



Role of Nuclear Energy in decarbonising Europe

FORATOM Director General Yves Desbazeille

25.11.2020

Who we are



FORATOM acts as the voice of the European nuclear industry in energy policy discussions with EU Institutions and other key stakeholders.



Key topics



EU Energy Policy:

- Economics of nuclear
- EU energy mix
- Euratom Treaty
- Security of energy supply
- Sustainability
- Special projects - Brexit

Nuclear technology:

- Innovation, R&D
- Nuclear safety*
- Nuclear transport
- Supply chain
- Waste disposal

Communication:

- Nuclear advocacy
- Perception of nuclear energy
- Promotion of nuclear energy
- Public opinion

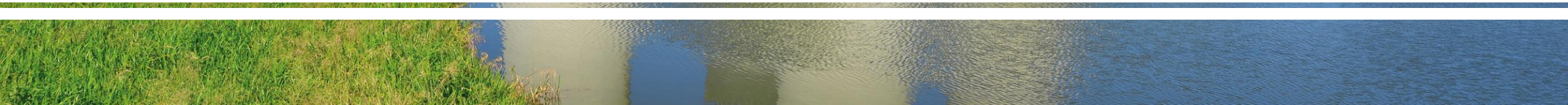
Legal aspects

* Topic overseen by ENISS





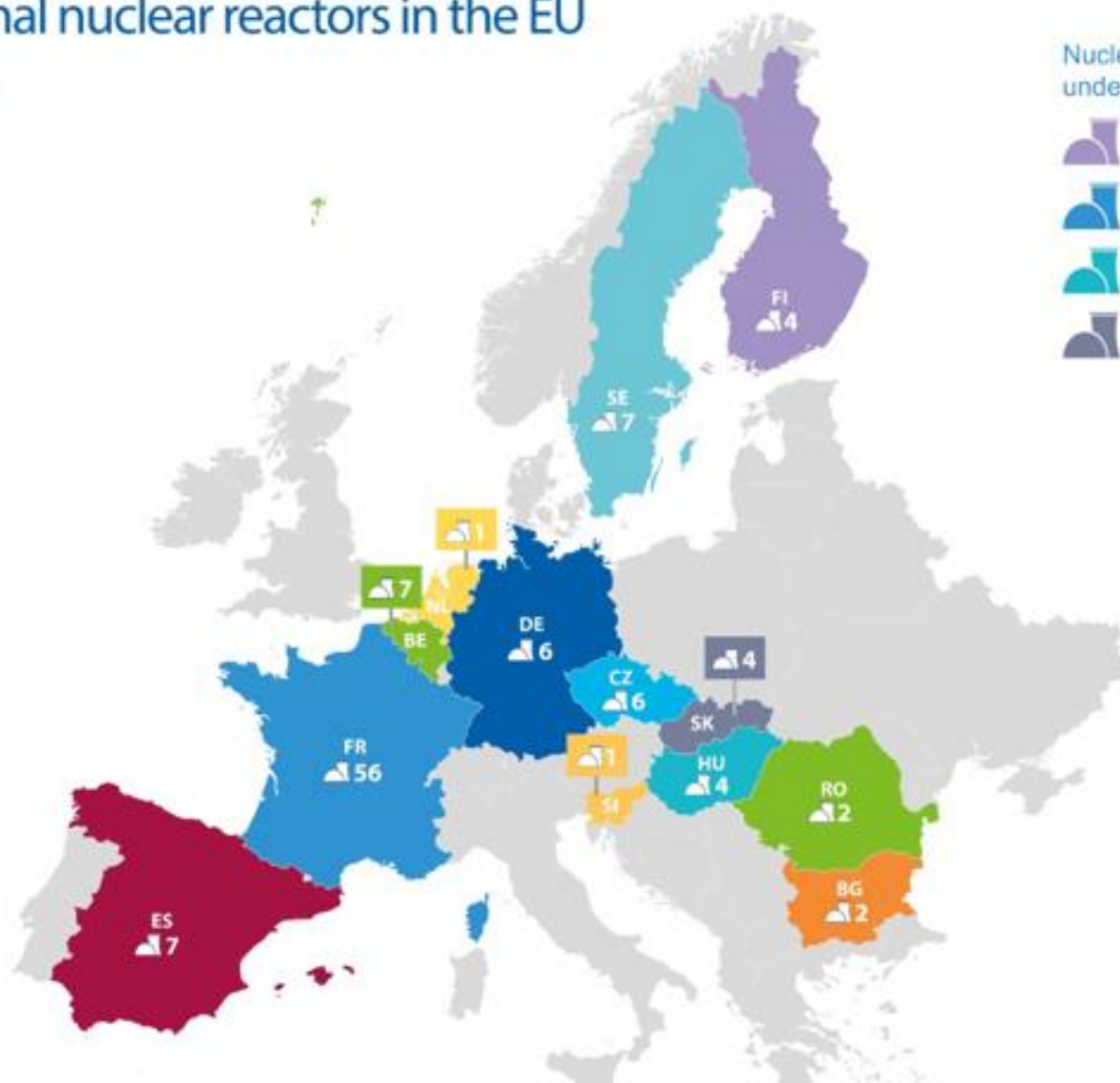
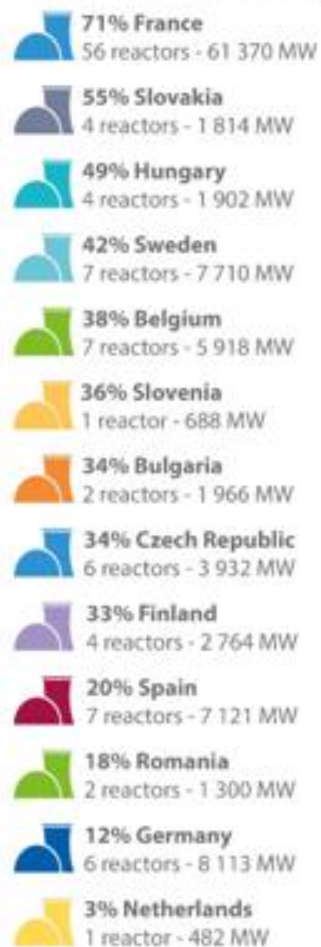
NUCLEAR ENERGY EU LANDSCAPE



