NUCLEARELECTRICA

SNNMISSION
We generate clean energy at standards of excellence

SNNVISION
We build a sustainable future for tomorrow's generation

WELCOME TO CERNAVODA NPP

SAFETY AND SUSTAINABILITY
PROFESSIONAL EXCELLENCE
CARE FOR EMPLOYEES
EMPATHY AND RESPONSIBILITY
SUSTAINABLE DEVELOPMENT

Romania's decarbonation targets

Reduce CO2 emmissions by 55% until 2030

Reduce import dependency from 20,8% today to 17,8% in 2030

Retiring coal capacities

Up to 4.59GWe of coal capacities will retire by

2032

Increase of nuclear capacity

Nuclear capacity will increase by 1.400 MW by 2031 with new CANDU UNITS and 465 MW with a 6 modules SMR

2031

Hydrogen estimated demand

According to the EU Hydrogen roadmap, hydrogen in the energy mix will increase from 2% to 14% by

2050

Nuclear Energy in Romania

Reduction of CO2 emissions in Romania since the commissioning of Units 1 and 2	~205 mil tones
Annual reduction of CO2 emissions due to the operation of Cernavoda NPP	~10 mil tones
Nuclear energy in Romania today – 1400 MWe	18-20%
Nuclear contribution to clean electricity	33%
Jobs in the industry	11.000
Cumulated turnover in 2017 - approx. RON 2,730 million (approx. EUR 590 million)	EUR 5.7 bln
Investments projected until 2030	EUR 12 bln

Nuclear Energy in Romania

Nuclear Energy in Romania

S. N. Nuclearelectrica S.A.
(HQ in Bucharest)

RoPower

100% shares since January 2014

Cernavoda Nuclear Power Plant

- Safe & efficient operation of Units 1&2 - CANDU 6
- Town heating supplier

Energonuclear (Units 3&4 project, including preservation of U3&4)

Nuclearelectrica Serv

Feldioara uranium octoxide processing line

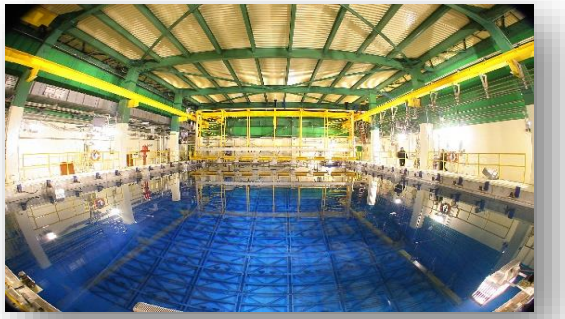
Pitești Nuclear Fuel Facility

- Nuclear fuel fabrication for two units

Shareholders structure

- Ministry of Energy 82.4981%
- Others 17.5019%

Fuel Cycle in Romania



- The Plant uses the **fuel bundles manufactured at its FCN Pitesti,** SNN subsidiary**.**

- The **spent nuclear fuel is stored in the spent fuel bay for 6 years** and then it is transferred to the **Interim Dry Storage Facility** (DICA). **DICA** is a modular structure, gradually built to accomodate the spent fuel resulted from the operation of 4 nuclear units (the two operating ones and future Units 3&4).

