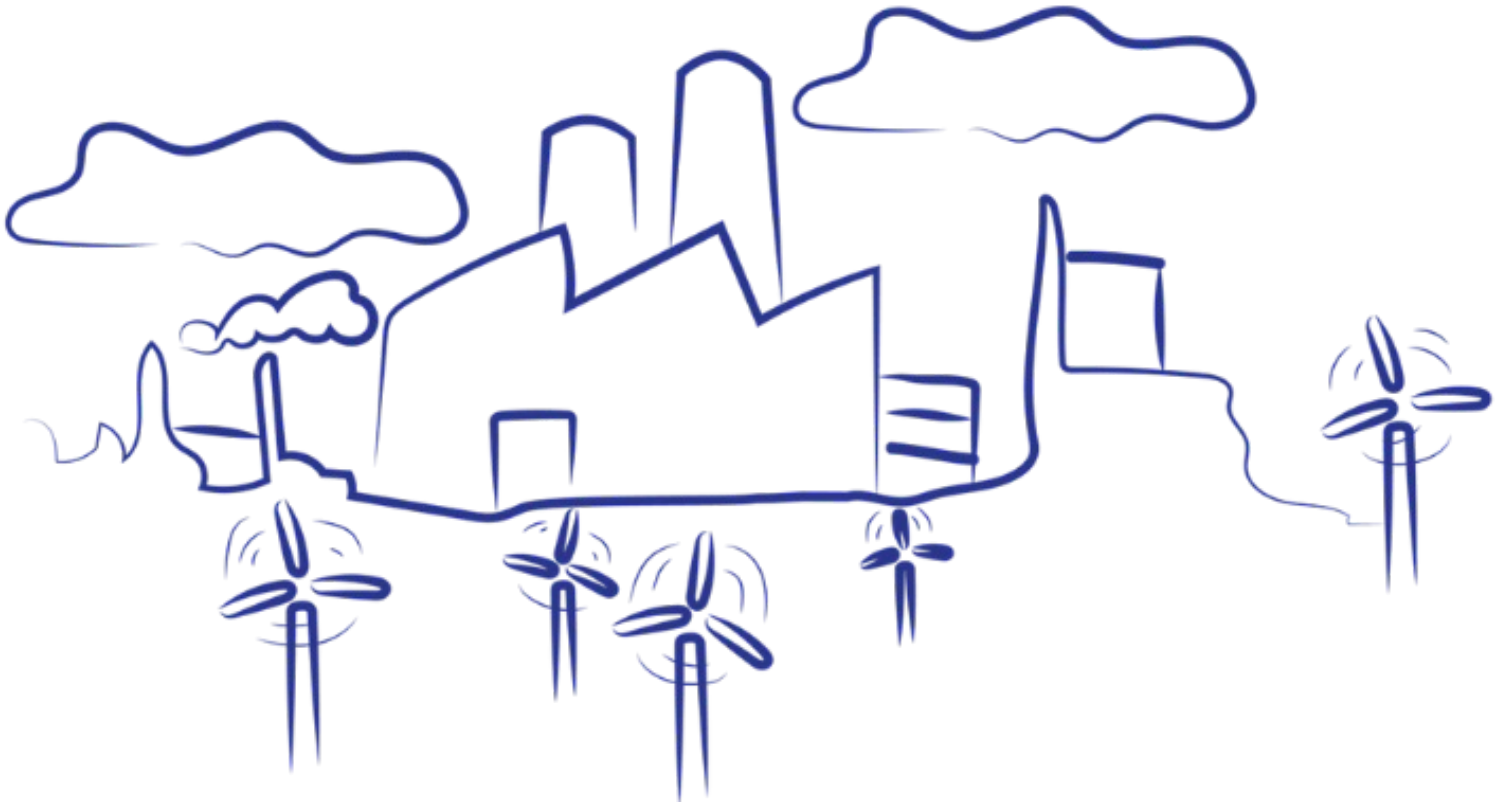
July, 2026

NEWSLETTER // **Environmental law**

Health & Safety
Environment
Food
Compliance
Criminal Law



The New Italian Law on Nuclear Energy

In search of a national legal framework

Table of contents

1. Introduction: rebuilding regulatory capacity

When discussing nuclear power in Italy today, the question is not whether the country will build new plants, but whether it is still capable of **governing a complex technology** such as nuclear power. The answer is not a foregone conclusion. The new Italian law on nuclear energy (A.C. 2669), submitted to the Chamber of Deputies on 17 October 2025, approved in its final reading by the Council of Ministers on 2 October 2025, and approved on first reading by the Chamber of Deputies on 4 June 2026, represents above all a project **to rebuild the regulatory capacity of the State**: before the reactors come the institutions; before the investments come the rules; before the market comes the regulator.

The new Italian law on nuclear energy consists of four articles. ***Article 1*** grants the Government a twelve-month delegation to adopt one or more legislative decrees, with the possibility of supplementary and corrective decrees within the following twenty-four months (***Art. 1, para. 3***). ***Article 2*** defines the scope of the delegation in sixteen points covering the entire nuclear life cycle. ***Article 3***, paragraph 1, sets out twenty-eight binding guiding principles and criteria for the delegated legislator. ***Article 4*** contains the financial provisions.

This paper examines the structure and critical issues of the new Italian law on nuclear energy, proposes the United States' Nuclear Regulatory Commission (NRC) model as a benchmark for comparison, and outlines some directions for building a modern nuclear regulatory architecture capable of attracting private investment while ensuring the highest international safety standards.

2. The European context and the regulatory framework

The European regulatory framework today offers nuclear power an unprecedented degree of legitimacy. Delegated Regulation (EU) 2022/1214 included nuclear energy in the **taxonomy of environmentally sustainable activities**, classifying it as a low-carbon source capable of contributing to the Union's climate objectives. This recognition is explicitly invoked by ***Art. 3, para. 1, letter b*** of the new Italian law on nuclear energy, which requires the delegated decrees to comply with "the criteria set out in the EU rules on sustainable activities taxonomy."

