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COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Strategy for the development and deployment of Small Modular Reactors (SMRs) in Europe

1. INTRODUCTION

The supply of homegrown, affordable and clean energy is key to achieving the European Union's strategic goals of industrial competitiveness and decarbonisation, as well as strategic independence and security of energy supply.

The emerging category of nuclear reactors known as **Small Modular Reactors** (**"SMRs"**), could contribute to attaining these EU policy objectives and become one of **Europe's next major industrial development projects**.

SMRs have the potential to mobilise entire value chains across several EU countries and in different business areas, including engineering, advanced materials and robotics, and to unlock private investment. They can bolster EU research and innovation leadership, create new technological knowledge and skilled jobs as well as long-term export capacity, while ensuring the highest standards of nuclear safety, security, safeguards and radiation protection in the EU to protect citizens and environment.

SMRs are expected to play a key role alongside traditional large-scale nuclear reactors in a flexible, safe, and efficient energy system, characterised by an ever-increasing share of clean electricity and a growing demand for decarbonised heat and steam supplies for industry and households. SMRs present opportunities both to off-takers in need of stable, flexible and clean energy at a large scale, and to an array of nuclear industry players, by, for instance, supplying low-carbon electricity and heat simultaneously.

Due to their size and modularity along with the specific advantages of nuclear energy, SMRs are attracting interest across Member States. Preliminary evaluations of expected SMR capacity in the European Union by 2050 range from 17 GW to 53 GW for electricity generation and other purposes (heat, hydrogen, synthetic fuels) ([1]).

What are the small and modular nuclear reactors?

SMRs refer to nuclear reactors that are designed (i) to be smaller in size and output compared to traditional nuclear reactors, and (ii) to be modular, meaning that the reactors or their components can be manufactured in a factory setting and transported to a site either for direct use or for assembly.

A useful classification of SMRs encompasses 1) **light water SMRs**, which have typically been developed from existing water-cooled nuclear reactors; 2) **Advanced Modular Reactors (AMRs)**, which use innovative concepts and next-generation (**Generation IV**) designs with different coolants (liquid metal, molten salt, or high-temperature gas) or novel nuclear fuel types; and 3) **Microreactors**, which typically produce less than 10 megawatts of electric power, have long refuelling cycles and can be transported ([2]).

([1]) Industry estimates and projections in the Nuclear Illustrative Programme (PINC), COM(2026) 120.

([2]) For an overview on the state of play for small modular reactors (SMRs) in a technoeconomic perspective: *An exploratory analysis of the Small Modular Reactor ecosystem*, Publications Office of the European Union, Luxembourg, 2025, https://data.europa.eu/doi/10.2760/4478311, JRC142326.

A variety of end uses, beyond electricity production

Combining SMRs with renewable and large-scale nuclear energy sources could provide a flexible, sustainable energy mix, while making it easier to maintain grid stability. SMRs can effectively support grid load balancing.

While the first SMR projects worldwide focus on electricity production, SMR technologies are likely to maximise their potential when targeting hybrid or off-grid applications and heat production for hard-to-abate industrial and residential purposes rather than competing only in the established EU electricity market.

By delivering low-carbon electricity and heat, SMRs can directly support the decarbonisation of hard-to-abate sectors at the heart of EU's industrial base including chemicals, steel, refineries, maritime transport, defence, and district heating, while alleviating the pressure on electricity grids from growing demand, including from data centres, low-carbon hydrogen and synthetic fuels production, and water desalination.

In addition, microreactors could be used in the future at various industrial sites, ports, airports and mining sites and to power defence or disaster relief operations. Given their size, portability and scalability, microreactors could serve as an enabler creating a wide market with multiple applications in the initial phase of deployment of this technology.

