SMRs: Europe's Energy Future

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Executive summary

The nuclear energy field stands at an unprecedented moment in time. For the first time in history, hundreds of start-up companies—backed by private investment—are emerging with innovative designs, particularly Small Modular Reactors (SMRs). This surge in entrepreneurial activity comes at a crucial moment: public opinion on nuclear energy is becoming increasingly favourable, driven by the need for energy independence, ultra-low greenhouse gas emissions, energy security, and the potential for lower long-term costs.

This creates a unique opportunity to foster a new dynamic, market-oriented ecosystem of nuclear projects. Countries like the United States are already advancing regulatory frameworks that foster open competition in nuclear innovation. In the EU, only a few countries are taking steps in this direction. The European Union must not fall behind. Achieving legal and regulatory neutrality will be key to unleashing the benefits of free market competition in the nuclear space over the coming decade.

1. Introduction to the new nuclear ecosystem: a case for SMRs

Despite the misleading mainstream idea, nuclear energy is still one of the biggest suppliers of electricity in the European Union. In 2023, thirteen EU Member States were operating nuclear power plants, which collectively generated approximately 619,600 gigawatt-hours (GWh) of electricity, a 1.7% increase compared to 2022. According to Eurostat, nuclear power accounted for 22.8% of the EU's total electricity production in that year, highlighting its significance in the Union's energy mix. In terms of CO2-free electricity production, nuclear energy accounted for more than 50 % of all Europe's generation. As Figure 1 presents, France remained the leading nuclear producer, generating 338,202 GWh, or 54.6% of the EU's nuclear output, followed by Spain (56,873 GWh; 9.2%), Sweden (48,470 GWh; 7.8%), and Finland (34,308 GWh; 5.5%). Although Germany contributed 7,216 GWh in early 2023, it fully exited nuclear energy production in April, despite having been the EU's second-largest nuclear generator until 2021[1].

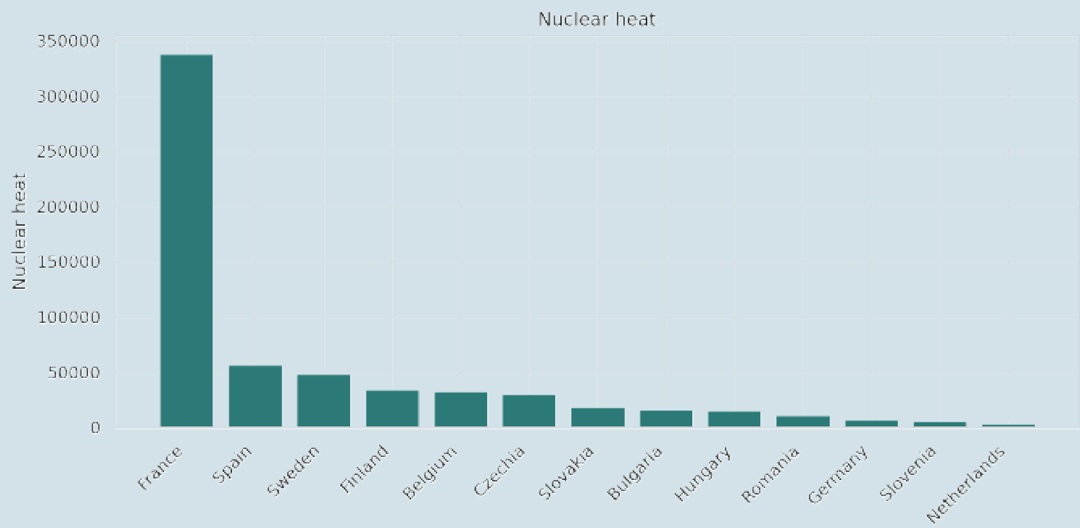
Generating close to one quarter of the entire electricity of Europe is a remarkable fact, taking into account that some countries have currently no nuclear reactors in operation. In terms of nuclear dependency, the countries that were the most dependent on nuclear power for the generation of electricity in home were: France (65.0% of its electricity came from nuclear sources), and Slovakia (62.0%).

Although some countries appear to prioritise the continuation of nuclear energy production by keeping existing reactors operational and build new ones, the EU's strategic focus seems to remain largely on renewables and grid expansion marginalising an arguably equally efficient energy option to conventional nuclear reactors: Small Modular Reactors (SMRs). SMRs represent a fundamental shift in how clean power can be generated today: smaller, safer and more flexible plug-and-play power plants that offer zero-carbon baseload which can be afforded and deployed at a smaller cost and without the complexity of large nuclear installations. What makes them particularly relevant in the current policy debates is their compatibility to economic and climate efficiency dimensions, such as innovative entrepreneurship, regu-

1 Eurostat (2025), *Nuclear energy production in the EU.*
https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250225-1.

latory neutrality, competition-driven market mechanisms, and energy systems decentralisation. Yet despite this promising future of efficiency, Small Modular Reactors (SMRs) face substantial regulatory and political roadblocks throughout the EU. Most of them stem from outdated licensing systems, rigid energy planning models, and a failure to create enabling conditions for emerging and more innovative technologies. These obstacles are both technical and ideological, reflecting a broader tension within EU policy. On the one hand, the active approaches to decarbonisation and on the other, a more liberal vision of energy transformation grounded in technological pluralism and market choice.

Figure 1.



Source: Eurostat (2025), Nuclear energy production in the EU.
https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250225-1.

Unlocking the potential of SMRs production in European countries requires more than regulatory reform; it demands a compelling political argument in which decarbonization could be driven by innovation and economic freedom. Other regions of the world, such as Canada, the United States, and the United Kingdom, have already adapted their regulatory frameworks and promoted market-led models which are advancing SMR development. This section seeks to shed light on the structural changes and policy imagination needed for Europe to follow and maybe lead this path, highlighting the economic incentives, alongside the technical advantages shown earlier in the analysis.

In the next sections, we will briefly analyse the current state of affairs of SMR deployment in the EU and then we will identify the core regulatory and political barriers to SMRs in the EU policy sectors. We will assess public opinion evolution regarding nuclear energy, a word on safety and technology of these new designs. The document proceeds with an analysis of comparative practices in other advanced economies and a proposal for rethinking the energy transition through a liberal lens, one that prioritises fair competition and technological diversity in the race to net-zero impact milestone.

"SMRs represent a fundamental shift in how clean power can be generated today: smaller, safer and more flexible plug-and-play power plants."

2. Why small, why modular? Why now?

It is important to make a distinction between the new and more decentralized SMR designs, and the new large-scale designs made by nuclear legacy corporations.

The designs created by the few nuclear legacy companies are large, supposedly safer, but at the same time, extremely costly in time and resources. Some of these designs made by state-driven or very large companies have been so unsuccessful that made their designers file bankruptcy[2] or ask for debt reorganisation[3].

This is supposed to contrast with the SMRs which are supposed to be smaller, cheaper and safer. The claims appear too good to be true, so in this document, we will try to assess their claims one by one.

Why the "S", of SMRs, Why Small? Interestingly, it could be thought that any energy source will benefit from scalability, and that the larger the power plant, the better. Nonetheless, as usually happens with theoretical models, some unexpected consequences arise when building a large reactor (1000 Megawatts or more). First, larger plants will take longer to build. This apparently obvious fact renders some very relevant consequences and is that the SMR will take shorter to start producing electricity, and therefore to start making profit. The earlier the profit is made, the less financial risk will be assumed, and in the current monetary framework, this could be crucial to make economic sense of the project. In this sense the myriads of designs of SMRs range between 1/10th and 1/3th of the power of a large one and would benefit from this aspect.

