

National Strategy for the Development of the Nuclear Sector in Romania

2026–2030, with a 2050 Outlook

Ministry of Energy

Nuclear and Radioactive Waste Agency (ANDR)

2026

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List of Abbreviations

Abbreviation	Meaning
ALFRED	Advanced Lead Fast Reactor European Demonstrator
ANC	National Authority for Research
ANDR	Nuclear and Radioactive Waste Agency
CANDU	Canada Deuterium Uranium reactor
EC	European Commission
CNCAN	National Commission for the Control of Nuclear Activities
CPPNM	Convention on the Physical Protection of Nuclear Material
DFDSMA	Final Disposal Facility for Low- and Intermediate-Level Radioactive Waste
ELI-NP	Extreme Light Infrastructure – Nuclear Physics
EURATOM	European Atomic Energy Community
ICSANT	International Convention for the Suppression of Acts of Nuclear Terrorism
NEA	Nuclear Energy Agency
GHG	Greenhouse Gases
OECD	Organisation for Economic Co-operation and Development
NECP	National Energy and Climate Plan
NNP	National Nuclear Programme
NRRP	National Recovery and Resilience Plan
RATEN	Autonomous Regie for Nuclear Energy Technologies
SNDDN	National Strategy for the Development of the Nuclear Sector in Romania for 2021–2030, with a 2050 Outlook (<i>historical reference</i>)
SNN	National Company Nuclearelectrica S.A.
SMR	Small Modular Reactor
SNDDN	National Strategy for the Development of the Nuclear Sector in Romania for 2026–2030, with a 2050 Outlook
EU	European Union

Foreword

"Nothing in life is to be feared; it is only to be understood."

— **Marie Curie**

As the nuclear sector has evolved, the accumulation of knowledge and experience has highlighted not only its potential but also the responsibility associated with the decisions taken.

The effects of such decisions are long-lasting, often extending beyond the lifetime of a single generation and requiring a careful, coherent and well-founded approach.

In this context, the development of the nuclear sector cannot be the result of fragmented or circumstantial initiatives.

It requires continuity, rigour and the ability to integrate the experience gained into a clear vision for future development, adapted to current realities and to the requirements of safety and responsibility.

The National Strategy for the Development of the Nuclear Sector has been developed to provide the strategic framework necessary for this process.

The document aims to guide the medium- and long-term development of Romania's nuclear sector, ensuring the safe and peaceful use of nuclear applications while providing coherence and predictability in support of future decision-making.

CHAPTER 1

INTRODUCTION

The **National Strategy for the Development of the Nuclear Sector**, hereinafter referred to as the **SNDDN**, constitutes the principal strategic policy document underpinning the sustainable development of Romania's nuclear sector.

The SNDDN establishes the conditions for the sustainable strengthening of the overall organisational and legal framework governing the safe and secure implementation of exclusively peaceful nuclear applications, both in the energy and non-energy sectors, while ensuring the protection of occupationally exposed workers, the environment, the public and property.

The periodic update of the SNDDN is coordinated by the **Nuclear and Radioactive Waste Agency (ANDR)**, the national authority responsible for promoting, developing and monitoring nuclear activities. The Strategy is based on recent advances in scientific research, developments in nuclear techniques and technologies, and takes into account both international and national good practices and lessons learned.

The SNDDN sets out Romania's policy for the future of nuclear applications and defines the medium- and long-term priority directions against which decisions and priorities may be assessed in a coordinated manner, ensuring that the development of plans and actions in the nuclear sector is consistent with the principles of sustainable development. Nuclear activities shall be developed on the basis of adequate financial and human resources so as to avoid placing unnecessary burdens on future generations.

This SNDDN has been developed in accordance with Article 8 of Government Ordinance No. 7/2003 on the promotion, development and monitoring of nuclear activities, republished, as subsequently amended and supplemented, in conjunction with Article 3(1)(a) and Article 4(2)(a) of Annex No. 1 to Government Decision No. 1437/2009 approving the Regulation on the organisation, functioning and organisational structure of the Nuclear and Radioactive Waste Agency, as subsequently amended and supplemented. The Strategy has been prepared in consultation with the principal institutional stakeholders in the nuclear sector, including ministries, public institutions and authorities, relevant organisations, economic operators and professional associations.

The SNDDN represents a synthesis of the principal strategic policy documents governing Romania's nuclear sector, namely:

- *National Nuclear Safety and Security Strategy*, adopted on 23 July 2014;
- *National Strategy for the Safe Management of Spent Nuclear Fuel and Radioactive Waste*, approved by Government Decision No. 102 of 19 January 2022;
- *Romania's Energy Strategy 2025–2035, with a 2050 Outlook*, approved by Government Decision No. 1491 of 21 November 2024.

In preparing the SNDDN, consistency and alignment were also ensured with existing or developing national strategies and programmes, as well as with integrated national plans approved at national or European Union level, in accordance with Romania's responsibilities and insofar as they are relevant to the scope of this Strategy.

The SNDDN also takes into consideration relevant strategic documents, programmes and plans currently in force or undergoing revision at various stages of adoption at national and sectoral level, which define the current framework for sustainable, energy, climate, economic, research, security and regulatory development, together with the specific documents prepared by the organisations involved in implementing the National Nuclear Programme. These include:

- Integrated National Energy and Climate Plan (INECP) 2021–2030, approved by Government Decision No. 1076/2021.
- Integrated National Energy and Climate Plan (INECP), updated October 2024.
- National Investment and Economic Recovery Plan 2021–2027.
- Romania's National Roadmap for Research Infrastructures 2017, approved by the European Commission.
- National Strategy for Research, Innovation and Smart Specialisation 2022–2027, approved by Government Decision No. 933 of 20 July 2022.
- Romania's Long-Term Strategy for Reducing Greenhouse Gas Emissions – Climate Neutral Romania by 2050, approved by Government Decision No. 1215 of 29 November 2023.
- National Strategy on Climate Change Adaptation for the Period 2024–2030, with the Perspective of 2050, approved by Government Decision No. 1010 of 14 August 2024.
- National Strategy for Non-Energy Mineral Resources 2025–2035, approved by Government Decision No. 1464 of 21 November 2024.
- Romania's National Sustainable Development Strategy 2030, adopted by Government Decision No. 877 of 9 November 2018 and published in the Official Gazette No. 985 of 21 November 2018.
- National Strategy on Critical Infrastructure, approved by Government Decision No. 718 of 13 July 2011.
- Strategy for the Refurbishment Project of Cernavodă Nuclear Power Plant Unit 1, approved by the General Meeting of Shareholders Decision of 28 September 2017.
- Investment Strategy of Societatea Națională Nuclearelectrică S.A. for the Period 1 July 2020 – 1 July 2025, approved by the Resolution of the Ordinary General Meeting of Shareholders of 12 June 2020.
- Strategy for the Continuation of the Cernavodă Nuclear Power Plant Units 3 and 4 Project, approved by the General Meeting of Shareholders Decision of 5 April 2021.
- Strategy for the Diversification of Raw Material Supply Sources for Nuclear Fuel Production, approved by the General Meeting of Shareholders Decision of 25 April 2018.
- Memorandum of Understanding between Societatea Națională Nuclearelectrică S.A. (SNN) and NuScale Power concerning the exchange of technical and economic information on the innovative nuclear technology developed by NuScale, signed on 19 March 2019.

