europe. Today, with electrification accelerating, data centres multiplying, industries racing to decarbonise and global pressures intensifying, its value is clearer than ever.

In this context, nuclear brings concrete and measurable benefits to all EU countries, regardless of whether these countries have nuclear facilities or not. It provides firm, dispatchable clean power that stabilises the grid and complements renewables. It strengthens Europe's energy sovereignty by reducing dependence on imported fossil fuels. It supports industrial decarbonisation with decarbonised electricity, heat and hydrogen. And it anchors a world-leading European value chain that supports 900.000 skilled jobs.

As highlighted in the Nuclear Illustrative Programme (PINC), nuclear energy brings significant benefits in terms of:

- **Building a decarbonised EU energy system.**
- **Ensuring the stability of the electricity system.**
- **Supporting the competitiveness of European industry.**

Significant investments are planned across the EU with both lifetime extension and new build projects, leading to an installed nuclear capacity of 150GW by 2050, enough to power more than 250 million homes[1].

Achieving this will require a series of concrete policy actions as outlined in this report. Above all, the sector needs a long-term policy framework that provides clarity, stability, and predictability for investors.

Implement a long-term vision to stimulate net zero with nuclear

Ensure an equitable financial framework which encourages investments

Speed up nuclear deployment through an accelerated regulatory framework

Enhance security of supply by investing in the entire nuclear fuel cycle

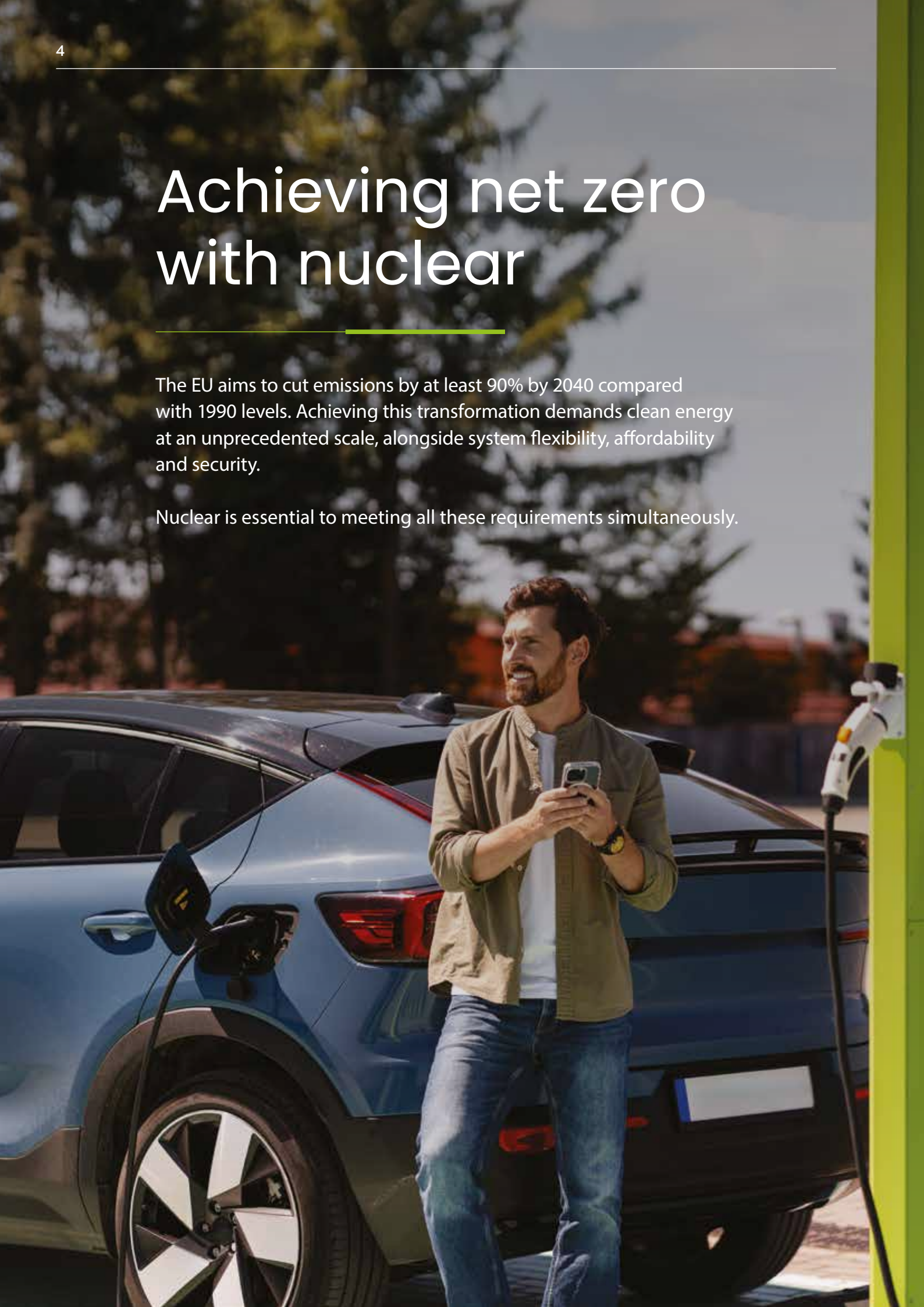
Sustain a Europe-based nuclear supply chain

[1] nuclearеurope calculation based on data from ODSSYEE-MURE

Achieving net zero with nuclear

The EU aims to cut emissions by at least 90% by 2040 compared with 1990 levels. Achieving this transformation demands clean energy at an unprecedented scale, alongside system flexibility, affordability and security.

Nuclear is essential to meeting all these requirements simultaneously.



Nuclear already provides **more than 30%** of the EU's low carbon electricity, delivering large-scale generation. As fossil fuels are phased out, nuclear offers firm, clean energy. This is critical to managing a system increasingly dominated by variable renewables. By providing continuous output, nuclear helps maintain grid stability, reduces the need for costly backup and storage solutions, and keeps overall system costs manageable.

The climate benefits are substantial. Nuclear already avoids millions of tonnes of CO_2 emissions every year in Europe, and planned investments, from lifetime extensions to new large-scale reactors and upcoming Small Modular Reactors (SMRs) and Advanced Modular Reactors (AMRs), will expand this contribution further. Nuclear also strengthens the resilience of the wider European energy system. Nuclear is therefore a shared European asset, underpinning decarbonisation well beyond national borders.

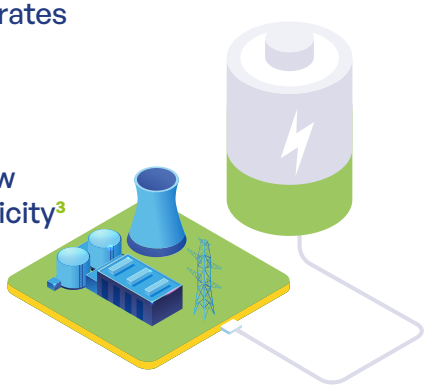
Nuclear will also be critical as Europe's energy landscape rapidly shifts towards electrification as part of its decarbonisation strategy. Electricity demand is projected to rise significantly in the coming decades as industry shifts to electrified manufacturing processes, homes install heat pumps, millions of electric vehicles connect to the grid and the power use of data centres increases, driven by digitalisation and AI. Indeed, data centres alone are expected to account for 10% of electricity demand growth in the EU by 2030, according to the IEA.[2] This marks a structural transformation: electricity will power a growing share of Europe's mobility, industrial processes, and digital infrastructure.

Nuclear has provided net zero energy for decades

Nuclear generates more than

30%

of the EU's low carbon electricity[3]



Without nuclear power, global CO_2 emissions from electricity generation would have been almost

20%

higher over the last half-century[4]

"To truly deliver the clean energy transition, we need all zero- and low-carbon energy solutions. Nuclear energy has a role to play in building a resilient and cleaner energy system."

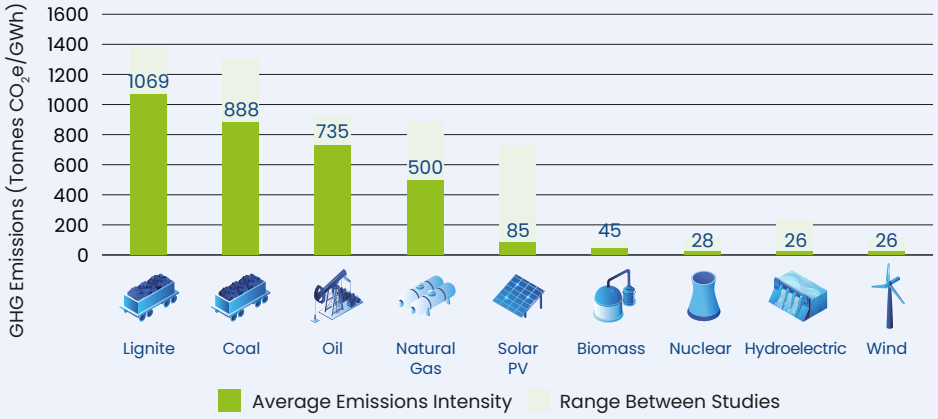
Dan Jørgensen, European Commissioner for Energy and Housing

[2] Overcoming energy constraints is key to delivering on Europe's data centre goals, IEA, 2025
[3] NuclearEurope Facts & figures & Nuclear Power in a Clean Energy System
[4] International Energy Agency - Nuclear Power in a Clean Energy System, 2019

Net zero electricity

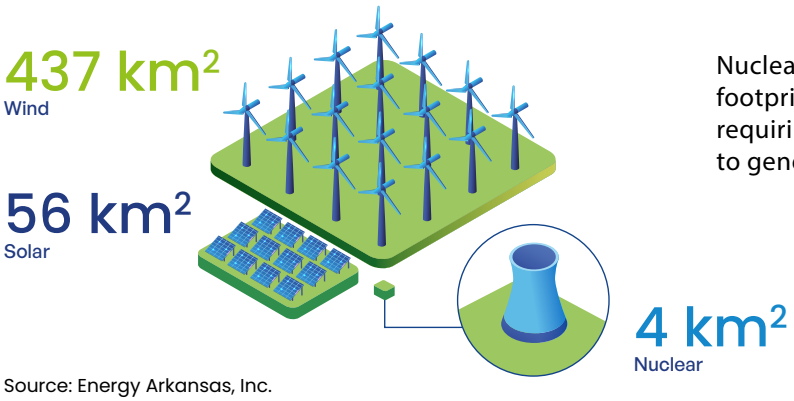
Nuclear is one of the cleanest sources of electricity production available today, as it does not emit any CO_2. Furthermore, its full life cycle emissions (including construction, fuel fabrication and decommissioning) are amongst the lowest of all energy sources.