Nuclear energy in the EU

107 Operational nuclear reactors in the EU

Nuclear share of electricity



Nuclear power plants under construction



ELECTRICITY PRODUCTION

26%

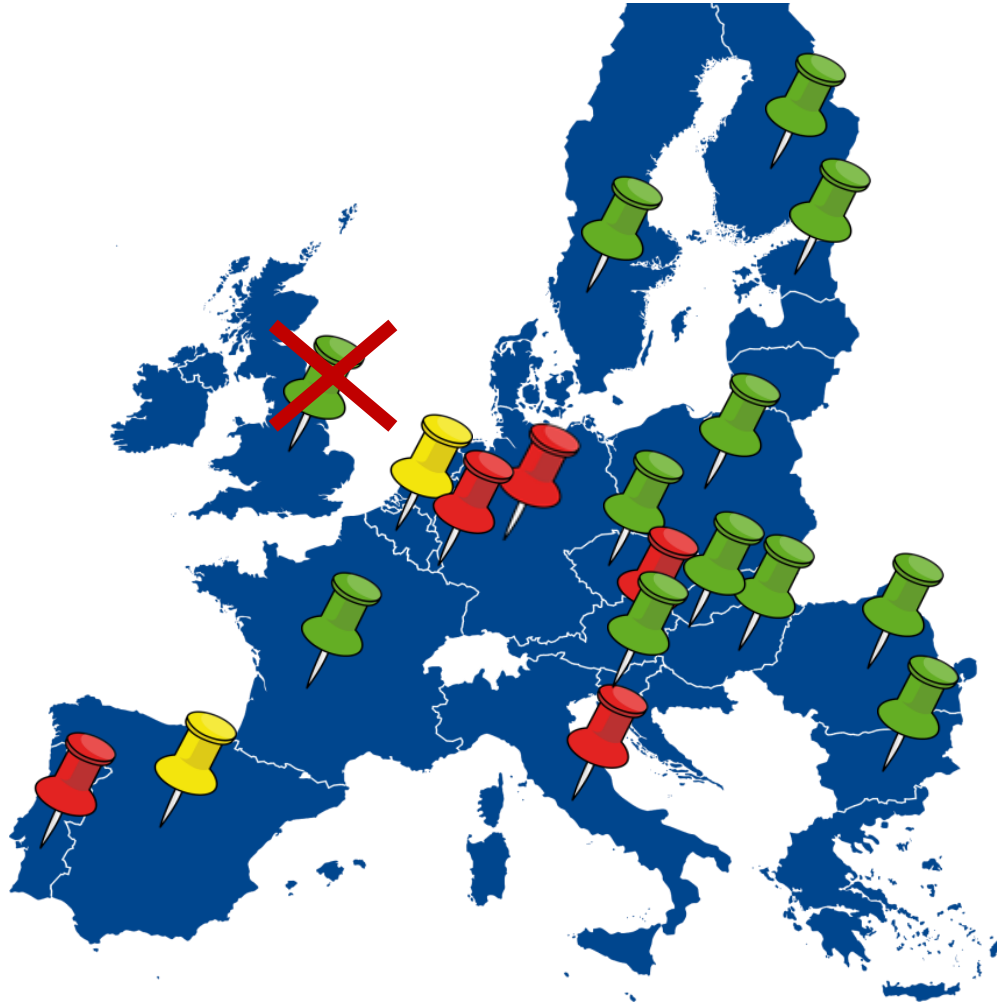


LOW-CARBON ELECTRICITY

50%



EU landscape



1. Many EU member states have recently announced their plans to invest in or continue using nuclear energy:

- Bulgaria
- Czech Republic
- Estonia
- Finland
- Hungary
- **Poland**
- Romania

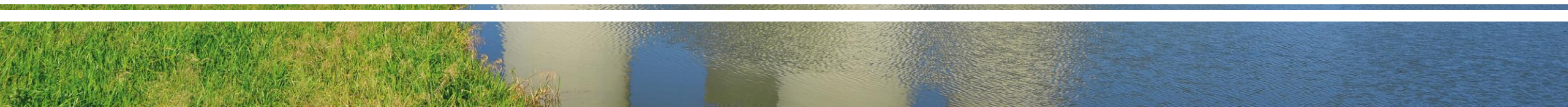
2. All nuclear projects, examined by the EC, have been cleared and will be carried out.