On the institutional front, the European Commission launched the **European Industrial Alliance on SMRs** in February 2024, aiming to accelerate the deployment of the first small modular reactors in Europe by the early 2030s. The Nuclear Illustrative Programme (PINC), presented by the Commission in June 2025, estimates that installed nuclear capacity in the EU will rise from 98 GWe in 2025 to around 109 GWe by 2050.

The Euratom framework — notably Directives 2009/71/Euratom (nuclear safety) and 2011/70/Euratom (management of radioactive waste), expressly referenced by ***Art. 3, para. 1, letter b*** of the new Italian law on nuclear energy — imposes precise obligations on Member States regarding the **independence of the regulatory authority,** safety culture and transparency. ***Art. 3, para. 1, letter s*** explicitly invokes the six principles of Art. 4(3) of Directive 2011/70/Euratom on waste management — minimisation, interdependence of stages, long-term passive safety, a graded approach, costs borne by producers, and documented decision-making — as binding guiding criteria for the delegated decrees.

3. The loss of regulatory capacity: a structural problem

Italy is today one of the few industrialised countries to have abandoned nuclear power through referendums on two occasions (1987 and 2011), progressively losing not only its plants but also the **administrative, licensing and inspection expertise** needed to govern this technology. The result is an institutional vacuum that the new Italian law on nuclear energy seeks to fill.

The Constitutional Court, in judgment no. 199/2012, clarified that rules repealed by referendum cannot simply be reinstated without a substantial change in the regulatory framework or in the underlying factual circumstances. This requires the delegated legislator to build Italy's nuclear framework from scratch rather than restore it. The new Italian law on nuclear energy is aware of this: its explanatory report explicitly describes new nuclear technologies as "a complete break with previous nuclear experience," characterising Italy's old plants as belonging "to a now-superseded technological past."