Lifecycle GHG emissions intensity of electricity generation technologies[5]



Nuclear has one of the lowest land footprints of all clean energy sources.

Land required by different energy sources to match the amount of electricity produced by a 1,800 MW nuclear power plant



Nuclear has one of the lowest land footprints of all clean energy sources, requiring limited geographical space to generate vast amounts of energy.

Source: Energy Arkansas, Inc.

[5] JRC report Technical assessment of nuclear energy with respect to the 'do no significant harm' criteria of Regulation (EU) 2020/852 ('Taxonomy Regulation')

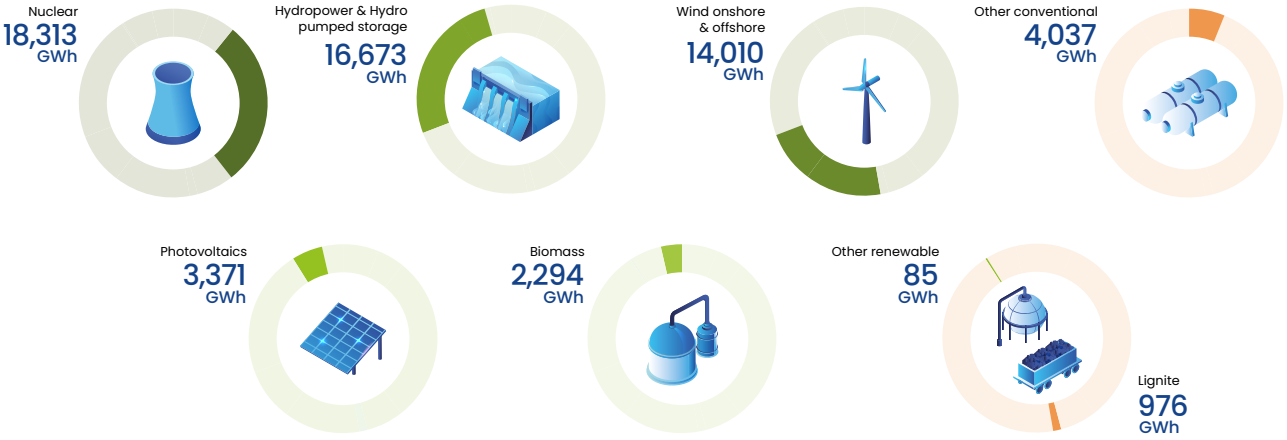
All EU countries benefit from complementarity

Nuclear and renewables complement each other well, with nuclear providing the firm, dispatchable and clean energy needed to balance the variability of wind and solar. Together, they create a resilient and decarbonised energy mix. Crucially, these benefits extend across the entire EU energy system.

Nuclear brings benefits to all EU countries

For example, Germany has no operational nuclear power plants but imports energy from other European countries with nuclear being the most important source of imported electricity.

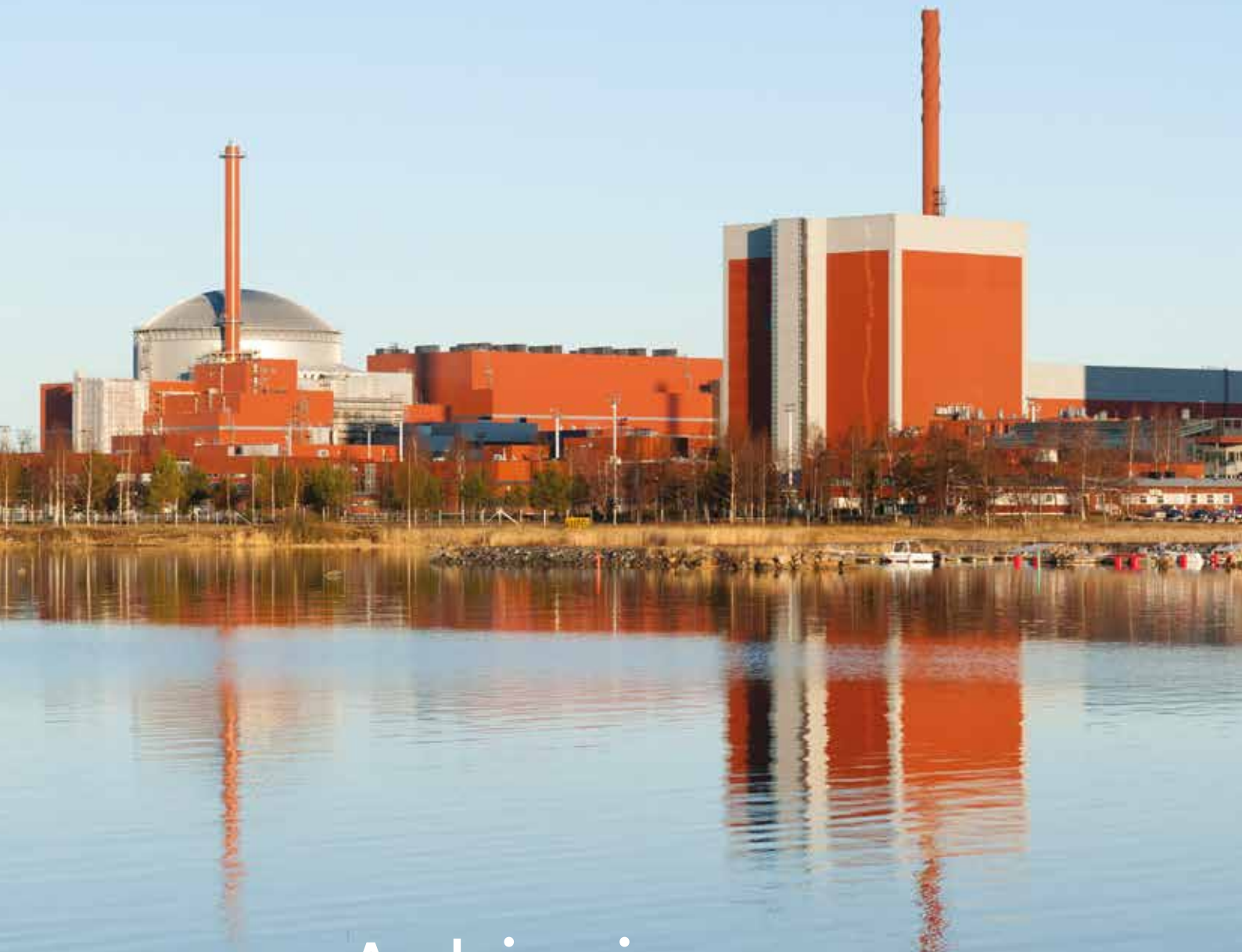
Energy mix of German electricity imports in 2024



Source: SMARD, 2025

Championing a stable & robust energy system

As a firm source of energy, nuclear provides reliable electricity 24/7. This supports the entire European energy system by ensuring a stable foundation. In addition to delivering clean power, nuclear offers both flexibility and so-called inertia, a feature that helps maintain grid frequency and prevent sudden fluctuations. Together, these characteristics improve grid stability and facilitate the integration of increasing amounts of variable renewable energy.



Achieving energy sovereignty with nuclear

Europe's drive for energy independence has become a strategic objective, shaped by recent geopolitical shocks, long-term climate goals and the need to protect households and businesses from volatile global energy markets.

As the energy transition accelerates, the debate is no longer limited to replacing fossil fuels. The challenge is to build a resilient, integrated system that strengthens our sovereignty, competitiveness and sustainability across the entire economy.

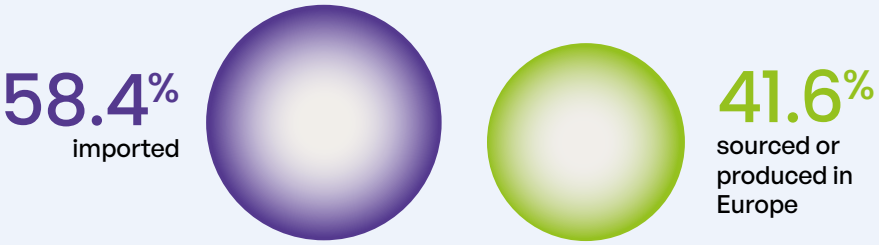
Despite progress, Europe remains heavily exposed. In 2023, imported fossil fuels accounted for 58% of the EU's primary energy needs, a share broadly unchanged from before the energy crisis.

