



STEFANO MONTI

President of the Italian Nuclear Association (AIN)

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Nearly four decades after abandoning nuclear power generation, Italy is preparing for a return to nuclear energy, with a focus on Small Modular Reactors (SMRs). The country aims to resume nuclear electricity production around 2035, with nuclear power potentially accounting for between 11% and 22% of electricity demand by 2050. In this interview, Stefano Monti, president of the Italian Nuclear Association (AIN), discusses legislative progress, industrial and technological challenges, and the need to strengthen energy security and competitiveness. He also calls on the European Union to place nuclear energy and renewables on an equal footing.

ITALY, FORTY YEARS LATER

Italy decided to phase out nuclear energy following the 1987 referendum. The last two operational power plants, Caorso and Trino Vercellese, were shut down in 1990.

Throughout all these years, AIN—an organization founded in 1958—has maintained its operations, focusing on research and industrial applications across various sectors.

You were appointed president in July 2023.

Who makes up the Association?

The Italian Nuclear Association (Associazione Italiana Nucleare, AIN) is a non-profit scientific and technical association with legal personality representing all the Italian entities (universities, industries and research centres) with expertise in the field of nuclear energy and related technologies. AIN represents the Italian nuclear system within the European Nuclear Society (ENS) and nucleareurope, the European Atomic Forum.

What are its main objectives?

Main objective of AIN is to provide a forum for discussion and a bridge between all those, whether organisations, institutions, companies or individuals, who are interested in developing peaceful applications of nuclear energy and nuclear technologies in line with the Euratom Treaty. In particular, the Association aims to develop and voice opinions on the nuclear sector, with a specific focus on issues related to building nuclear plants

and infrastructure in Italy and on nuclear fusion programmes. It also aims to contribute, at both European and global level, to initiatives involving the use of the various forms of nuclear energy and of radioactive substances for industrial, research and medical purposes. The Association also pays constant attention, nationally and internationally, to research and training. Furthermore, it seeks to maintain relations with national, international and supranational bodies in the nuclear sector, and with similar organisations in other countries, in order to make its positions known and to compare them with others, where they differ, in a spirit of constructive dialogue.

Nearly forty years later, Italy is reconsidering the nuclear option. When did the country begin evaluating a return to nuclear energy?

On 9 May 2023, the Italian Chamber of Deputies approved two motions. Together they gave the Meloni Government a political mandate to reconsider nuclear power as part of the national energy mix. It was the first such opening since the 1987 referendum that ended nuclear generation in Italy. The mandate was later the basis for the National Platform for Sustainable Nuclear (PNNS), set up by Minister of Environment and Energy Security (MASE) in September 2023 and gathering all the relevant Italian stakeholders (industries, utilities, off-takers, universities, research institutes, professionals in the different areas of nuclear energy, etc.). That body led to the Government's later legislative steps on new nuclear.

What are the most critical factors driving this reconsideration?

Among the EU's large economies, Italy is the most dependent on imported energy, and its electricity prices are among the highest in Europe. Roughly three quarters of the energy it consumes comes from abroad, much of it natural gas, which also sets the wholesale price of electricity in most hours. At the same time, Italy has committed to ambitious decarbonization targets, both for the power sector and for other end uses of energy such as heating, transport and industry. Meeting these goals is therefore not only a climate obligation but also an opportunity to reduce the country's exposure to volatile import prices and strengthen its energy security. Thanks largely to generous subsidies over the past two decades, Italy now has a significant share of renewables (hydro, solar, wind and biomass), but on their own they are not enough to meet its energy goals. Addressing the energy trilemma of security, affordability and sustainability therefore requires nuclear power as well. Nuclear should be seen not as a competitor to renewables but as a complement to them: its role is to replace gas, not renewables, which will continue to grow in the coming years.

What is Italy's current primary energy sources?

Italy's energy supply is still dominated by fossil fuels, with oil and natural gas making up roughly three-quarters of the total. The most recent full breakdown shows natural gas (35%), oil and petroleum products (38%), renewables (20%), coal and other solid fuels (3.4%), imported electricity (3%), and non-renewable waste (approx. 1%). As for electricity, in 2024, thermal power dominated generation with 51.3%, while renewables accounted for 34.9%, and large hydropower accounted for the remaining 13.8%.