Consistently, ***Art. 2, para. 1, letter e*** establishes that the delegated decrees will govern the **decommissioning and dismantling** of existing nuclear installations, with the possibility of repurposing the relevant sites for the purposes set out in letters f), g) and h) of the same article (respectively: energy production, fuel fabrication, and waste storage and disposal). The break with the past is therefore not only technological, but also legal and institutional.

ISIN (the National Inspectorate for Nuclear Safety and Radiation Protection), established under Legislative Decree no. 45/2014 implementing the Euratom directives, currently carries out monitoring and control functions over decommissioning plants, but lacks the licensing expertise needed to process applications for new plants. ***Art. 2, para. 1, letter o*** of the new Italian law on nuclear energy opens the door to establishing an independent administrative authority "including through the reorganisation or abolition of the bodies and entities currently competent in this area" — a formula that explicitly includes a possible reorganisation of ISIN itself.

4. The structure of the new Italian law on nuclear energy: scope, criteria and procedure

Art. 2 of the new Italian law on nuclear energy defines in sixteen points (letters a-r) the matters that the legislative decrees will have to regulate. Three aspects deserve particular attention for their regulatory implications.

The national programme (***Art. 2, letters a-b***): the decrees must establish a national programme for the development of sustainable nuclear energy, contributing to the carbon-neutrality strategy, energy security and the containment of costs for end customers. The programme involves the university system and public research bodies (***Art. 3, para. 1, letter a***) and serves as a "non-binding framework" to guide private-sector proposals — a deliberate choice that preserves the centrality of private initiative without imposing top-down planning.

Integrated authorisation procedures (***Art. 2, letter f; Art. 3, letters e-l***): the new Italian law on nuclear energy provides for integrated authorisation procedures under the competence of MASE (the Ministry of Environment and Energy Security) for the testing, construction and operation of plants (***Art. 3, letter f***). The resulting authorisation title **replaces every other administrative measure**, with the exception of environmental assessment (***Art. 3, letter g***). Plants are declared to be of public utility, non-deferrable and urgent, with the possibility of imposing an expropriation-related constraint (***Art. 3, letter i***). Authorisation titles automatically amend existing local zoning and urban planning instruments (***Art. 3, letter h***).

Financial guarantees (***Art. 2, letter p; Art. 3, letter o***): the decrees must establish a system of guarantees, borne solely by authorised operators, covering the entire life cycle of the plants, "including through the establishment of one or more funds" intended to cover decommissioning, waste management and dismantling costs. This principle echoes the fourth "fundamental choice" set out in the explanatory report and draws on decommissioning-financing models already adopted in other jurisdictions.

The 28 guiding principles and criteria of Art. 3 — thematic structure

Sustainability and international standards (letters b, c, d): compliance with the EU taxonomy, IAEA standards, waste minimisation, best available technologies.

Authorisation procedures (letters e, f, g, h, i, l): siting, integrated MASE procedure, concentration of authorisation titles, automatic zoning amendment, public utility, recognition of foreign titles (NEA/OECD).

Testing and sites (letter m): criteria for authorising private entities to test advanced technologies; identification of suitable sites.

Protection of the territory and guarantees (letters n, o, p, q, r, s): landscape and artistic heritage; financial guarantees borne by operators; site protection; enhancement of local areas; consultation with municipalities; waste management and decommissioning.

Controls and sanctions (letters t, u, bb, cc): costs borne by operators; insurance instruments; independent authority; criteria for supporting operators.

Training and research (letters ee, gg, hh): technical and qualitative standards for personnel; university and postgraduate training; promotion of research and technology transfer.

Information and market (letters v, z, aa, ff): regional agreements; information campaigns; coordination with the electricity market.

5. The NRC model: separation, independence and the role of the private sector

A comparison with the United States offers valuable insights. **The Nuclear Regulatory Commission (NRC),** established in 1974 by the Energy Reorganization Act, was created precisely out of the recognition that the promotion of nuclear power and the oversight of its safety cannot coexist within the same institution. Before the NRC, the Atomic Energy Commission (AEC) performed both roles, giving rise to clear conflicts of interest. Separating these two mandates was the founding act of modern American nuclear regulation.