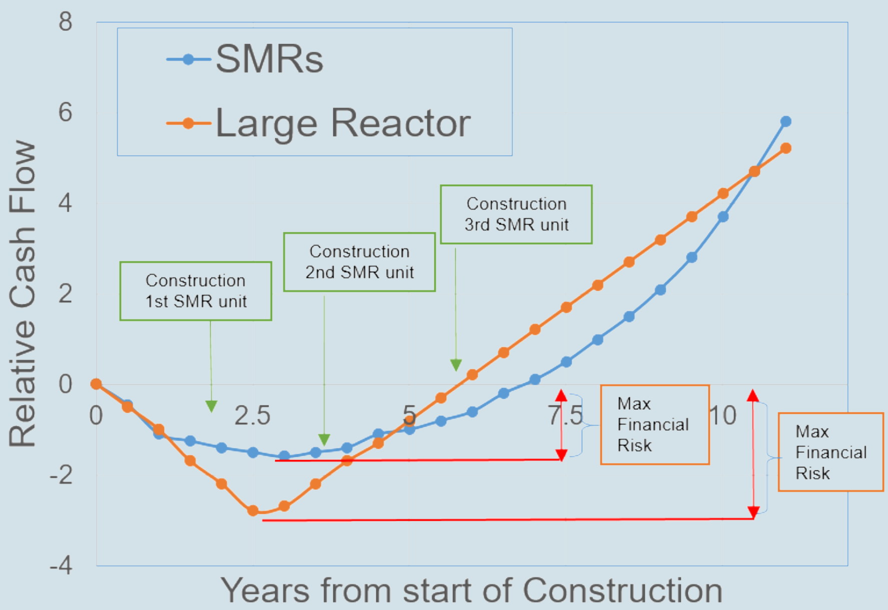
Why the "M" of SMR, what exactly is modularisation? Modularisation basically means that the reactor components could be built off-site, and then simply assembled on site. The large size of conventional reactors prevented those to do it, but some of those designs will be completely built, including the containment, on the factory, and then deployed to be installed on site. This

2 Reuters, 2017 "How two cutting edge U.S. nuclear projects bankrupted Westinghouse". https://www.reuters.com/article/world/how-two-cutting-edge-us-nuclear-projects-bankrupted-westinghouse-idUSKBN17Y0C7/.
3 Reuters, 2015, "Rescued Areva faces uncertain future as nuclear fuel group". https://www.reuters.com/article/business/energy/rescued-areva-faces-uncertain-future-as-nuclear-fuel-group-idUSL5N0YQ137/.

supposedly will reduce the costs and would allow for scalability, this is, once the first SMR is already producing energy, the second one can be built incurring in less financial risk, which will be even lower for the 3rd, 4th and so on.

All those two factors ("S" and "M") cause that if we look at the cash flow of a large power plant, and an SMR construction as we can see in the Figure 2, it appears obvious that the financial risk assumed by any construction company is greatly reduced, lowering the entrance barrier, that prevented companies to enter the market and distorted the competition between designs. As seen, the main changes SMRs introduce in the market is an economic one, lowering the entrance barrier, and favouring entrepreneurs and start-up companies.

Figure 2. Cash Flow of a SMR versus a Large Reactor



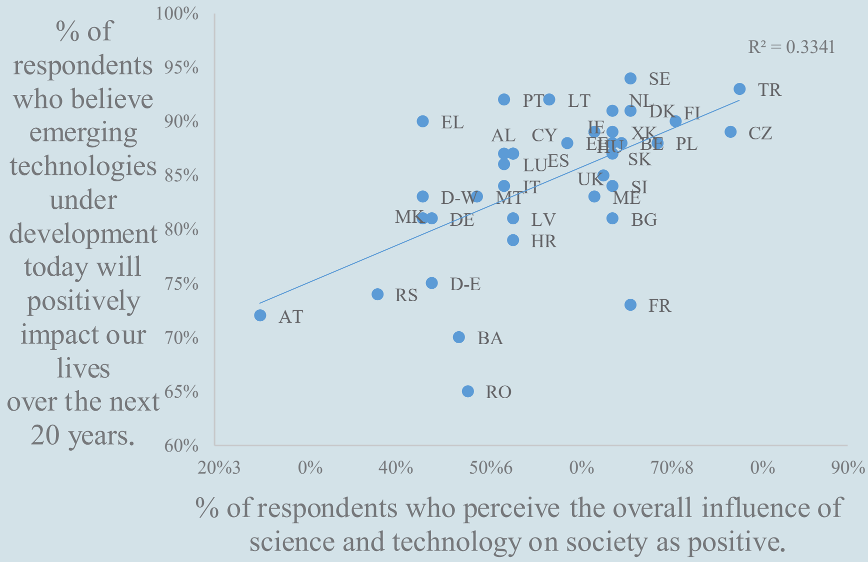
Source: Adapted from Handbook of Small Modular Reactors. Chapter 3. 2014.

"The earlier the profit is made, the less financial risk will be assumed, and in the current monetary framework, this could be crucial to make economic sense of the project."

3. A heated debate: the public opinion and nuclear energy

As 2025, some antagonism to nuclear power is still present in the European Union[4]; governments of countries like Spain are pushing for their closure. Nonetheless, at the individual level, polls show that the majority of the population is in favour of maintaining them active[5] in what is named as "Long Term Operation". This hesitation to nuclear energy is normally correlated to a lack of scientific knowledge[6]. As Figure 3 suggests, there is a correlation between the percentage of people who believe that science and technology can have a positive effect on society and the percentage of people who believe that nuclear can have a positive effect on our way of life in the next 20 years in Europe.

Figure 3. Correlation on views that science and technology can have a positive effect on society and that nuclear can have a positive effect our way of life in the next 20 years



Source: European Commission (2025), Special Eurobarometer SP557: Public Opinion in the European Union. https://europa.eu/eurobarometer/surveys/detail/3227.

4 According to a 2025 empirical study "the market demand" is identified as "the most influential factor, with public acceptance, regulatory clarity, economic viability, and government support playing critical roles". R.E. Josephs, T. Yap, M. Alamooti, T. Omojiba, A. Benarbia, O. Tomomewo, and H. Ouadi (2025), *Regulation of Small Modular Reactors (SMRs): Innovative Strategies and Economic Insights, Eng*, 6, 61. https://doi.org/10.3390/eng6040061.
5 La Vanguardia 2025. "La mitad de los españoles apuesta por alargar la vida de las nucleares". https://www.lavanguardia.com/politica/20250526/10719017/mitad-espanoles-apuesta-alargar-vida-nucleares.html.
6 E. C. Urbina, "Nuclear power in Spain and the common good: the dialogue as a communicative proposal for social acceptance," *RUTA Comun.*, vol. 8, pp. 27–44, 2017.

This renewed support of nuclear energy at the European level is even more evident in the post-2022 landscape with the Russian Invasion of Ukraine and the energy crisis that followed[7].

The support for nuclear energy in Europe has had highs and lows throughout history. In the early years, it had a parallel enthusiastic development to that of the United States. The first commercial reactors were built in France, Belgium, Switzerland, Sweden, Germany or the United Kingdom during the 1950s and 1960s. More countries started to embrace nuclear energy like Spain or Italy during the following decades, pushed by events such as the Oil Crisis of 1973, which highlighted the importance of energy independence and sovereignty.

However, together with this initial enthusiasm, concerns were raised and an opposition to nuclear energy was formed. Nuclear Power Plants were viewed by a section of the population as semi-military projects, as countries like UK, France or Spain, had an initial interest in nuclear fission derived from the atomic bomb and atomic propulsion for ships and submarines. In this sense, the opposition to nuclear energy was originally tied to the opposition of nuclear bombs testing, which verged with peace, anti-war or disarmament movements.

After some victories such as the Partial Nuclear Test Ban Treaty of 1963 and the Comprehensive Nuclear-Test-Ban Treaty of 1996, the anti-nuclear movements transmuted towards banning the civil use of Nuclear Energy. This, combined with the 1979 accident to Three Mile Island in the USA, almost coincident with the "viral" film The China Syndrome, on which Michael Douglas and Jane Fonda had to deal with a nuclear accident, provoked the anti-nuclear movement to gain momentum in a natural manner. Thus, in the 1980s, Nuclear Energy construction practically halted in Europe and the United States because of economic and negative public opinion reasons.

Then, little by little the nuclear sector silently gained some momentum favoured by improved economic conditions and during the late 90s and early 2000s, countries were discussing a possible "Nuclear Renaissance", or nuclear comeback, with new designs from the major companies being supposedly

7 Bohdanowicz, Łopaciuk-Gonczaryk, and Kowalski, "Europe Becomes Pro-Nuclear? Drivers of Public Support for Nuclear Energy in Six EU Countries after the Energy Crisis of 2022".