- Agreement between the Government of Romania and the Government of the United States of America on Cooperation Regarding the Cernavodă Nuclear Power Projects and the Civil Nuclear Energy Sector in Romania, signed on 21 September 2020 and ratified by Law No. 200 of 16 July 2021.
- Agreement signed at COP26 between Societatea Națională Nuclearelectrică S.A. (SNN) and NuScale Power to advance the deployment of NuScale's Small Modular Reactor (SMR) technology in Romania, signed on 4 November 2021.
- RATEN Development Strategy for the Period 2015–2025, Revision I, February 2021.
- Memorandum on the Construction in Romania of the ALFRED Lead-Cooled Demonstration Reactor, approved at the Government meetings of 9 February 2011 and 7 January 2014.
- Memorandum of Cooperation between Ansaldo Nucleare and ENEA (Italy) and the Nuclear Research Institute Pitești (RATEN ICN) for the implementation of the ALFRED project, signed in 2013 and renewed in 2021.
- National Nuclear or Radiological Emergency Response Plan, CNCAN, 2022. National Nuclear and Radiological Emergency Response Plan, CNCAN, 2022.

CHAPTER 2

RELEVANT GENERAL INFORMATION

Over the past decades, Romania has undergone profound changes in its economic and social landscape, increasingly shaped by a changing public perception of the relationship between citizens, the State and the essential public services it provides. In today's globalised environment, where fluctuations in international markets directly affect the domestic policies and actions of every country, the absence of predictability and rigorous planning may have adverse consequences for national economies and, ultimately, for the stability of the State itself. More than ever before, these developments highlight the pressing need for security across all sectors of activity, particularly in the energy sector, whose reliable operation constitutes one of the fundamental prerequisites for social stability and sustainable development.

The exclusively peaceful applications of nuclear energy are of particular importance to strategically significant sectors, including energy, education and scientific research, medicine, industry and agriculture. This is the primary reason why such applications must receive the attention they deserve and be integrated into a strategic vision assumed and promoted by the Romanian State.

For this reason, since the 1950s Romania has consistently demonstrated its commitment to promoting the peaceful uses of nuclear energy, allocating significant resources to scientific research in this field. This has led to the development of successive generations of specialists whose pioneering work has enabled the continuous advancement of the nuclear sector to its current level of maturity.

A particularly important factor contributing to this development has been Romania's close cooperation with the **International Atomic Energy Agency (IAEA)** in Vienna, complemented by its long-standing technical cooperation with other countries possessing advanced nuclear programmes.

At present, Romania's sectoral policies place particular emphasis on both the energy and non-energy applications of nuclear energy, recognising nuclear energy as one of the most reliable and environmentally sustainable sources of energy. The current global debate on energy is centred on identifying solutions capable of meeting the continuously growing demand for energy while simultaneously ensuring security of supply, safety, affordability and minimising environmental impacts.

Romania is among the fourteen Member States of the European Union that continue to include nuclear energy as a component of their national energy mix.

In accordance with **Romania's Energy Strategy 2025–2035, with a 2050 Outlook**, approved by Government Decision No. 1,491/2024, Romania intends to replace a significant share of electricity generation capacity based on high greenhouse gas emission sources with new, efficient and low-emission generation capacities, including natural gas, nuclear energy and renewable energy sources.

Nuclear energy represents a key element of **Romania's energy security** and of its efforts to reduce greenhouse gas (GHG) emissions from electricity generation. Accordingly, the refurbishment of existing nuclear units and the construction of new ones will contribute to replacing highly polluting generation capacities while enhancing the flexibility of the national power system.

Romania's current nuclear power sector is represented by the **Cernavodă Nuclear Power Plant (Cernavodă NPP)**, where two **CANDU-PHWR-6** nuclear power units are in operation (Unit 1 since 1996 and Unit 2 since 2007), each with an installed electrical capacity of approximately **705 MWe**. Both units operate with high standards of operational performance and economic efficiency while ensuring nuclear safety and the protection of the public, workers and the environment. Together, the two operating reactors at Cernavodă account for more than **18%** of Romania's total electricity production and approximately **33%** of the country's low-carbon electricity generation.

In line with the provisions of Romania's Energy Strategy, one of the key investment measures supporting Romania's energy security is the expansion of generation capacity at the Cernavodă Nuclear Power Plant through the completion and commissioning of two additional **CANDU 6** units, with the first of these reactors scheduled to enter commercial operation in 2030.

Romania's long-term energy development outlook also envisages the introduction of innovative nuclear technologies based on **Small Modular Reactors (SMRs)**, together with advanced **Generation IV nuclear reactor technologies**, as a means of increasing the share of low-greenhouse-gas-emission electricity generation.

Furthermore, in the context of the new international decarbonisation objectives reflected in the **National Recovery and Resilience Plan (NRRP)** and the **National Energy and Climate Plan (NECP)**, Romania has committed to decommissioning up to **4.59 GW** of coal-fired electricity generation capacity by 2032 and to reducing carbon dioxide emissions by **55% by 2030**, compared with 2005 levels. Within this framework, the deployment of **Small Modular Reactor (SMR)** technology represents a significant opportunity for expanding Romania's decarbonised

electricity generation. SMRs constitute a smaller, modular and scalable version of commercially proven Generation III reactor technology that has been successfully deployed worldwide for more than fifty years. Their deployment is expected to be followed, towards the end of this decade, by the introduction of **Generation IV nuclear reactors**. Nuclear safety and nuclear security pursue the common objective of protecting occupationally exposed workers, the public and the environment against exposure to ionising radiation or radioactive contamination exceeding the limits established by the applicable legislation. An integrated approach is justified by the close interrelationship between these two disciplines and by the need to ensure that nuclear safety and nuclear security measures are implemented in a coherent and coordinated manner.

Romania also promotes research activities focusing on the cross-cutting aspects of the safe and secure use of nuclear technologies and non-energy applications of ionising radiation in sectors such as medicine, industry, nuclear forensics, agriculture, climate change monitoring and mitigation, as well as the restoration and preservation of cultural heritage.

Support will continue to be provided for research dedicated to the peaceful energy and non-energy applications of nuclear technologies, including:

- research, development and innovation supporting the sustainable production and use of energy through nuclear technologies;
- medical, industrial and scientific applications of nuclear technologies;
- the production and use of radioisotopes.

CHAPTER 3

PRIORITIES, POLICIES AND THE EXISTING LEGAL FRAMEWORK

3.1 Priorities

A number of priorities have been established to support both nuclear power generation and non-energy nuclear activities.

Supporting nuclear electricity and heat generation through:

- supporting the continued operation of existing nuclear technologies and the construction of new nuclear reactors;
- supporting the deployment of **Small Modular Reactor (SMR)** technologies;
- supporting the development and deployment of advanced **Generation IV Lead-cooled Fast Reactor (LFR)** technologies;
- supporting the associated activities and programmes required to underpin these technologies;
- ensuring a stable legislative and regulatory framework;
- ensuring safe operation and establishing the framework for a complete nuclear fuel cycle, including activities related to the safe management of radioactive waste.

