



Contribution of nuclear LTO to EUs security of supply

Yves Desbazeille

Director General

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Membership

FORATOM - the voice of the European nuclear industry in energy policy discussions with EU Institutions & other key stakeholders.

The membership of **FORATOM** is made up of 15 national nuclear associations representing more than 3,000 companies.

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Bulgaria

Finland

France

Hungary

Italy

Netherlands

Romania



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Slovenia

Spain

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CEZ (Czech Republic), **Fermi Energia** (Estonia), **NUVIA** (France), **PGE EJ 1** (Poland), **Rolls-Royce** (UK) and **URENCO** (Netherlands) are Corporate Members

Background



IPCC

- At an international level, the latest IPCC report (Global Warming of 1.5°C, October 2018) recognises that nuclear power is essential if the world is to keep global warming to below 1.5 degrees.
- According to one of the IPCC scenarios, a six-fold increase in global nuclear capacity is needed if we want to achieve our climate goals.



IEA

- According to its report launched in May 2019 - Nuclear Power in a Clean Energy System – *“Lifetime extensions of nuclear power plants are crucial to getting the energy transition back on track”*
- Recommendations of “Energy Policy Review” 2020 of IEA is for concerned MS *“...to keep the nuclear option open by supporting the lifetime extension of existing nuclear power plants as well as new plants...”*



European Commission

- “Clean Planet for All” – confirms that nuclear will form the backbone of a carbon-free European power system together with renewables.
- Nuclear capacity will be in the range of 99 to 120 GW (15% in the electricity mix)



European Commission

- “Stepping up Europe’s 2030 climate ambition” communication – consider for 2030 a nuclear capacity of 92 GW, that cannot be achieved without a extensive programme of lifetime extension of the current fleet of nuclear reactors

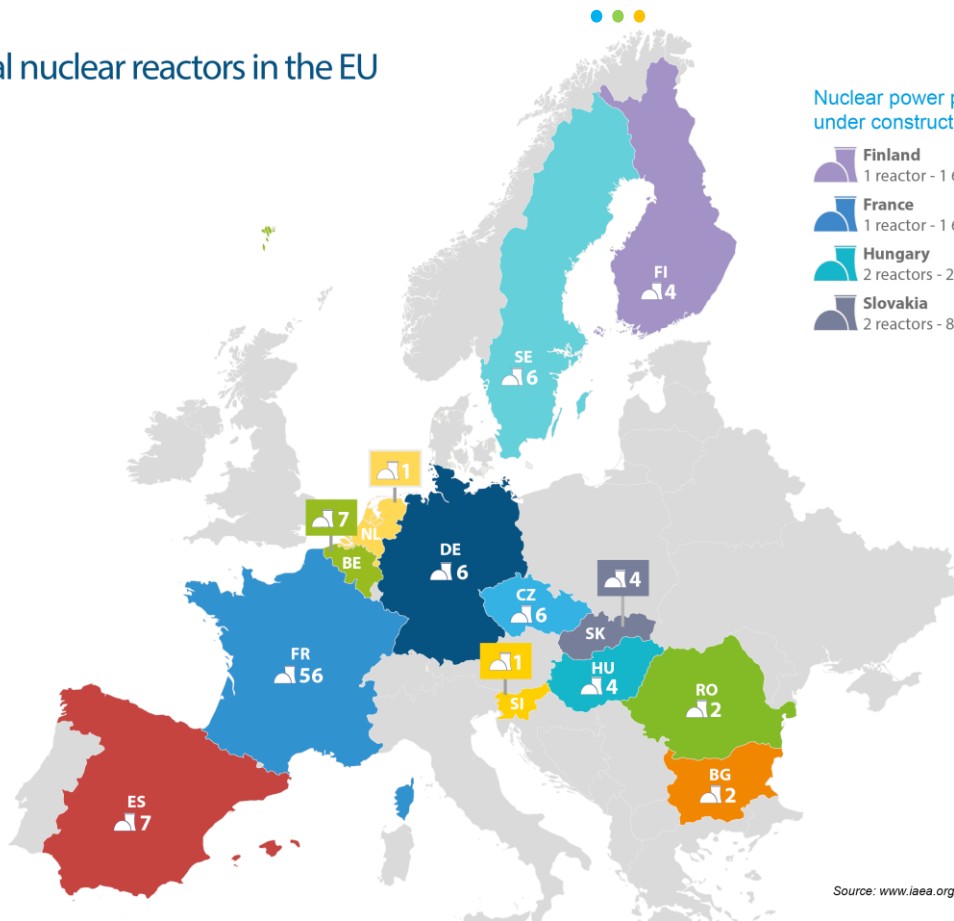
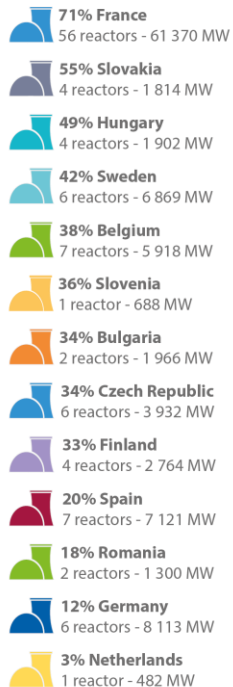
Currently the 105 GW of installed nuclear capacity in the EU accounts for around 1/4 of the electricity generated and almost 50% of the low-carbon electricity. Nuclear power will clearly play an important role in the 2050 carbon-free power sector.