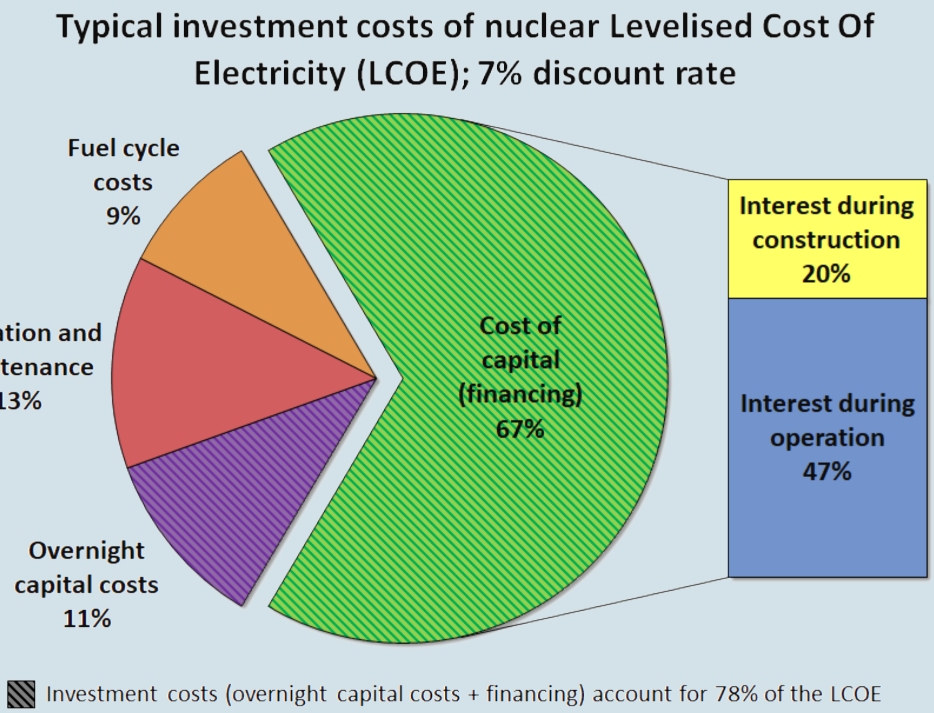
safer, cheaper, and cleaner. This inertia got all truncated with the Earthquake that Japan Suffered in 2011, that left thousands of deaths and many infrastructures impaired, including three units at the prefecture of Fukushima. Some politicians reacted fast to this new fearful situation, and Germany passed a law to close all the nuclear reactors before 2020[8] even though there was not a single death caused by radiation in any Japanese nuclear power plant during the earthquake and the following days.

In the case of Germany, the energy transition and nuclear phase-out was a big promise of the political parties involved, and propaganda was created around it, promising a cleaner energy mix, with a cheaper electricity bill for the population if phase out from nuclear was performed. Polls showed that the population was supportive of these measures in general. But, even though the population mentioned fear of accidents as the reason for the closure, it looks like their priorities have changed in the last two years in the post 2022 world. In the second half of 2024, Germany had the highest household electricity prices in the EU, at €0.39 per kWh with one of the highest carbon intensity electricity. This turn of events has made the majority of the population (around 60%) see the nuclear phase out as wrong.

The striking events of the Ukraine invasion in 2022 created a renewed nuclear support that is not only based on the high electricity prices derived from it. The so-called energy independence, or energy sovereignty was also mentioned as a relevant factor by the nuclear supporters. If the energy consumption depends largely on sources such as natural gas, and a country does not produce it, it can be subject to the interest of foreign powers or companies, especially in state-driven semi-oligopolistic markets such as natural gas or petrol. An obvious question is therefore, why nuclear energy is seen as a way to regain energy independence. The answer to this question is double. Firstly, because the price of the nuclear energy fuel, (uranium ore), is a very small percentage of the nuclear energy total cost compared to hydrocarbon sources, where the fuel price completely drives the energy cost (see Figure 4). Secondly, because the Uranium ore supply is heavily decentralised, and liberal democracies such as Canada or Australia hold large amounts of these ores, creating the environment for a market where competition plays a significant role.

8 BASE (n.d.), *Nuclear Phase-Out in Germany*.
https://www.base.bund.de/en/nuclear-safety/nuclear-phase-out/nuclear-phase-out.html.

Figure 4. Costs breakdown of a Nuclear Power Plant



Source: https://blog.policy.manchester.ac.uk/posts/2022/10/how-can-nuclear-help-with-energy-costs-and-how-do-we-pay-for-nuclear/

Nevertheless, one of the newest and most powerful arguments in favour of nuclear power is not related to the price. It is so strong that the green party in Finland, for example, has changed its tone and it is now a nuclear supporter. This new actor is climate change, and the policies derived from it. Given that nuclear energy does not produce CO2 during its operation, it has become one of the cleanest and energy dense sources. This is viewed for example in the

Green Taxonomy made by the EU[9], where in fighting climate change, nuclear energy had to be included in any subsidy that works in that direction.

It is not only the general public that is interested in this possibly cheaper and reliable electricity. The industrial sector is also interested due to the current emphasis in electrification of processes to satisfy the climate goals. To address these challenges, the EU has launched the European Industrial Alliance for SMRs[10], which targets commercialisation by the early 2030s and seeks to enhance industrial cooperation, reinforcing Europe's role in global clean energy markets. This initiative fits the European Commission's proposed 90% net reduction in greenhouse gas emissions by 2040, building on the current legislative target of a 55% cut by 2030, as suggested in the recent impact assessment[11]. A key dimension of this strategy is the creation of the conditions to enable full implementation of existing legislation, supportive financing mechanisms, and a level playing field for clean technologies, including nuclear. The newly launched Industrial Alliance on SMRs[12] illustrates the EU's intent to secure a resilient clean-tech supply chain and skilled workforce while reducing reliance on fossil fuels

It is in this environment where an abrupt change of the nuclear paradigm has started in the last 5 years. The perceived positive opinion has lowered the fear of new investors; and hundreds of start-up companies have launched themselves into competition to achieve the next design of nuclear reactor. Contrary to the early years of nuclear energy on which large, state-driven monetary efforts were made, this time, venture capital is entering the field. More than 2 billion euros have been raised by different companies, each proposing a different design of new reactors, (most of them being Small Modular Reactors). This new ecosystem opens a realm of opportunities, which can align with a liberal framework and that will be explored in the present paper.

9 European Commission (n.d.), *EU Taxonomy: Complementary Climate Delegated Act to Accelerate Decarbonisation.* https://finance.ec.europa.eu/publications/eu-taxonomy-complementary-climate-delegated-act-accelerate-decarbonisation_en.
10 European Commission (n.d.), *European Industrial Alliance on Small Modular Reactors.* https://single-market-economy.ec.europa.eu/industry/industrial-alliances/european-industrial-alliance-small-modular-reactors_en.
11 European Commission (2024), *Commission Recommendation for a 2040 Climate Target and EU-wide Industrial Decarbonisation*, Press Release IP/24/588 (Brussels: European Commission). https://ec.europa.eu/commission/presscorner/detail/en/ip_24_588.
12 European Industrial Alliance on SMRs. https://single-market-economy.ec.europa.eu/industry/industrial-alliances/european-industrial-alliance-small-modular-reactors_en.

4. Nuclear energy again? A new hope

Electricity demand is going to increase in the next few years. Data centres, electric vehicles and industry electrification are expected to grow largely in Europe. The manner in which this increase in electricity demand is going to be addressed can very likely influence the prosperity of a region or the quality of life of its inhabitants. For this reason, it is important to comment on a couple of facts related to nuclear energy, and in particular, these new designs.

