



Romania's plans to deploy NuScale SMRs

Fermi Energia SMR conference 8th February 2022

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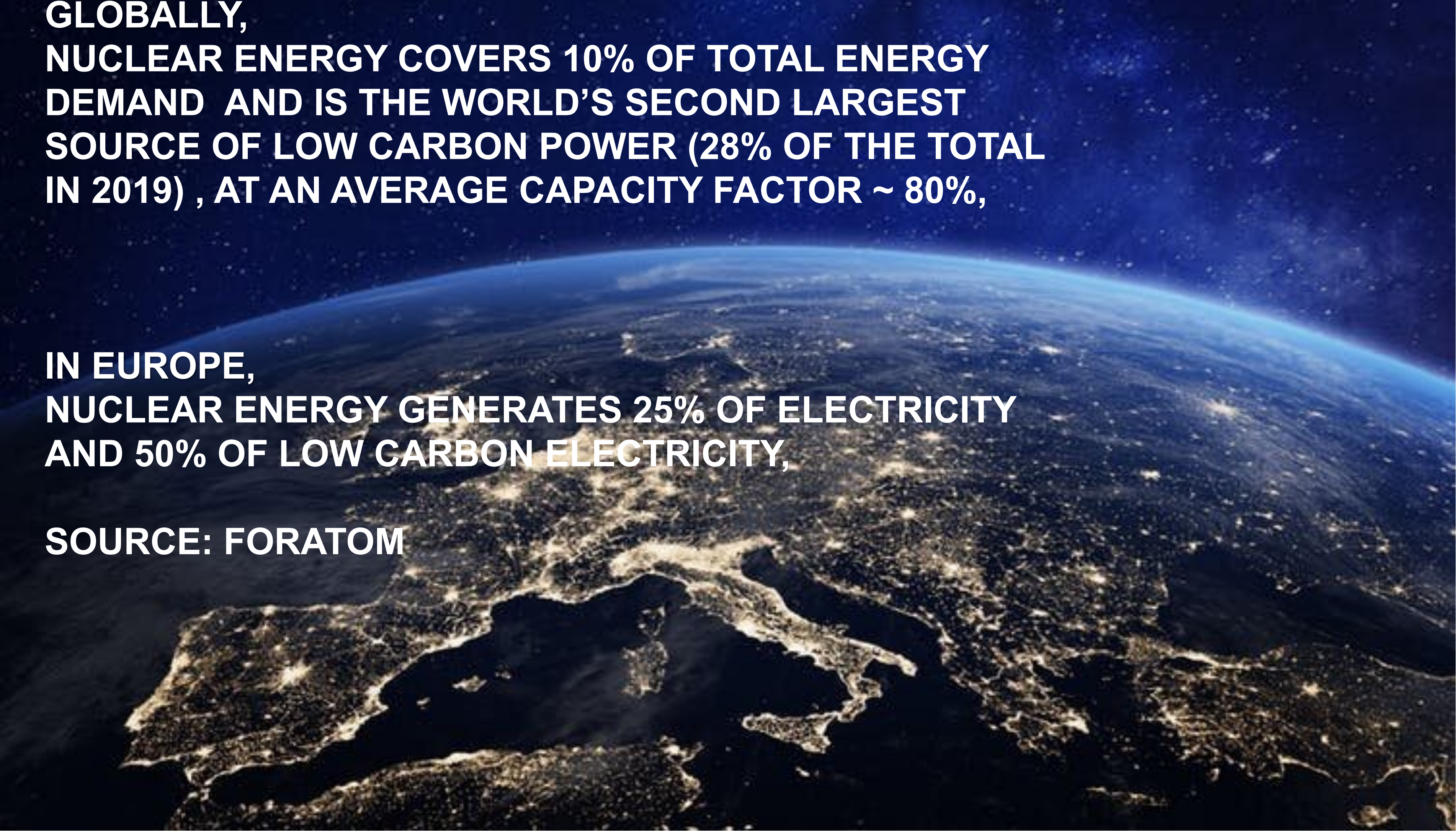


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**GLOBALLY,
NUCLEAR ENERGY COVERS 10% OF TOTAL ENERGY
DEMAND AND IS THE WORLD'S SECOND LARGEST
SOURCE OF LOW CARBON POWER (28% OF THE TOTAL
IN 2019) , AT AN AVERAGE CAPACITY FACTOR ~ 80%,**

**IN EUROPE,
NUCLEAR ENERGY GENERATES 25% OF ELECTRICITY
AND 50% OF LOW CARBON ELECTRICITY,**

SOURCE: FORATOM



European Union and Sustainable Future



- **European Green Deal**
- **Fit for 55**
- **Taxonomy Regulation: a framework for the sustainable investments**
- **Subsequent Taxonomy Delegated Acts**
- Zero carbon emissions by 2050
- The decarbonization target by 2030 accelerated from 40% to 55%.



