



2026

EUROPEAN HYDROGEN ENERGY CONFERENCE

SEVILLE

11th · 13th March 2026

Tailoring Low-Carbon Energy Systems for a Secure Transition; Aspects from Romania

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Hydrogen National Strategies in Europe

What does it mean:

1. At the **societal level**, the subject is considered important.
2. **Political makers** understand the contribution of hydrogen as an integral element of the energy sector, in particular, but also of industry and the economy in general.
3. The **private sector and stakeholders** have perspectives and can develop businesses.
4. The **labor market** and institutions that train specialists (e.g. universities, schools, etc.) understand the need to train new types of jobs and new skills.

Source: European Hydrogen Observatory



EU Green Deal

EU's commitment to reach carbon neutrality by 2050:

1. Phase 1 (2020-2024): 6 GW of renewable H2 electrolyzers (1 million tonnes),
2. Phase 2 (2025-2030): 40 GW of renewable H2 electrolyzers (10 million tonnes),
3. Phase 3 (2030-2050): $\frac{1}{4}$ of the EU's renewable electricity production will be used for hydrogen production.

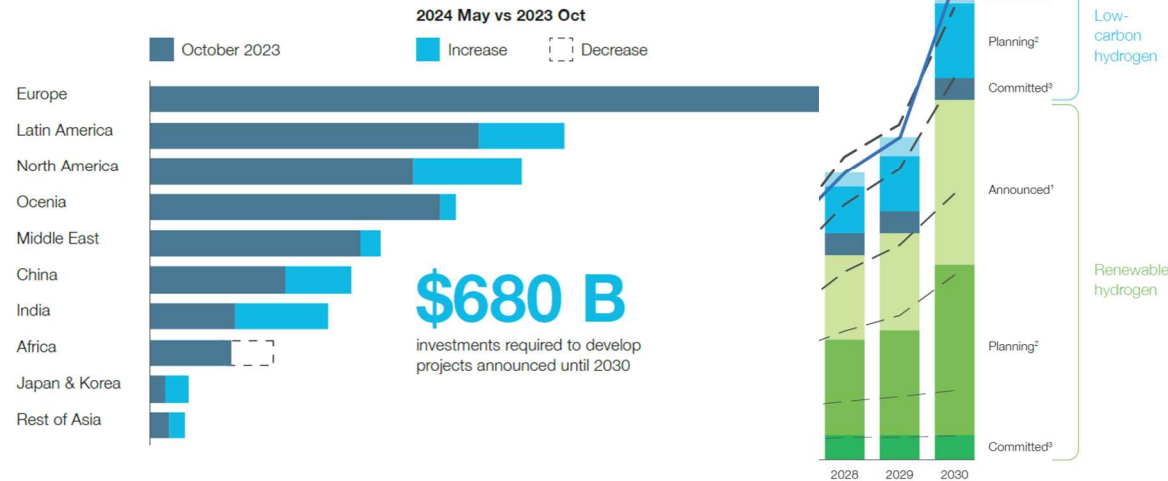
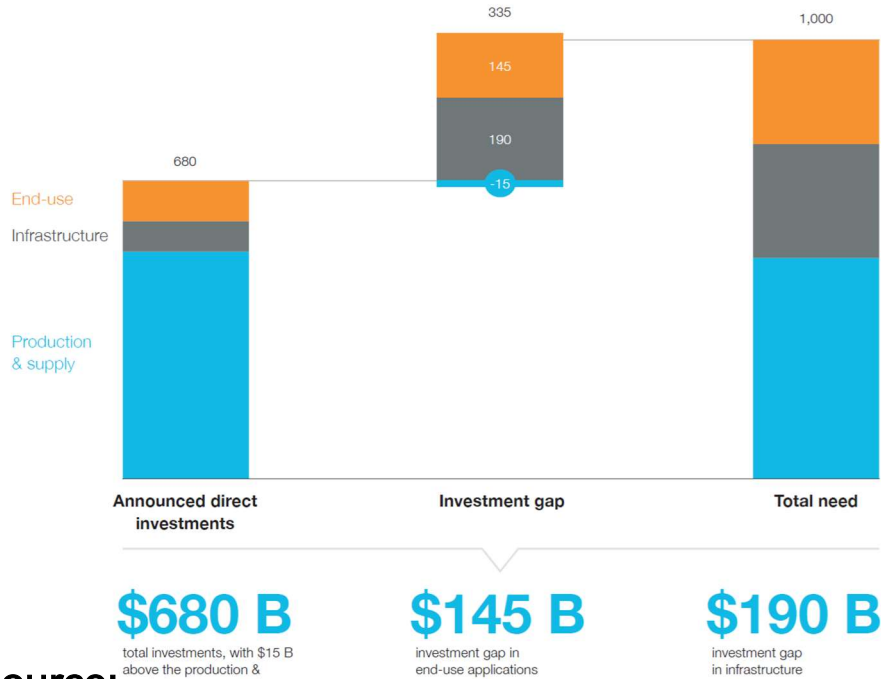