Electricity generation is gradually shifting towards domestic, net zero sources such as wind, solar and nuclear. Yet other sectors remain vulnerable. Transport, for example, is still 88% dependent on imported fossil fuels.

Accelerating the shift from imported fossil fuels to locally produced electricity is the most effective way of achieving energy sovereignty. Nuclear is Europe's largest single source of clean, homegrown energy. It provides firm, dispatchable, clean electricity 24/7, which is essential to shoring up Europe's energy sovereignty and strategic autonomy.

Reducing Europe's energy dependence

Total EU Energy use



The EU remains dependent on energy imports. The EU's energy import dependency rate stood at 58.4% in 2023 meaning over half its energy needs were met by imports.

Source: European Commission

€1.8 trillion

As Europeans, we paid a steep price for our energy dependency. During the gas crisis from 2021 to 2024, when fossil fuel prices surged, the EU spent €1.8 trillion on fossil fuel imports, around €930 billion more than the same volumes would have cost at pre-crisis rates.[6]

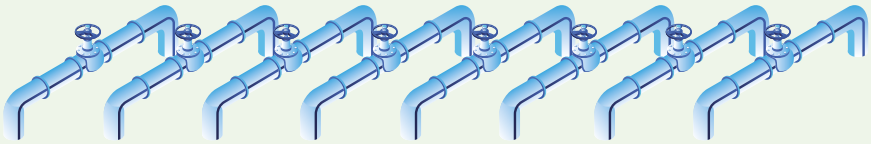
[6] EMBER: Shockproof: how electrification can strengthen EU energy security

Electrification + nuclear = less energy imports

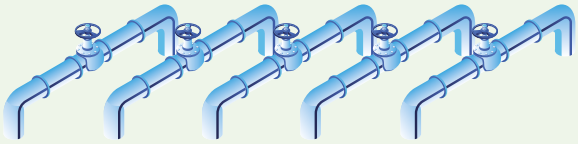
A shift towards electrification can help reduce Europe's energy dependence. Therefore, immediate support for electrification which stimulates demand and encourages investment, is key. As heat pumps replace boilers, electric vehicles take the place of combustion engines and industry continues to electrify, electricity demand will rise, making nuclear power essential to meeting this growing requirement.

By having more nuclear in Europe, much less natural gas would need to be imported from third countries, leading to greater security of supply. Reaching #150GW nuclear by 2050 would reduce gas consumption by around 180 billion cubic metres (bcm) between 2031 and 2050 (which is the equivalent of 37% of total gas consumption). Under a #200GW scenario, gas consumption would fall by about 220 bcm.

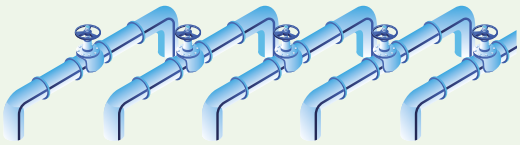
#100GW scenario - EU natural gas consumption from 2030 to 2050



#150GW scenario - EU natural gas consumption from 2030 to 2050



#200GW scenario - EU natural gas consumption from 2030 to 2050



Source: Pathways to 2050: the role of nuclear in a low-carbon Europe, Compass Lexecon, 2024

Abundant availability of uranium

Whilst it is true that currently, the uranium used to fuel nuclear facilities is still imported, it is nevertheless abundantly available and can be sourced from a wide range of reliable international partners, reducing the geopolitical risks associated with other fuels.

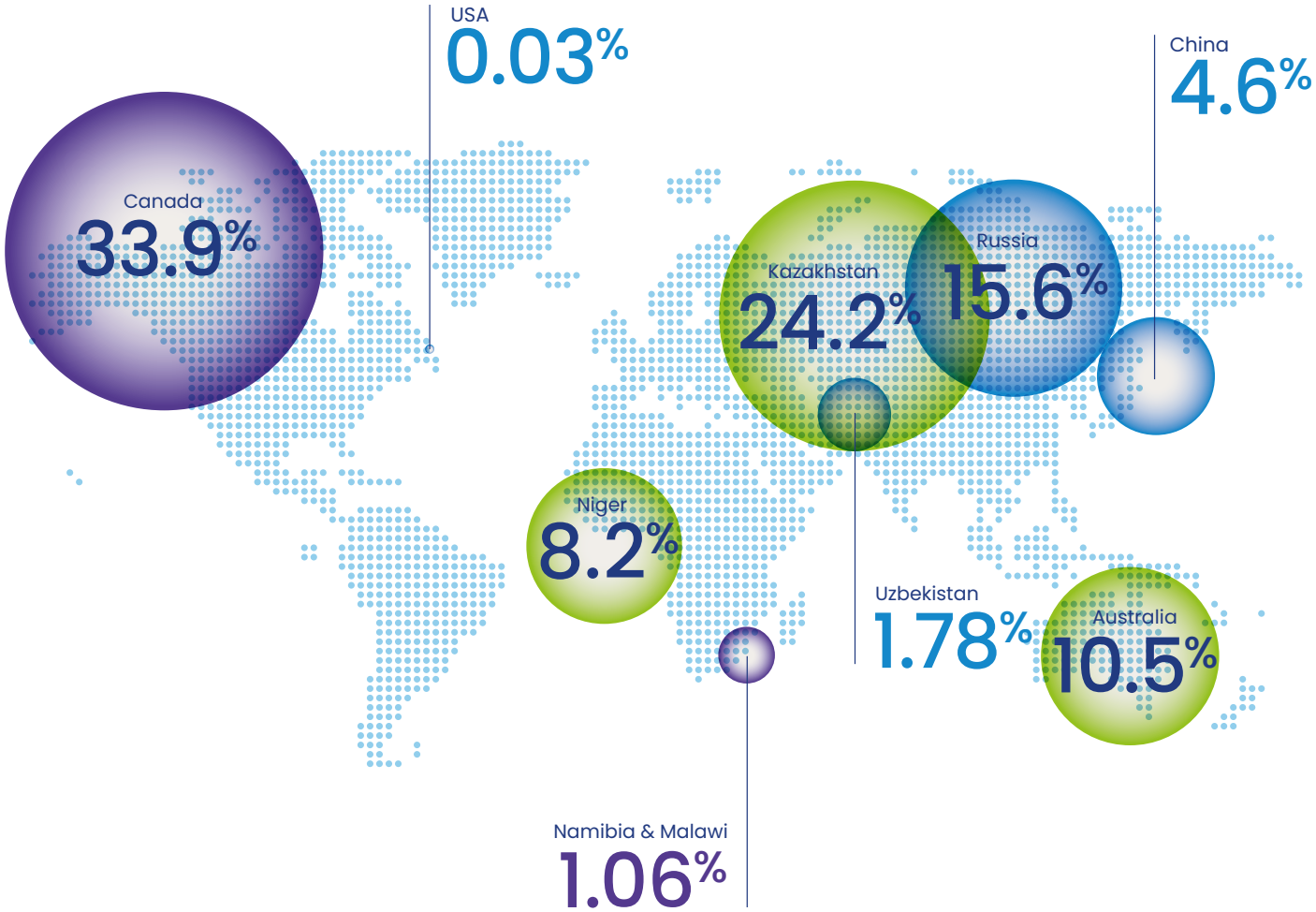
Crucially, nuclear requires only very small quantities of uranium to generate large amounts of energy, giving Europe a strategic advantage: even modest stocks can support decades of reliable, net zero generation.

With uranium suppliers spread across stable regions, including Australia and Canada, the EU benefits from a broad, resilient import base. Europe also has domestic uranium resources that could be used if necessary (e.g. in Sweden). Combined with uranium's exceptional energy density, this makes nuclear a key pillar of Europe's long-term energy security and reduced dependency on volatile fossil fuel markets.

Furthermore, recycling & reprocessing of both existing and future spent nuclear fuel (including current stockpiles) significantly reduces the volumes of waste generated by turning it into a resource. In addition, it would extend uranium resource availability well beyond the end of the century, reinforcing the long-term resilience and sustainability of the nuclear sector. More information about how the nuclear sector applies circular economy principles can be found in our online toolkit.

Who supplies uranium to the EU?

Uranium resources are available from a diversity of suppliers (% for 2024)