Supporting non-energy nuclear applications through:

- supporting nuclear applications in medicine and healthcare;

- promoting the implementation of nuclear techniques and technologies in the food, agricultural and industrial sectors;
- supporting the development of nuclear forensics within the global nuclear security architecture and in combating the illicit trafficking of nuclear and radioactive materials, thereby contributing to the prevention of nuclear terrorism;
- supporting studies on the radiological impact of nuclear activities on the environment, environmental radioactivity, radiation protection and dosimetry;
- ensuring the stable and sustainable development of scientific research, technological development, innovation and responsiveness to societal needs;
- continuously developing and modernising the education and training system to ensure that human resources meet the competence requirements established by nuclear regulations.

3.2 Nuclear Sector Policies

The development of a **nuclear power programme** requires sustained attention to numerous complex and interdependent issues over an extended period, while taking into account its interactions with other industrial sectors. The implementation of a nuclear programme represents a commitment extending over at least one hundred years. It requires the maintenance of a sustainable national infrastructure throughout the entire life cycle of nuclear facilities, including research and development, design, site selection, construction, operation, shutdown and decommissioning, as well as throughout the management of radioactive waste until the final disposal of radioactive waste and spent nuclear fuel and the environmental remediation of affected sites.

At the same time, this renewed emphasis on the nuclear sector is expected to strengthen the role of the non-energy applications of nuclear science and technology, which make an essential contribution and provide significant benefits to the development of a modern society.

➤ **Romania's Energy Security Policy**

A new national energy policy is required in the context of the evolving European energy landscape.

Ensuring energy security constitutes the primary objective of Romania's new energy policy, in line with the European objective of establishing an integrated energy market.

The green transition and the digitalisation of the energy sector will be achieved by promoting electricity generation from renewable energy sources, improving energy efficiency and supporting technologies that enhance energy security.

Energy security plays a fundamental role in strengthening Romania's national security interests, including the achievement of sustainable economic development through the prudent management of resources for the benefit of its citizens.

Accordingly, through its Government Programme, its commitments under the **National Energy and Climate Plan (NECP)** and the intergovernmental partnership between Romania

and the United States approved by Parliament, Romania promotes investments in the energy sector, particularly in clean energy technologies. These include the completion of **Cernavodă Units 3 and 4**, the refurbishment of the existing units at the **Cernavodă Nuclear Power Plant**, and the deployment of advanced nuclear technologies for electricity generation.

➤ **Policies for the Transition to Climate Neutrality**

Climate change policies represent a global challenge requiring a comprehensive approach based on concrete actions at the international, regional, national and local levels.

Policy and regulatory decisions must support the deployment of modern, low-emission technologies that take into account the specific characteristics of Romania's energy sector. Priority should be given to projects capable of making the greatest contribution to achieving national and European climate objectives.

Achieving the European Union's target of reducing greenhouse gas emissions by **55% by 2030**, compared with 1990 levels, requires a substantial expansion of nuclear electricity generation capacity. At regional level, energy independence must become a strategic objective. Within this context, strengthening Romania's energy independence represents one of the Government's primary priorities.

➤ **National Policy for Radioactive Waste Management**

Romania's national policy for radioactive waste management is fully aligned with international requirements established under the **Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management**, ratified by **Law No. 105/1999**, as well as with the radioactive waste management policy promoted by the **European Union** through the relevant Euratom Directives.

In accordance with the provisions of **Council Directive 2011/70/Euratom**, the Member States of the European Union have established national policies and programmes for the responsible and safe management of spent nuclear fuel and radioactive waste.

The **National Medium- and Long-Term Strategy for the Safe Management of Spent Nuclear Fuel and Radioactive Waste**, approved by **Government Decision No. 102/2022**, constitutes the strategic policy document governing radioactive waste management activities, including final disposal and the decommissioning of nuclear and radiological facilities.

The benefits arising from the ***application of non-energy nuclear techniques and technologies*** will contribute to increasing public acceptance of nuclear energy in Romania, while offering more cost-effective solutions than non-nuclear alternatives. They will also promote greater responsibility in the prudent use of fossil fuel energy resources and improve public understanding of the need to reduce greenhouse gas emissions (GHGs), toxic gases, particulate matter and acid rain associated with the combustion of fossil fuels.

For Romania, the further development of non-energy nuclear applications provides favourable conditions for revitalising research and the production of new materials, techniques and equipment in the following areas:

- **Medicine and healthcare:** production of radioisotopes and the development of radiation-based applications for medical use;
- **Food and agriculture:** improved food preservation, enhancement of genetic variability, improved fertiliser management, insect pest control, conservation and management of existing water resources, and identification of new water resources;
- **Industry:** nuclear materials and techniques providing solutions for industrial needs, including industrial and environmental tracers, instrumentation, industrial radiography, and pollutant detection and analysis;
- **Nuclear forensics:** characterisation of nuclear and radioactive materials for the purpose of combating illicit trafficking in radioactive materials;
- **Advanced particle accelerator technologies:** development of new particle acceleration technologies based on ultra-short pulse high-power lasers and identification of applications with significant potential in medicine, energy and industry;
- **Research, development and innovation:** application of radioisotopes for age determination and dating techniques, development of advanced detectors for major national and international research facilities, application of nuclear techniques in environmental and materials sciences, and research and development in the field of mineral resources.

3.3 Legal and Regulatory Framework

In Romania, nuclear activities are carried out under the provisions of Law No. 111/1996, as subsequently amended and supplemented, which governs the regulation, licensing and control of nuclear activities conducted exclusively for peaceful purposes, as well as other activities involving exposure to ionising radiation. The purpose of this legal framework is to ensure compliance with nuclear safety, radiation safety and radiation protection requirements for occupationally exposed workers, patients, the public, property and the environment, while maintaining risks at the lowest practicable level and fulfilling the obligations arising from the international conventions and agreements to which Romania is a Party.

The promotion, development and monitoring of nuclear activities conducted exclusively for peaceful purposes constitute national priorities within the framework of Romania's sustainable development policies. Nuclear activities are carried out in accordance with Government Ordinance No. 7/2003, republished, as subsequently amended and supplemented, as well as Government Ordinance No. 11/2003 on the Safe Management of Radioactive Waste and Spent Nuclear Fuel.

Romania is a Member State of the European Union and of the European Atomic Energy Community (Euratom), a Member State of the International Atomic Energy Agency (IAEA), and a member of the OECD Nuclear Energy Agency (OECD/NEA). Romania actively participates in the activities of these organisations and implements the relevant European Union nuclear acquis through its national legislation.

Romania has been a founding Member State of the International Atomic Energy Agency (IAEA) since 1957. In 2017, Romania also became a member of the OECD Nuclear Energy Agency (OECD/NEA), further recognising the country's sustained commitment to maintaining high standards in the nuclear field.

Under the auspices of the IAEA, Romania has adopted and implemented the international legal instruments to which it is a Party, including:

- the Vienna Convention on Civil Liability for Nuclear Damage;
- the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention;
- the Convention on the Physical Protection of Nuclear Material (CPPNM);
- the Convention on Nuclear Safety;
- the Convention on Early Notification of a Nuclear Accident;
- the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency;
- the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Since 2007, Romania has implemented an Integrated Safeguards System, enabling the real-time monitoring of nuclear material management. Since 1 May 2010, Romania has applied the Comprehensive Safeguards Agreement together with its Additional Protocol.