Use case on chemical industries

Affordable, low-carbon electricity and high temperature industrial heat (steam) are key for many chemical manufacturing facilities. Different SMR designs produce steam at various temperature levels, approximately ranging from 200°C to 550°C, which can be converted to electricity and/or used in multiple chemical production processes, including in petrochemical, ammonia and chlor-alkali industries. In addition, provision of electricity by SMRs will be particularly relevant for (i) steam cracking, where the very high temperatures required (750–900°C) could be obtained by electrification, as well as for (ii) ammonia and methanol production, where natural gas reforming could be replaced by water electrolysis. Furthermore, many chemical industries are concentrated around 150 chemical clusters located across the EU ([3]). The geographical co-location of SMRs within these sites as replacements for today's fossil-fuelled cogeneration plants could make them an attractive energy solution by reducing distribution costs and improving energy efficiency.

Use case on district heating

Heating and cooling account for 50% of the EU final energy consumption, with approximately 75% of heat demand currently met by fossil fuels ([4]). Although there are already several large nuclear power plants in Europe supplying district heating networks, modern district heating networks are designed to operate between 70–120°C, and are thus compatible with low-temperature and low-pressure SMRs. In addition, SMRs can provide low-carbon electricity or absorption cooling to support air-conditioning and refrigeration needs, helping to meet the growing demand for cooling.

([3]) COM(2025) 530 final, 8.7.2025.

([4]) Potentials and levels for the electrification of space heating in buildings, Final Report, Publications Office of the European Union, Luxembourg, 2023, https://op.europa.eu/en/publication-detail/-/publication/2ae4481d-8f3b-11ee-8aa6-01aa75ed71a1/language-en

Use case on data centres

Data centres currently account for approximately 70 TWh of electricity consumption in Europe, which could reach 115 TWh by 2030 ([5]). SMRs can deliver dispatchable, low-carbon electricity with a high annual load factor that is ideal for colocation and hyperscale AI-driven data centres, while their scalable modular design allows power capacity to expand along with digital infrastructure. In addition, co-locating SMRs with data centres, possibly even "behind-the-meter", may alleviate grid constraints by delivering on-site electricity, reducing dependence on congested transmission networks, costly grid upgrades, and associated fees.

Increased autonomy, improved energy security, and ever-safer applications

SMRs can strengthen EU's energy security and autonomy by reducing reliance on fossil fuels, while complementing other forms of energy such as renewables.

Furthermore, certain AMR designs are being developed based on the concept of a closed fuel cycle. They will feature significant technological innovations aimed at increasing nuclear safety and sustainability, the latter through significantly improved fuel utilisation and by minimising high-level radioactive waste, in line with circular-economy objectives. In terms of enhancing safety, these designs rely extensively on inherent and passive safety features, reducing dependence on active systems which require external power supply and operator interventions. This strengthens defence-in-depth and enhances resilience and overall nuclear safety robustness. Adherence to the "water efficiency first" principle, as stated in the Water Resilience Strategy ([6]), will ensure the further sustainability and safety of this technology, as well as ensure that reactor design, cooling technologies and siting decisions minimise pressure on water resources.

The diverse industrial applications of SMRs, including future AMRs, position them as potential drivers of local economy development, creating demand for high-skilled jobs. At the same time, potentially reduced amounts of high-level radioactive waste can contribute to increase public trust in nuclear technologies.

Setting out a vision for the development of SMRs in the EU

SMRs should be considered a shared European industrial project, built on strong collaboration in research, supply chain, licensing, skills, and financing across the EU, and founded on the principles of safety, sustainability and circularity. This collaboration will help SMRs reduce time-to-market, scale quickly and become competitive, bankable, and profitable projects. A fragmented approach would lead to duplicated efforts, slower regulatory approvals, limited manufacturing capacity, and higher unit costs, undermining public confidence and future investments – such a scenario should not be accepted for the development of this strategic technology for Europe. Pooling resources will provide the capacity needed to deliver SMRs for both the EU market and beyond.

The successful deployment of SMRs will depend largely on the creation of a strong market demand and a conducive business environment. The increasing need across various industries to electrify and decarbonise production will be a significant driver. At the same

([5]) Energy and AI, IEA, Paris, 2025, https://www.iea.org/reports/energy-and-ai, Licence: CC BY 4.0.