During the transition towards 2050, nuclear power will mainly rely on LTO.

Nuclear energy in EU27

106 Operational nuclear reactors in the EU

Nuclear share of electricity



EU ELECTRICITY PRODUCTION

26%



EU LOW-CARBON ELECTRICITY

50%

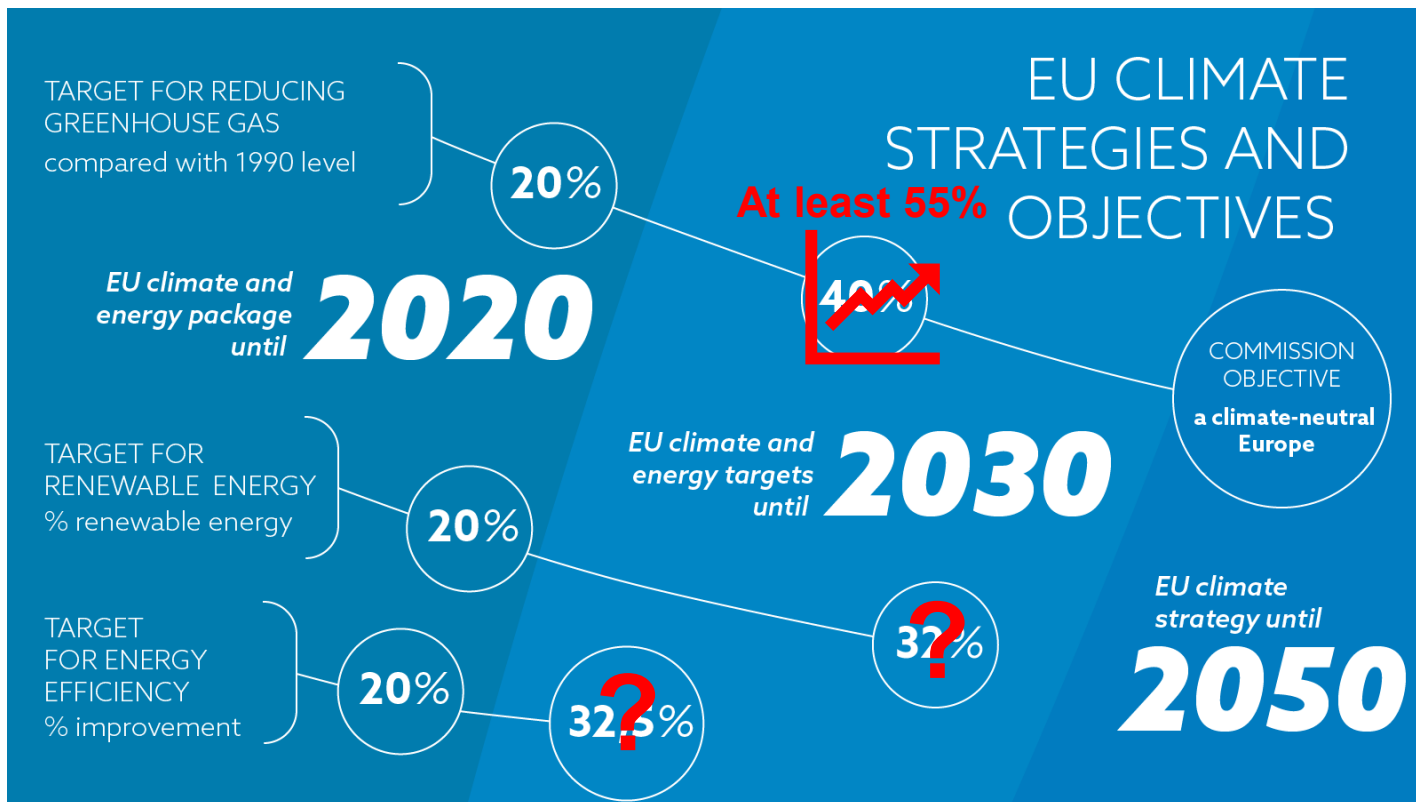