Accordingly, Romania has established and maintains a robust national legislative, regulatory and organisational framework for nuclear safety and nuclear security applicable to nuclear and radiological facilities. This framework is fully consistent with the relevant international conventions and treaties (including the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the Convention on the Physical Protection of Nuclear Material (CPPNM) and the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT)), the applicable Euratom Directives, the IAEA Safety Standards, and internationally recognised guidance on nuclear security.

3.4 Allocation of Responsibilities

In Romania, the National Strategy for the Development of the Nuclear Sector (SNDDN) and the associated National Nuclear Programme (NNP) constitute the principal public policy instruments through which the Government supports and monitors the medium- and long-term development of the national nuclear sector in pursuit of sustainable development. The Strategy is approved by Government Decision, in accordance with the applicable legislation.

The principal authorities and organisations involved at national level in implementing the SNDDN and carrying out nuclear activities are presented below.

Ministry of Energy

The **Ministry of Energy** is the central public authority responsible for Romania's energy policy. It is responsible for developing and implementing the Government's strategy in the fields of electricity and heat generation, transmission, distribution and supply, including energy

produced from renewable sources, hydrogen and other alternative or unconventional energy sources.

The Ministry of Energy also provides funding for RATEN's Annual Research and Development Programme, in accordance with Government Ordinance No. 54/2013, thereby supporting the development of the national technical support capability and international cooperation in the field of nuclear energy.

National Company Nuclearelectrica S.A. (SNN)

National Company Nuclearelectrica S.A. (SNN) is a Romanian joint-stock company established under Government Decision No. 365/1998. SNN is a majority state-owned company, with the Romanian State, represented by the Ministry of Energy, as its principal shareholder, alongside Romanian and foreign institutional and individual shareholders.

The company's principal field of activity is the generation, transmission and distribution of electricity, while its core business activity is electricity generation. In addition, SNN carries out complementary activities supporting its core business, as defined in its Articles of Association.

Electricity generation through nuclear technologies, which constitutes an activity of strategic national interest, is carried out through two branches without legal personality:

- Cernavodă Nuclear Power Plant Branch (Cernavodă NPP), responsible for the safe operation of Units 1 and 2 and playing a key role in implementing the Refurbishment Project for Cernavodă Unit 1;
- Nuclear Fuel Plant Branch (FCN Pitești), responsible for manufacturing nuclear fuel for the Cernavodă Nuclear Power Plant. FCN Pitești is licensed by Atomic Energy of Canada Limited (AECL) as a supplier of PHWR CANDU-6 nuclear fuel.

SNN is the sole shareholder of EnergoNuclear S.A., established in 2009 as the dedicated project company responsible for the completion of Cernavodă Units 3 and 4. The company implements the Strategy for the Completion of Cernavodă Units 3 and 4, approved by the General Meeting of Shareholders on 5 April 2021, on the basis of the updated Feasibility Study for the Completion of Units 3 and 4, finalised in December 2020.

Following approval by its shareholders, SNN also established Feldioara Uranium Concentrate Processing Plant S.R.L., a wholly owned subsidiary responsible for processing nuclear raw materials. The company plays a key role in implementing SNN's strategy for diversifying the supply sources of raw materials required for nuclear fuel production and supporting the company's future developments in this field.

Autonomous Regia for Nuclear Energy Technologies (RATEN)

The **Autonomous Regia for Nuclear Energy Technologies (RATEN)** is responsible for the development of technologies required to provide the national scientific and technical support for the nuclear power sector, ensuring the safe operation of nuclear installations. Its principal

fields of activity include the development of technologies for advanced Generation IV nuclear reactors, spent nuclear fuel management, radioactive waste management, the production of radioisotopes for medical and industrial applications, scientific research, engineering design, technological development, the education and training of nuclear specialists, the provision of technical support to the central public administration, public information activities, and participation in international cooperation programmes in the nuclear field.

National Authority for Research (ANC)

The **National Authority for Research (ANC)** is the specialised central public administration authority with legal personality operating under the authority of the Ministry of Education and Research. It is responsible for coordinating and implementing national research, development and innovation policies.

ANC performs a coordinating role in implementing the National Strategy for Research, Innovation and Smart Specialisation 2022–2027, approved by Government Decision No. 933/2022, as well as the Government Programme in the fields of scientific research, technological development and innovation.

In the field of research, development and innovation, the Authority:

- coordinates Government policies at national level within its areas of competence and supports, promotes, develops and monitors research and development activities;
- formulates and implements national research, development and innovation policies aimed at expanding the national and international research and innovation base, promoting sustainable economic development, facilitating the transfer of research results and advanced technologies into society and the economy, and ultimately improving citizens' quality of life.

For this purpose, ANC:

- provides funding for research and development activities carried out by the national research and development institutes operating under its coordination in the nuclear field, including:
 - *Horia Hulubei National Institute for Research and Development in Physics and Nuclear Engineering (IFIN-HH);*
 - *National Institute for Research and Development for Laser, Plasma and Radiation Physics (INFLPR);*
 - *National Research and Development Institute for Cryogenic and Isotopic Technologies (ICSI Râmnicu Vâlcea).*
- provides permanent funding for the operation, maintenance and utilisation of special installations and facilities of national interest supporting scientific, technical and logistical activities in the nuclear research sector.

National Commission for the Control of Nuclear Activities (CNCAN)

The National Commission for the Control of Nuclear Activities (CNCAN) is Romania's competent regulatory authority in the nuclear field, exercising responsibilities for regulation,

licensing and regulatory oversight. Through the regulations it issues and the measures adopted within licensing and inspection processes, CNCAN ensures the regulatory framework within which natural and legal persons may safely conduct nuclear activities.

Pursuant to Law No. 111/1996, CNCAN is empowered, inter alia, to:

- a) issue legally binding regulations and guidance documents detailing the requirements relating to nuclear safety, radiation safety, radiation protection, management systems, nuclear non-proliferation safeguards, physical protection, the transport of radioactive materials, radioactive waste management, spent nuclear fuel management, emergency preparedness and response, and the supply of products and services for nuclear and radiological facilities, as well as any other regulations necessary for licensing and regulatory oversight;
- b) develop the national regulatory strategy and policy concerning nuclear safety, radiation safety, radiation protection, nuclear non-proliferation, physical protection of nuclear materials and facilities, the transport of radioactive materials, the safety of radioactive waste and spent fuel management, and nuclear and radiological emergency preparedness and response, as an integral component of the SNDDN, for approval by Government Decision;
- c) periodically review and update its regulations to ensure alignment with European Union legislation, international standards, international conventions ratified by Romania, operating experience, technological developments and lessons learned from relevant research activities;
- d) initiate draft legislation within its field of competence and issue regulations independently or jointly with other competent authorities.

Nuclear and Radioactive Waste Agency (ANDR)

In accordance with Government Ordinance No. 7/2003, the **Nuclear and Radioactive Waste Agency (ANDR)** is responsible for ensuring the harmonisation of national nuclear policies and monitoring the implementation of the National Nuclear Programme (NNP), which encompasses the objectives and policies relating to the promotion, development and monitoring of nuclear activities.