([6]) COM(2025) 280 final, 4.6.2025.

time, it is crucial to provide potential off-takers with a clear outlook about future SMR electricity supply, expected cost trends and associated investment risks.

To create a sound industrial ecosystem for SMR deployment in Europe certain conditions should be met: (i) deliver first-of-a-kind SMR installations as soon as possible and not later than the early 2030s, considering global developments ([7]), (ii) speed up the development of advanced designs (AMRs) in parallel since they cover potential additional market applications such as high-temperature heat for industrial applications, or maritime propulsion, (iii) nurture a European industrial supply chain able to provide a broad spectrum of components for different design options, (iv) create the conditions for a fleet-approach enabling series production, (v) streamline regulatory processes and support a collaborative approach among regulatory authorities across the EU to enable timely SMR licensing and economies of scale, while ensuring ambitious safety and environmental standards are maintained.

This calls for an EU-wide strategic approach to coordinate European development efforts and the deployment of SMRs in the early 2030s, via closer cooperation between Member States and in cooperation with like-minded partner countries at the global level.

2. THE ROLE OF EU INDUSTRY AS DRIVING FORCE FOR SMR DEPLOYMENT

Focusing on the deployment of concrete SMR projects within an integrated European programme

In September 2025, the **European Industrial Alliance on Small Modular Reactors** ([8]), (the "Alliance") presented its 2025–2029 **Strategic Action Plan**, which forms an actionable programme for the industry to deliver on time and on budget, focusing on a limited number of projects. While the Alliance has already identified concrete SMR projects, it needs to further stimulate and coordinate industry actions to deliver:

1) light water small and modular reactors (LW-SMRs);
2) advanced modular reactors (AMRs).

Some of the most advanced LW-SMR projects are based on designs of non-EU origin. While implementing these projects in the EU is consistent with the aim to get SMRs operational by the early 2030s, it is essential to develop a balanced and mutually beneficial cooperation with the technology holders and like-minded partner countries. These projects will contribute to the development of a strong EU supply chain, and EU partners involved in these projects need to retain intellectual property rights related to technologies and solutions developed in the EU. The EU research on LW-SMRs safety should be

([7]) In December 2025, the United States Department of Energy (DoE) announced grants totalling USD 900 million to support initial US deployments of Generation III+ SMR technologies. The US DoE had also provided approximately USD 450 million under the SMR Licensing Technical Support programme. In Canada, the province of Ontario is investing CAD 1 billion through the Building Ontario Fund, and the federal government is providing CAD 2 billion through the Canada Growth Fund to build Canada's first SMR. The UK government has established the Advanced Nuclear Fund totalling GBP 385 million for the development of a domestic SMR design and AMRs. The first SMRs are already operating in China and Russia.

([8]) Since February 2024, the SMR Industrial Alliance has brought together almost 400 organisations, including companies, research institutions, governmental bodies and non-governmental organisations. It set a clear objective of first SMRs operating in the EU by the early 2030s. In 2024, it held the first call to identify concrete projects that can contribute to the achievement of this objective.

implemented independently of the reactor design origin of those projects to be potentially deployed in the EU.

AMRs need a particular push for further development and innovation including by means of testing and demonstration facilities. The projects currently identified by the Alliance are based on EU designs and research efforts and have benefited from projects funded under the Euratom Research and Training Programme in 2021–2025. Generation IV projects are essential for securing technological knowledge and leadership in the EU, with fast-spectrum AMRs also offering opportunity to ensure the sustainability of the nuclear fuel cycle in the longer term.

Focus on achieving a European supply chain for modular and serial production

A **competitive European supply chain** should be promoted for securing a high degree of local content and European added value in all SMR projects. This includes fuel cycle services such as enrichment and conversion, in line with the objectives of REPowerEU ([9]).

The coordinated use of resources available across Europe is essential to achieve complementarity and develop world-class competencies within the EU. This approach will foster a highly competitive European industrial supply chain with strong capabilities and sufficient capacity, while simultaneously stimulating robust market demand across sectors and applications. The Commission's **Industrial Accelerator Act** proposal ([10]) aims to contribute to these objectives.