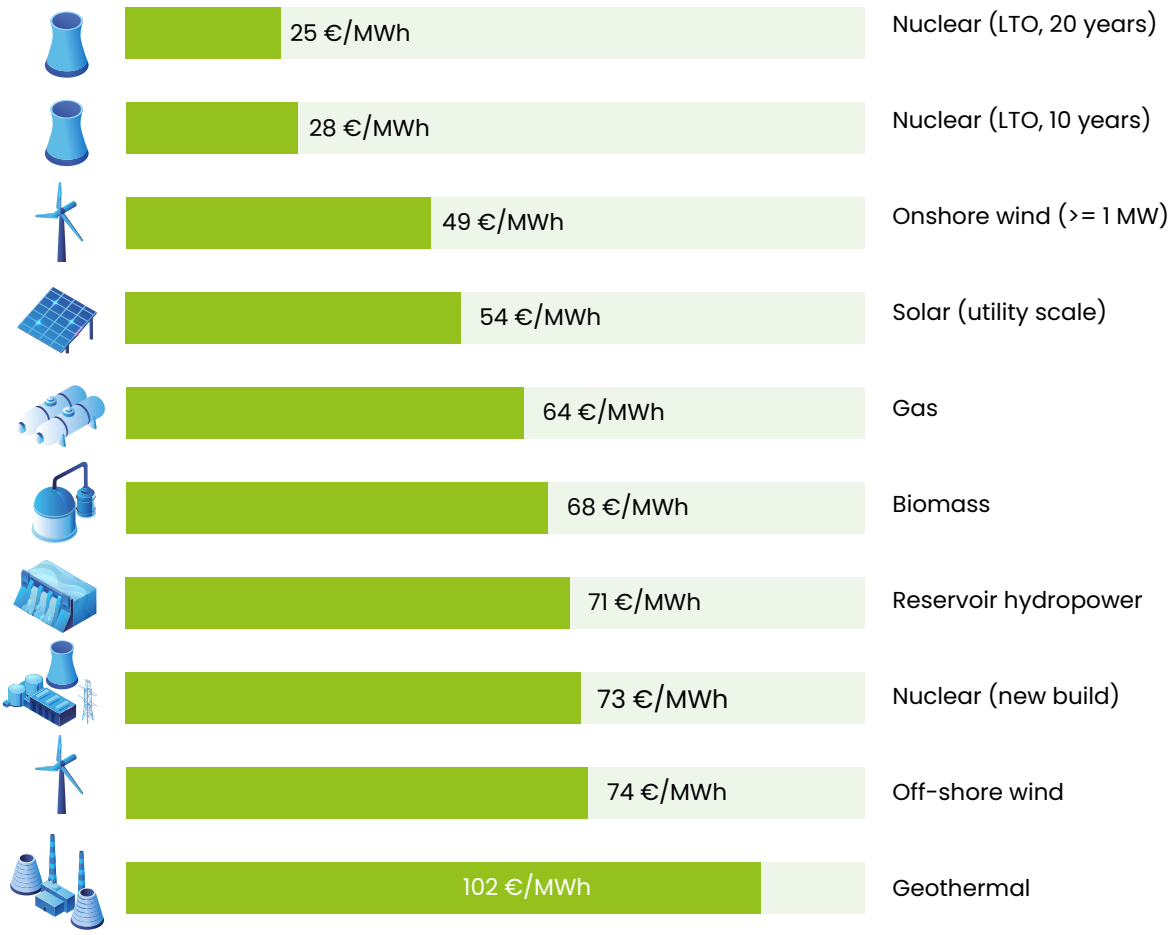
Source: 2024 ESA report

Strengthening growth & competitiveness with nuclear

Our industrial competitiveness depends on a stable, affordable and predictable supply of energy. As businesses decarbonise their manufacturing processes, scale up digital operations, integrate automation and AI systems, and navigate increasingly volatile global energy markets, the need for reliable, net zero energy has never been greater. Energy-intensive sectors such as chemicals, steel, cement, and fertilisers can only thrive if energy is both consistently available and shielded from extreme price fluctuations.

Nuclear enables affordable energy

Investing in nuclear means investing in an affordable energy system. When calculating entire system costs, nuclear compares very favourably with other clean energy sources. Variable renewables can still be cost-effective, but their value declines as their penetration increases due to higher investments in grids, storage and backup technologies.



Comparison of median LCOE (levelised cost of electricity) for different technologies in Europe (7% discount rate)[7]

LCOE metrics are not sufficient to characterise the competitiveness of different power generating technologies. A comparison should include entire system costs, such as networks and flexibility costs, in addition to the sole production costs.

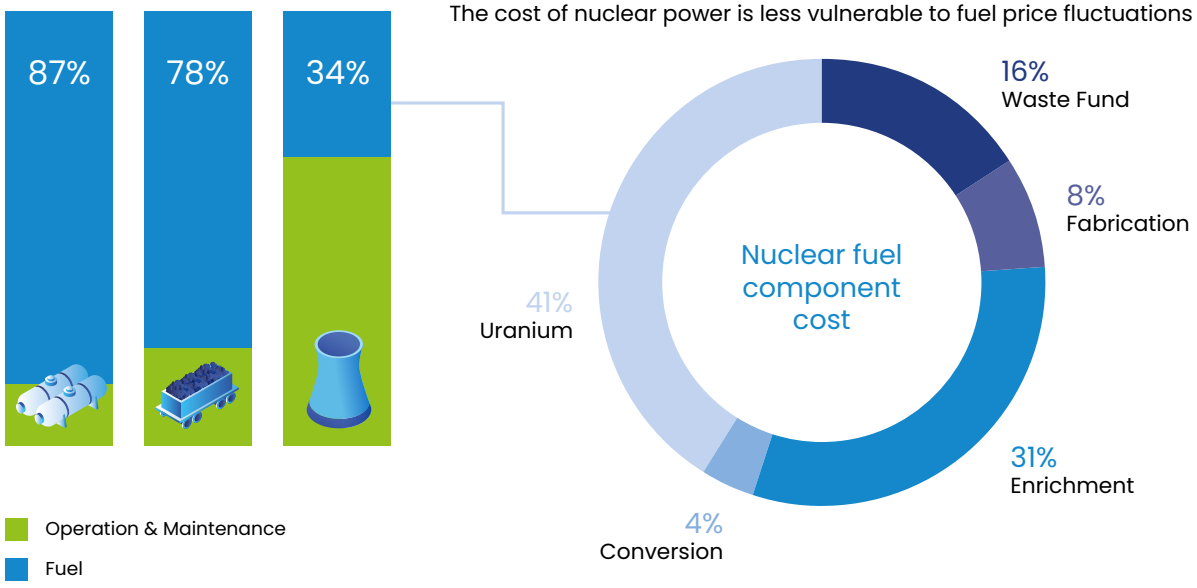
[7] Source: IEA 2020

Limited impact of energy price fluctuations

Nuclear is less vulnerable to price fluctuations because its cost structure is fundamentally different from that of fossil-fuel-based generation. Whilst it does come with a high upfront cost, operation and maintenance costs throughout its 60year+ lifespan are low.

Once a plant is operating, the marginal cost of generating electricity is very low and largely insulated from global commodity markets. Fuel plays only a small role in overall nuclear generation costs, typically around 5–10%. This stability means nuclear offers a reliable hedge against market volatility, whilst providing constant power to energy consumers.

Breakdown of operating costs for nuclear, coal & gas generation



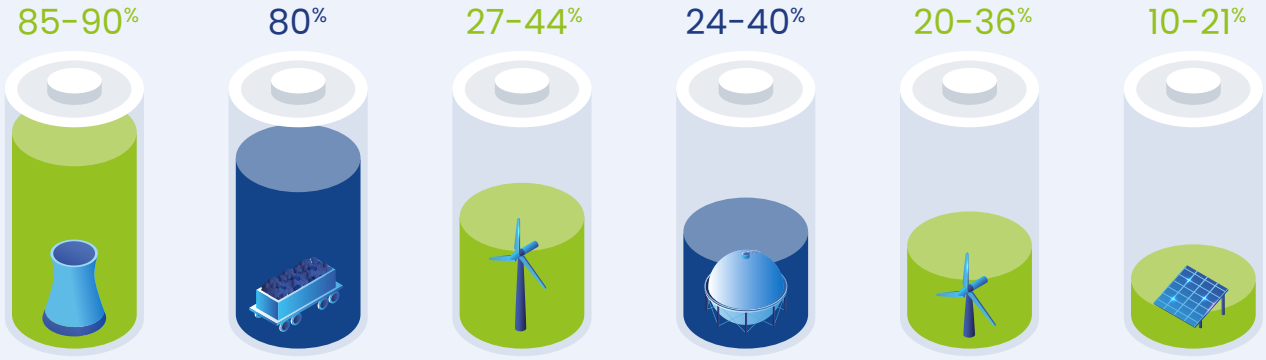
Source: World Nuclear Association 2017, Nuclear Energy Institute

Providing firm and reliable energy to match industrial needs

As a provider of firm and reliable energy, nuclear provides Europe's industries with a constant supply of decarbonised energy.

Providing reliable energy

Energy performance*



*% of rated capacity factor

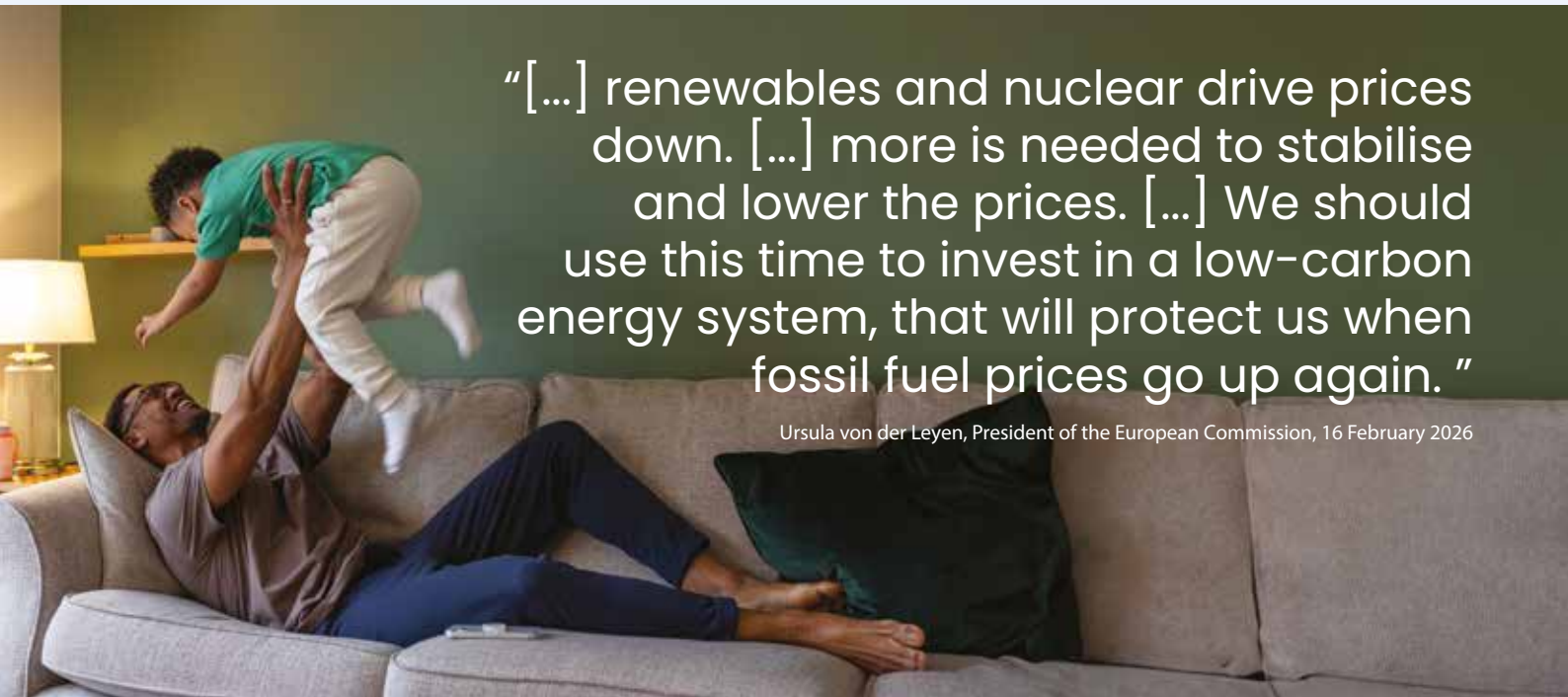
Source: ASSET project, "Technology pathway in decarbonisation scenarios", 2018