The NRC is an independent federal agency, governed by five commissioners appointed by the President and confirmed by the Senate, serving staggered five-year terms. It has a workforce of approximately **2,800 employees**, largely engineers, physicists and nuclear specialists. Its budget — roughly $900 million a year — is funded predominantly through **fees paid by operators**, with only a small share coming from federal appropriations. This self-financing model ensures adequate resources without burdening public finances and creates a virtuous link between the cost of regulation and operators' activity.

The three pillars of the NRC model

1. **INSTITUTIONAL SEPARATION**: a clear distinction between the promotion of nuclear power (DOE — Department of Energy) and safety regulation (NRC). No structural conflict of interest.
2. **THE CENTRAL ROLE OF PRIVATE OPERATORS**: in the US, nuclear plants are privately owned and operated. The NRC issues licences, inspects and sanctions, but does not run plants. Industrial risk rests exclusively with private operators.
3. **GRADUAL, TRANSPARENT LICENSING**: the authorisation process is public, documented, open to public comment, structured in distinct phases (design certification, construction, operation, renewal) and subject to periodic review.

For SMRs, the NRC has developed streamlined licensing pathways. The **Design Certification** of the NuScale VOYGR module was the first SMR to obtain federal certification (2022), paving the way for a scalable, standardised authorisation model known as "**licensing by reference**": the design is certified once and then applied to multiple sites, drastically reducing authorisation time and cost. The new Italian law on nuclear energy, by referring to "titles however designated, including certifications, already issued by the competent authorities" of NEA/OECD countries (***Art. 3, para. 1, letter l***), implicitly opens the door to a mutual-recognition mechanism that could draw on NRC certifications already obtained by international manufacturers.

6. Towards a National Nuclear Safety Authority

The new Italian law on nuclear energy opens the possibility of establishing an independent administrative authority (***Art. 2, para. 1, letter o***), but does not make it mandatory. The delegated legislator will be able to choose between strengthening the existing ISIN and creating a new institution. This is a welcome but insufficient opening: international experience and the obligations arising from Directive 2009/71/Euratom indicate **that the independence of the regulator is not an option but a systemic requirement**. An authority placed under the direction or influence of MASE — which simultaneously promotes the development of nuclear power — would be structurally compromised in its credibility.

Art. 3, para. 1, letter bb specifies that the independent authority, if established, will have to carry out "certification, oversight, supervision and control functions relating to compliance with technical safety rules according to the best European and international practices." The functional scope is therefore clear: the question is whether there is the political will to make it genuinely independent.

Minimum requirements for a modern Italian Nuclear Authority

1. **EFFECTIVE INDEPENDENCE**: a collegial body with commissioners appointed by Parliament, fixed non-renewable terms, and a revolving-door ban of at least three years after leaving office.

2. **SELF-FINANCING (NRC model)**: the cost of regulation borne by operators through fees and contributions — consistent with Art. 2, letter o, which already provides for financial autonomy.

3. **SPECIALIST EXPERTISE**: a workforce made up of nuclear engineers, physicists, medical specialists, legal experts and cybersecurity specialists — not public-administration generalists.

4. **TRANSPARENCY AND PARTICIPATION (*Art. 3, letters t, z, aa*)**: public proceedings, periodic hearings, systematic publication of inspection results, and public information campaigns.

7. SMRs: technology, regulation and opportunities for Italy

a) What SMRs are — definition and technical characteristics

Small Modular Reactors (SMRs) are a new generation of nuclear reactors typically characterised by a per-module output below **300 MWe** (compared with 1,000-1,650 MWe for large conventional reactors), designed to **be manufactured in series in industrial facilities** and subsequently transported and assembled at the installation site. This definition is adopted by the IAEA and is expressly referenced ***by Art. 3, para. 1, letter c*** of the new Italian law on nuclear energy, which provides for the identification of the types of plant that may be authorised, "including modular or advanced technologies, in accordance with the conventions or definitions adopted by the IAEA."