STRATEGIC INDUSTRY

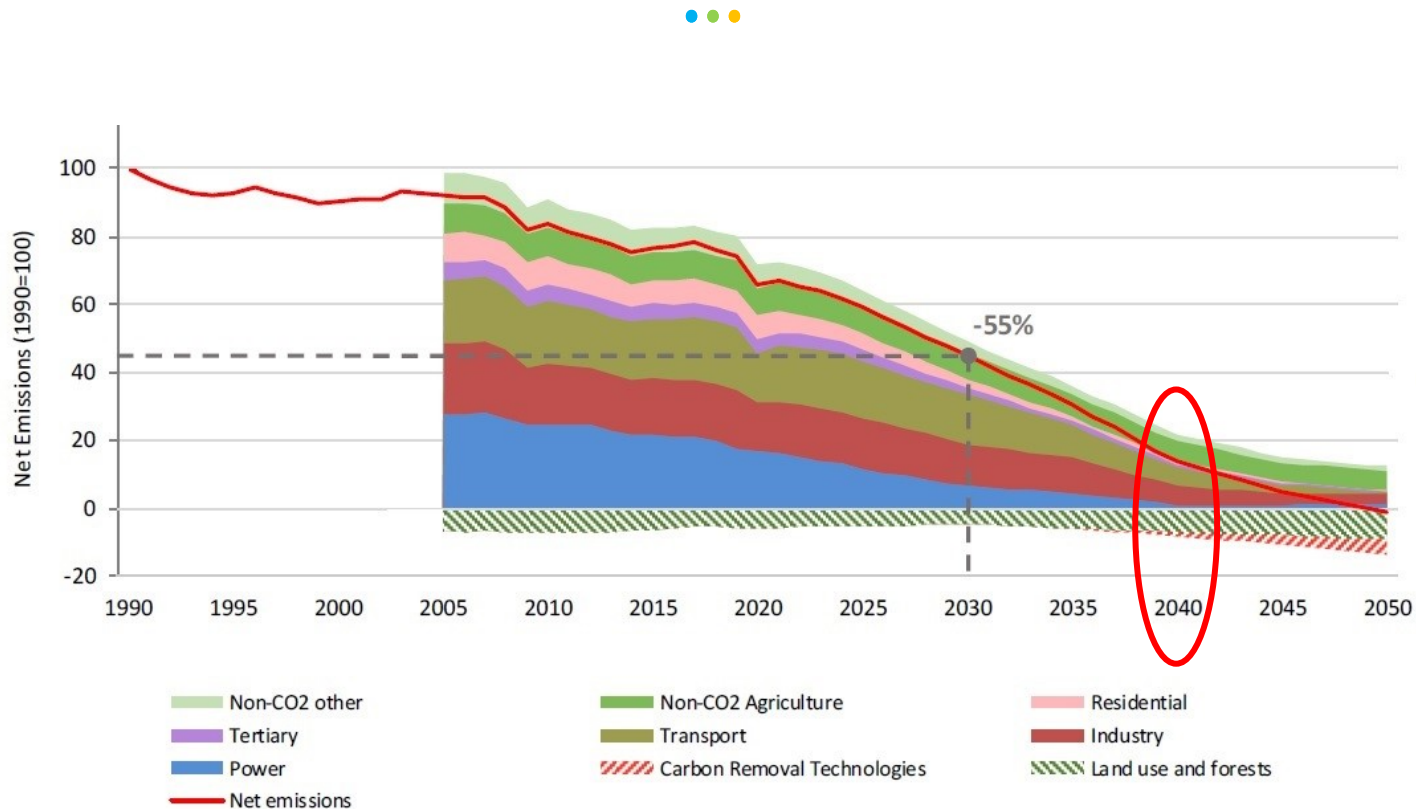
1.1m JOBS



Decarbonisation of the EU economy



Decarbonisation of the EU economy

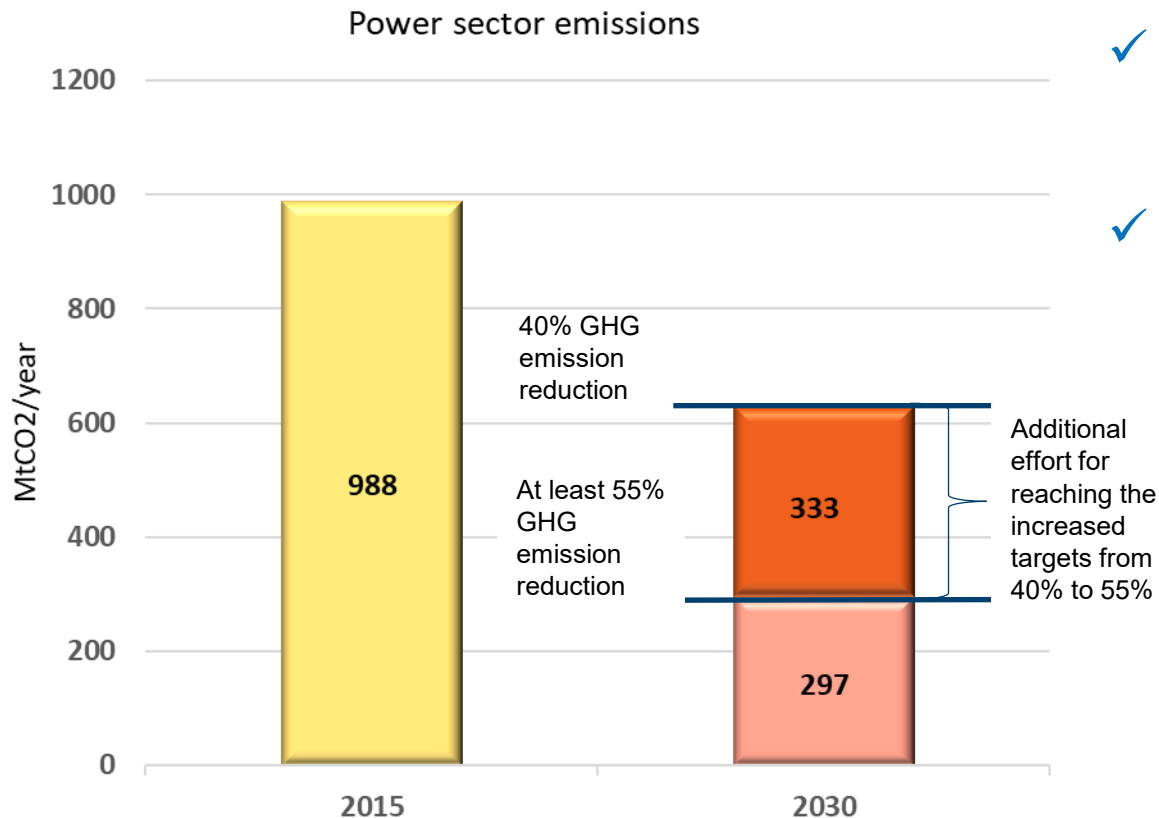


Source: Stepping up Europe's 2030 climate ambition - COM(2020) 562 final