Nuclear also produces both hydrogen...

Several sectors will require a stable and affordable supply of clean hydrogen to decarbonise. Electrolysers used to produce this clean hydrogen require large and constant amounts of electricity. Given that nuclear can produce a constant supply of affordable electricity, it is a perfect solution. According to an analysis by Compass Lexecon, 150 GW of nuclear capacity could replace around 33% of clean hydrogen imports expected between 2030 and 2050. Expanding to 200 GW could replace over 60%, strengthening Europe's energy sovereignty and reducing dependence on imported fuels.

...as well as decarbonised heat

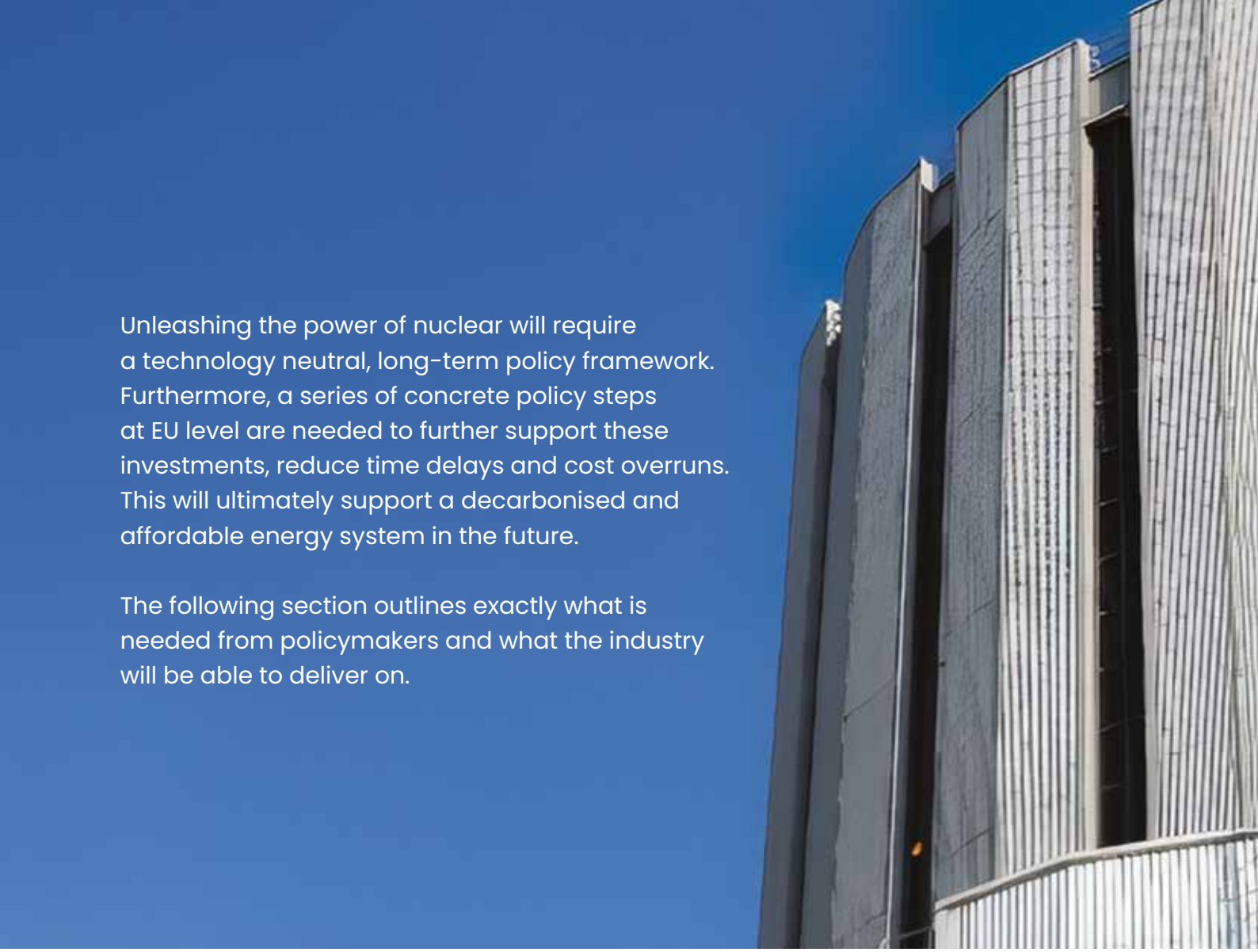
Nuclear energy can play a crucial role in delivering low-carbon heat, not just electricity, which makes it a powerful tool for decarbonising both urban heating systems and industrial processes. Already today, some nuclear power plants are providing decarbonised heat used for district heating purposes to the communities located in the vicinity of the plant. Similarly, nuclear can provide heat directly to industrial customers, supporting the decarbonisation of their processes. This versatility of nuclear, and the possibility of providing a mix of electricity, heat and hydrogen, is considered in several Small Modular Reactor and Advanced Modular Reactor designs.



"[...] renewables and nuclear drive prices down. [...] more is needed to stabilise and lower the prices. [...] We should use this time to invest in a low-carbon energy system, that will protect us when fossil fuel prices go up again. "

Ursula von der Leyen, President of the European Commission, 16 February 2026

Establishing the right policy framework to harness the full potential of the European nuclear sector



Unleashing the power of nuclear will require a technology neutral, long-term policy framework. Furthermore, a series of concrete policy steps at EU level are needed to further support these investments, reduce time delays and cost overruns. This will ultimately support a decarbonised and affordable energy system in the future.

The following section outlines exactly what is needed from policymakers and what the industry will be able to deliver on.

A variety of investments are needed to achieve 150GW

Achieving the 2050 150GW installed nuclear capacity targets set by the Nuclear Alliance of Member States will require significant investments.

Lifetime extension

Extending the operational life of existing reactors for as long as is technically and economically viable is widely recognised as the cheapest source of clean electricity available today.

Small Modular Reactors (SMRs)

Member States are also showing keen interest in SMRs. Lower upfront costs, combined with greater modularity and versatility, means that they can be coupled with industrial clusters as well as providing heat for district heating systems. The deployment of such technologies is expected as of the early 2030s in Europe.

New large Reactors

Around half of Europe's nuclear fleet will reach the end of its life in the 2030s and 2040s. This, combined with growing demand for clean electricity, heat and hydrogen, means that several Member States are planning to build new large reactors to meet future demand.

Advanced Modular Reactors (AMRs)

AMRs are Generation IV reactors which use novel and innovative fuels, coolants, and technologies to generate low carbon electricity, and take advantage of the same modular-build principles as SMRs.

1 A long-term policy vision to stimulate net zero with nuclear

One of the main advantages of nuclear is its long-life span of 60 years. This durability makes nuclear a strategic, long-term investment, requiring a long term, stable vision, both at EU and national level. The EU should therefore focus on implementing policies that will secure this long-term framework, and which support all net zero sources of energy. This requires, in particular, placing all net-zero energy sources, including nuclear and renewables, on an equal footing, whilst maintaining a high climate ambition.

Climate Target 2040

A Net Zero Energy Directive which outlines concrete proposals on how it can be achieved should be developed in support of the 2040 climate target, rather than technology specific targets in order to incentivise vital investment in all clean energy sources. Such a directive could include:

- An overarching clean energy target
- Targets for the promotion of hydrogen from net zero energy sources
- Targets for the promotion of net zero energy use in heating and transport

Electrification Action Plan

Nuclear must be explicitly recognised as an essential enabler of Europe's clean energy transition. The Action Plan should:

- Propose ambitious electrification targets based on in-depth impact assessments of users' needs and capabilities. This would create confidence in investments and allow energy intensive industries to adopt a pragmatic electrification plan.
- Ensure technology neutrality, both in terms of electricity generation and electrification technologies.
- Present a fiscal framework favourable to homegrown technologies and electricity sources.
- Create the conditions for robust financial support towards industrial electrification, both for CAPEX and OPEX.