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What are the country's energy needs, particularly considering the growing role of data centers as large consumers?

In Italy, as in the rest of the EU, electrification is expected to play a major role in the coming years. Electricity demand is forecast to almost double by 2050, from around 306 TWh/year today to some 580 TWh/year. Part of this growth will come from digital technologies, particularly data centres and cloud services, artificial intelligence and high-performance computing. This sector currently consumes around 7 TWh/year, a figure expected to exceed 15 TWh/year by 2030.

There is much discussion regarding the energy trilemma: balancing competitiveness, decarbonization, and security of supply. How is Italy approaching this challenge?

We need to distinguish between short, medium and long term strategy. For the short term we have nothing than emergency relief for prices; for the medium term we will have a big push on renewables, and for the long term a bet on nuclear. Gas sits underneath all of it, and that is the main weak point.

What steps have been taken to advance a potential re-launch of nuclear energy?

Parliament has approved an enabling law (Law no. 169 of 29 September 2026) that creates the framework for Italy to produce nuclear power again, focusing on new-generation technologies rather than restarting the old plants. The goal is nuclear electricity by around 2035, and a PNIEC scenario sees nuclear covering 11–22% of demand by 2050. The law will be implemented through legislative decrees covering the tangible and intangible infrastructure needed, including the regulatory regime and the establishment of a new safety authority. The government aims to issue the draft decrees by the end of this year. In parallel, Nuclitalia, a joint venture of Enel (51%), Ansaldo Energia (39%) and Leonardo (10%), is carrying out a detailed assessment of a few pre-selected advanced technologies, with an initial focus on water-cooled SMRs. It is also analysing related issues such as energy scenarios including nuclear, possible funding and financing schemes, the status of the supply chain, the regulatory framework, fuel and the fuel cycle, and waste management and decommissioning, etc.. We hope to be in a position to launch a real nuclear programme by 2027.

Has it been determined which reactors are most suitable? Large-scale reactors or Small Modular Reactors (SMR)?



The above-mentioned enabling law makes reference to advanced reactors, including SMR and AMR. For the long term the law also mentions nuclear fusion. Large, advanced reactors are not excluded but it is a matter of fact that currently the focus is on SMR-LWR and then AMR, in particular the Lead-cooled fast reactor.

Italy has an ambitious plan of deployment of SMRs with 2035 and for 2050 that we envy in Spain. SMRs will provide a lot of advantages in terms of generation and grid. However, SMR technologies are not proven yet. How is Italy tackling uncertainties related to design completeness and licensing of new SMRs? Which technologies are more realistic to be deployed in this scenario?

Indeed, the lack of operational and even licensing experience in Western countries is a major issue. The overall approach needs to be de-risked, for instance by excluding, in the first phase, technologies that still require considerable R&D and experimentation. This is why Nuclitalia is focusing on light-water SMRs for near-term deployment: one design is already under construction in a Western country, and others are close to licensing.

Italy already has nuclear sites that were licensed in the past. What is your strategy for siting? Will the existing sites be used or alternative ones are under evaluation?

The former nuclear sites are certainly of interest. However, since the focus is also on SMRs for cogeneration (electricity and heat), other potential sites should be considered, including those near industrial districts.

The Italian industry is globally renowned. However, nearly four decades have passed since the decision to phase out nuclear energy was approved. What challenges must the domestic industry overcome to successfully execute new nuclear projects?

Although Italy has not produced a single nuclear kWh since the late 1980s, it has the second-largest nuclear manufacturing

industry in the EU. This is thanks to the extensive and highly regarded involvement of Italian companies in nuclear projects abroad: of the six nuclear power plants connected to the grid in the EU over the last 20 years, three had an Italian company as architect-engineer. We also have a strong, well-respected academic community, concentrated in the CIRTEN university consortium, and successful nuclear R&D carried out by ENEA and INFN, among others. That said, we clearly need to strengthen and expand our nuclear supply chain. Some 70 Italian companies are already qualified and certified for nuclear work, and there is room to grow that number into the hundreds. The main challenges are coordination and workforce. We need not only nuclear engineers but engineers from every discipline, along with technicians, welders, project managers and more. This is a major challenge, and one we are also tackling together with our EU partners.