The Alliance needs to facilitate the development of an EU supply chain to ensure that businesses and workers benefit in full, and to pay particular attention to regional supply chains relevant for specific SMR projects. Developing **modular manufacturing** for SMRs in Europe is essential and should be inspired by other industrial domains such as shipbuilding or passenger aircraft manufacturing. Modularity of designs and diversity of suppliers will enable shorter construction times compared to traditional nuclear power plants, paving the way for a stronger and more competitive European industry.

Furthermore, constructing a fleet of SMRs with a consistent design across multiple countries will require **industrial standardisation** and **regulatory cooperation in licensing**. Both are essential to reduce construction times and costs through improved production methods and optimised processes across Member States.

Closer industrial cooperation and project consolidation are needed

Industrial experience in the nuclear sector in Europe is solid and can be channelled towards the SMR market. However, due to the very low number of new-builds over the last decades, the supply chain needs to be revitalised to avoid the creation of import dependencies. European companies are now developing their capacities and building up workforces to respond to the demands for new nuclear projects, whether large scale reactors or SMRs.

SMR developers, utility companies, potential end-users, and companies along the supply chain, including small and medium-sized enterprises, need to work closely together to

([9]) COM(2025) 440 final/2, 12.5.2025, REPowerEU Roadmap.

([10]) COM(2026) 100, 4.3.2026, Proposal for a Regulation on establishing a framework of measures for accelerating industrial capacity and decarbonisation in strategic sectors (Industrial Accelerator Act).

stimulate robust market demand, to develop the necessary supply chain capabilities and to establish compelling business cases for SMRs.

SMR start-ups and scale-ups across the EU working on the same or very similar reactor designs or technologies should explore opportunities to **join forces and collaborate** on bringing them to the prototype stage, even if they are likely to be competitors in end markets. These companies could pool access to testing facilities and build demonstration facilities jointly. The development of fuel cycle capacities, including new fuel production and, in some cases, additional reprocessing capacity, needs to proceed in parallel with reactor design activities. It is not economically viable to develop, produce, and implement a large array of different fuels and waste management strategies.

In some cases, start-ups could develop solutions by working together, and in other cases they could pool resources to co-invest in facilities with other economic operators, for example in the fuel supply chain. The barriers to overcome are significant and require vast resources – financial and human – and will thus be more effectively addressed through collective effort. Even projects working on different reactor designs should explore collaboration in the modular manufacturing of certain components and structures.

Action 1: ***Focus on EU industry initiatives by identifying a limited number of projects to receive support from suppliers and other partners across EU countries***

Member States and the European Industrial Alliance on SMRs need to focus their support on a limited number of the most promising SMR designs where Europe can secure global leadership, enhance its competitiveness and strategic autonomy, and set the global standard for waste management and circularity.

In order to maximise the chances of success, the Alliance should focus on promoting cooperation and the joining of forces among the supported projects, in line with EU and relevant national competition laws. The Alliance will regularly reassess the identified projects against this objective.

Action 2: ***Develop a competitive European supply chain in alignment with local content requirements***

Member States, with the support of the Alliance, need to work on strengthening the European supply chain for SMR development by identifying gaps and promoting collaboration between suppliers as well as with SMR developers, in alignment with the local content requirements of the Commission's Industrial Accelerator Act proposal.

Action 3: ***Develop and implement industrial standards supporting a fleet approach to SMR deployment***

The industry, including utility companies and operators, in cooperation with standardisation bodies ([11]) is encouraged to continue working on developing and implementing industrial standards supporting a fleet approach to SMR deployment, and to develop the concept of modular manufacturing.

These actions need to be launched swiftly in line with the goal to have SMRs operational in the early 2030s.

([11]) Such as European Committee for Standardisation (CEN) and International Organisation for Standardisation (ISO).