Governance of the Energy Union Regulation

The Governance of the Energy Union regulation should ensure a technology neutral approach by recognising nuclear at the same level as renewables under the National Energy and Climate Plans (NECPs). Furthermore:

- Some form of tracking measure in relation to electrification should be included.
- It should include specific Key Performance Indicators (KPIs) in NECPs (also for each sector) to enable rigorous monitoring and strategic adjustments. This should be subject to a peer review.
- There should be greater harmonisation amongst the different NECPs.

A stable market design

The right market design will also help support investment in clean energy technologies. We therefore call for the following:

- Nuclear energy should be treated on an equal footing with other fossil-free and low-carbon technologies in taxation policies, benefiting from the lowest tax rates in order to reflect its minimal CO_2 emissions.
- The guidance developed for Member States on the use of Contracts for Difference and Power Purchase Agreements should focus on clean energy as a whole and should include a methodology that recognises the specific carbon content for all clean technologies.
- PPAs with durations aligned more closely to the life of the facility must also be enabled.
- Tripartites for nuclear which include the participation of a public counterparty (such as a Member State or an institutional financial entity) acting as guarantor, which helps de-risk projects and mobilise capital at scale.
- The value of clean firm generation, both in terms of overall system management and grid services, should be fully recognised.
- Provide continuity in relation to the electricity market design and EU Emissions Trading System as these are key to delivering on investments

Other policies where the principle of technology neutrality must be adhered to include:

- **The Delegated Act for Low Carbon Fuels (hydrogen)**: The public consultation linked to the draft methodology outlining the criteria for recognising low-carbon electricity from nuclear power plants must be launched by 30 June 2026 at the very latest.
- **Sustainable transport investment plan:** Policies to decarbonise transport should recognise the role of nuclear alongside renewables, specifically in regard to hydrogen production for e-fuels, and the potential of nuclear propulsion technologies for the shipping industry.

How greater nuclear capacity will support the EU's objectives

A long-term, technology neutral framework supporting nuclear will bring considerable support to the EU's own climate and energy objectives. As highlighted in recent research from Compass Lexecon, it will enable dramatic savings in overall energy system costs, CO_2 emissions, gas consumption and hydrogen import dependence.

#150GW nuclear will:	#200GW nuclear will:
✓ Save around 430 $MtCO_2$	✓ Save around 500 $MtCO_2$
✓ Save €310bn in total energy system costs	✓ Save €450bn in total energy system costs
✓ Reduce gas consumption by about 180 bcm	✓ Reduce gas consumption by about 220 bcm
✓ Reduce dependence on hydrogen imports by up to 33%	✓ Reduce dependence on hydrogen imports by up to 61%

This will lead to greater EU competitiveness in a more climate friendly, affordable & secure energy system

Source: Pathways to 2050: the role of nuclear in a low-carbon Europe, Compass Lexecon, 2024

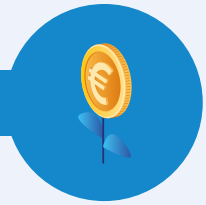
2 An equitable financial framework to stimulate investments in nuclear

As highlighted under the EU Nuclear Illustrative Programme (PINC), significant investments will be required to achieve the 2050 installed nuclear capacity targets set by the Nuclear Alliance of Member States and the National Energy and Climate Plans. Encouraging such investment will require an equitable financial framework which demonstrates EU support for nuclear. This is particularly important for long-term investment projects such as nuclear which have a high upfront cost. Implementing the following policy improvements will considerably facilitate the sector's access to private financing and ultimately lead to significant cost savings.

Multiannual Financial Framework

The next EU budget should be closely aligned with the EU's objectives in terms of decarbonisation, affordability, security of supply and respect the principle of technology neutrality. Today, several EU instruments still leave nuclear in a grey zone. The next MFF must therefore explicitly recognise nuclear at the same level as renewables across electricity generation, hydrogen, heat, R&D, and fuel-cycle activities:

- The European Competitiveness Fund and the Cohesion Fund must refer specifically to both nuclear and renewables (thus removing the current ambiguity).
- In the event existing funds are carried over to the next MFF, all current nuclear exclusions must be removed.
- The Budget Expenditure Tracking and Performance Framework should include both hydrogen and heat produced from nuclear as categories in their own right with a 100% contribution to climate change mitigation (CCM). The entire nuclear fuel cycle should be explicitly included, with a 100% contribution to CCM. R&D expenditure on nuclear fission should also be classified as contributing 100% to CCM.
- With regards to innovation funding (Euratom and FP10), we call for a greater share of the Euratom budget to be allocated to all fission technologies. Better synergies between Euratom and FP10 should also be foreseen.
- The Connecting Europe Facility should be opened to cross-border nuclear projects.
- The Industrial Decarbonisation Bank must include bridging or pilot mechanisms to support projects that are not yet ready for commercialisation.



Sustainable Finance Taxonomy

Given the importance of compliance with the taxonomy for private investors, and the fact that, in line with the science, nuclear is a sustainable activity, the scope of the taxonomy should be amended as follows:

- Nuclear should be treated on the same level as renewables (i.e. it should no longer be considered as transitional and subject to sunset clauses).
- All fuel cycle activities should be included under the taxonomy as enabling activities, including notably those related to mining, conversion, enrichment, fuel fabrication and reprocessing of spent fuel.
- Investments in nuclear projects outside of the EU should also be included in the taxonomy (in line with investments in, for example, renewables).

European Investment Bank (EIB) support

The recent loans in support of fuel cycle capacity in France and upgrades to the Olkiluoto nuclear power plant in Finland are a step in the right direction. Additional actions which would further support investment in nuclear include:

- The EIB must also ensure such support for nuclear capacity (e.g. the lifetime extension of the existing fleet and the construction of new capacity).
- EIB credit guarantees should be enabled for nuclear Power Purchase Agreements as foreseen under the Clean industrial Deal.
- EU de-risking mechanisms from the European Investment Bank (EIB) and InvestEU should support and de-risk the fast development and early deployment of First of a Kind technologies and crowd in private investment.

Clean Energy Investment Strategy

In order to unlock capital for nuclear and enable the financing of both fleet lifetime extensions and new build projects, we call for the following:

- Integrate nuclear fully into the EU's clean energy investment architecture.
- Design technology-neutral de-risking instruments, including guarantees for long-term contracts (PPAs), credit enhancement tools, and EU-backed project finance facilities that can crowd in private capital at scale as well as CAPEX grants and revolving financial instruments offering favourable conditions (such as lower interest rates, longer tenors, and grace periods) given that the cost of finance directly affects the compensation required from market mechanisms.

How an equitable financing framework will allow the industry to deliver within budget

Having clear and understandable mechanisms to access public loan guarantees and public lending would enable project developers and owners to commit to new investments. In addition, access to public financing support would also help attract private investors to participate in the projects.

Furthermore, an equitable financing framework will enable the European nuclear industry to ensure the delivery of cost effective new nuclear projects. More nuclear delivered on time and within budget will also render energy more affordable thanks to energy system cost savings.

3 An accelerated regulatory framework to speed up nuclear deployment

Achieving 150GW of installed nuclear capacity by 2050 will require the rapid roll out of new nuclear capacity (in addition to extending the life of the existing nuclear fleet for as long as is technically and economically viable). Recent nuclear projects have faced challenges which has led to project delays. In this respect, the industry needs to implement lessons learnt from these projects to help speed up future projects. In addition, several external factors must be addressed as these can also help, or hinder, the deployment of these future projects.

State aid

Currently, the State aid approval procedure is a lengthy process that slows down project deployment (although we recognise that the recent approval of the Polish nuclear project in less than 12 months was a positive step forward). We therefore recommend the following in order to speed up this process:

- Streamline the State aid procedure for nuclear projects.
- Allocate greater resources to the relevant EU services involved in the State aid approval process.
- Speed up the assessment procedures for nuclear projects by including, for example, presumptions of compatibility for certain conditions governing the validity of State aid. These presumptions could cover the verification of positive conditions, such as the incentive effect and the significant contribution to Union objectives, as well as a partial verification of negative conditions, in particular with regard to the necessity and appropriateness of the aid.
- Implement a fast-track procedure for certain projects on a case-by-case basis.
- Put a maximum period of 12 months for the approval of State aid projects.

Licensing Acceleration Programme for strategic technologies

Another area which must benefit from a more accelerated process relates to licensing. This is essential for the standardisation of projects and products across the industry. In this respect we call for:

- A more flexible regulatory approach that allows for staged authorisations, particularly to accommodate private sector involvement in scaling-up technology projects like SMRs and AMRs.
- A more streamlined process whereby a series of preliminary permissions or authorisations could be developed aligned with private company project timelines to reduce delays and attract investment, while maintaining the high existing standards.
- A greater interaction between national regulators to encourage harmonisation of the licensing process. (a good example of this is the work undertaken by European bodies such as ACER). In addition, a principles-based approach could be considered.

How an accelerated regulatory framework will deliver faster investments

The European nuclear industry is ready to implement lessons learnt from recent projects. This, combined with a more streamlined, harmonised approval, will lead to faster deployment times, similar to those seen during the 1970's and 80's.

4 Investing in the entire fuel cycle to ensure security of supply

Ensuring a resilient nuclear sector in the European Union requires strategic investment across the entire fuel cycle. The EU already hosts several long-standing industrial champions with world-class expertise in fuel-cycle services. As highlighted by the Commission in its Communication from 6 May 2025, the European nuclear sector has made progress in terms of replacing nuclear fuel from Russia with fuel from other countries, even if the sector is still dependent on Russia for some elements of the fuel cycle. With the right policy framework which supports the ramping up of fuel cycle capacity in the EU (including reuse and recycling) this remaining dependence can be dramatically reduced.