The National Nuclear Programme is implemented through short-, medium- and long-term sectoral strategies comprising specific activities and responsibilities in the nuclear field.

Within this framework, ANDR:

- provides specialised technical assistance to the Government in the development and adoption of policies relating to the promotion, development and monitoring of the exclusively peaceful applications of nuclear energy, both energy and non-energy, the safe disposal of radioactive waste, the national coordination of radioactive waste management and the decommissioning of nuclear installations;
- develops the *National Strategy for the Development of the Nuclear Sector* and the *National Nuclear Programme*, in consultation with ministries, central and local public

authorities, economic operators, professional associations active in the nuclear field and representatives of civil society;

- monitors, at national level, the implementation of exclusively peaceful nuclear activities in accordance with the SNDDN and the National Nuclear Programme;
- serves as the National Liaison Office for Romania's Technical Cooperation Programme with the International Atomic Energy Agency (IAEA);
- acts as the national contact point for Romanian institutions engaged in nuclear activities in their relations with the European Union and other international organisations in the nuclear field;
- initiates legislative proposals and harmonises national legislation within its area of competence in accordance with European Union legislation and the international agreements to which Romania is a Party;
- reviews and endorses draft legislation relating to the nuclear sector;
- reviews and endorses investment documentation concerning the siting and construction of nuclear power reactors, research reactors, final disposal facilities for radioactive waste and spent nuclear fuel, as well as documentation related to the decommissioning of nuclear power and research reactors.

CHAPTER 4

VISION AND PRINCIPLES

4.1 Vision

Within the time horizon established by this National Strategy, Romania aims to become one of the leading regional and international actors in the nuclear sector, both by ensuring energy security through sustainable energy sources with minimal impact on the environment and the public, and by achieving excellence in the peaceful uses of nuclear energy across all fields of application, in accordance with the highest international standards of performance.

Through the development of its nuclear sector, Romania will strengthen the resilience of its national energy system, contributing to long-term stability and enhancing its capacity to respond effectively to climate, technological and geopolitical challenges.

In line with *Romania's Energy Strategy 2025–2035, with a 2050 Outlook*, Romania intends to replace a significant share of energy generation based on high greenhouse gas emission sources with new, efficient and low-emission generation capacities, including nuclear energy, natural gas and renewable energy sources.

4.2 Principles

The strategic objectives, courses of action and the specific activities set out in this National Strategy cannot be achieved without continuous adherence to the following fundamental principles:

- **The principle of sustainable development:** Activities in the nuclear sector shall be carried out with due regard to sustainable development, understood as meeting the needs of the present without harming the environment or compromising the ability of future generations to meet their own needs.
- **The principle that the benefits of nuclear applications shall outweigh their costs and risks:** The use of nuclear energy shall provide benefits that exceed the associated costs and risks.
- **The principle of legality and regulatory predictability:** Activities in the nuclear sector shall be conducted within a coherent, predictable legislative and organisational framework, fully aligned with the applicable international nuclear standards and regulations, ensuring that the national nuclear programme is implemented in a safe and controlled manner.
- **The principle of long-term commitment:** Activities in the nuclear sector shall be carried out within a predictable environment, based on long-term political and institutional commitments.
- **The principle of responsibility of all institutional stakeholders and nuclear operators:** Activities in the nuclear sector shall be conducted in accordance with the "**polluter pays**" principle, with all institutional stakeholders and operators assuming their respective responsibilities in compliance with the applicable legal framework.
- **The principle of non-proliferation:** Nuclear activities shall be carried out exclusively for peaceful purposes, taking into account the risks associated with the proliferation of nuclear weapons.
- **The principle of protecting occupationally exposed workers, the public, property and the environment:** Nuclear activities shall be conducted under the highest standards of safety to ensure that occupationally exposed workers, the public, property and the environment are protected in accordance with the applicable national legislation and international standards.
- **The principle of protecting present and future generations:** Present and future generations, as well as the environment, shall be protected against radiation risks, and radioactive waste shall be managed in such a manner as to avoid imposing undue burdens on future generations.
- **The principle of continuous improvement:** The education system, the continuous development of personnel competencies, and the support provided for nuclear research, development and innovation activities shall be continuously adapted to meet the needs of the national nuclear programme.
- **The principle of transparency in decision-making:** Decisions concerning the use of the peaceful applications of nuclear energy shall be taken in a transparent manner, thereby facilitating the active involvement of all interested parties.
- **The principle of using the best available techniques and technologies:** Nuclear activities shall make use of the best available techniques and technologies without imposing unjustified costs on future generations and while taking into account potential transboundary effects.

CHAPTER 5

SCOPE

This Strategy applies to the planning, implementation, monitoring and continuous improvement of activities in the nuclear power and non-power sectors, which are carried out exclusively for the peaceful and sustainable development of society and are developed within the time horizon covered by the Strategy, including:

- Activities related to the development of nuclear energy projects (such as research reactors, Small Modular Reactors (SMRs), and Generation IV reactors);
- Activities related to the refurbishment and/or construction of new CANDU nuclear reactors;
- Nuclear research, development and innovation (RDI) activities;
- Activities related to the safe management of radioactive waste and spent nuclear fuel arising from the operation of nuclear installations (for electricity generation and/or research reactors) and radiological facilities, including waste generated during their operation, refurbishment and decommissioning;
- Activities related to the shutdown and decommissioning of nuclear installations;
- Activities related to the preservation of the quality and quantity of heavy water over the medium and long term for CANDU nuclear reactors;
- Activities related to the management of radioactive waste originating from industries other than the nuclear industry;
- Activities supporting strategic objectives in other national strategic sectors that interface with the nuclear sector, including the mining sector for energy mineral resources (radioactive ores representing natural accumulations of uranium and thorium in the form of naturally occurring chemical compounds), hydrogen production, and other related fields;
- Industrial, medical and research applications involving the use of radioactive sources.

With regard to activities in the extractive sector, including uranium mining and the processing of nuclear raw materials, this National Strategy for the Development of the Nuclear Sector is aligned with the relevant sectoral strategic documents currently in force, namely the National Strategy for Non-Energy Mineral Resources 2025–2035, approved by Government Decision No. 1464/2024, and the Romania's Energy Strategy 2025–2035, with the Perspective of 2050, approved by Government Decision No. 1491 of 21 November 2024.

These documents establish the policy framework, measures and responsibilities applicable to mining activities, the restoration of areas affected by mining operations, and the management of waste resulting from mining activities. These matters are regulated separately and are therefore not addressed in detail within this Strategy.

CHAPTER 6

6.1 STRATEGIC OBJECTIVES

The National Strategy for the Development of the Nuclear Sector (NSDNS) establishes the fundamental strategic objectives that provide the framework for the entire medium-term (2030) and long-term (2050) planning and analysis process. Achieving these objectives requires the sustainable development of the nuclear sector, based on the use of nuclear power and non-power applications exclusively for peaceful purposes, while ensuring nuclear security, nuclear safety, and the protection of the population and the environment.