As mentioned, nuclear Energy does not produce CO2 during operation. The steam seen through the cooling towers is just water steam. Nuclear energy is one of the cleanest energy sources in terms of greenhouse emissions, similarly to renewable energy. Europe's decarbonisation and energy security challenges can be addressed, to a certain extent, by Small Modular Reactors (SMRs),

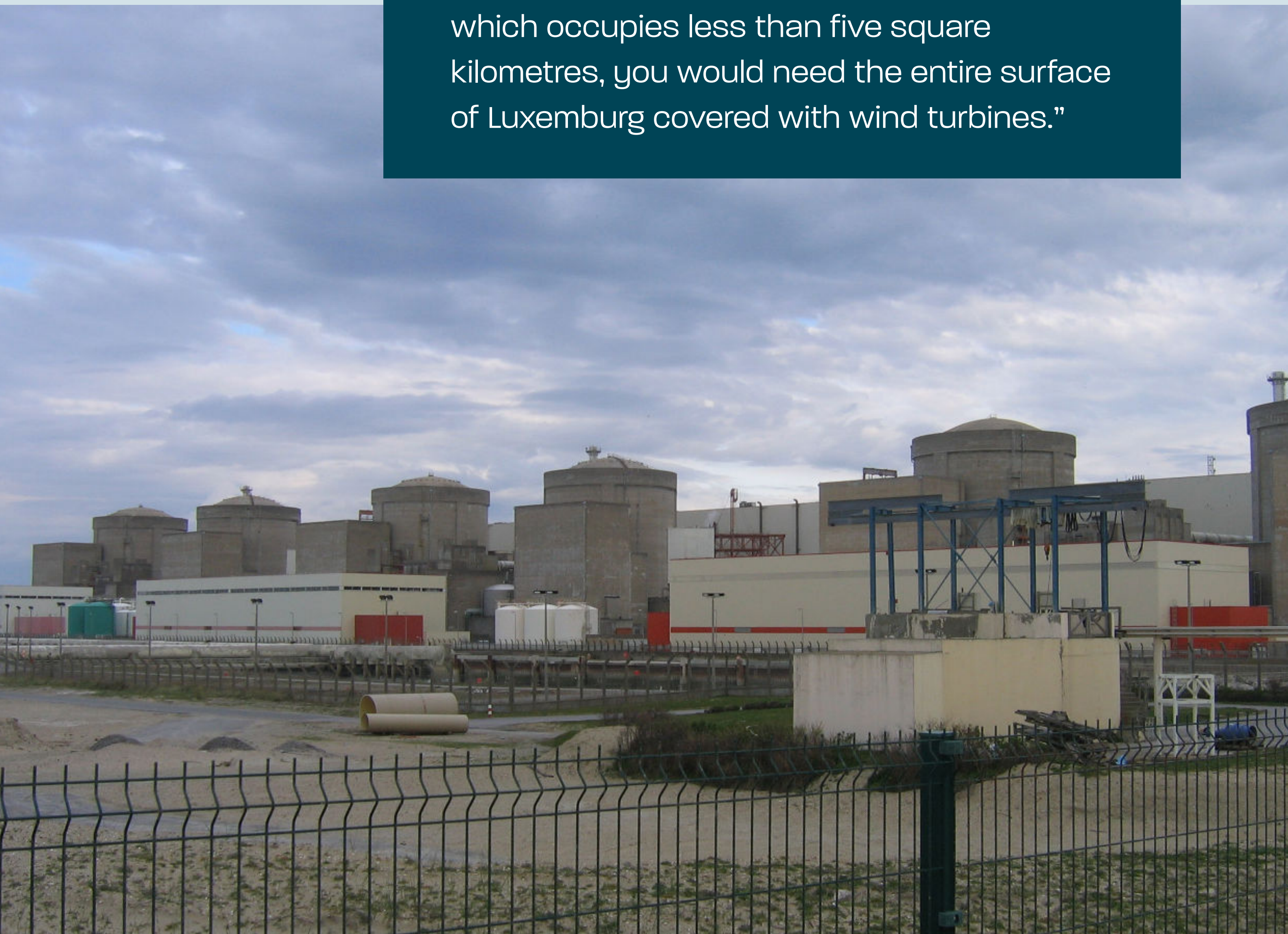
> "Europe's decarbonisation and energy security challenges can be addressed, to a certain extent, by Small Modular Reactors (SMRs), one of the cleanest energy sources in terms of greenhouse emissions, similarly to renewable energy."

Nuclear Energy is the densest energy source in terms of space required to produce a unit of power. To produce the same amount of energy generated in the nuclear site Gravelines, (France) which occupies less than five square kilometres, you would need the entire surface of Luxemburg (around 2000 km2) covered with wind turbines one after the other. Similar comparisons can be made for solar panels and space required.

In terms of the European nuclear industry and corporations, it must be commented that Europe has large autonomy in maintaining and developing nuclear technology, from the nuclear fuel enrichment and fabrication to the nuclear reactor technology design. The entire technology supply chain can be found within European borders.

The manner in which electricity is produced in a Nuclear Power Plant, largely differs from that generated in other low-carbon sources such as solar or wind. These last three, largely dependent, are intermittent, and they depend on the weather forecast, which can change on a day-to-day basis. As seen in the largest and most recent European blackout in Spain and Portugal, the challenges of managing net frequency and voltage are compounded in low-inertia grids with high shares of renewables. Unless grid operators ensure adequate synchronous capacity or deploy advanced grid-forming technologies. The April 28th Spanish blackout event shows how insufficiently programmed or unresponsive voltage control resources (not the mere presence of solar or wind), can lead to cascading failures.

> "To produce the same amount of energy generated in the nuclear site Gravelines, which occupies less than five square kilometres, you would need the entire surface of Luxemburg covered with wind turbines."



The job market created around the nuclear industry involves high-quality jobs that provide a large amount of financial freedom. Both top-level and bottom-level expertise have good projections and satisfaction as reported by their workers. Currently. This is extremely relevant for another reason. Most of the nuclear workforce in Europe were hired during the 1970s and 1980s, at the beginning of their career, and most of them are now entering retirement at a large scale[13]. The replacement of this workforce is a very difficult task. The know-how of building new power plants appears to be almost lost as proven by the recent European constructions, but the know-how of operating and maintaining a reactor is still present. Nonetheless, there will not be much time on which Europe will lose this experience and will be completely subject to foreign corporations (Chinese, Russian, American or Korean).

It is precisely this lack of competition between the state-driven or too-large-to-care companies that contributed to the "failure-to-deploy" of the previous nuclear designs. In any market, competition is key to provide the best product, highlight inefficiencies or incentivize innovation. The nuclear new designs from the 1990s and 2000s were developed in an environment of no-competition. The pseudo-oligopoly formed by the state-driven companies and the legacy-ones created designs that did not reach maturity, or that failed to prove their supposed advantages.

The financial benefits of SMR deployment have already been raised across other market economies outside the EU. In these markets, SMRs are pivotal as a policy and industrial strategy that aligns with market principles, such as competition, decentralisation, and innovation. Countries such as the United States, the United Kingdom, and Canada, contrary to the cautious steps taken on the EU level, are actively using burden-free regulatory and financial instruments to accelerate SMR development, often with a deliberate focus on de-risking early projects at their first stages, while letting market mechanisms determine long-term viability. The golden rule of market-led development sets the government to act not as direct operators, but as facilitators, de-risking early-stage deployment to allow capital markets to lead the scaling phase.

The United States offers the most comprehensive case of a development industrial policy backing SMRs. In 2025, the U.S. Department of Energy reis-

13 Specialist Sounds Warning Over 'Huge Shortage' Of Skilled Workers.
https://www.nucnet.org/news/specialist-sounds-warning-over-huge-shortage-of-skilled-workers-7-2-2024.

sued a $900 million funding call to support Generation III+ light-water SMRs[14]. Interestingly, awardees are selected solely on technical merit, highlighting a commitment to competition and technical excellence rather than politically predetermined winners[15]. The programme is designed to bridge the gap between the existing nuclear fleet and future advanced reactor technologies, while leveraging domestic supply chains and expertise tied to the current light-water reactor infrastructure. By reducing time-to-revenue through modular construction and factory fabrication, the programme seeks to attract private capital and drive cost reductions through series production[16].

Britain's earlier experience with large-scale nuclear construction has been marked by high costs and delays, as exemplified by Hinkley Point C nuclear power station. The government's agreement with Électricité de France (EDF) involved fixed-price contracts well above market rates, which the National Audit Office later estimated could result in £30 billion in subsidies.[17] In response, attention has shifted to Rolls-Royce's SMR initiative, which has attracted both private (£195 million) and public (£210 million) funding. These SMRs aim to be cheaper, faster to build, and easier to replicate than their large counterparts. With a projected cost of £2.2 billion per unit (falling to £1.8 billion through economies of scale), and a modular build time of three to four years, they could be more attractive to a broader range of energy investors.[18] By matching capacity to local grid needs and using prefabricated factory components, SMRs in the UK embody a more decentralised and scalable energy innovation model.