REPowerEU

The European industry fully supports the need to ramp up fuel cycle capacity including reprocessed uranium and spent fuel reprocessing in the EU in order to increase our independence from Russia. We therefore call for the following:

- The EU needs to include the entire fuel cycle (including reprocessing) under the Sustainable Finance Taxonomy.
- Quotas on non-Western producers under the supervision of the Euratom Supply Agency should be introduced.
- Adequate funding should also be granted to the European Radioisotope Valley to ramp up radioisotope production in the EU and build a robust, EU-based supply chain.
- Ensure EU support for reprocessing infrastructure in the EU to enable the recovery of materials from spent fuels to generate new fuels.

Communication on Circular Economy in the nuclear sector

The European nuclear industry already applies a circular economy approach to its activities in order to reduce, reuse and recycle the waste it generates. In this respect, many solutions already exist today[8]. To provide clarity, predictability, and strategic direction for the decades ahead, we call on the European Commission to develop a Communication on Circular Economy in the nuclear industry. This initiative should:

- Present a coherent EU framework integrating reprocessing, recycling pathways, interim storage, and geological disposal as complementary components of a responsible waste strategy.
- Outline a long-term vision for the management of high-level waste and spent fuel, ensuring alignment with Europe's climate, sustainability, and energy-security objectives.
- Enable access to EU-level financial support - including EU programmes, the EIB, and innovation funding - to accelerate investments in both reprocessing capacities and long-term disposal infrastructure.
- Provide regulatory and policy certainty to support Member States and operators in implementing sustainable, cost-effective waste solutions.

[8] Applying a circular economy approach to nuclear waste, nucleareurope

14%
In 2024, 14% of the uranium used in the EU was sourced from Russia

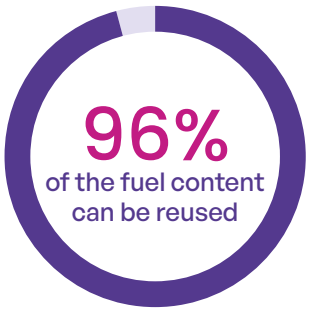
In uranium enrichment services Russia covered almost
24% of EU needs

Uranium

Around
23%
of the whole EU demand for uranium conversion services was satisfied from Russia

Source: REPowerEU on nuclear imports

Circular economy in the nuclear sector:



The treatment and reuse of nuclear fuel currently

saves up to around
25%
of natural uranium resource

1/5
cuts final waste volumes by a factor of 5

1/10
reduces long-term radiotoxicity by a factor of 10

Source: nucleareurope circular economy toolkit

How decisive policies will help to strengthen the sector's security of supply

The European nuclear sector is committed to ramping up its activities in Europe in order to reduce our dependence on imports and strengthen security of supply. European fuel suppliers are already investing in new capacity and will commit to doing more if the right policy measures are implemented. The sector will furthermore continue to invest in reprocessing and recycling activities (including continued research & development) to become a world leader in circular economy practices, thus reducing our need for new materials.

5 A policy framework sustaining a supply chain based in Europe

The nuclear industry supports close to one million high-quality jobs across Europe, with a value chain that stretches far beyond power plants. It sustains a broad ecosystem, including key industrial sectors such as steel, chemicals and cement.

With a significant number of projects in the pipeline, the supply chain will require the support of concrete policy measures in order to maintain Europe's global nuclear leadership and know-how.

Nuclear Illustrative Programme (PINC)

The PINC rightly highlights the challenges the nuclear sector is facing in relation to supply chain capacity. Going forward, the EU should:

- **Ensure that the PINC:** tracks progress towards the realisation of nuclear investments through the regular publication of updates, looking at investment, supply chain and workforce gaps in different Member States.
- Function as a strategic instrument to identify the enabling conditions for investment (particularly in supply chain capacity), promote regulatory harmonisation, and support Member States in the establishment of robust, future-proof nuclear infrastructure and a sustainable value chain.

European Industrial Alliance on SMRs

This Alliance brings together a significant number of stakeholders and is vital in terms of supporting Europe's SMR industry. Going forward, we recommend:

- Continued support for the Alliance in its mission to facilitate and accelerate the development, demonstration, and deployment of SMRs in Europe by the early 2030s.
- Following the publication of the Strategic Action Plan, the Alliance should focus on implementing the Top Ten Actions in a timely manner and supporting the advancing of both existing and newly identified projects.
- An ambitious SMR strategy with concrete actions on financing, licensing, research and the supply chain.

Support for an EU based supply chain

In order to ensure maximum benefits for Europe, EU policies should aim to support manufacturing facilities in the EU.

- **Industrial Accelerator Act:** In order to ensure maximum benefits for Europe's economy and workforce, the IAA should support manufacturing in the EU, regardless of a company's country of origin. Concrete support for an EU-based supply chain is key.
- **Public procurement:** An ambitious review of the public procurement framework should further strengthen sovereignty considerations, especially regarding European energy and industrial sovereignty. It should maintain provisions on essential security interests and introduce a European preference principle for strategic sectors.
- **Important Projects of Common European Interest (IPCEIs):** It is good to see that the EU is open to allowing IPCEIs to be used for nuclear. In this respect, a wide scope which covers a broad range of nuclear projects (such as large reactors, non-electric applications of nuclear and the fuel cycle) could bring significant benefits.

Stimulating Skills, Research, Development & Innovation

Encourage greater synergies across sectors in the fields of skills, research and development.

- **Skills:** Greater synergies with other industries would bring significant benefits to all as many sectors are currently facing similar skills shortages. A more horizontal approach to skills at EU level (rather than 'technology silos'), combined with adequate funding and greater mobility and portability opportunities would bring benefits across the EU. Furthermore, structured support for training pipelines (graduate schools, mobility schemes, apprenticeships) could prove beneficial.
- **Research, development & innovation:** Dedicated scientific programmes should be established for licensing and safety science, industrialisation (including construction and manufacturing), as well as additional research and innovation in fields including the fuel cycle, waste and decommissioning. Furthermore, the EU should move ahead with plans for a **European Radioisotopes Valley Initiative** to secure EU supply of medical radioisotopes through increased own production.

Annual economic benefits of nuclear up to 2050
(includes direct, indirect & induced)

Disposable household income

€51Bn
€59.3Bn

Public revenues

€61.6Bn
€71.9Bn

Total jobs

1.48Mn
1.67Mn

Impact on EU economic output

€330.3Bn
€383Bn

Source: Economic and Social Impact Report, Deloitte, 2025

How a strong European supply chain will help delivering investments

A strong supply chain which is located in Europe will bring multiple benefits. First and foremost, it will help speed up the deployment of nuclear projects, given that one of the bottlenecks faced by the industry today is the limited supply chain available to provide the components for nuclear projects. Furthermore, it will bring significant benefits to Europe's economy in terms of job creation and economic growth.

More than just energy

The value of the nuclear industry reaches far beyond power generation. It underpins a wide range of essential applications that support modern life, from the medical isotopes used daily in the diagnosis and treatment of multiple illnesses, to radiation technologies that sterilise medical equipment, preserve food safety and protect global supply chains.

Nuclear science drives progress in agriculture through crop improvement and pest control, supports advanced industrial processes with precise imaging, and contributes to cutting-edge research in space science and particle physics.

These capabilities rely on highly specialised expertise, sophisticated infrastructure and a robust European supply chain.

Seeing the nuclear sector through this broader lens reveals an industry that is not only an energy provider, but also a cornerstone of modern healthcare, innovation, and industrial competitiveness.

1 person out of **2**

will benefit from nuclear medicine during their life

500Mn

radiological imaging procedures are performed each year in the EU

Around

10Mn

diagnoses that use small amounts of radioactive substances are carried out annually in the EU per year

Around

1.5Mn

radiotherapy procedures are performed in the EU each year, mainly for cancer treatment

Source: Belgian Nuclear Forum

Medical applications

Nuclear technology plays a critical role in modern medicine. Radioisotopes are widely used in diagnostic imaging, including PET and SPECT scans, enabling early detection of cancers, cardiovascular diseases and neurological disorders. In radiotherapy, precise radiation beams are used to treat tumours while preserving surrounding tissue, improving survival rates for millions of patients each year.

Nuclear technology is also used in a range of other diagnostics tools. For example, in COVID-19 PCR tests, radioisotopes and irradiation techniques help sterilise equipment and support the production of key reagents, while nuclear-derived methods in molecular biology enable the precise detection of viral genetic material.
Europe is a global leader in medical isotope production and research, making nuclear science an essential pillar of its healthcare system.

Agriculture & Food

Nuclear applications are also essential for agriculture and environmental protection. Nuclear technology helps cut pesticide use by offering precise, non-chemical pest control. Techniques like the Sterile Insect Technique use radiation to sterilise male insects so pest populations fall naturally, while nuclear-based plant breeding creates crops that are more resistant to pests. Together, these approaches reduce reliance on chemical pesticides.

Space

Nuclear technology has long supported aerospace innovation. Radioisotope power systems provide reliable, long-duration energy for deep-space missions where sunlight is too weak for solar panels. These systems power spacecraft, landers and probes for decades, enabling exploration of distant planets and the outer solar system. Nuclear-based materials testing is also essential for ensuring the durability of components exposed to extreme temperatures and radiation conditions in space.