3. CATALYSING FINANCING FOR THE DEVELOPMENT OF THE SMR VALUE CHAIN

The SMR business model relies on shorter construction times and smaller initial investment amounts compared to large-scale nuclear power plants, which in turn allows a lowering of overall financing costs (per unit), making SMRs particularly attractive to potential investors. A key enabler of this business model is the ability to build additional reactor modules in sequence, therefore having reactor units generating revenues prior to the completion of the full plant. However, this business model has yet to be proven in practice, and its success largely depends on the ability to achieve modularity and serial production. These activities need funding to overcome high initial capital costs, long permitting timelines, and the development of a reliable supply chain.

Facilitate the mobilisation of private investment via de-risking instruments

The aim of public funding should be to mobilise available private capital through suitable instruments, such as guarantees for first-of-a-kind SMR projects ([12]).

Member States that are considering SMRs as part of their long-term energy strategy, should develop de-risking instruments in a coordinated way to attract investors. In doing so, they should seek to leverage the transparency provided by corporate transition plans under the Corporate Sustainability Reporting Directive ([13]).

Public support for de-risking SMR projects as they advance towards commercialisation is essential. To address financing challenges, EU budgetary guarantees under the current InvestEU ([14]), could contribute to the de-risking of investments in the most innovative SMRs, covering also Generation IV reactors and the associated fuel cycle facilities and supply chain. Also the Innovation Fund has mechanisms that can support first-of-a-kind SMR deployment through its calls for proposals, providing a platform for funding and development of mature projects at pre-commercialisation stage.

The **IPCEI** (Important Project of Common European Interest) candidate on innovative nuclear technologies, including SMRs, can be instrumental in pooling resources behind common projects related to research, development and innovation activities or first industrial deployment ([15]) of such technologies. Participating in a potential future IPCEI on innovative nuclear technologies should also make it easier for SMR projects to mobilise private capital.

The **Net-Zero Industry Act** (NZIA) ([16]) could streamline permitting processes, help to fast-track strategic projects and facilitate access to finance.

Under the NZIA, Member States and EU regions could designate certain areas as Net-Zero Acceleration "**SMR Valleys**", defined as geographical zones focused on activities related

([12]) Clean Energy Technology Observatory: Nuclear Power in the European Union - 2025 Status Report on Technology Development, Trends, Value Chains and Markets, Publications Office of the European Union, Luxembourg, 2026, https://publications.jrc.ec.europa.eu/repository/handle/JRC144653, JRC144653.

([13]) Corporate sustainability reporting - Finance - European Commission

([14]) RDI activities; in accordance with Regulation (EU) 2021/523, this excludes 'the decommissioning, operation, adaptation or construction of nuclear power stations', OJ L 107, 26.3.2021, pp. 30–89.

([15]) First industrial deployment means the upscaling of pilot facilities, demonstration plants or of the first-in-kind equipment and facilities covering the steps subsequent to the pilot line, including the testing phase and bringing batch production to scale, but not mass production or commercial activities.

([16]) OJ L, 2024/1735, 28.6.2024.

to the manufacturing or assembly of SMRs. These SMR Valleys could help streamline permitting procedures, while fully adhering to rigorous safety and environmental standards, improve access to financing and foster innovation and business collaboration among local suppliers. They may also enable the Member State or the region concerned to design supportive measures, such as tax incentives in line with the Commission's recommendations on tax incentives to speed up the clean industrial transition ([17]).

The Clean Industrial Deal State Aid Framework (CISAF) ([18]) streamlines State aid for manufacturing capacity in clean technologies. It may enable Member States to provide support aimed at expanding manufacturing capacity for NZIA products and main specific components, including relevant SMR technology.

Drawing from the Mankala ([19]) and Industrikraft ([20]) models, industry can collaborate to co-invest in SMR projects to drive the development of that technology in the EU. Furthermore, synergies could be leveraged with other sectors targeted by EU initiatives, including battery giga-factories and large computation and data hubs like AI giga-factories, which are positioning themselves as future SMR end-users, in line with trends observed in other parts of the world.