Canada, too, has prioritised SMRs within its federal clean energy strategy, with provincial-level partnerships emerging to develop deployment roadmaps. The targets of remote electrification, industrial heat in off-grid areas, and decarbonisation can be further supported by SMRs, in specific interest areas such as mining regions and Indigenous communities. Globally, over 80 commercial

14 The programme is twofold: First Mover Team Support (up to $800 million) for deployment consortia, and Fast Follower Deployment Support (approximately $100 million) to address licensing, siting, and supply chain barriers.
15 U.S. Department of Energy (2025), *$900 Million Available to Unlock Commercial Deployment of American-Made Small Modular Reactors*, Office of Nuclear Energy, 24 March. https://www.energy.gov/ne/articles/900-million-available-unlock-commercial-deployment-american-made-small-modular-reactors.
16 International Atomic Energy Agency (2023), *What Are Small Modular Reactors (SMRs)?* https://www.iaea.org/newscenter/news/what-are-small-modular-reactors-smrs.
17 *The Economist* (2022), 'Can Smaller Reactors Make Nuclear Power Economic?', *The Economist*, 17 November. https://www.economist.com/britain/can-smaller-reactors-make-nuclear-power-economic/21806208.
18 Ibid.

SMR designs are under development, targeting a range of use cases such as district heating, desalination, and hydrogen production.[19]

These non-EU cases suggest that advanced liberal economies are not relying on top-down mandates but are instead crafting market-enabling policies that reduce risk, promote investor confidence, and build the industrial ecosystem needed for long-term competitiveness. Unlike centralised procurement or national monopolies, these models favour pluralism in energy sources and pathways, aligning innovation with economic freedom.

Theoretical literature has also documented that SMRs offer a range of economic advantages that position them as a cost-effective and flexible complement to large-scale nuclear and renewable energy sources. As Locatelli et al. (2014)[20] show SMRs reduce interest during construction (IDC) by up to 40% compared to large reactors due to their shorter build times, cutting one of the major cost drivers in nuclear projects. This advantage enhances their financial viability and appeal to private investors. Modular efficiency also plays a critical role; Mignacca & Locatelli (2020)[21] find that although SMRs may have higher per-MWe capital costs, they can achieve competitive levelized costs of electricity (LCOE) through modular construction, standardisation, and economies of series production.

In addition and as previously commented, SMRs offers the possibility of diversification of the energy mix by relying on a stable and competitive market of the fuel (uranium) which would enhance energy sovereignty for all embarking countries.

Finally, nuclear power plants are not only relevant in terms of energy, but they are critically necessary for many non-power nuclear technologies. One of the most important is the radiopharmaceutical industry and nuclear medicine, an industry with a market of more than 6 billion € which require nuclear reactors to generate many elements used against cancer and other illnesses.

19 International Atomic Energy Agency (2023), *What Are Small Modular Reactors (SMRs)?* https://www.iaea.org/newscenter/news/what-are-small-modular-reactors-smrs.
20 Locatelli, G., Mancini, M., & Bingham, C. (2014). *Small Modular Reactors: A comprehensive overview of their economics and strategic aspects*. Progress in Nuclear Energy. https://eprints.whiterose.ac.uk/91148/1/Accepted%20version.pdf.
21 Mignacca, B., & Locatelli, G. (2020). Economics and finance of Small Modular Reactors: A systematic review and research agenda. Renewable and Sustainable Energy Reviews. https://www.mdpi.com/1996-1073/16/18/6491.

In short, SMRs offer more than just a technical solution; they embody the values of a liberal democratic order. In a time when the energy transition risks becoming overly technocratic or protectionist, SMRs provide an opportunity to reframe the policy debate around openness, innovation, competitiveness, and citizen empowerment.

The new SMRs assessed in the previously mentioned studies compelled an incredibly diverse number of designs, some of them quite esoteric, with certain advantages and drawbacks each. In the next section, we will try to briefly summarize each group.

Table 1. Summary of Studies for different SMR designs and applications

Study	Authors	Year	Journal	Key Evidence / Benefit of SMRs
Small Modular Reactors: A comprehensive overview of their economics and strategic aspects	Locatelli, Mancini & Bingham	2014	Progress in Nuclear Energy	SMRs reduce interest during construction (IDC) by up to 40%, enhancing financial viability through shorter build times.
Economics and finance of Small Modular Reactors: A systematic review and research agenda	Mignacca & Locatelli	2020	Renewable and Sustainable Energy Reviews	Despite higher per-MWe costs, SMRs can achieve competitive LCOE via modular construction, standardisation, and series production.
Techno-economic feasibility of a hybrid SMR/H2 energy system	Chalkiadakis et al.	2023	Energies	Demonstrates economic feasibility of SMRs in off-grid industrial clusters, showing adaptability to infrastructure-constrained regions.
SMRs as a Solution for Renewable Energy Gaps: Spatial Analysis for Polish Strategy	Zarębski & Katarzyński	2023	Energies	Shows SMRs reduce renewables curtailment and balancing costs in low-flexibility grids by providing dispatchable backup.
Small Modular Reactor Deployment and Obstacles to Be Overcome	Tokuhiro et al.	2023	Energies	SMRs at 92% capacity factor deliver 3x more electricity per federal dollar than solar/ wind under equal incentives; highlights cost-efficiency and long operating life.

5. Technology assessment

The perfect nuclear reactor concept, one that fits all purposes at the best cost with the safest systems is a technological utopia. All designs have some theoretical known benefits and drawbacks and some practical unknowns. The only manner in which the best designs will stand out will be through competition and due to the information transmission, which is generated in a healthy market. In this section, we are going to list the "theoretical" advantages or disadvantages of each design, and we leave the practical ones to be found by the market in a possible future.

One of the main innovations proposed by SMRs is their potential to serve purposes beyond electricity generation. Depending on the temperature of their coolant, see Figure 5, SMRs can help to electrify many industrial sectors such as steel making, petroleum refining or seawater desalination. While these capabilities still need to be demonstrated in practice, they represent a promising point of differentiation for this new generation of reactors.

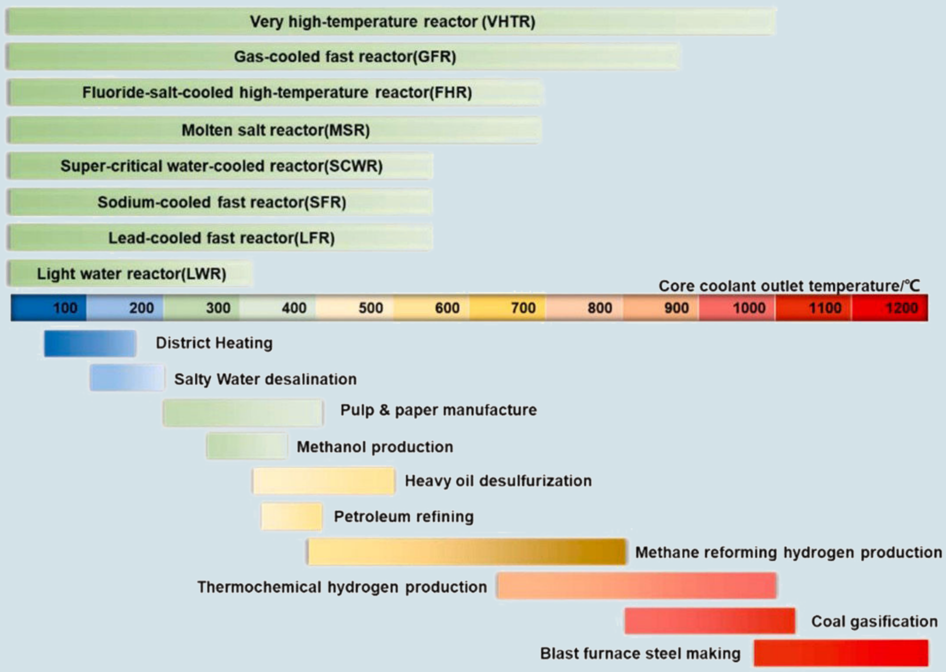
The most prevalent design of SMRs are the ones that resemble a scaled-down design that use water as the coolant of the reactor, so-called Light Water SMRs. These designs are similar to the ones of submarines, and they benefit from the large know-how of dealing with water as coolant, and the mature market of water-systems technology. The temperature of the water reached would allow them to be used for cogeneration purposes.

"SMRs can help to electrify many industrial sectors such as steel making, petroleum refining or seawater desalination."

Following, one of the most researched SMRs are the ones that use liquid metals as coolant instead of water, in particular liquid Sodium or Lead. These designs will likely suffer more maintenance problems, as already shown in previous functioning reactors (phoenix or super-phoenix in France). On the advantages, those designs will be able to rely less on the Uranium price, as they can be used to re-generate the fuel, and the temperature reached would allow to generate hydrogen (in case the hydrogen industry takes off in Europe).