3. Each MS has the right to choose nuclear as part of its energy mix in line with the objectives of the Euratom Treaty.

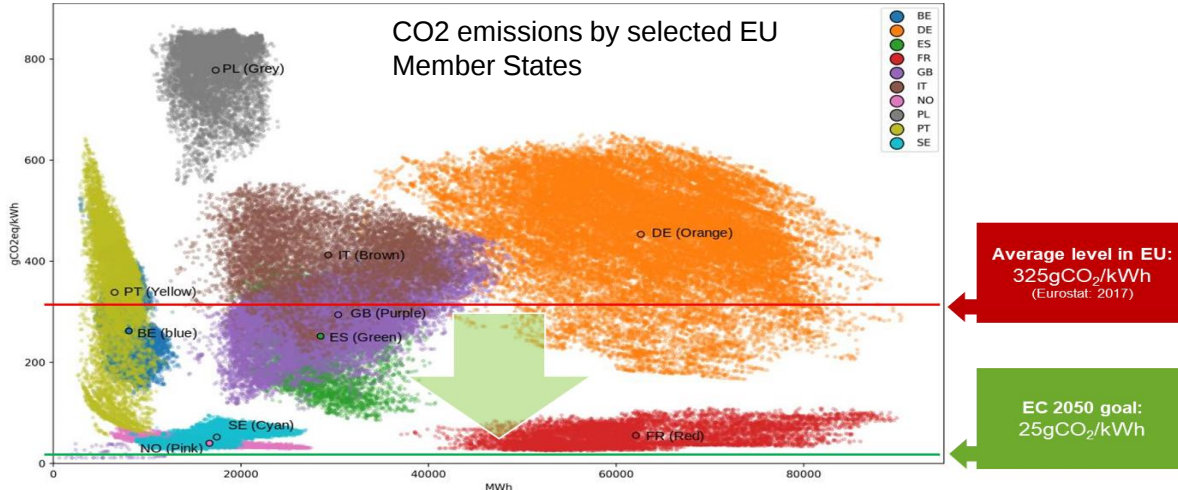




ROLE OF NUCLEAR IN DECARBONISING THE EU



Role for Nuclear in decarbonisation



Source: Tranberg, B., Corradi, O., Lajoie, B., Gibon, T., Staffell, I., & Andresen, G. B. (2018). Real-Time Carbon Accounting



"Alongside renewables, energy efficiency and other innovative technologies, **nuclear can make a significant contribution to achieving sustainable energy goals** and enhancing energy security."

Fatih Birol, Executive Director, IEA

source: IEA, 2019



- ✓ All low-carbon primary energy sources, including renewables, **nuclear** & fossil with CCS, have a role to play.
- ✓ Nuclear power increases its share (on average by around 2.5 times) in most 1.5°C pathways with no or limited overshoot by 2050.
- ✓ A **significant increase** in the contribution of **nuclear energy** is necessary

Source: IPCC, "Global Warming of 1.5°C", 2018



"**Without nuclear energy** as a dispatchable and low carbon energy source, **the overall cost of achieving deep decarbonisation targets will increase significantly**"