Tripartite agreements between off-takers of electricity or heat from innovative SMRs, nuclear industry invested in innovative SMR development, reactor vendors and supply chain companies, and Member States could facilitate access to financing and help the development and deployment of innovative SMR projects in Europe.

Public funding to support EU start-ups

Europe has several innovative startups in the nuclear sector thanks to a long history of nuclear research, supported also by the Euratom research programmes. The **EU Startup and Scaleup Strategy** ([21]) aims at facilitating access to finance, public procurements, markets, services, and talents for innovative start-ups and scale-ups, including in the area of nuclear technologies. It also announced the creation of the Scaleup Europe Fund as part of the European Innovation Council (EIC) Fund, to mobilise significant private funds and make direct equity investments in strategic sectors. Moreover, the EIC can provide support to innovative startups developing disruptive nuclear technologies.

([17]) C(2025) 4319 final, 2.7.2025.

([18]) C(2025) 7600, Communication from the Commission – Framework for State Aid measures to support the Clean Industrial Deal (Clean Industrial Deal State Aid Framework).

([19]) Nuclear Economics in Finland, https://nucleus.iaea.org/sites/INPRO/df8/Section%202/Plenary_Economics_07_Stahl.pdf

([20]) https://www.industrikraft.se/en

([21]) EU Startup and Scaleup Strategy - Research and innovation, May 2025.

Action 4: ***Develop de-risking schemes for the scaling up of innovative nuclear technologies***

In light of the outcome of the ongoing call for proposals under the Innovation Fund with regard to SMR projects, the European Commission will consider an additional temporary InvestEU top-up of EUR 200 million until 2028 to further support the deployment of the initial commercial units of innovative nuclear technologies, including LW-SMRs, AMRs, Microreactors and fusion, within the EU ([22]).

The new Scaleup Europe Fund, which aims at investing in the most promising European companies in strategic technology areas, could also help innovative nuclear technologies to achieve faster deployment.

Action 5: ***Design IPCEI on innovative nuclear technologies***

Member States will design the IPCEI for innovative nuclear technologies, including SMRs, in line with objectives outlined in this strategy, with a focus on creating the conditions for securing European global leadership and enhanced competitiveness. The Commission will continue to support the process through the Design Support Hub and promote a coherent approach with the progress of the Alliance's activities.

Action 6: ***Support the development of SMRs within Net-Zero Acceleration Valleys***

When setting up Net-Zero Acceleration Valleys, Member States and regions are encouraged to identify the potential for using power and heat sourced from SMRs and, where appropriate, set up a corresponding enabling framework.

A strong commitment and an inclusive engagement of all the actors is necessary to swiftly deliver on these actions with a view to deploy first SMRs in the early 2030s and develop strong and competitive supply chain.

4. A PUBLIC POLICY WILL BE NECESSARY TO SUPPORT THE SMR ECOSYSTEM

The development and deployment of SMRs must be industry-led. At the same time, some public support is necessary to help overcome initial economic and regulatory barriers. Policy initiatives will also be needed to protect the intellectual property and technological know-how in this sector, and to revitalise the industrial supply chain and human capital.

R&D&I support for SMRs

Over the past decades, various national support programmes and the Euratom Research and Training Programme have advanced R&D&I for technologies that benefit SMRs. These initiatives have fostered collaboration among Member States and strengthened the EU's leadership in the nuclear sector through increased expertise and know-how.

In 2024, five Euratom research projects related to LW-SMRs and AMRs were launched with a total value of EUR 30 million. The Commission expects to continue funding research on the safety of SMRs with EUR 15 million under the Euratom Research and Training Programme in 2026–27. As for the 2028–34 multiannual financial framework, the Commission has proposed a significant increase in resources to support research, development and innovation in the area of nuclear energy, which will also benefit the SMR field.

([22]) In compliance with State aid rules.