The strategic objectives shall be achieved simultaneously through a set of operational measures comprising priority actions, projects and investments implemented in phases over time, according to a short-, medium- and long-term implementation schedule (detailed in Annex 1 – National Nuclear Programme (NNP)), while ensuring the continuous improvement of nuclear and radiological safety and security, as well as the protection of occupationally exposed workers, the public and the environment against the harmful effects of ionising radiation.

The medium- and long-term strategic objectives for the development of nuclear power and non-power activities in Romania are:

- **SO 1** – Maintaining a high level of performance and increasing the number of CANDU nuclear power units.
- **SO 2** – Construction of new types of nuclear power plants through a phased approach, over time and across different technologies (Small Modular Reactors (SMRs) and innovative Generation IV reactors).
- **SO 3** – Development of an integrated nuclear fuel cycle ensuring the sustainability and efficiency of the nuclear power sector.
- **SO 4** – Safe management of spent nuclear fuel and radioactive waste, including the closure and institutional control of radioactive waste disposal facilities.
- **SO 5** – Strengthening scientific and technical support capabilities and enhancing the role of research and innovation in the nuclear sector.
- **SO 6** – Ensuring the availability of highly qualified human resources required for the successful achievement of the proposed objectives.
- **SO 7** – Maximising the benefits of non-power nuclear applications in medicine, industry, agriculture, the space industry, hydrogen production and other fields.

The development of the nuclear sector, as defined by the strategic objectives of the NSDNS, is consistent with the Romania's National Sustainable Development Strategy 2030 and contributes to the achievement of relevant Sustainable Development Goals (SDGs).

The expansion of low-carbon nuclear generating capacity, including through the continued operation and expansion of existing units and the deployment of SMR and Generation IV technologies, contributes to SDG 7 – Affordable and Clean Energy and SDG 13 – Climate Action by reducing greenhouse gas emissions and strengthening energy security.

Strengthening the research, development and innovation component of the nuclear sector, together with the associated technological infrastructure, supports SDG 9 – Industry,

Innovation and Infrastructure by promoting advanced technologies and strengthening the national research capacity.

Furthermore, expanding non-power nuclear applications in medicine, industry and agriculture contributes to SDG 3 – Good Health and Well-being, while ensuring safety and compliance with requirements for the protection of the public and the environment.

In accordance with the vision and strategic objectives of the NSDNS, the development of the nuclear sector shall be achieved through the implementation of strategic projects of national interest identified in the National Nuclear Programme (NNP), which forms an integral part of the NSDNS, namely:

1. Completion of Units 3 and 4 at the Cernavodă Nuclear Power Plant (NPP);
2. Refurbishment of Unit 1 and Unit 2 at the Cernavodă Nuclear Power Plant;
3. Licensing, construction and commissioning of the National Repository for Low- and Intermediate-Level Radioactive Waste (DFDSMA);
4. Licensing, construction and commissioning of the Deep Geological Repository (DGR);
5. Construction of the Heavy Water Detritiation Facility (CTRF) at the Cernavodă Nuclear Power Plant;
6. Construction of the first SMR-based nuclear power plant;
7. Construction of the experimental facilities supporting the ALFRED Demonstrator;
8. Construction of the ALFRED Demonstrator for the demonstration of Lead-cooled Fast Reactor (LFR) technology;
9. Construction of a research infrastructure for the production of radioactive ion beams and radioisotopes of medical interest;
10. Development of technologies for fundamental and applied nuclear physics research using the ELI-NP high-power laser system.

Nuclear energy, as a low-carbon source of energy, accounts for a significant share of Romania's total electricity generation—approximately 18%—and represents a fundamental component of the country's energy mix. Romania's nuclear energy programme is supported by domestic resources and infrastructure covering the entire open nuclear fuel cycle, giving the country a high degree of independence in nuclear power generation.

Analyses concerning the achievement of environmental and energy security objectives, security of supply and diversification of energy sources to ensure a balanced energy mix capable of providing electricity at affordable prices for consumers demonstrate that the Cernavodă Units 3 and 4 Project represents one of the optimal solutions for addressing the future electricity generation capacity deficit resulting from the gradual retirement of existing generating capacities reaching the end of their operational lifetime.

Increasing the generating capacity of the Cernavodă Nuclear Power Plant is also an investment measure supporting Romania's energy security objectives.

The completion of the Units 3 and 4 investment project will provide an additional contribution of approximately 11 TWh of electricity to the national power system and increase installed capacity by 1,448 MWe over the medium and long term, taking into account two operating cycles following the refurbishment of each Cernavodă nuclear unit.

Considering the operational characteristics of nuclear power plants, this additional capacity will have a high availability factor and will contribute to meeting the base-load electricity demand of the National Power System (NPS).

The systemic effects expected following the commissioning of these two units include:

- increasing the generating capacity of the National Power System (NPS), with positive effects on energy security through strengthening Romania's contribution to regional energy markets;
- commissioning new generating units with high efficiency and reliability, thereby improving the overall efficiency and reliability indicators of the electricity generation system;
- creating a surplus of electricity generation capacity that will allow the temporary withdrawal from operation of other generating units for modernisation and refurbishment or, where justified, their permanent retirement;
- supporting the transition to a low greenhouse gas emission energy sector;
- maintaining economically viable domestic activities related to uranium resource exploitation, uranium ore processing, nuclear raw material processing and nuclear fuel production;
- recovering the investments made in the construction of Cernavodă Units 3 and 4;
- making use of the strategic heavy water inventory established in previous years for the operation of the Cernavodă Nuclear Power Plant;
- ensuring the active participation of Romania's nuclear supply chain (engineering, design, equipment manufacturing, etc.) and creating additional employment opportunities;
- strengthening cooperation between the nuclear industry (both power and non-power sectors) and education and training institutions, thereby ensuring the availability of highly qualified personnel required for the operation of nuclear and radiological facilities.

In line with the evolution of global and regional energy policy objectives, as well as the considerations regarding Romania's new national energy security policy presented in Chapter 3.2, it is estimated that by 2050 an electricity generation sector based entirely on low-carbon technologies will rely on an electricity mix in which nuclear energy will make a significant contribution, ensuring:

- base-load electricity generation;
- power system stability and security of supply through reducing energy dependence and increasing the resilience of the energy sector to external factors, while providing an appropriate safety margin against current uncertainties related to the success or failure of different technologies and to international political and economic developments, and facilitating refurbishment periods with minimum reliance on electricity imports;
- expanded use of nuclear technologies for non-power applications (cogeneration, hydrogen production, industrial processes, medicine, desalination, etc.);
- opportunities for electricity exports and contributions to regional energy security, positioning Romania as a regional stability hub.

Furthermore, in order to achieve the strategic objectives and support nuclear projects and activities, a number of general measures shall be pursued:

- ensuring a robust and fit-for-purpose legal and regulatory framework;
- ensuring a sustained investment programme;
- ensuring adequate financial and human resources;
- strengthening the capacity of the domestic industry;
- increasing investment in research and innovation in order to provide high-quality scientific and technical support integrated within the European and international scientific community;
- promoting international cooperation and partnerships;
- capitalising on development opportunities through international cooperation projects;
- maintaining a high level of national expertise in Romanian nuclear research and increasing its contribution to the development of nuclear energy.