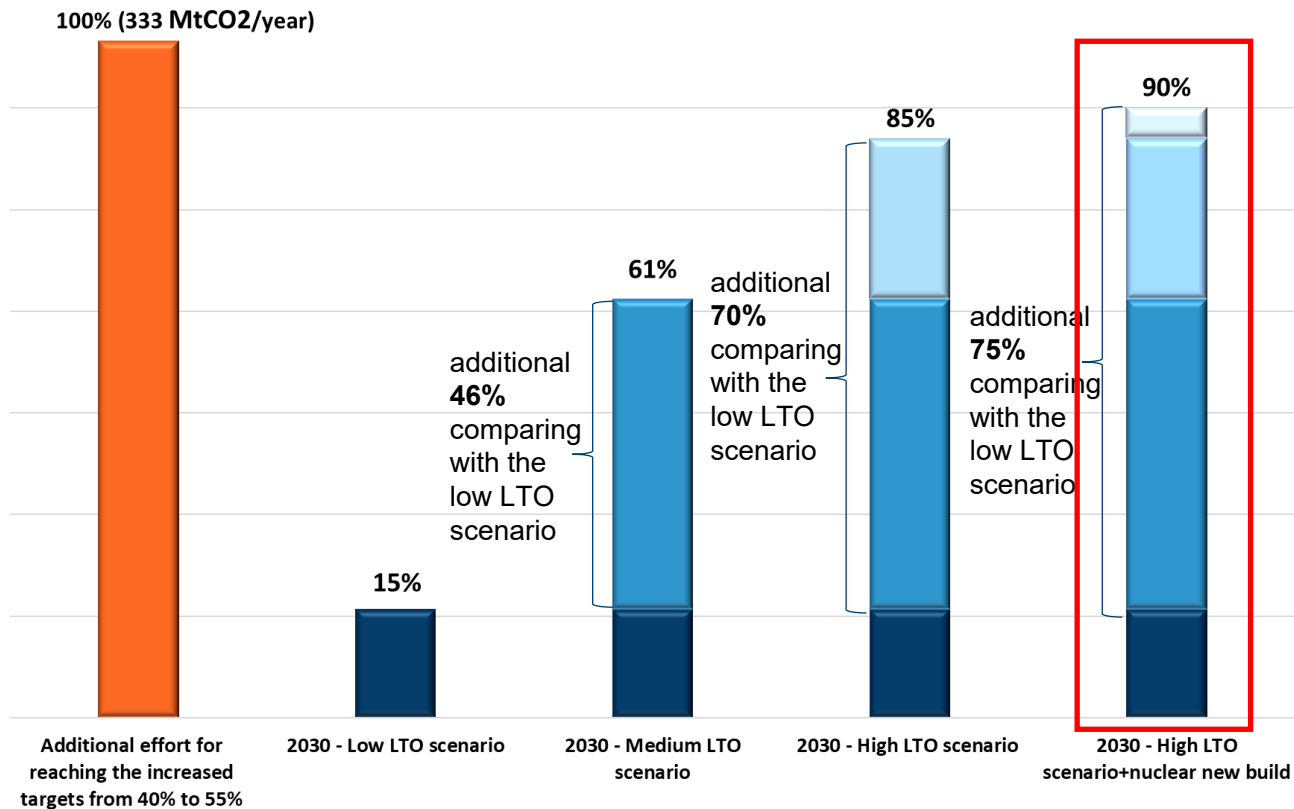
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Impact of the lifetime extension of the existing nuclear fleet on the new decarbonization targets



- ✓ FORATOM made its own analysis based on the Impact Assessments of the different communications related to decarbonisation targets.
- ✓ For the power sector, for
 - 40% GHG emissions reduction targets, the maximum annual emissions are 630 MtCO₂
 - At least 55% GHG emissions reduction targets, the maximum annual emissions are 297 MtCO₂