Desalination

Nuclear desalination offers a sustainable solution for regions facing water scarcity. The heat generated by nuclear reactors can be used to power desalination processes, producing large volumes of fresh water without increasing greenhouse gas emissions. This approach is particularly relevant for coastal areas with limited freshwater resources. By coupling reactors with desalination plants, countries can enhance water security while maintaining low-carbon credentials.

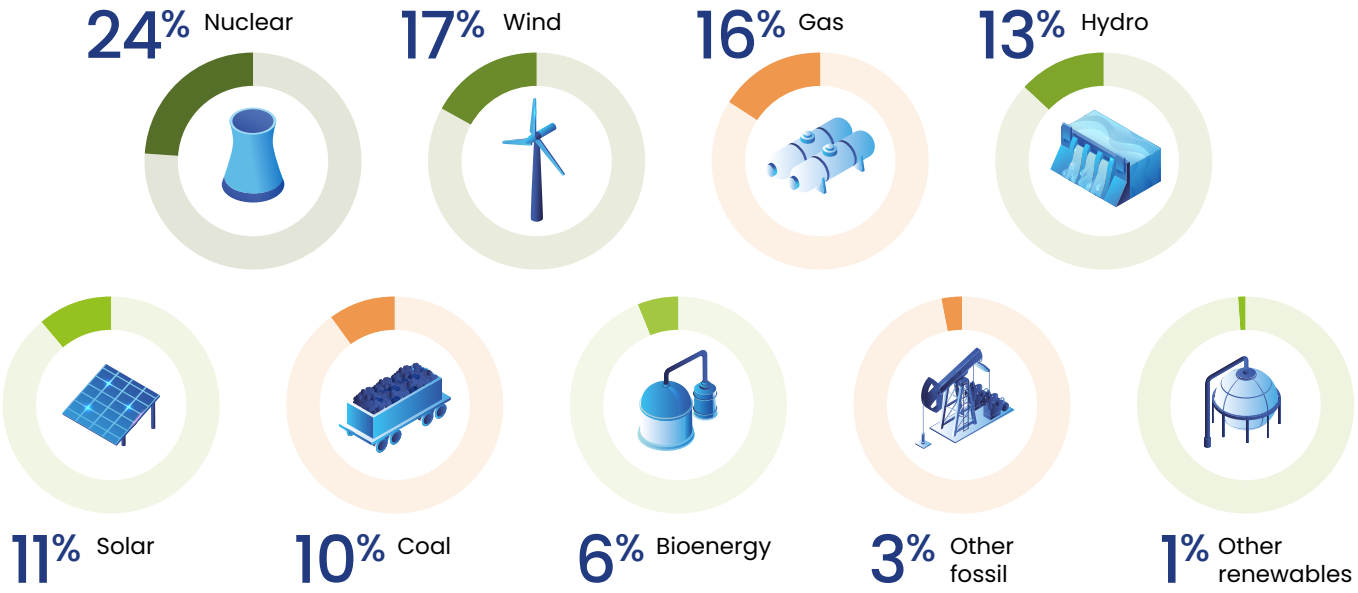
The nuclear sector in Europe

The single largest source of electricity in Europe

Today, nuclear energy is one of Europe's most strategic assets. It provides around one quarter of the EU's electricity, delivering firm and dispatchable energy that stabilises the grid and supports the integration of variable renewables.

Nuclear energy is a cornerstone of Europe's clean, reliable and sovereign energy system. With around 100 reactors delivering roughly 100 GW of installed capacity, the sector currently generates over 30% of the EU's low-carbon power, making it the largest source of decarbonised electricity.

Electricity generation by technology (% in 2024)



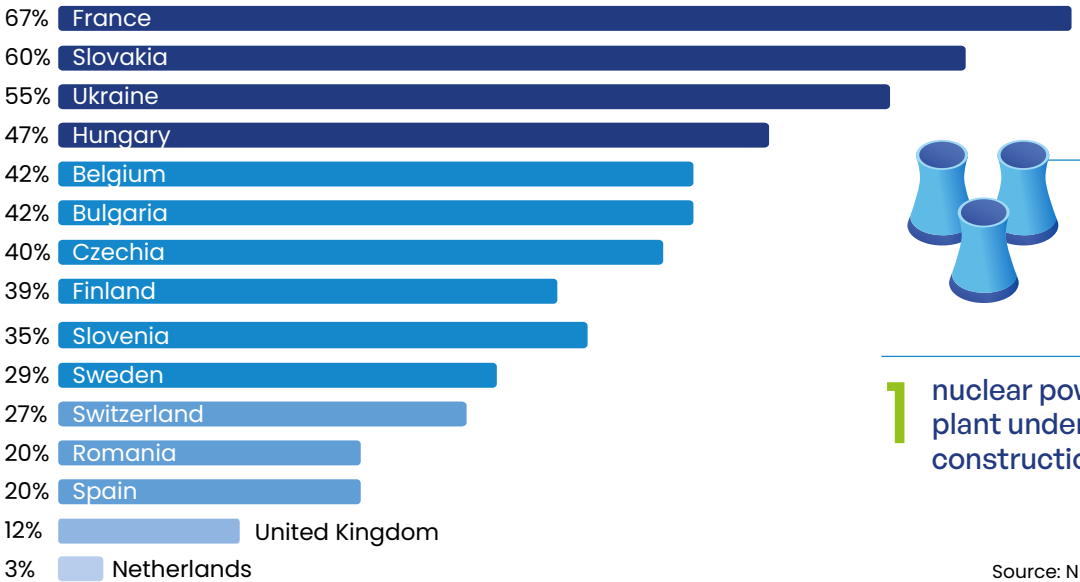
Source: EMBER: Shockproof: how electrification can strengthen EU energy security

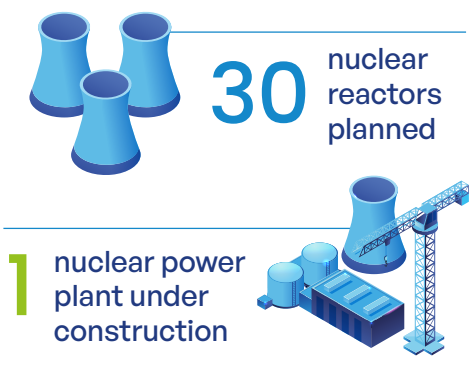
Nuclear produces close to a quarter of electricity in the European Union

Even countries that do not operate nuclear power plants benefits directly from nuclear because Europe's electricity system is highly interconnected.

Power flows across borders through an integrated grid, meaning that clean and reliable nuclear produced in one country supports the stability and affordability of supply in neighbouring countries.

Nuclear is a major source of electricity in several Member States





Source: NuclearEurope Facts & figures

NUCLEAR FACILITIES IN EUROPE

Legend

- Nuclear power plants
- Nuclear fuel facilities
- Nuclear research facilities
- Radioactive waste management facilities

Nuclear in Europe

100 nuclear reactors in operation in the EU

+4 in Switzerland

+9 in the UK

+15 in Ukraine

24% of the EU's electricity production (2024)

€100 billion per year

900.000 jobs

FRANCE 57 67%	SLOVAKIA 5 60%	UKRAINE 15 55%	HUNGARY 4 47%	BELGIUM 4 42%	BULGARIA 2 42%
CZECHIA 5 40%	FINLAND 5 39%	SLOVENIA 1 35%	SWEDEN 6 29%	SWITZERLAND 4 27%	ROMANIA 2 20%
SPAIN 7 20%	UNITED KINDGOM 9 12%	NETHERLANDS 1 3%			

Number of reactors

Share of electricity generated by nuclear

Bringing prosperity to Europe's economy

The nuclear sector's economic contribution is equally substantial. The sector supports around 900.000 jobs across engineering, manufacturing, construction, operation, research and innovation, and generates billions in economic value each year.

The nuclear sector plays a vital role in Europe's social fabric by sustaining high-quality employment across a wide range of communities, including many rural and industrial regions where alternative opportunities are limited. It supports jobs, spanning not only engineers but also a large share of vocational and technical profiles.

The nuclear sector in Europe

Is responsible for over

€250Bn

in EU economic output

Leads to

€38Bn

in disposable household income

Generates nearly

€48Bn

in public revenues

Supports around

900.000

jobs covering a broad range of skill sets, from construction to nuclear engineers

Source: Economic and Social Impact Report, Deloitte, 2025

A strategic European value chain

Crucially, nuclear is also one of the few strategic net zero value chains that is almost entirely based in Europe. The European nuclear supply chain spans the entire lifecycle. Not only does this reinforce our industrial sovereignty and reduce our dependence on external suppliers, it also ensures that innovation, economic value and high-quality employment remain in Europe, strengthening its strategic autonomy.

Europe's nuclear industry is a recognised world leader, built on decades of technological excellence, innovative prowess and a uniquely comprehensive value chain. From fuel cycle services and reactor components to advanced materials, digital systems and engineering expertise, European companies offer capabilities matched by few global competitors.

Its strength lies in a complete, highly integrated value chain that extends far beyond the countries that operate nuclear reactors. Thousands of companies across all Member States supply equipment, materials, digital technologies and specialist services, making nuclear one of Europe's broadest and most interconnected industrial systems. This ecosystem reaches far beyond energy generation, as it also includes vital medical diagnosis and treatment, as well as space and agricultural applications.

nuclear europe

nucleareurope is the Brussels-based trade association for the nuclear energy industry in Europe. The current membership of nucleareurope is made up of **17 national nuclear associations** – active across Europe – and the companies that they represent, and **24 Corporate Members**. Nearly 3.000 companies are represented, from Europe's (and the world's) largest nuclear utilities and nuclear fuel cycle companies to other undertakings engaged in the transport of nuclear materials and the management of radioactive waste.

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