What strategy is in place to recover the Italian ability to operate the new nuclear fleet? Are domestic utilities and/or foreign partners involved?

It is too early to talk about nuclear operators for the future Italian fleet. However, the work being carried out by Nuclitalia and Ansaldo, together with several certification companies, is of paramount importance for strengthening the domestic supply chain. At national level, AIN is also cooperating with ANIMA Confindustria to involve Italian mechanical engineering companies in the nuclear supply chain. We also have foreign partners: over the last few years, AIN has signed agreements with GIFEN (France), RomAtom (Romania) and IGEOs (Poland), as well as a letter of intent with the CNA (Canada). Further cooperation with other foreign partners is currently under discussion.

THE SITUATION IN EUROPE

Optimism surrounding nuclear energy is a tangible reality across Europe. Nevertheless, numerous factors must be considered if a true return to nuclear power generation is to be achieved. How must Europe evolve to address this nuclear trilemma?

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At the Nuclear Energy Summit near Paris on 10 March 2026, Commission President Ursula von der Leyen stated: “We have home-grown low-carbon energy sources: nuclear and renewables. Together, they can become the joint guarantors of independence, security of supply, and competitiveness – if we get it right – now.” She added: “I believe that it was a strategic mistake for Europe to turn its back on a reliable, affordable source of low-emissions power.” We welcome this recognition. But the €200 million guarantee announced alongside the new SMR strategy is modest compared with the investment needed, and it leaves the underlying policy architecture unchanged. EU targets, funds and state-aid rules still treat nuclear as a second-class low-carbon technology. If nuclear and renewables are joint guarantors of the energy trilemma, they should be treated on an equal footing. We call on the Commission to move to technology-neutral, low-carbon targets; to open EU funding instruments and EIB lending to nuclear new build; and to give nuclear projects the same streamlined state-aid treatment that renewables already enjoy.

What role do costs play in this future outlook, especially when considering Europe's major global competitors?

As the Draghi report makes clear, EU competitiveness depends heavily on the cost of energy: European industry pays two to three times more for electricity than its US competitors, and four to five times more for natural gas. Tackling this gap is urgent, and it must be done in a technology-neutral way. Europe is at a decisive energy crossroads. To remain competitive, resilient and on track for climate neutrality, the EU must take tough decisions quickly. The challenge is fourfold: decarbonise, secure energy supply, make energy affordable, and protect



industrial competitiveness. Technology neutrality means giving every low-carbon option a fair place in that effort, nuclear included. Nuclear is one of the few strategic net-zero value chains in which Europe has industrial leadership across the entire life-cycle, from fuel enrichment and reactor construction to operation, decommissioning and waste management.

A LOOK INTO THE FUTURE

You have an extensive track record in the sector, offering a highly valuable international perspective. What is your vision regarding the medium-term role of nuclear energy in Italy and Europe? Will large reactors become a reality in Italy to cope with the growing demand in the second half of the century?

Large reactors are not in current plans: the government has explicitly said it is not pursuing big traditional plants. They could, however, return in a second phase if demand surges and siting dozens of SMRs proves harder than using a few large coastal sites, though the cost overruns seen in recent Western builds and possible public opposition remain significant obstacles. For now, the focus is on SMRs, which have yet to prove they can be delivered on time and on budget. Their track record will largely determine how Italy's nuclear strategy evolves.

Do you encourage young professionals to join this industry?

Absolutely. Bringing young professionals into the sector is one of AIN's core objectives. Nuclear offers the chance to work on cutting-edge technology while contributing directly to decarbonisation and energy security. But the competition for talent is fierce, and young people will only commit to a field that offers a stable future. That requires two things: clear recognition at EU level that nuclear is part of the solution, and an industry able to offer rewarding, long-term careers.

PERSONAL INSIGHTS

- **The book you are currently reading:** *“Cento anni in compagnia dell'atomo: breve storia del nucleare”*. Lorenzo Pinna.
- **An unforgettable piece of music.** *Stairways to heaven*. Is a song by the English rock band Led Zeppelin.
- **The place you always return to.** Paris.