The term "modular" denotes a dual characteristic: components and systems are **standardised and interchangeable** (constructive modularity), and installed capacity can be **increased progressively** by adding modules (system modularity). This makes it possible to tailor output to grid or local needs without having to build a large-scale plant from the outset.

From a technological standpoint, SMRs fall into three broad categories, alongside which the new Italian law on nuclear energy places fusion reactors (***Art. 2, letter i***) as a long-term objective:

Category	Output per module	Coolant technology	Development status	Examples
SMR (Gen III+)	50–300 MWe	Pressurised water (PWR)	Advanced / commercial licensing	NuScale VOYGR, AP300 (Westinghouse), ARC-100
AMR (Gen IV)	10–300 MWe	Molten salt, sodium, lead, gas	Research / demonstration	BREST-300 (Russia), Natrium (TerraPower), ALFRED (Europa)
Microreactors	< 10 MWe	Gas / molten salt / solid coolants	Prototype / military	eVinci (Westinghouse), Holos-Quad
Fusion reactors (long term)	> 50 MWe (estimated)	D-T plasma / magnetic confinement	Research — ITER, DTT	ITER, Commonwealth Fusion, DTT-ENEA

SMR applications go beyond electricity generation. ***Art. 2, para. 1, letter f*** of the new Italian law on nuclear energy explicitly mentions "hydrogen production" among the purposes of new-generation plants. SMRs can indeed supply **high-temperature industrial heat**, district heating, low-emission hydrogen via electrolysis or thermochemistry, and support for desalination. This versatility makes them potentially central tools for decarbonising hard-to-abate sectors (heavy industry, chemicals, steel, cement).

b) The competitive advantages of SMRs over large plants

Italy's 2024 National Integrated Energy and Climate Plan (PNIEC) identifies two decisive factors for the economic competitiveness of SMRs compared with large conventional plants. The first is the **reduction in construction time and cost**: SMRs require smaller unit investments, also reducing interest expense during construction — historically one of the most significant cost items for large-scale nuclear power. The second is the **accelerated learning curve**: serial factory production makes it possible to quickly capture the benefits of standardisation, lowering costs across successive production runs.

From a safety perspective, advanced third-generation SMRs incorporate **passive safety systems** (natural-convection cooling, intrinsic containment systems, safety based on "thermal inertia") that reduce reliance on active interventions in the event of an accident. This allows for — and indeed calls for — less stringent siting requirements than for large plants, with significant implications for siting in a highly seismic country such as Italy, where around 95% of the territory is classified as at hydrogeological risk (a figure that emerged during the parliamentary fact-finding inquiry).

c) SMR-specific regulatory challenges

Standardised licensing: the serial nature of SMR production makes a site-by-site authorisation process inefficient. The model to adopt is **preventive design certification**, along the lines of the NRC, followed by a simplified approval for each site. The new Italian law on nuclear energy correctly provides for (***Art. 3, letter c***) the identification of plant types that may be authorised, and (***Art. 3, letter l***) the recognition of titles already issued by authorities of NEA/OECD countries. Combined, these two criteria could make it possible to import design certifications already obtained in other countries, drastically cutting start-up times.

Digitalisation and cybersecurity: new plants feature digital control systems and extensive connectivity. Future regulation will need to explicitly incorporate **nuclear cybersecurity** requirements, an area in which Italy currently lacks specific legislation. ***Art. 3, letter b*** of the new Italian law on nuclear energy requires compliance with the "technical parameters identified by the IAEA," which already include cybersecurity guidelines (NSS No. 33-T). The NRC has published binding rules on the subject (10 CFR Part 73.54) that could serve as an operational reference.

Modularisation and supply-chain oversight (vendor inspection): factory production of standardised components shifts part of the safety responsibility from the site to the manufacturer. The authorisation system will need to include **factory quality-control** mechanisms and component traceability throughout the supply chain — aspects not explicitly addressed by the new Italian law on nuclear energy, which will need to be introduced in the delegated decrees.