CERNAVODA NUCLEAR POWER PLANT

CANDU technology – Canadian Deuterium Uranium

706,5 MWh/ Unit

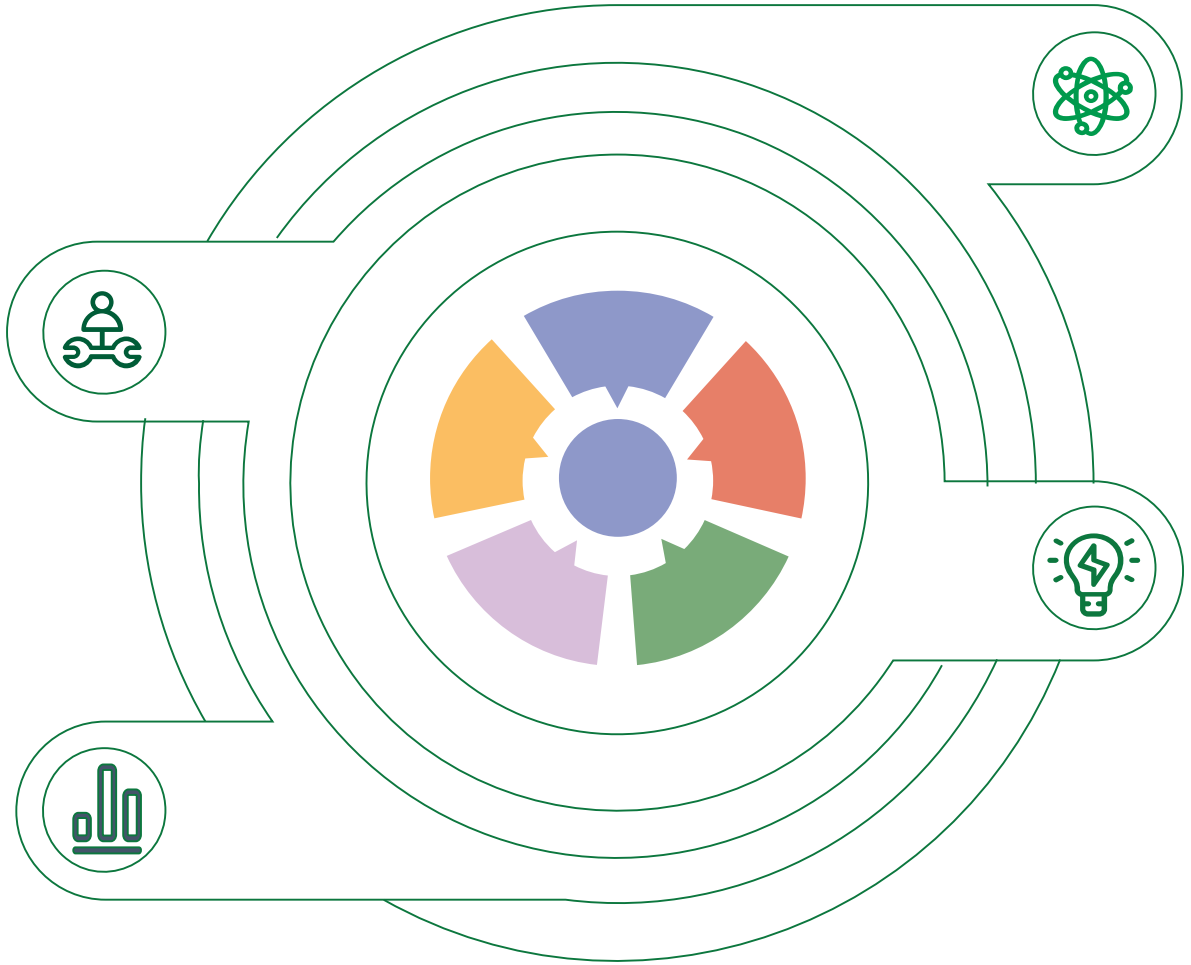
Both units CANDU6: U2 is more advanced U1