Impact of the lifetime extension of the existing nuclear fleet on the new decarbonization targets



Benefits of nuclear LTO

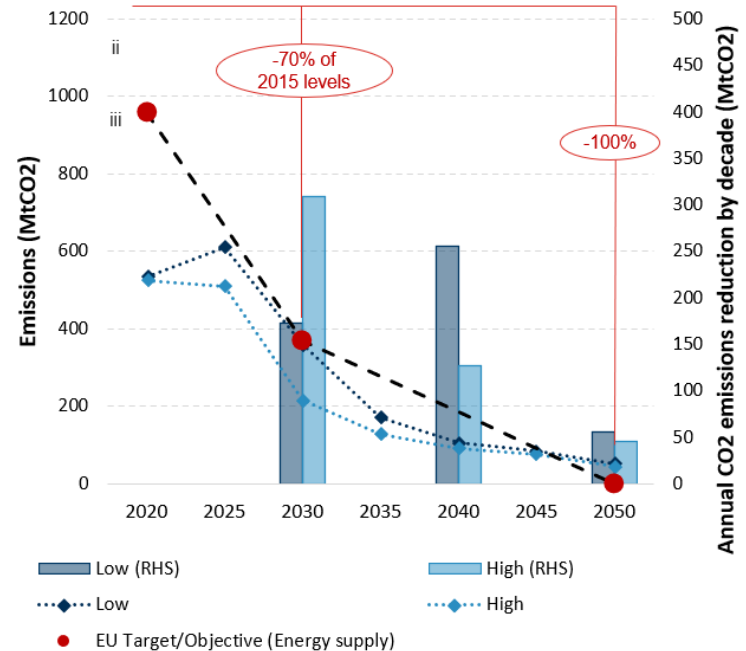


Benefits of nuclear LTO

Decarbonisation

- ✓ An early closure of nuclear plants would need additional fossil power generation resulting in **1590 Mt** of additional CO₂ emissions or **19% of total CO₂ emissions from the power sector** over 2020-2050 in the low nuclear scenario.
- ✓ While both scenarios achieve the CO₂ emission reduction target in 2030 and the 2050 objective, **the overall carbon budget in the case of high nuclear scenario will be lower than in low nuclear scenario.**
- ✓ Furthermore, anticipated closure of nuclear in the low scenario would lead to increased CO₂ emission by 2025, thus jeopardizing 2030 increased ambition.

The updated “Pathways to 2050: Role of nuclear in a low-carbon Europe” Compass Lexecon report soon to be released



A decrease in the share of low-carbon capacity resulting from not investing in the LTO of existing nuclear reactors will increase emissions in the medium term.