Reaching the environmental targets proposed by the Green Deal, the Fit for 55 package, and the targets for 2050 assumed at COP 21 Paris, **cannot be achieved without the contribution of nuclear energy** along with renewables!

NuScale SMRs technology (1)



- **NuScale - the first small modular reactor design approved by the U.S. Nuclear Regulatory Commission (NRC), since August of 2020**
- NuScale's SMRs technology is one of the **most mature**, having the appropriate supply chain for constructions, development and deployment at commercial scale at the level of 2028.
- NuScale is using **well known, safe nuclear technology principles** (of light water reactor - PWR), which has been used more than 60 years in operations, now at a more advanced, safer and improved design.

Advantages of NuScale SMRs technology (2)

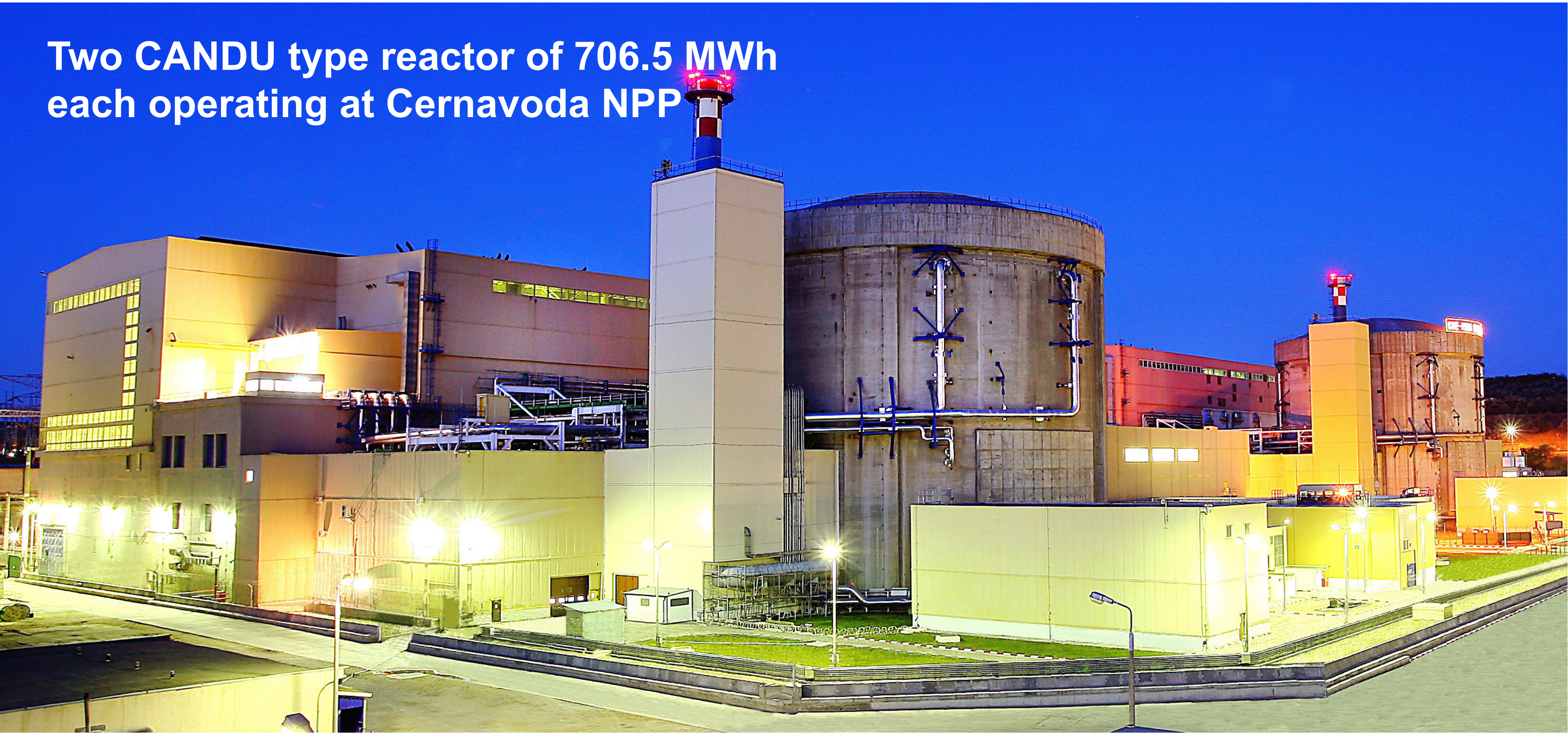


- NuScale SMRs **could be sited on decommissioned coal plant sites** – this has to be a strategy of the countries in the Three Seas Initiative,
- NuScale **cost competitive:** for an equivalent installed capacity, the cost for a PWR with four loops is of 5,557 US \$/kW vs. 2,850 US \$/kW for NuScale
- **Construction schedule** of less than 36-months from the first safety concrete
- **The target LCOE** for the first 12-module power plant is of \$64/ MWh

Nuclear Energy in Romania



Two CANDU type reactor of 706.5 MWh each operating at Cernavoda NPP



Nuclear Energy in Romania



Reduction of CO₂ emissions in Romania since the commissioning of Units 1 and 2

170 million tones

Annual reduction of CO₂ emissions due to the operation of Cernavoda NPP

10 million tones

Nuclear energy in Romania today – 1400 MWe, 10.346,759 MWh, FC: U1 – 93.86%, U2 – 89,18%

18-20%

Nuclear contribution to clean electricity

33%

Jobs in the industry

11.000 jobs

Cumulated turnover in 2017 - approx. RON 2,730 million (approx. EUR 590 million)

EUR 590 m

Investments projected until 2030

EUR 8-9 bln

Deploying the first NuScale SMR in Europe



- **Small modular reactors are the future of energy stability in Europe:** leading countries such as France and the United Kingdom are taking accelerated steps to develop and implement SMRs as soon as possible in this decade.