Uses natural uranium as fuel and heavy water as moderator and cooling agent

Management processes developed based on WANO/INPO standards

CERNAVODA NUCLEAR POWER PLANT

April 1979
Starting
Construction
Cernavoda NPP

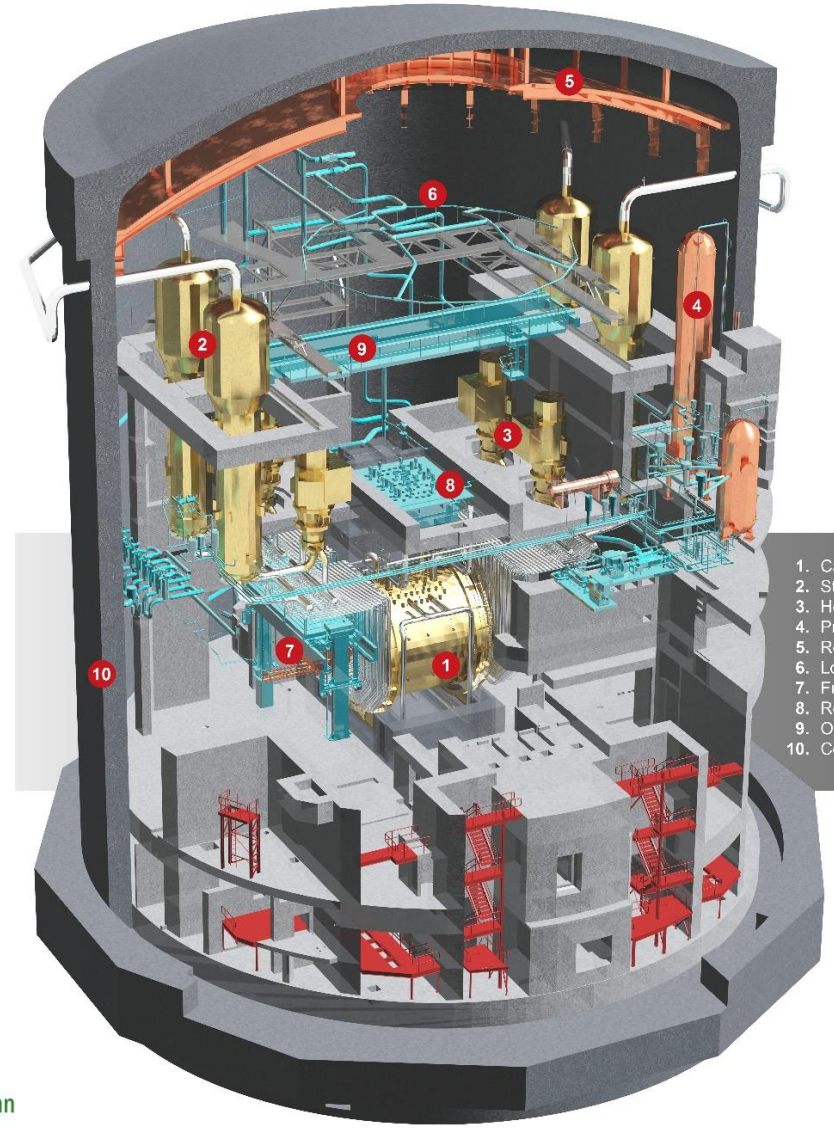


First criticality
U1 - April 1996
U2 - May 2007

In-service date
U1 - December 1996
U2 - September 2007

In-service GCF
U1 - 90.23%
U2 - 93.79%

CERNAVODA NUCLEAR POWER PLANT



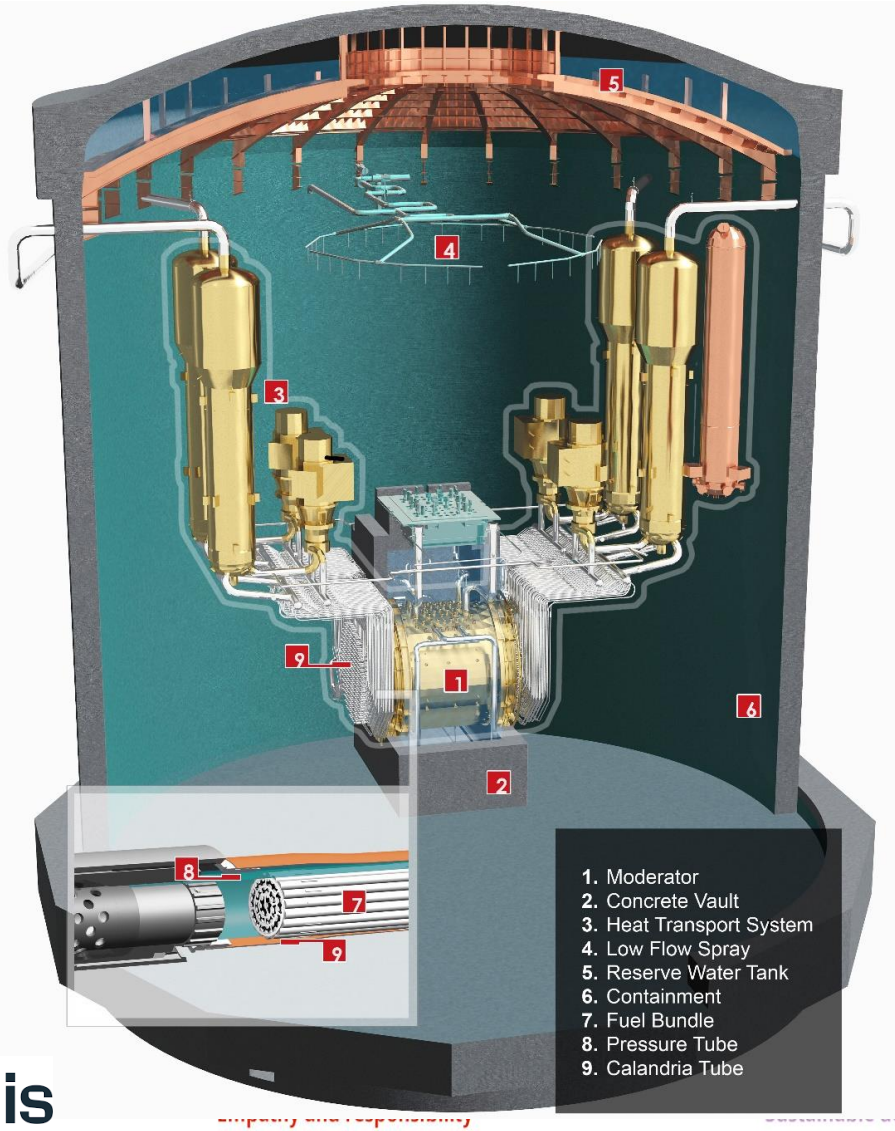


Photo property

AtkinsRéalis

SNN's Projects to Meet Romania's Decarbonation Targets

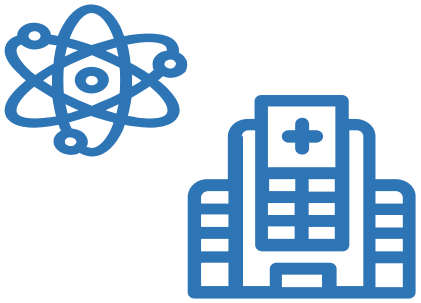
Refurbishment / Life Extension of Unit 1

Two new CANDU Units around 2031

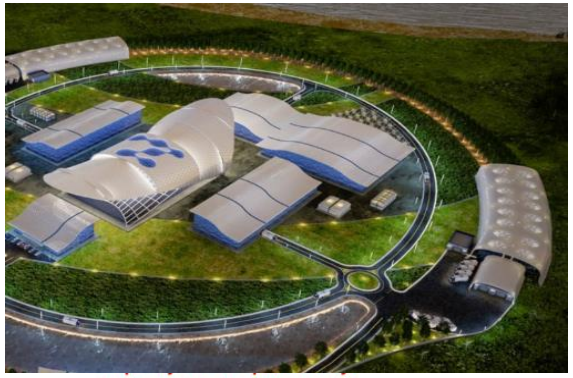
Integrated Nuclear Fuel Cycle

CTRF

Medical Isotopes



SMR Development



Refurbishment of Unit 1 – benefits

- Extending the life of the reactor with another 30 years, starting 2029
- Another 5.5 million MWh/year of clean, safe, stable and affordable energy for 30 years
- Avoiding 5 million tons of CO2 emissions/year, for 30 years
- Unit 1 was put into operation in 1996 and produced until the end of 2023, 139 million MWh of energy (at the end of 2023), representing 9% of the annual national consumption.
- By the end of 2023, Unit 1 has avoided more than 135 million tons of CO2 emissions.

Other benefits of Unit Refurbishment 1

- Conservation and development of the value chain
- Increasing the number of jobs and the number of specialists by recruiting and training staff dedicated to this project; maintaining jobs for the next 30 years
- According to the NEA study, the energy produced by refurbished nuclear power plants has the lowest cost, including when compared to renewable energy

Refurbishment / Life Extension of Unit 1

Phase 1 — finalized

Final Investment Decision approved on February 23rd, 2022, based on the Feasibility Study.

Phase 2 — Project implementation (engineering, procurement, EPC contract, licensing, COM Opinion, FID).

- In July 2022, it was signed the first contract with Candu Energy, SNC-Lavalin
- In February 2023, it was signed the first contract with Candu Energy, SNC-Lavalin, for engineering services

Phase 3 — Effective development of the refurbishment project - end 2026 – beginning 2029.