There are SMR concepts that use a gas like CO2 or Helium as coolant, and that can reach very high temperatures, up to 1000 degrees Celsius. These designs would be able to help through co-generation to industries that require high temperatures for their chemical processes like petroleum refining or steel making. These designs are based on built experimental reactors, which have been normally expensive due to the more complicated airtightness of the gas.

Figure 5. Potential thermal capabilities and applications of different SMRs versus operating temperature



Source: International Atomic Energy Agency. 2018.

A design that has gained some attention is one on which the fuel is not fixed in the core but dissolved in a molten salt. The coolant is therefore a mix of molten salt and fuel, which inhibits any kind of reactivity accidents by design. On the downside, molten salt is extremely corrosive, and all the components exposed to it will need to be either replaced or maintained with high standards.

Last but not least, a disruptive design, which is not backed up yet by proven technology, but that could be a revolution if successful are the fusion reactors. Fusion reactors can use sea water as pseudo-fuel which is a potentially infinite source. Dozens of start-ups have been created in the last years and the expectation on their development is growing.

> "These designs would be able to help through co-generation to industries that require high temperatures for their chemical processes like petroleum refining or steel making. These designs are based on built experimental reactors, normally expensive due to the more complicated airtightness of the gas."

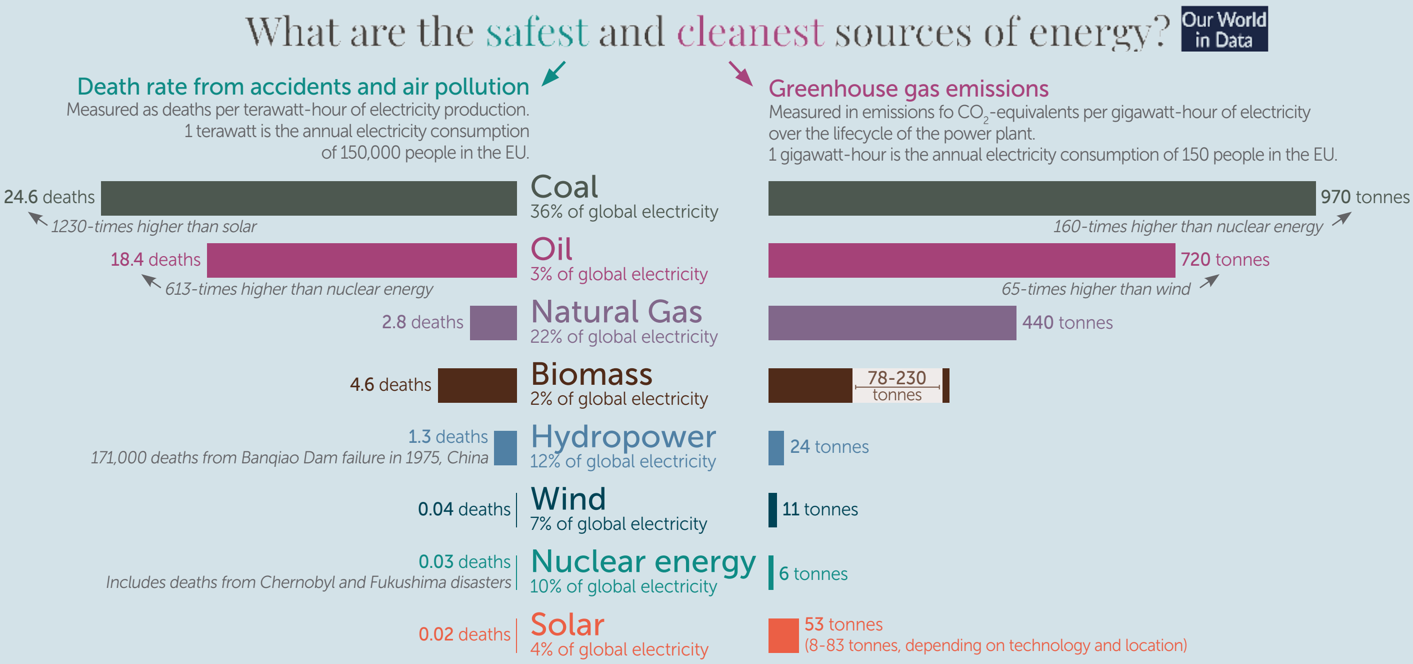
As a final note, it is extremely important to mention that all the new designs described in the previous version, with the improved safety capacities mentioned in this one, will need to receive the approval of the regulatory authorities of each country. This is; the regulatory bodies will need to evaluate each new design and perform an independent assessment of the claims and adequacy of the safety systems in order to provide an approval for building such. This issue can generate a large bottleneck for all new reactors, which could distort the competition, as it will not be based on their outcomes or capacities, but rather on dependence of the regulatory authorities.

This bottleneck is already on the table, as already raised by some regulatory authorities, they do not have yet the capacity to assess a molten salt reactor, or a liquid metal reactor, or any less conventional type of reactor. They would need either training or more resources, or more freedom to face this new challenge that SMRs bring with them. A push for SMR designs would definitely involve conversations about the regulation training surrounding new designs.

6. A necessary word on safety of SMRs

As seen in the introduction, the safeness of nuclear reactors has historically been a factor in the public acceptance of nuclear energy. Even though nuclear energy remains as one of the safest sources of energy (see Figure 6) the public sometimes holds a different view. The extent to which this factor can hinder or foster nuclear energy is debatable, but it is undeniable that the three main accidents in nuclear power plants (Three Mile Island, Chernobyl and Fukushima) have caused a regression of political support of nuclear energy.

Figure 6. Death rate and Greenhouse emissions for different energy sources



Source: Our World in Data. "What are the safest and cleanest sources of energy?" Accessed June 2025.

The first major accident of the list occurred in 1979 at the Three Mile Island Nuclear Generating Station, and it was a combination of several small technical and interpretation errors which resulted in a partial meltdown of the core. The operators stopped this meltdown, a safe state was reached and not a single person was affected by radiation above the limits. Second, the Chernobyl accident was a perfect example of how central planning can result in a catastrophic event. Orders from Moscow in the middle of a safety experiment to raise the power, and an urge to perform that experiment created an unstable situation that resulted in disastrous. If more autonomy would have been given to the operators, it is likely that the accident would have been avoided. Finally, the Fukushima accident has to be understood in a context of a large chaos created by a tsunami and a total blackout of the grid.

Neither of those accidents can supposedly happen in an SMR. The reason that the first or third accident is extremely unlikely is because SMRs store much less power in their cores, than large nuclear power plants. Less power to sell, but also less power to deal with in case of an accident. Some of those designs are supposedly able to withstand a Fukushima-type of accident for 72 hours without any single human intervention because they rely on passive or natural mechanisms for cooling the core and non-electrical equipment. The reason why a Chernobyl type of accident cannot occur neither in an SMR (not also in a conventional western reactor), is because the design has an inherent negative reactivity during accidents; this is, contrary to the soviet design, if anything abnormal happens, the reactor shuts itself down.

Finally, it is worth talking about the nuclear waste, as this is normally a relevant aspect for the general population. The production energy of any kind (not only nuclear), will generate by-products—just like most industrial activities—producing waste that can potentially be hazardous to humans. Regarding nuclear waste, the following should be noted: Thanks to its high energy density, spent fuel and the most dangerous nuclear waste occupy very little volume compared to other sources. All the nuclear waste generated to date in Spain would fit inside a football field. As an example, the low- and intermediate-level waste from all of Spain's nuclear power plants is stored at the El Cabril facility, along with radioactive waste from hospitals and other nuclear technology applications. In total, this facility occupies an area of about 0.3 square kilometres. The waste is controlled at all times, and only when it poses no hazard is finally disposed of. For the spent fuel, the disposal will occur in the so-called "Deep Geological Repositories" which are built in high seismically stable zones where the nuclear waste will be disposed of, sine die.

As another visual example, the nuclear waste associated with all the energy consumed by a single person over their entire lifetime would fit inside a regular soda can. This waste is monitored throughout its entire life cycle, until the associated radioactivity is lower than that of natural uranium ore and poses no health risk to anyone. This contrasts with other types of waste, such as CO_2 from other power plants, which is released into the atmosphere and immediately becomes delocalized.