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Some numbers/aspects:

Hydrogen accounts
direct investments USD **1000 billion** by 2030.



Source: Hydrogen Insights September 2024, Hydrogen Council, McKinsey & Company

Green and low-carbon!

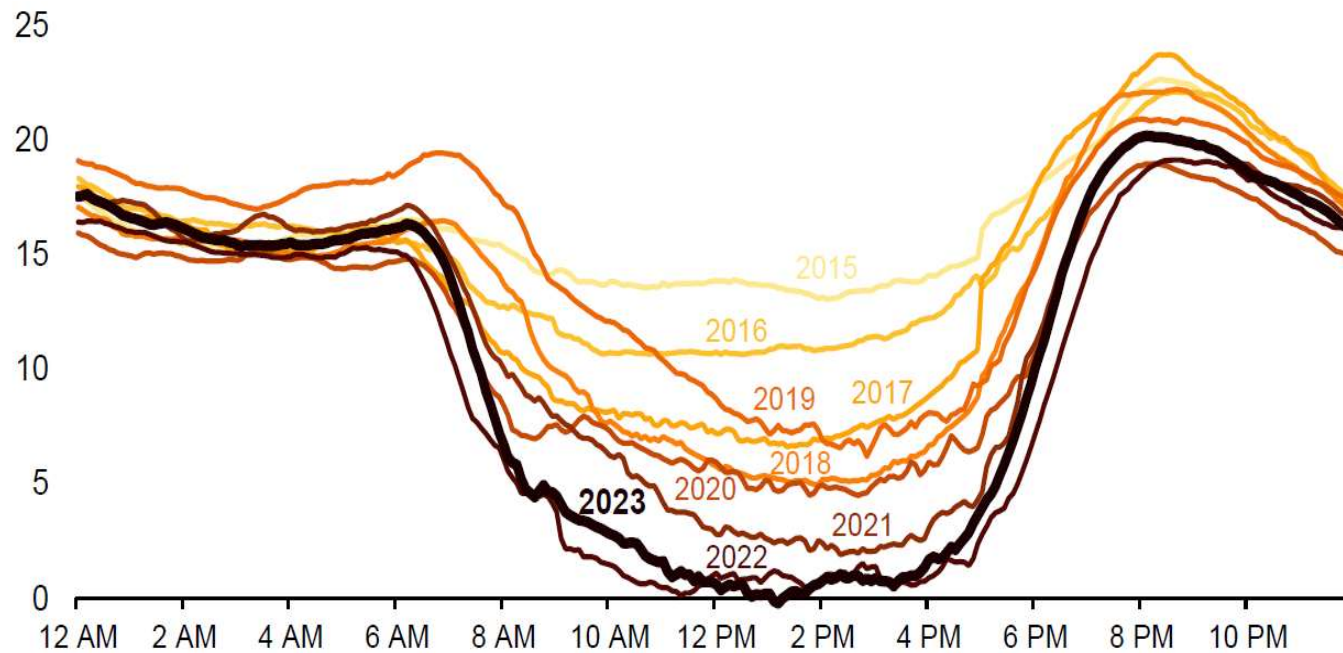
The key troubles with renewable electricity:

1. Intermittency,
2. Grid Infrastructure Limitations
(Grid Congestion),
1. Energy Storage Needs,
2. Low Energy Density and Efficiency,
3. Environmental and Ecological Impact,

In this context of green hydrogen, two aspects must be understood:

- 1 - the troubles faced by renewables will automatically transfer to renewable hydrogen;
- 2 - a reassessment of technologies must be made in order to consider the entire low-carbon portfolio.

Intermittency, new reality,
the net load variation for a typical day



Reference: U.S. Energy Information Administration, data source: California Independent System Operator (CAISO).

The key troubles with renewable electricity:

1. **Intermittency,**
2. Grid Congestion,
3. Energy Storage Needs,
4. Low Energy Density and Efficiency,
5. Environmental and Ecological Impact, ...

This reality from energy systems, the increased sharp between the periods with minimum and maximum electricity consumption, has been named, quite unscientifically and non-technically, as **"duck curve"** *.

* EIA, As solar capacity grows, duck curves are getting deeper in California, June 2023, U.S. Energy Information Administration, <https://www.eia.gov/todayinenergy/detail.php?id=56880>, (accessed at 25.08.2023).

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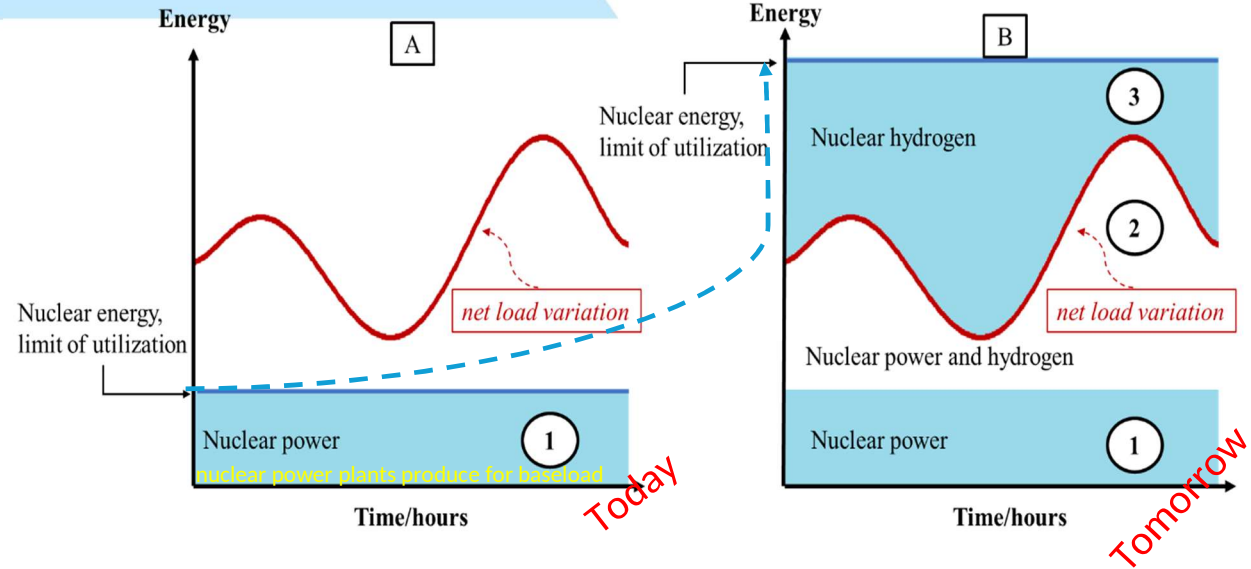
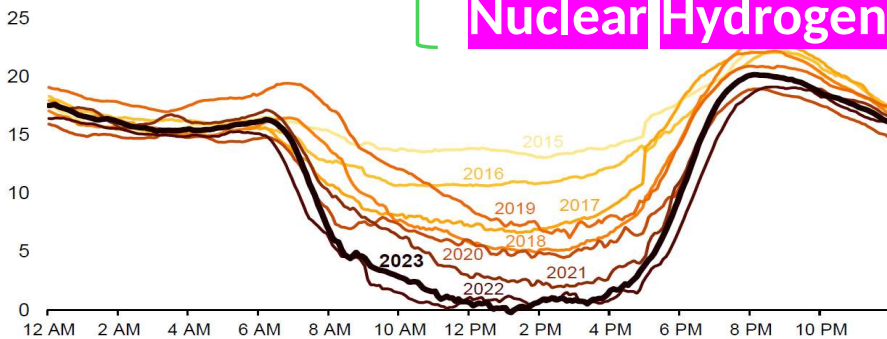
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Low-Carbon