CANDU Units 3 & 4 project

Preparatory Stage:

- Energonuclear S.A., the project company, signed the **first contract** with Candu Energy, SNC-Lavalin, Design Authority and CANDU Technology original equipment manufacturer (OEM)
- **Candu Energy** will provide **engineering services** - updating of technical reports, support for Project licensing and the Notification of the Cernavoda 3 & 4 investment project to the European Commission (e.g. licensing basis documents, updating the Safety Design Guides, updating the list of safety related design changes etc.).

CANDU Units 3 & 4 project

- The **Cernavodă NPP Units 3 and 4 project consists in** the completion of the construction and commissioning of 2 units of at least 724 MWe installed each, with annual electric energy output of more than 10.5 TWh, each.
- **CANDU type nuclear technology will be used**. The existing civil structures, approximately 40% completed, are owned by the National Nuclear Electric Company ("SNN"),
- The **Romanian State owns assets necessary** for the development and operation of the Project (1,100 tons of heavy water for the initial inventory and uranium octoxide for the first load of nuclear fuel).
- The **development of the Project** will be carried out through the project company EnergoNuclear S.A. ("EN"), currently 100% owned by SNN.
- It is estimated that Units 3 and 4 will be **commissioned in 2031/2032**

Cernavoda Tritium Removal Facility (CTRF)

- CTRF technology is aimed at **extracting the tritium from the heavy water** in the moderator and thus ensuring a significant reduction of the radioactive emissions in the environment and of the professionally exposed personnel internal dose.
- Among expected benefits are: reinforcing the ALARA principle - by personnel dose reduction and reduction in emissions to environment; significant waste storage and decommissioning costs savings.
- On **June 27, 2023, Nuclearelectrica and Korea Hydro & Nuclear Power (KHNP) signed the Engineering, Procurement and Construction (EPC)** contract for the completion of Europe's first Tritium Removal Facility (CTRF) at Cernavoda Nuclear Power Plant (Cernavoda NPP) and on May 23, 2024, the work on construction site started.
- Using a Romanian innovative technology, developed by the Romanian National and Development Institute for Cryogenic and Isotopic Technologies, Cernavoda Tritium Removal Facility will be the **world's third and Europe's first Tritium Removal Facility**
- CTRF represents an opportunity for **contribution to global tritium supply for fusion, mainly with respect to ITER** (the International Thermonuclear Experimental Reactor) as well as to recover and use He3 resulted from tritium disintegration.

Romania has the opportunity to become

- a **European hub** for tritium production and export – the fuel candidate of future clean fusion reactors.
- develop its suppliers' chain in partnership with Korea, and become a **center for development and export of the Romanian tritium removal technology and know-how**, **using localized factories and workforce**.

Medical Isotopes Project

- The **nuclear industry is currently essential** both for the generation of clean electricity and for ensuring the production of medical isotopes.
- The **CANDU nuclear power plant** is considered **one of the most feasible technologies for producing medical isotopes**. It allows us to produce medical isotopes efficiently and in compliance with nuclear safety standards.
- The production of medical isotopes also has a **corporate social responsibility component in line with the company's vision** of building a sustainable future. Exploring the possibility of medical isotopes production in the Cernavoda reactors is a major step for the Romanian nuclear industry towards fully realizing the beneficial effects of nuclear technology in healthcare.
- **Isotopes play an essential role in medicine**, cancer treatment, medical imaging, sterilization of medical devices, new drug development, neutron research, border security, food preservation, and much more.
- Thus, **in 2022 and 2023, Nuclearelectrica expanded its projects portfolio** by concluding **partnerships with Canadian** (BWXT Medical Ltd, part of BWX Technologies, Laurentis Energy Partners) **and French (Framatome) companies** to explore the production of medical isotopes at CNE Cernavodă.
- It is a **significant step to help improve the health of millions of people** and demonstrate the multiple benefits of nuclear power plants, which generate clean energy, contribute to energy stability, decarbonization and economic growth.

First SMR in Europe in Romania

NuScale SMR is the first small modular reactor design approved by the U.S. Nuclear Regulatory Commission (NRC), since August of 2020.