- NuScale has signed MoU with different countries – Canada, Poland, Bulgaria, Ukraine, Czech Republic, UK, Kazakhstan etc., and is developing a 6 modules SMR in UTAH, US
- **Romania appears to be an ideal candidate for the first deployment of NuScale in Europe,** having the opportunity to prove its nuclear leading experience worldwide.
- Nuclearelectrica, as preferred operator, has signed a **Teaming Agreement with NuScale Power at the end of 2021** to deploy the first SMR in Romania, at the level of 2027/2028.

Romania's GHG emission reduction targets and Nuclear Power



The **SMRs** together with SNN plans for **Cernavoda Unit 1 LTO** and **Units 3 & 4** completion, and further development of the **renewable technologies**, represents an important part of the Romanian Energy Strategy

- **Nuclear Power is a key factor for GHG reduction with 40% by 2030** vs. 2019, on the road to be Carbon-neutrality by 2050, at the right time to support Romania's decarbonation targets
- **Enhancing the security of energy supply**, by reducing imports dependency from 21% today to 18% in 2030
- Replacing 4.6 GWe from the **coal capacities** to be retired by 2032

*(** PNIESC - Integrated National Plan in the field of Energy and Climate Change and PNRR - National Recovery and Resilience Plan)*

NuScale SMRs in Romania



NuScale power plant with 6 modules of an installed capacity of 462 MWe

- 193 permanent jobs
- 1500 jobs during construction
- 2300 jobs in manufacturing
- 4 million tons of CO2 avoided every year

- SNN and NuScale shall work in a coordinated fashion with the European Commission
- Regulatory Bodies from the both countries has to identify synergies and efficiencies utilizing lessons learned from NuScale's previous design certification review by the US NRC

Vision



ROMANIA COULD PROVIDE IN THE FUTURE

- **Production and assembly of SMRs components**
- **Preparation and training of future operators and specialists**
- Romania will develop the first full-scope simulator for the Control Room of a NuScale to be used for the training of the new generation of engineers



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