Member States and the Commission, through its Joint Research Centre, operate state-of-the-art nuclear research infrastructure. However, further investments are needed in new, complementary experimental facilities for testing fuel, materials, and specialised equipment, and to optimise their use by the different nuclear industry players. It is important to identify and prioritise the development of these new experimental and testing facilities to address the core R&D&I needs of SMRs in the EU. SMR projects could have access to the Commission's nuclear research infrastructure and benefit from the JRC's expertise, including its Modelling Hub.

What else Member States can do to support SMR deployment

Different SMR projects with similar designs are currently being pursued in various Member States. Since resources are limited, to increase the chances of success, Member States should join forces and pool their resources behind common projects and develop a common de-risking instrument for SMR financing. Future research and innovation activities could also address water- related aspects of SMR deployment, including advanced cooling technologies, integrated energy-water system modelling and hybrid infrastructures supporting both energy and water services such as desalination or advanced water reuse.

Many SMR projects involve companies from several Member States. Such projects require frequent transfers of data, technology and equipment across national borders. These exchanges can be delayed significantly by export controls even within the EU as technologies and components needed for SMRs are often categorised as dual-use items. Without prejudice to EU legislation on export controls of dual-use items, the competent Member State authorities should streamline export control procedures for transfers between Member States to avoid undue administrative burden and delays for these, often small, companies.

As many other high-tech sectors, the SMR ecosystem needs a growing pool of **skilled and competent workers**. It is crucial to monitor supply and demand based on national workforce assessments with the support of the European Human Resources Observatory for the Nuclear Energy Sector and to develop tailored training and education programmes at both national and EU levels. The Observatory should also feed into the forthcoming European Skills Intelligence Observatory announced under the Union of Skills ([23]). European Nuclear Skills Initiative ([24]) supports actions to maintain and further develop the skills for the safe use nuclear technologies in the EU, including SMRs. Member States and the Commission should work on the establishment of an **EU Net-Zero Academy for Nuclear Technologies, including SMRs,** to support the retention of skills and the building up of a competent workforce ([25]).

Support to European regulatory collaboration in SMR licensing and nuclear safety

Licensing processes are essential for delivering SMR projects on time. Cooperation among national safety authorities is essential during the pre-licensing and licensing phases to

([23]) COM(2025) 90 final, 5.3.2025.

([24]) Euratom Research and Training Work Programme 2023–25; European Nuclear Skills Initiative; Skills for nuclear

([25]) The establishment and implementation of the Academy should be informed, as appropriate, by the outcomes of the review of existing Skills Academies announced in the Communication on the Union for Skills.

ensure that new reactor designs proposed to the market comply with the highest standards of nuclear safety.

The European Nuclear Safety Regulators' Group (ENSREG) has established a dedicated taskforce within which regulators from several Member States exchange information on SMR designs in the pre-licensing phase. Such collaboration can avoid duplication, save resources and speed up the licensing of reactor designs, while having a positive effect on nuclear safety. The taskforce could be developed into a "regulatory coalition of willing", in which the countries involved could align their licensing procedures or mutually recognise each other's licensing decisions.

In addition to the Commission grant scheme to support the Member States' nuclear safety regulators, mechanisms such as the NZIA's "**Regulatory Sandboxes**" or "**Joint Early Reviews**" between national nuclear safety regulators could facilitate collaboration and shorten the time needed for licensing, while ensuring that rigorous safety standards are maintained.

Regulatory sandboxes for net-zero technologies, including SMRs, are structured frameworks allowing the companies involved to test, qualify, and validate new approaches and innovative components under the supervision of a competent regulatory authority or several regulatory authorities agreeing to work together. To facilitate compliance with safeguards requirements, operators of installations must follow a safeguards-by-design approach ([26]).

Action 7: ***Removing barriers to intra-EU flows and protecting European IP***

Member States need to simplify and speed up administrative procedures related to export controls between Member States for SMR projects. Member States and the Commission should explore how to protect European IP developed in the context of SMRs, mainly through foreign direct investment screening and merger control mechanisms.