6.2 COURSES OF ACTION FOR ACHIEVING THE STRATEGIC OBJECTIVES

In order to implement the strategic objectives defined above, the main courses of action for the nuclear power sector and non-power nuclear activities in Romania have been identified as follows:

SO 1 – Maintaining a high level of performance and extending the operating lifetime of existing units, while increasing the number of CANDU nuclear power units, through:

- Completion of the construction and commissioning of Units 3 and 4 at the Cernavodă Nuclear Power Plant;
- Refurbishment of the operating units at the Cernavodă Nuclear Power Plant;
- Maintaining design and research capabilities for CANDU technology in the following areas:
 - safety analyses;
 - structural materials and advanced nuclear fuels;
 - instrumentation and control, equipment and process analysis;
 - radioactive waste management and radiation protection;
 - ensuring a high level of operational performance through the use of appropriately qualified equipment and personnel, while meeting the requirements for the continuous enhancement of nuclear safety under normal operating conditions and accident conditions.
- Studying fuel scenarios and fuel cycle strategies, such as:
 - accident-tolerant fuel;
 - advanced CANDU fuel;
 - the possible use of other fuel types, in compliance with the international treaties and conventions to which Romania is a Party and taking into account the types of nuclear reactors introduced into operation.
- Ensuring the availability of material and human resources for the national nuclear power programme by aligning them with the education system, providing specialised training within research and design institutes, and strengthening international cooperation.

SO 2 – Construction of new types of nuclear power plants through a phased approach, over time and across different technologies (Small Modular Reactors (SMRs) and innovative Generation IV reactors), through:

- Construction of nuclear power plants based on Small Modular Reactor (SMR) technology through technology transfer and the development of national capabilities to support their manufacturing and operation;
- Construction of the experimental infrastructure required to demonstrate the technical and economic feasibility of Generation IV lead-cooled fast reactors;
- Continuation of research activities and completion of the ALFRED Demonstration Reactor;
- Establishment of a regional hub for promoting know-how in the operation and manufacturing of Small Modular Reactors.

SO 3 – Development of an integrated nuclear fuel cycle ensuring the sustainability and efficiency of the nuclear power sector, through:

- Ensuring the supply of nuclear fuel through integrated national systems, taking into account the types of nuclear reactors introduced into operation;
- Integration of the fuel cycles of CANDU nuclear power plants with those of new-generation reactors;
- Management of radioactive waste, including spent nuclear fuel, through the provision of interim storage at nuclear power plant sites in the short and medium term;
- Defining, completing and implementing solutions for the final disposal of radioactive waste and spent nuclear fuel in the medium and long term;
- Providing radioactive waste treatment and conditioning solutions, as well as spent nuclear fuel conditioning solutions, in order to comply with the waste acceptance criteria for disposal facilities;
- Implementing applications that increase the efficiency of nuclear power plants and their contribution to the economy (production of various isotopes that can be used in the medical industry and for medical treatments, such as cobalt, molybdenum, lutetium, etc.);
- Assessing documented alternative scenarios that consider the possibility of implementing in Romania a DUPIC (Direct Use of Spent PWR Fuel in CANDU) fuel cycle, to be used both within the SMR deployment project and for future CANDU units. The possibility of using spent fuel from CANDU reactors within the ALFRED project shall also be assessed;
- Active participation at the international level in maintaining the sustainability of the CANDU technology, implementing new reactor technologies, and managing an integrated national nuclear fuel cycle.

SO 4 – Safe management of spent nuclear fuel and radioactive waste in a manner consistent with the development of nuclear power, including the closure and institutional control of radioactive waste disposal facilities

The fundamental objective of the **National Strategy on the Safe Management of Spent Nuclear Fuel and Radioactive Waste** is the continuous improvement of the responsible and

safe management of spent nuclear fuel and radioactive waste, without imposing unjustified burdens on future generations.

To this end, the periodic updating of this Strategy, as required by legislation, shall support the achievement of the strategic objectives of the NSDNS through:

- updating the National Programme for the Management of Spent Nuclear Fuel and Radioactive Waste to include, in an appropriate, phased and documented manner, plans and technical solutions covering the management of spent nuclear fuel and radioactive waste from generation to final disposal, arising from the future nuclear activities provided for in the NSDNS;
- defining, completing and implementing solutions for the final disposal of radioactive waste and spent nuclear fuel in the medium and long term;
- developing pre-disposal and disposal solutions for waste arising from non-nuclear activities.

SO 5 – Strengthening scientific and technical support capabilities and enhancing the role of research and innovation in the nuclear sector

- Developing a research and development programme aligned with the nuclear energy projects included in the NSDNS;
- Supporting the research, development and innovation programme underpinning the national nuclear programme, together with the related infrastructure;
- Increasing public and private investment in research and development for the nuclear sector;
- Developing technologies for fundamental and applied nuclear physics research using the ELI-NP high-power laser system;
- Developing and establishing new research and development infrastructures in the field of terrestrial and space mineral resources (DECENEU);
- Strengthening research excellence;
- Maintaining and continuously developing expertise and competence within the national nuclear community;
- Encouraging the development of new potential energy sources for electricity generation;
- Developing research and development programmes and projects relating to hydrogen production using electricity and heat generated by nuclear reactors (in coordination with the actions and measures set out in the national hydrogen strategy);
- Exploiting research, development and innovation results, particularly to mobilise private investment and support the development of sector-specific policies;
- Strengthening international cooperation.

SO 6 – Ensuring the availability of highly qualified human resources required for the successful achievement of the proposed objectives, through:

- Ensuring the human resources required for the commissioning of new nuclear installations and the continued operation of existing ones;
- Revitalising the national education system;

- Maintaining and continuously developing expertise and competence within the nuclear community;
- Promoting complementarity among education and training providers and facilitating cooperation between them;
- Establishing a national and international training centre using dedicated platforms for SMR technologies and other advanced reactor systems;
- Supporting the establishment of national platforms providing training programmes for various occupational categories in both the nuclear power and non-power sectors;
- Supporting those involved in university and postgraduate education, as well as students and researchers in the nuclear field (undergraduate dissertations, master's theses, doctoral theses, scientific papers, etc.).

SO 7 – Maximising the benefits of non-power nuclear applications in medicine, industry, agriculture, research and hydrogen production, through:

- Developing ionising radiation metrology;
- Expanding the use of irradiation technologies in high value-added industries, including the medical device, pharmaceutical and cosmetics industries, as well as in agriculture and cultural heritage preservation;
- Initiating the development of hydrogen production capacities using electricity and heat generated by nuclear reactors (in coordination with the actions, measures and objectives set out in the National Hydrogen Strategy);
- Developing innovative medical applications;
- Advancing nuclear forensics in order to reduce threats to nuclear security by making use of progress in analytical instrumentation and data evaluation techniques;
- Conducting research in the nationally defined smart specialisation areas, including research aimed at developing new materials, methods, techniques, technologies and advanced equipment to stimulate economic growth;
- Assessing the impact of ionising radiation on the environment and biological systems in order to ensure radiation protection and radiological safety in nuclear practices;
- Developing and implementing new irradiation technologies for the production and extraction of radioisotopes and the preparation of radiopharmaceutical compounds.