Advanced fuels (Art. 3, letter d): Accident Tolerant Fuels (ATF) and TRISO fuels — envisaged by ***Art. 3, letter d*** of the new Italian law on nuclear energy among the technologies to be promoted for waste minimisation purposes — offer significantly greater safety margins than conventional fuels: in the event of an accident, ATFs withstand much higher temperatures without releasing fission products; TRISO fuels, used mainly in high-temperature reactors, feature a triple-layer ceramic structure that provides an almost absolute containment barrier.

8. Industrial supply chain, skills and the role of the private sector

The success of Italy's new nuclear policy will depend decisively on the country's ability to rebuild a **competitive national industrial supply chain**. Italy retains significant assets: ENEA maintains internationally recognised research expertise in LFR systems and fusion (DTT in Frascati); Ansaldo Nucleare has taken part in international projects; SIET has experimental facilities for component qualification (including passive safety systems for NuScale and Westinghouse AP600); CIRTEN brings together the leading universities with nuclear engineering programmes. The new Italian law on nuclear energy devotes two specific guiding criteria to strengthening this ecosystem: letter gg) provides for the enhancement of university and postgraduate training; letter hh) for the promotion of research and technology transfer.

The 2024 PNIEC estimates that, under the conservative nuclear scenario, Italy could install up **to 8 GW of nuclear capacity by 2050** (around 11% of national electricity demand), with an estimated system saving **of €17 billion** compared with a no-nuclear scenario. The first plant could be operational around 2035 (***Art. 2, para. 1, letter f*** provides for the regulation of "testing" as a stand-alone phase preceding construction).

The American model shows that nuclear power can, and should, be **a privately led, publicly regulated sector**. In Italy, ***Art. 2, letter q*** provides for the possibility of "support for plant construction and energy production," but without defining its form. The delegated decrees will have to choose among alternative models: Contracts for Difference (CfDs) on the British model, loan guarantees, tax incentives, or minority public equity stakes. The guiding criterion under ***Art. 3, letter cc*** — which provides for determining the criteria for supporting operators "on the basis of the principle of favouring greater consistency with the national programme" — indicates that the choice of incentive model must be consistent with the objectives of the national programme, ruling out indiscriminate aid.

9. Radiation protection, safety and the waste cycle

Future regulation will need to cover the entire life cycle of plants, with particular attention to three aspects.

Radiation protection and new sensors: new-generation radiation-protection systems — based on distributed sensors, artificial intelligence and real-time monitoring — allow for continuous surveillance of plant perimeters and surrounding areas. The new Italian law on nuclear energy (***Art. 3, letter t***) provides that the cost of controls be borne by operators, but does not set minimum technological standards. The delegated decrees will need to fill this gap, in coordination with Legislative Decree no. 101/2020, which transposed Directive 2013/59/Euratom on basic radiation-safety standards.

Management of radioactive waste: ***Art. 2, para. 1, letter h*** of the new Italian law on nuclear energy governs the temporary storage and final disposal of radioactive waste. The new nuclear framework must be consistent with the process already under way for the National Repository for Radioactive Waste (DNRT), whose authorisation procedure — according to SOGIN estimates — is unlikely to conclude before 2029. ***Art. 3, letter s*** expressly invokes the principles of Art. 4(3) of Directive 2011/70/Euratom as binding criteria for the delegated decrees.

Advanced fuels and the fuel cycle (*Art. 3, letter d*): ***Art. 2, letter g*** of the new Italian law on nuclear energy provides for the regulation of "nuclear fuel fabrication and reprocessing" plants. Reprocessing — provided for by the new Italian law on nuclear energy but not by current legislation — paves the way for a potentially closed fuel cycle, in which residual plutonium and uranium are reused as fuel in Generation IV AMRs, drastically reducing the volume and radiotoxicity of high-level waste.