Action 8: ***Establish an "SMR coalition" on policy, regulatory, licensing and economic aspects of selected SMR designs to facilitate SMR deployment by early 2030s***

Interested Member States should establish an "SMR coalition" to facilitate the introduction of the Alliance's selected SMR designs, across their territories, through in-depth policy and regulatory cooperation and minimise – when impossible to avoid – locally customised solutions. Countries could align their licensing procedures or mutually recognise each other's licensing decisions. The Commission will maintain a grant scheme to support EU regulators working on common safety assessments and joint early reviews of SMR projects. The Commission will assist Member States in developing regulatory sandboxes for SMRs.

On both actions, the interested Member States are encouraged to move swiftly to facilitate deployment of the first SMRs in the early 2030s and create the conditions for a fleet-approach for their wider adoption.

([26]) The Commission provides a clear framework for the application of Euratom safeguards in current and future nuclear installations, including SMRs: Commission Regulation (Euratom) 974/2025 of 26 May 2025 on the application of Euratom safeguards, OJ L, 2025/974, 16.6.2025.

Public awareness and international cooperation

Ensuring public awareness of SMR development initiatives is critical to build trust around these projects. The Commission will continue pursuing a culture of transparency on nuclear energy. In preparation for this communication, the Commission engaged stakeholders via a Call for Evidence ([27]) and a broad Stakeholders' Forum in January 2026.

Member States interested or concerned by SMRs could develop and implement communication and awareness actions aimed at improving the understanding of SMRs. These strategies should communicate in transparent terms the characteristics, safety measures, and potential benefits of SMRs to the public, including at the local level, to address specific community concerns and interests.

International collaboration with organisations such as the International Atomic Energy Agency or the OECD-Nuclear Energy Agency and with partner countries such as the United States, Canada, the United Kingdom, Japan and South Korea will continue. The EU remains open to non-EU players, with due caution to prevent the emergence of new import dependencies. Working closely together with candidate and potential candidate countries, in line with the process of their gradual integration, will be an integral element of the strategy.

In addition to industrial cooperation between the European Union, Member States and partner countries, there is scope for enhanced dialogue on regulatory frameworks.

Action 9: Working with international like-minded partners for mutual benefit

The Commission will continue to cooperate with partner countries planning to deploy SMRs in the near term, including candidate and potential candidate countries and partner countries in our Southern neighbourhood, as well as with international organisations such as the OECD-Nuclear Energy Agency and the International Atomic Energy Agency, and international initiatives such as the Generation IV International Forum. In particular, cooperation with the International Atomic Energy Agency is key to develop common safeguards approaches for SMRs. The Commission will also facilitate business-to-business dialogues for the mutual benefit of the industry of the EU and that of relevant partner countries.

5. CONCLUSIONS

SMRs have significant potential to contribute to efforts to make the EU the first climate-neutral economy while ensuring energy security, affordability, and industrial competitiveness, as well as strengthening strategic autonomy.

The EU has built relevant technological expertise and facilities over the past decades, supported by a broad industrial base, all of which are crucial assets in the development and deployment of SMRs in Europe. The EU is also a world leader in the nuclear energy life cycle, including in closing the fuel cycle through reprocessing and the recycling of nuclear materials.

In the global race of the emerging SMR market, the EU needs to take urgent action to stay at the forefront, remain competitive and continue developing new technologies. The Commission is committed to creating the enabling conditions for SMRs development and

([27]) Call for evidence, Small modular reactors – future development and deployment in Europe

deployment, while ensuring adherence to the highest standards in nuclear safety, security, safeguards, radiation protection and in radioactive waste management to protect citizens and environment.

Deployment of the first SMRs in Europe is realistically targeted for the early 2030s. However, the success of this endeavour hinges on access to capital, the pooling of knowledge, infrastructure and resources by various actors, an alignment of regulatory frameworks across Member States, a shortening of licensing timelines, standardisation of designs, the adoption of a fleet approach, and the development of strong supply chains.

This strategy calls for collective commitment and coordinated action from EU institutions, Member States, industry, and research organisations. Together, these efforts will realise the potential of SMRs to contribute to a sustainable, competitive, and resilient future European energy system.