Green energy

&

Nuclear Hydrogen



Reference: U.S. Energy Information Administration, data source: California Independent System Operator (CAISO).

New nuclear energy potential!

New opportunities:

- new capacities of nuclear power plants over the baseload barrier,
- zero-carbon hydrogen production,
- New nuclear reactors/power plants, for hydrogen production ...

Grid services:

- grids congestion/back-ups,
- balancing mechanisms,
- spinning reserves,
- arbitrage in the electricity market ...

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Theoretical approaches and dissemination: studies, articles, briefings presentations posters books, participation in the



Progress of the IAHE Nuclear Hydrogen Division on international hydrogen production programs

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NUCLEAR HYDROGEN PERSPECTIVES IN ROMANIA

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ABSTRACT

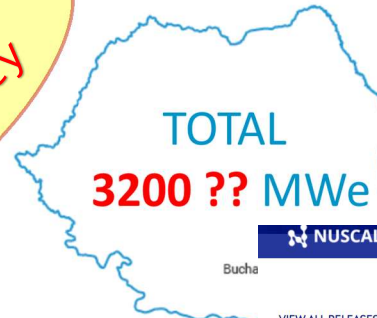
This work presents the latest advances of nuclear hydrogen perspectives in Romania. The topic is really new and nuclear hydrogen is considered a new perspective through its low carbon or zero carbon production. The role of nuclear hydrogen production in a low-carbon economy is analysed now by many scientist and many stakeholders, especially national or local authorities, consider that as a new perspective for nuclear energy sector.

Nuclear reality

Reactor Name*	Model	Reactor Type	Net Capacity (MWe)	Construction Start	First Grid Connection
Cernavoda 1	CANDU 6	PHWR	650	1983-03	1996-07
Cernavoda 2	CANDU 6	PHWR	650	1983-07	2007-08

Reactors planned in Romania

Reactor	Type	MWe	Planned commercial gross operation
Cernavoda 3	Candu 6	720	2031
Cernavoda 4	Candu 6	720	2032
Total (2)		1440	



NuScale and Nuclearelectrica Team Up to Advance Clean Nuclear Technology in Romania 11/02/2021

As world leaders and government officials convene in Glasgow to address climate change,

International Association for Hydrogen Energy (IAHE) → Nuclear Hydrogen Division (2010)



- 2010 WHEC Conference, Essen, Germany
- 20 attendees
- one Romanian delegate



The mission of the IAHE Nuclear Hydrogen Division is to organize and promote activities that foster development of nuclear systems for hydrogen production, including thermochemical cycles, electrolysis, and related elements such as safety and materials science.

THE WHITE HOUSE

NuScale Power, bringing the most advanced civil nuclear technology to a critical part of Europe. The partnership will bring SMR technology to Romania, positioning U.S. technology to lead in the global race for SMR deployment. The commercial agreement will include a six-module NuScale plant initially creating over 3,700

Virgil Popescu: Vom instala SMR pe amplasamentele existente ale centralelor pe cărbune; o centrală NuScale cu 6 module de 462 MWe ar preveni emiterea a peste 4 milioane de tone de emisii de CO2 pe an



Thank you for attention!

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