7. Core regulatory barriers to SMRs

A legacy framework misaligned with SMR innovation

Currently, EU legislation on nuclear power is based on a regulatory framework that was originally designed for large reactors. This framework poses significant challenges for the licensing and deployment of SMRs, as it often fails to address the passive safety systems, the integral designs, and modularity that define SMRs. This kind of prescriptive, one-size-fits-all regulation both increases compliance complexity and delays approval processes and drives up costs. On the contrary, a more suitable regulatory framework needs to be more flexible, featuring performance-based, risk-informed, and technology-neutral rules, a goal-oriented regulation. Such a flexible framework fits better the SMRs design and is able to allow regulators to evaluate safety and performance outcomes rather than enforcing rigid technical specifications unsuited to innovative technologies.

Moreover, practical concerns require sound regulatory responses. Such concerns should deal with the emergency planning zone (EPZ) sizing, staffing requirements, and cybersecurity risks; failing to modernise regulatory frameworks could hinder innovation, undermine economic sustainability, and create long-term barriers to SMR commercialisation, particularly in countries adhering strictly to legacy licensing models.

Fragmented frameworks: the lack of harmonisation as an obstacle to SMR deployment

Furthermore, the regulatory frameworks across nuclearized countries will influence the deployment of SMRs. Reactor vendors must often adapt their designs significantly, from country to country, at considerable cost and delay, to align with diverse national legislation[22]. According to the OECD's Nuclear Energy Agency (NEA), these regulatory adaptation costs can add up to 30% of a plant's engineering and construction costs[23,24]. In addition, existing licensing models do not reflect the manufacturing shift SMRs introduce. Unlike traditional nuclear plants on-site built, SMRs rely on factory-fabricated modules, which require an in-factory process of certification. Without the right kind of regulatory provisions for certifying these integral components during manufacture, efficiency gains and cost reductions associated with modularity can be severely undermined.

Other substantial regulatory barriers include the high fees charged by regulators, which disproportionately impact smaller-output SMRs. For instance, applying flat fees results in SMRs bearing much higher per-kilowatt licensing costs than large reactors. The U.S. Nuclear Regulatory Commission has

22 Rohunsingh, S., Sainati, T., Hanson, B., & Kay, R. (2023). Licensing small modular reactors: A state-of-the-art review of the challenges and barriers. *Progress in Nuclear Energy*, 164, 104859. https://doi.org/10.1016/j.pnucene.2023.104859.
23 OECD (2020), *Unlocking Reductions in the Construction Costs of Nuclear*. https://www.oecd.org/content/dam/oecd/en/publications/reports/2020/08/unlocking-reductions-in-the-construction-costs-of-nuclear_2ca6777b/33ba86e1-en.pdf.
24 World Economic Forum. (2023). *Framework to accelerate the deployment of advanced nuclear and small modular reactors*. Geneva: World Economic Forum. https://www3.weforum.org/docs/WEF_Framework_for_Advanced_Nuclear_and_SMRs_2023.pdf.

acknowledged and begun to address this inequity, but most jurisdictions still maintain outdated fee structures.

As mentioned above, there are also capability gaps among regulators. Many have only licensed light-water reactors and lack the expertise or frameworks to assess non-LWR or first-of-a-kind (FOAK) SMRs, resulting in slow learning curves and increased administrative risk. This challenge is compounded by long licensing durations, often exacerbated by protracted public hearings, fragmented stakeholder coordination, and confidentiality limitations in early design stages.

To overcome these hurdles, regulatory authorities should pursue the adoption of goal-setting (performance-based) approaches, update their internal capacities, create provisions for in-factory certification, and collaborate internationally to harmonise licensing criteria. The regulatory bodies of each member country must remain independent, but agreements or cooperation that resembles a harmonized regulatory framework will strongly benefit the SMR market. Examples of this cooperation are not seldom, with the aviation cybersecurity industry or as proof of concept. Without these changes, the cost competitiveness and deployment speed of SMRs will be constrained[25]. It has been documented that SMRs could account for 4.5% of the energy market by 2050 (base case scenario), highlighting the current opportunity for harmonized efforts between policymakers, the regulatory bodies, and the industry stakeholders[26]. Technological maturity suggests current designs are viable, with future R&D focusing on market appeal and safety.

At the same time, the landscape of Small Modular Reactor technology around the world is characterised by rapid advancements and diverse regulatory approaches, particularly when comparing the European Union to North America and Asia. In the EU, a strong boost in adoption of SMRs could lie in this cooperation and harmonization on the standardisation of certification processes and the mobility of SMR units. The progress observed in the United States serves as a guideline, where the Nuclear Regulatory Commission has granted safety certification to one SMR design and is actively evaluating several others, signifying a more streamlined and decisive regulatory pathway[27].

25 Rohunsingh et al., *Licensing SMRs – Challenges and Barriers*.
26 Josephs et al. (2025), *Regulation of SMRs*.
27 Eurelectric. (2020). *Unlocking the potential of small modular reactors in the EU*. Position Paper, November. https://www.eurelectric.org/wp-content/uploads/2024/06/unlocking_the_potential_of_small_modular_reactors_in_the_eu-2020-030-0674-01-e.pdf.

The International Atomic Energy Agency (IAEA) already develops safety standards, requirements and guidelines that are used on the national level by each regulatory body.

A common guideline framework could facilitate the emergence of a unified SMR market and operate as a catalyst to strengthen the EU's position as a global industrial leader. The EU, with its deep R&D capacity extended to nuclear, is well-positioned to lead in SMR development, creating high-value jobs, intellectual property, and export opportunities. According to Eurelectric[28], pre-feasibility assessments have already identified strong global demand, which could potentially reach hundreds of SMRs worldwide by 2040. This vision could offer a strategic opportunity for Europe's industrial strategy and regional economies to benefit from a competitive advantage, by early investment and leadership in this sector.

Financing the future, unlocking investment: financial barriers to SMR market entry

Despite growing political support, efforts to change the narrative and industrial interest, SMRs face a significant structural disadvantage in attracting capital investment. The absence of tailored financing tools, rigid insurance frameworks, and public-private risk-sharing mechanisms impedes SMR deployment, as the current EU financial ecosystem lacks tailored instruments; such instruments need to be designed in a way that reflects the unique features and risks of SMRs. Long lead times, FOAK technology risk, and regulatory uncertainty are some of the key obstacles to financial development in the sector, yet not the only ones[29]. Traditional nuclear finance models, such as state guarantees or utility-owned megaprojects, are ill-suited to the modular, distributed nature of SMRs deployment. These policies tend to hinder innovation and economic efficiency, leading to a disruptive environment for the sector to grow. On top of that, the lack of a dedicated insurance and liability framework for modular nuclear systems adds additional risk layers for investors. Insurance providers

28 Eurelectric, *Unlocking SMR Potential in the EU*.
29 World Economic Forum. (2023). *Framework to accelerate the deployment of advanced nuclear and small modular reactors*.

often rely on historical data to price risk, making SMRs, with their novel designs and operational profiles, difficult to underwrite. This reinforces a vicious cycle: absent insurance clarity leads to increased capital costs, which in turn leads to project bankability declines, and finally, to investors' withdrawal.

Moreover, the current EU taxonomy framework, despite the "transitional" nuclear fission acknowledgment, still suffers from political contestation and a lack of long-term clarity. State aid eligibility and access to green finance are grey areas with a lot of political pressure. This regulatory ambiguity deters private investment by increasing policy risk, especially in countries with volatile political attitudes toward nuclear power. A policy design that addresses these challenges should aim to develop an EU-oriented and SMR-compatible financing mechanism. This mechanism would allow risk-sharing vehicles such as public-private equity funds and advanced market commitments or carbon contracts-for-difference (CfDs). Also, it should reform the insurance regulations to accommodate modularity and passive safety features, as well as technology-neutral capacity market rules. Without such institutional innovation, SMR developers will remain locked out of capital markets or dependent on state aid, undermining the potential for a competitive nuclear ecosystem.

"Traditional nuclear finance models, such as state guarantees or utility-owned megaprojects, are ill-suited to the modular, distributed nature of SMRs deployment."