Romania has in plan the development of a SMR power plant, which will replace a former coal plat

The SMR will have 6 modules of 77 MWe each, and 462 MWe installed capacity and will generate:

- 193 permanent jobs
- 1500 jobs during construction
- 2300 jobs in manufacturing
- Will avoid 4 million tons of CO2/ year

Project implementation will be compliant with the Romanian and European legislation

MEETING THE NEEDS OF THE LOCAL COMMUNITY

Community Information and Consultation Council

The Council was established with the aim of a comprehensive approach to consultation community and has the role of supporting the plant and our whole organization in identifying and responding effectively to questions, the concerns and interests of the community in relation to the activity of the Cernavoda NPP.

CICC is made up of 30 members whose concerns interfere with the existence and activity of Cernavoda NPP: citizens of the city of Cernavoda and the communes of Saligny and Seimeni; representatives of non-governmental organizations, local administration, important institutions (schools, police, hospitals, agriculture, churches etc.) and the private business environment**.**

Among the objectives of the Council are the following:

- provides consultations, advice, opinions on the communication activities of Cernavodă NPP to the community regarding the environmental and economic effects and social impacts of the plant's operation on the community; provide data, information for environmental assessments related to Cernavodă NPP; participates in the visits made to the Cernavodă NPP site which are relevant to the local community.

The Council meets at least twice a year, and once it visits the plant site.

MEETING THE NEEDS OF THE LOCAL COMMUNITY

Community Information and Consultation Council

MEETING THE NEEDS OF THE LOCAL COMMUNITY

Community Development & Benefits

- **Cernavoda NPP provides jobs for local community:**

- **~ 750** employees from Cernavoda and neighboring towns;
- **~ 1050** employees from Constanța, Fetești, Medgidia and neighboring towns.

To them are added the employees of the NuclearelectricaServ subsidiary and the employees of the collaborating companies of Cernavoda NPP.

- **The Dual and Professional School Program** project for high school students through which they are coming and learning a trade in our company. Throughout the practice the students benefits of free meals, school supplies, prizes at the end of the year to stimulate performance and a monthly scholarship they receive it during school.

MEETING THE NEEDS OF THE LOCAL COMMUNITY

Community Development & Benefits

- Cernavoda NPP provides **heating** for city of Cernavoda. This process started in 1996 and, in present, we are delivering about 75 000 Gcal/Year.
- Ensuring a **constant income to the local budget** through fees and taxes (~ 49% of the local budget comes from the NPP).
- **Providing accommodation** for part of the employees.
- **Investments in community development through CSR projects:** ex. in 2023, money was allocated for the complete restoration of the Operating Block and the Anesthesia and Intensive Care Department and the balneotherapy center in the Cernavodă City Hospital;

Taxes Cernavoda City Hall (in EURO)					
	2021	2022	2023	2024	total
1. Buildings tax	12,579,918.82 €	13,532,968.31	14,310,214.40	18,114,537.03	58,537,638.56
2. Land tax	137,465.14 €	141,015.35	148,207.21	235,908.94	662,596.64
3. Transportation vehicles tax	8,261.87	8,181.49	8,590.20	9,607.56	34,641.12
4. Other taxes - site advertising	208.98	235.10	248.16	287.34	979.58
5. Other Taxes	0.00	159.15	564.92	18,069.80	18,793.88
Total taxes/year	**12,725,854.80**	**13,682,400.25**	**14,467,824.90**	**18,378,410.69**	**59,254,649.79**

MEETING THE NEEDS OF THE LOCAL COMMUNITY

Community Development & Benefits

In June 27, 1991, the "Emergency Social Program for the improvement of living conditions for Cernavodă and for the construction and operation personnel of the plant" was started and implemented. Completed projects were transferred without payment to the city of Cernavoda.

The most important completed projects are the following:

- ✓ Kindergarden;
- ✓ Drinking water station (pumping and treatment);
- ✓ Modernization of intersections and streets;
- ✓ Heating networks (infrastructure);
- ✓ "Sfânta Maria" bridge for car access to the Cernavodă station and the Fetești-Cernavodă highway, over the Danube - Black Sea Canal;
- ✓ Energetic High School from Cernavodă;
- ✓ Hospital and polyclinic dispensary in Cernavodă;
- ✓ Sewage and waste water treatment station;
- ✓ Four wells of drinking water;
- ✓ Housing complex;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