Reasons: dependence on fossil fuels to back up needs

Benefits of nuclear LTO

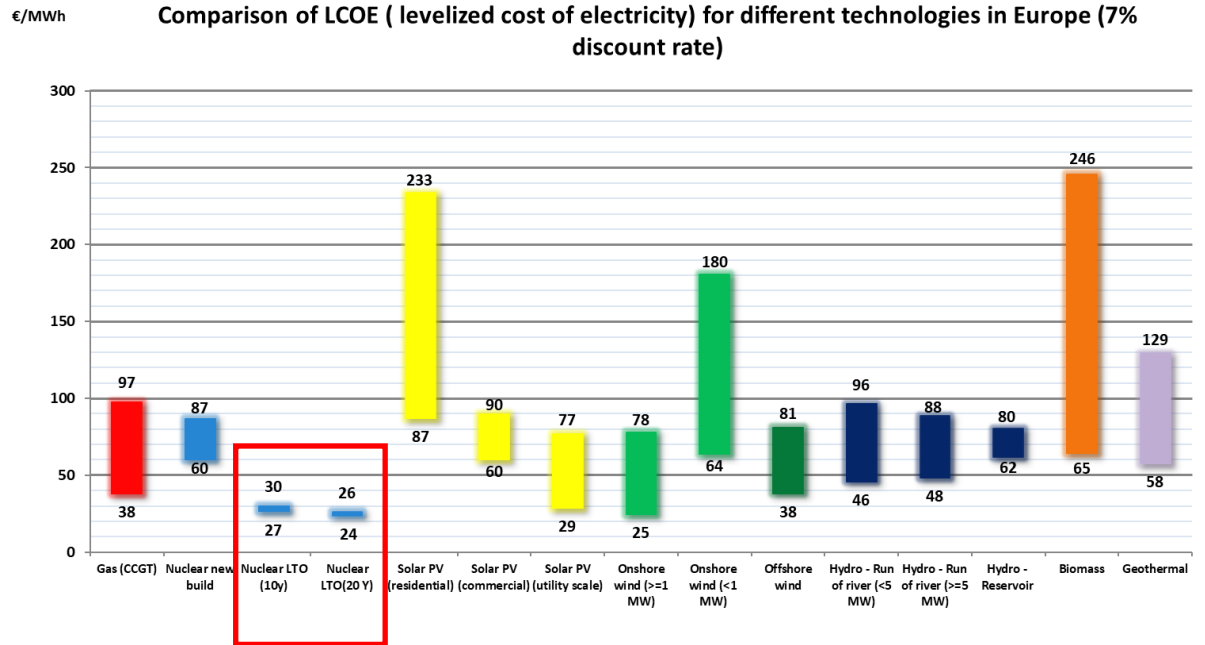


Benefits of nuclear LTO

Economy

Nuclear LTO is the most economically advantageous compared to other power sources

Beside the lowest generation costs for LTO, the lifetime extension and new build in the high scenario have a positive impact on consumer costs, by saving a total of **392bn€**



(preliminary results of the updated “Pathways to 2050: Role of nuclear in a low-carbon Europe” Compass Lexecon)

FORATOM takeaways from the [“Projected Costs of Generating Electricity 2020”](#) IEA report



Benefits of nuclear LTO

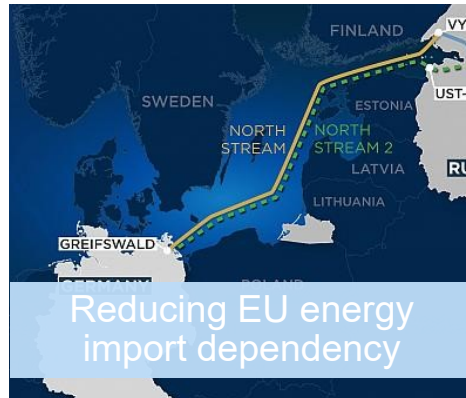


Nuclear LTO provides a great advantage thanks to the “...timely implementation of reasonably practicable safety improvements”.

- ✓ Safety improvements bring older generation reactors to a level of nuclear safety standards in compliance with the amended Nuclear Safety Directive.
- ✓ There is no cliff edge effect in either the level of safety or technical degradation due to ageing when reaching the original design lifetime.



Benefits of nuclear LTO



Benefits of nuclear LTO

Energy security and system reliance

Fossil-fuel lock-in effect

- Over 2020-2050 – increase coal consumption by 12% & gas by 26%
- Increase EU import dependency

Capacity margin from dispatchable sources

- A recent report from [France Stratégie](#) has showed some significant security of supply risks in western Europe (see table below). This situation will be similar in other regions
- [France Stratégie](#), the “threshold from which the electrical system becomes unstable is currently estimated at 40% vRES”

Capacity margin in Western Europe (source France Stratégie)(MW)

	2020	2025	2030	2035
FS estimate with current phase-out scenarios	34	16	-7,5	-10
FORATOM High LTO scenario	34	31	21	18

Regarding LTO, what has to be done at EU level?

Ensure a coherent, consistent & stable EU policy framework (including Euratom).

Pursue the ambitious net-zero CO2 emissions target for the EU in 2050 and to choose the most economic and technical feasible path to achieve it.

Develop & implement a strong industrial strategy to ensure that Europe maintains its technological leadership.

Support human competences development