8. The case for regulatory neutrality and competition

While the EU sharpens its climate targets and considers new frameworks for post-2030 decarbonisation, its design of the energy policy must uphold regulatory neutrality, that is, avoiding preferential treatment for specific technologies while enabling all credible low-carbon options to compete on equal footing. Regulatory neutrality equals that policy frameworks do not favour specific technologies, but instead enable competition based on measurable performance criteria, such as emissions, reliability, system resilience, affordability, and cost within a common market framework. However, it should be perceived that regulatory neutrality is not a passive stance; on the contrary, it is an active condition for a competitive energy market. Policy makers decide based on outcomes, rather than predetermining which technologies should deliver them. Both in the USA and UK, this logic of merit-based decision-making underpins the energy strategies developed. The US Department of Energy's SMR funding model allocates support based solely on technical merit, without mandating specific technologies in law or regulation[30]. Similarly, the British model of openness, such as Rolls-Royce's SMR initiative, stems from its alignment with the government's objectives for reliable, dispatchable, low-carbon energy, rather than from a fixed nuclear mandate driven by perceptions or misleading preferences[31].

By contrast, EU frameworks continue to reflect an implicit hierarchy of technologies, favouring intermittent renewables over dispatchable low-carbon sources like large-scale nuclear or SMRs. This is evident in how subsidy schemes, taxonomy classifications, and project permitting are structured. Such policies risk undermining cost-effectiveness, especially as Europe's energy needs grow more complex. Grid stability, industrial heat decarbonisation, and rural electrification all require firm low-carbon capacity—roles for which SMRs may be ideally suited.

Failing to ensure a level playing field has consequences. It limits investment signals, discourages technological experimentation, and entrenches incumbent subsidies. The experience with Hinkley Point C suggests that there are economic drawbacks in one-off megaproject deals, which are backed by

30 U.S. Department of Energy, *$900 Million SMR Deployment*.
31 *The Economist*, 'Smaller Reactors'.

long-term fixed-price guarantees. While large reactors continue to face high capital costs and long construction timelines, SMRs promise to lower entry barriers, unlocking more agile market participation, especially if supported by risk-sharing mechanisms that do not rely on government monopolies.

Indeed, SMRs could thrive in competitive procurement environments, where technology-neutral auctions or contracts for difference are structured around emissions intensity, reliability, and cost[32]. Such mechanisms would allow emerging nuclear solutions to compete directly with other firm sources, such as hydrogen-ready gas turbines or battery storage, without requiring preferential carve-outs. Regulatory neutrality, in this sense, is not merely an ideological preference but a pragmatic strategy for delivering decarbonisation at scale.

The principle of competition is also critical in resisting protectionist industrial policy trends. Europe's clean energy discourse increasingly leans toward strategic autonomy, which, while politically resonant, can lead to technology nationalism and bureaucratic overreach. Innovation flourishes where markets are open, regulatory risk is minimised, and technologies are rewarded for performance, not provenance. Unlike ongoing subsidies, such incentives aim to address coordination failures and early-stage investment risks, allowing technologies to compete once deployed, rather than permanently shielding them from market forces.

SMRs should be integrated into a broader framework of regulatory pluralism, where their value can be assessed on technical, environmental, and economic grounds. Such an approach would also reinforce public trust by showing that climate action is not being dictated by political favourites but guided by transparent and consistent criteria.

32 For instance, technology-neutral auctions could assign value to reliability or peak-hour output, favouring firm low-carbon resources like SMRs without explicitly subsidising them.

9. Conclusions

The current situation surrounding nuclear energy is unprecedented and demands close attention, as it presents a new opportunity to move toward a more diversified energy mix capable of competing in a liberalized electricity market. Nuclear energy has historically faced low public acceptance, influenced both by factual concerns and misinformation. This sentiment is currently vanishing, as other aspects of energy such as energy sovereignty or reliability are seen as more critical as seen in section 2. What is more important, nuclear energy has historically been an industry with very large entrance barriers, both economic and regulatory, which created the perfect storm for a distorted competition between designs. Currently, and as seen in section 4 and 5 of this document, several new technologies of SMRs are currently on the table and given that these new designs are smaller and modular, the entrance barrier will drop enough to foster competition between the different companies and designs. SMRs present a unique opportunity for Member States to bypass capital-intensive, centralised energy systems in favour of modular, more manageable technologies which can also be used for other scopes (water desalination, heat production, hydrogen production … etc.). This is especially relevant for post-industrial regions, Eastern Member States, and remote areas where new capacity is urgently needed but public finances are constrained. The competitiveness argument, in light of the weaknesses identified in the famous Draghi Report, is equally strong. SMRs offer clean, reliable energy, a critical advantage as Europe seeks to decarbonise energy-intensive industries, electrify transport, and maintain grid stability alongside variable renewables. A liberal energy market, premised on fair rules and innovation-based entry, would allow SMRs to compete with hydrogen, CCS, and flexible gas solutions—based on system value, not political preference.

A vision for Europe that trusts innovation, enables competition, and creates regulatory environments where new ideas can flourish is the ideal environment, with respect to both the environmental and financial milestones of sustainability and inclusive growth[33]. This document has shown that SMRs exemplify this vision, being technologically advanced, scalable, and well-suited to a decen-

33 J. W. Goodel, C. Gurdgiev, A. Paltrinieri and S. Piserà (2024), *Do price caps assist monetary authorities to control inflation? Examining the impact of the natural gas price cap on TTF spikes, Energy Economics*, 131, 107359. https://doi.org/10.1016/j.eneco.2024.107359.

tralised, pluralistic energy system. Even though today, SMRs face unnecessary regulatory, financial, and ideological obstacles in the European Union. A clean and prosperous future needs this kind of innovative policy solutions, which are marginalised because of outdated licensing models, fragmented regulatory regimes, and policy frameworks that continue to favour familiar technologies over emerging solutions. The opportunity cost of inaction is growing industrial competitiveness, grid resilience, energy independence and climate targets all depend on access to clean, firm capacity.

If SMRs market flourish, then, it is likely that the energy supply of Europe will be vastly secured, the electricity grid will increase its reliability, the European Union will comply easier with the climate change goals of greenhouse emissions and it will maintain alive an industry (nuclear) on which Europe has been a leader on, and on which the know-how is slowly fading away.

A liberal reform agenda shall restore regulatory neutrality, ensuring that nuclear and SMRs are not excluded or disadvantaged in climate finance, permitting, or subsidy schemes. Merit-based assessments must be coupled with clear and fair competition rules, enabling SMRs to prove their value in open procurement processes, capacity markets, and performance-based contracts.

"If SMRs market flourish, then, it is likely that the energy supply of Europe will be vastly secured".

To make this vision operational, the EU policy response should include:

1. An optional, EU-wide SMR Regulatory Sandbox, which will build on early pilot successes,[34] to let Member States choose to trial first-of-a-kind designs under harmonised, performance-based licensing requirements.

2. Technology-Neutral Incentives: Clean energy subsidies and contracts for difference should reward emissions reduction, reliability, and cost, not specific technologies.

3. Public–Private Innovation Finance: EU investment schemes (e.g., InvestEU, Innovation Fund) should support SMR demonstration through co-financing and de-risking instruments, not perpetual state ownership.

4. A systematic review, and where unjustified repeal, of tech-specific exclusions in green planning and climate finance, so that nuclear power, and in particular SMRs, is assessed based solely on its economic and environmental outcomes.

More than a blueprint for SMRs, these reforms signal a broader ambition: to align European energy innovation with the values of freedom, openness, and resilience, the cornerstones upon which the European Union was originally built. In a world of escalating geopolitical risk and climate urgency, a bold liberal free market approach can lead the EU to technological thrive, respecting the rule of law tradition and people's prosperity. Europe's energy future should not be shaped by inertia, bureaucratic or worse: ideological blindness central planning. What is needed is policy imagination—a framework that allows new technologies like SMRs to earn their place through performance, cost-effectiveness, and social value. Not every technology needs a subsidy. What every technology deserves is a chance to compete.

34 See for example the sandbox cases in both the UK and the US. The UK's multi-stage SMR competition "sandbox" phases in 2023 and 2024, through early design reviews, guided a shortlist of vendors while the U.S. Nuclear Regulatory Commission' s 2018–19 pilot projects (under Regulatory Guide 1.233) had tested risk-informed, performance-based licensing for advanced reactor concepts. For more see Department for Energy Security and Net Zero, Great British Nuclear, Coutinho, C., & Bowie, A. (2023, October 2). *Six companies through to next stage of nuclear technology competition*. GOV.UK; Nuclear Regulatory Commission. (2020, June 9). *Guidance for a technology-inclusive, risk-informed, and performance-based methodology to inform the licensing basis and content of applications for licenses, certifications, and approvals for non-light water reactors (Regulatory Guide 1.233). Federal Register*.

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About ELF

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