To achieve the strategic objectives and the expected results, these courses of action shall be supported by a series of measures aimed at capitalising on international cooperation in promoting nuclear projects and informing the public in order to increase public acceptance.

- Capitalising on development potential through international cooperation projects
 - ✓ Continuing the implementation of technical assistance projects carried out by Romania under the IAEA Technical Cooperation Programme and financed from the IAEA budget; identifying areas of common interest at the international and regional levels and making full use of international cooperation opportunities in the nuclear field;
 - ✓ Implementing technical assistance projects in third countries in support of Romania's own development objectives (for example, in the fields of regulation, research reactor decommissioning, nuclear forensics, etc.);

- ✓ Providing specialised expertise and concluding partnerships and cooperation agreements in the nuclear field;
 - ✓ Implementing new initiatives in the form of pilot projects to encourage the introduction of innovative technologies and techniques;
 - ✓ Developing projects in the field of education and vocational training through the provision of scholarships and training placements abroad.
- Promoting nuclear projects and informing the public in order to increase public acceptance
- ✓ Informing the public and ensuring public participation, in accordance with the law, regarding nuclear activities and the development of nuclear projects, while duly observing the legal provisions governing classified information;
 - ✓ Informing and preparing the public living in the vicinity of potential sites for new nuclear projects in order to facilitate public acceptance of their siting;
 - ✓ Proposing social programmes for local communities hosting new nuclear facilities;
 - ✓ Harmonising public information policies concerning the development of nuclear power and non-power nuclear activities;
 - ✓ Increasing the visibility of nuclear activities through dissemination at the national, regional and international levels.

CHAPTER 7

EXPECTED RESULTS

The expected results arising from the implementation of this Strategy are as follows:

- ❖ An updated institutional and legislative framework aligned with international requirements and standards, IAEA documents, and internationally recognised best practices;
- ❖ Clearly defined and assigned roles, responsibilities, authority and accountability for ensuring nuclear safety and nuclear security across all entities involved;
- ❖ Maintaining the nuclear power generation capacities required in the medium and long term in order to contribute to the security of electricity supply, reduce energy dependence, and support Romania's sustainable, low-carbon energy and economic development;
- ❖ Development of the national nuclear programme through the construction of new types of nuclear power plants, thereby strengthening the national energy sector, based on the principle of sustainable development;
- ❖ Ensuring the long-term management of spent nuclear fuel and radioactive waste under conditions of nuclear safety and nuclear security, while protecting present and future generations;
- ❖ Advanced national research, development and innovation capabilities appropriate to the needs of the nuclear sector;
- ❖ Ensuring a sufficient number of qualified and motivated personnel, together with adequate financial resources, for high-technology activities carried out by the entities directly involved in the nuclear sector;
- ❖ Effective use of international cooperation frameworks and mechanisms;

- ❖ Providing the public with accurate and consistent information regarding nuclear activities;
- ❖ Increasing public confidence in the State institutions entrusted with responsibilities and competences in the nuclear sector;
- ❖ Increasing the international visibility of Romania's national expertise and services in the nuclear field (e.g. the ALFRED infrastructure, the TRIGA reactor, RATEN ICN laboratories, the NFL-RO laboratory, radioisotopes and radiopharmaceuticals used in research, medicine, industry, agriculture and education, advanced detectors used at major national and international research centres, and the laboratories of INCDMRR and ICPMRR Bucharest);
- ❖ Supporting and strengthening research and development capacity in the nuclear sector at the national, regional and international levels.

CHAPTER 8

8.1 FUNDING SOURCES

For the implementation of the **National Strategy for the Development of the Nuclear Sector in Romania** and for the development and implementation of the projects, investments and actions set out in the **National Nuclear Programme (NNP)**, the following financing measures and funding sources shall be considered, in particular:

- Ensuring the availability of funding sources and maintaining adequate financial resources;
- Allocating, as appropriate, budgetary resources and/or own-source revenues in a balanced manner across all institutions involved, in order to provide financial support for the projects and actions arising from this Strategy;
- Supporting research and innovation programmes through public funding;
- Attracting and making the best possible use of external funding obtained through international cooperation programmes, including European Union funds;
- Attracting private investors and external financing, including foreign investment;
- Using market-based financing mechanisms and instruments to support the financing of the national nuclear programme (such as the **Contracts for Difference (CfD)** support scheme);
- State guarantees and/or government loans to facilitate project financing;
- Budgetary funds allocated for financing nuclear installations and special facilities of national interest, as approved from the State budget;
- Funding for activities carried out under approved scientific research programmes, financed from State budget appropriations allocated to scientific research;
- Approved national and sectoral financing programmes supported by national resources and non-reimbursable European Union funds (e.g. the **Modernisation Fund**, the **National Recovery and Resilience Plan (NRRP)**, approved financing schemes, etc.);
- Special funds generated from fees and charges, administered efficiently and effectively in accordance with the **"polluter pays" principle** and the applicable legislation.

The ministries involved shall ensure the implementation and financing of the activities arising from the implementation of the **National Strategy for the Development of the Nuclear Sector in Romania**.

8.2 LEGAL IMPLICATIONS

Legislative initiatives for the amendment and/or supplementation of higher-level normative acts, such as laws and Government Ordinances, as well as lower-level normative acts, such as Government Decisions and the orders and instructions issued by national authorities and ministries, shall be prepared in accordance with the annual legislative plans, based on the new requirements and opportunities arising from this Strategy.

CHAPTER 9

STRATEGY IMPLEMENTATION AND PROGRESS MONITORING

The **National Strategy for the Development of the Nuclear Sector (SNDDN)** shall be reviewed and updated periodically, taking into account developments in the principal national strategic documents relating to the nuclear sector, including:

- ✓ the National Nuclear Safety and Security Strategy;
- ✓ the National Strategy for the Safe Management of Spent Nuclear Fuel and Radioactive Waste;
- ✓ the National Strategy for Critical Infrastructure Protection;
- ✓ the National Radon Action Plan;

as well as the provisions of Romania's Energy Strategy 2025–2035, with a 2050 Outlook.

The lines of action supporting the achievement of the strategic objectives established under the SNDDN shall be implemented through the major projects, investments, measures and actions included in the National Nuclear Programme (NNP), which forms an integral part of the Strategy.

Implementation shall be carried out through:

- national and sectoral programmes and action plans approved by the Government of Romania and the competent authorities, including the Ministry of Energy, the Ministry of Education and Research, CNCAN, ANDR and other relevant public institutions;
- national and sectoral research, development and innovation programmes, together with the institutional strategies, investment programmes, environmental programmes, social programmes and corporate development plans of the organisations directly responsible for implementing the projects and activities established under the SNDDN and the National Nuclear Programme.

Monitoring of the implementation of this Strategy shall be carried out annually by the Nuclear and Radioactive Waste Agency (ANDR) on the basis of annual reports prepared by the institutions responsible for implementing the Strategy.

The results of this monitoring process shall be consolidated into an annual implementation report, which shall also include an action plan containing the measures necessary to support the continued implementation of the SNDDN. This report shall be prepared by ANDR on the basis of proposals submitted by, or in cooperation with, the institutions involved in implementing the Strategy.