10. Conclusions: institutional quality as the key to success

The new Italian law on nuclear energy (A.C. 2669) does not mark the immediate return of nuclear power to Italy. If well implemented, it marks the return of **the State's capacity to regulate it**. The new Italian law on nuclear energy has the merit of covering the entire nuclear life cycle, of explicitly invoking IAEA standards and Euratom directives, of providing for financial guarantees borne by private operators, and of opening the door to an independent authority. Its limitation, however, is that it leaves many crucial choices to the delegated decrees, without imposing clear-cut solutions on the most sensitive issues.

There are three critical points the decrees will need to address clearly:

> **First**: establishing the independent authority cannot remain optional. Directive 2009/71/Euratom and international experience show that without an autonomous, credible and adequately funded regulator — along the lines of the NRC — no private investor will put capital into Italian nuclear power. Art. 2, letter o opens the door: the delegated decrees must have the courage to walk through it.

Second: the SMR licensing model must be defined before authorisation applications start arriving. The combination of (Art. 3, letter c) identification of authorisable plant types, (Art. 3, letter f) the integrated MASE procedure, and (Art. 3, letter l) recognition of foreign certifications already provides the necessary legal tools. What is missing is the will to translate them into a clear, predictable licensing framework.

Third: skills training — governed by Art. 3, letters ee and gg — is the priority of priorities. No rule can make up for a shortage of nuclear engineers, inspectors, physicists and specialised legal experts. The university and postgraduate training programme must begin now, regardless of the industrial outcomes of the new Italian law on nuclear energy.

The NRC model cannot be exported wholesale, but its fundamental principles — separation of promotion and regulation, genuine independence, self-financing, the role of private operators, transparent licensing — are universal. Italy has the opportunity to build a modern regulatory system that draws on existing expertise and embraces international best practice. Success will not depend on the technology, but on the quality of the institutions that govern it.

NOTES AND REGULATORY REFERENCES

[1] A.C. 2669 — Bill delegating powers to the Government on sustainable nuclear energy, submitted to the Chamber of Deputies on 17 October 2025, approved in its final reading by the Council of Ministers on 2 October 2025, and approved on first reading by the Chamber of Deputies on 4 June 2026.

[2] Parliamentary Dossier No. 623, Senate and Chamber Research Services — Delegation to the Government on sustainable nuclear energy (A.C. 2669), 16 January 2026.

[3] Commission Delegated Regulation (EU) 2022/1214 of 9 March 2022, supplementing Regulation (EU) 2020/852 with technical screening criteria for nuclear-energy-related activities.

[4] Council Directive 2009/71/Euratom of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations (as amended by Directive 2014/87/Euratom).

[5] Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste.

[6] Legislative Decree no. 101/2020 — Implementation of Directive 2013/59/Euratom on basic safety standards for protection against ionising radiation.

[7] Energy Reorganization Act of 1974, Pub. L. 93-438 — the law establishing the United States Nuclear Regulatory Commission (NRC).

[8] NRC, 10 CFR Part 73.54 — Protection of digital computer and communication systems and networks (nuclear cybersecurity).

[9] IAEA, Safety Standards Series NSS No. 33-T — Computer Security of Instrumentation and Control Systems at Nuclear Facilities (2018).

[10] Italy's National Integrated Energy and Climate Plan (PNIEC), June 2024 update, Ministry of the Environment and Energy Security — conservative nuclear scenario (8 GW by 2050).

[11] Constitutional Court, judgment no. 199/2012 — prohibition on reinstating rules repealed by referendum without a substantial change in the regulatory framework or the underlying factual circumstances.

[12] IAEA, Safety Standards Series — a technical body of standards comprising Safety Fundamentals, Safety Requirements (GSR, SSR) and Safety Guides (e.g., SSR-2/1 on the safety of nuclear power plant design).

Contacts

B-HSE Società tra Avvocati a r.l.

Address: Corso d'Italia, 29, 00198, Roma
website: www.b-hse.it
E-mail: info@b-hse.law

Pec: b-hselaw@pec.it
Cod.fisc. 15944151008
P.iva 15944151008
Crea 1625132

Società tra Avvocati

Health & Safety
Environment
Food
Compliance
Criminal Law