Source: MIT „The Future of Nuclear Energy in a Carbon-Constrained World”, 2018

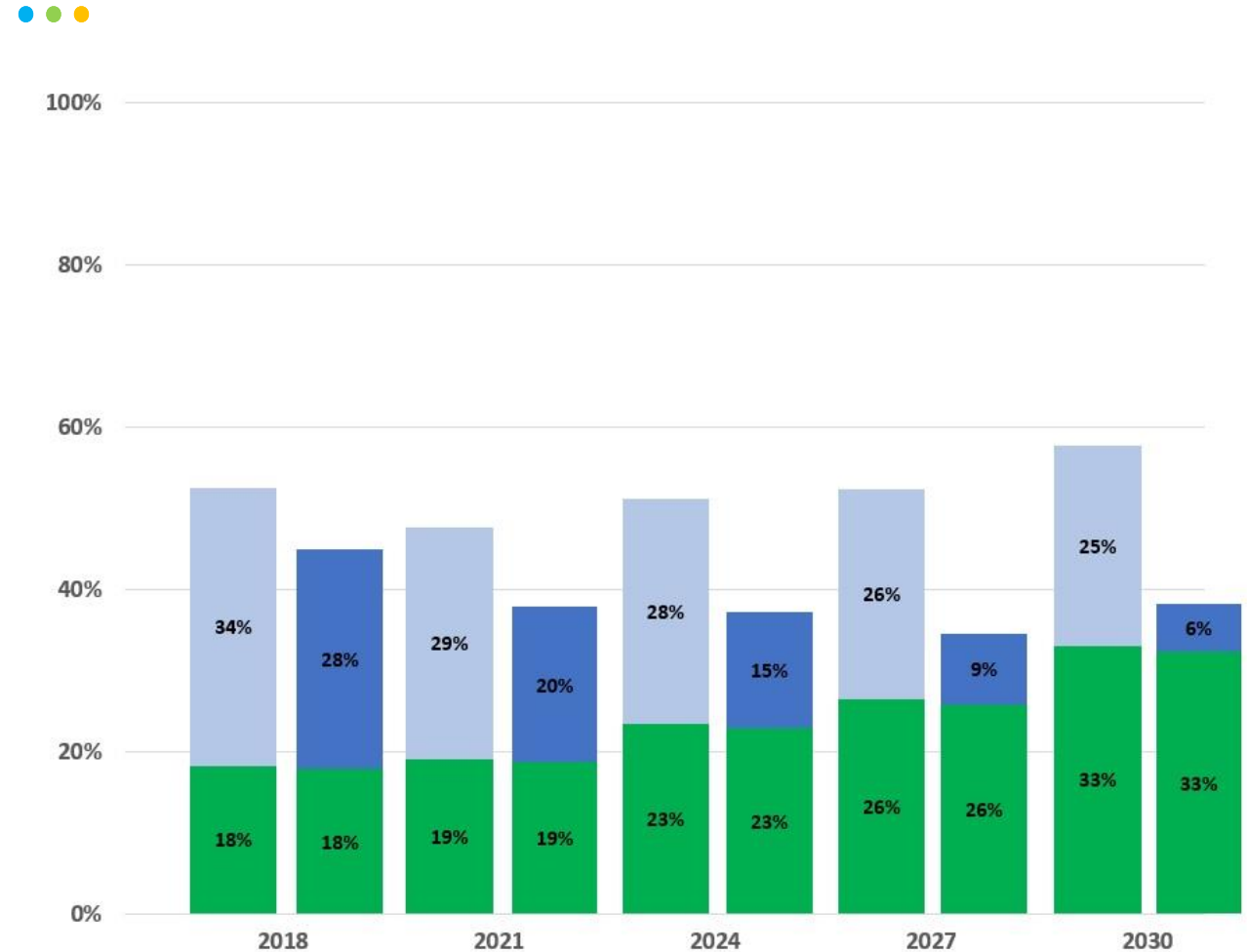


www.foratom.org | foratom@foratom.org |

Role for Nuclear in decarbonisation

To achieve the intermediate decarbonisation targets in the transition towards 2050, the role of nuclear power plants will be crucial

- ✓ If the EU were to invest in maintaining a fully operational nuclear fleet over, then 58% of its electricity would come from low-carbon sources by 2030.
- ✓ The decrease in the share of low-carbon capacity resulting from not investing in nuclear LTO, will increase emissions in the medium term.

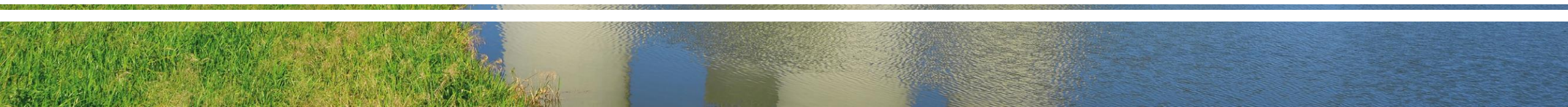


FORATOM calculation on the share of low-carbon electricity generation with (light blue) and without (dark blue) LTO and renewables (green)





INITIATIVES IMPACTING THE NUCLEAR SECTOR



EU developments impacting the nuclear sector





EUROPEAN GREEN DEAL

European Green Deal



European Green Deal

“The European Green Deal is a roadmap for making the EU’s economy sustainable by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all”.



What needs to be done?

- If the EU wants to achieve its zero-carbon target by 2050, then its current 2030 CO2 reduction targets may not be enough.
- Commission should allow Member States to choose their own low-carbon energy mix.
- Commission should adopt a technology-neutral approach.
- Ensure a stable, coherent & consistent policy environment

European Green Deal



Topics followed by FORATOM

list updated depending on the identified impact on nuclear

Climate ambitions

- EU Climate Law
- 2030 Climate Target Plan
- Review of relevant legislative measures – Energy Efficiency Directive review

Clean, affordable and secure energy

- Assessment of the final National Energy and Climate Plans
- Strategy for smart sector integration
- Hydrogen strategy

Industrial strategy for a clean and circular economy

- EU Industrial strategy
- Circular economy

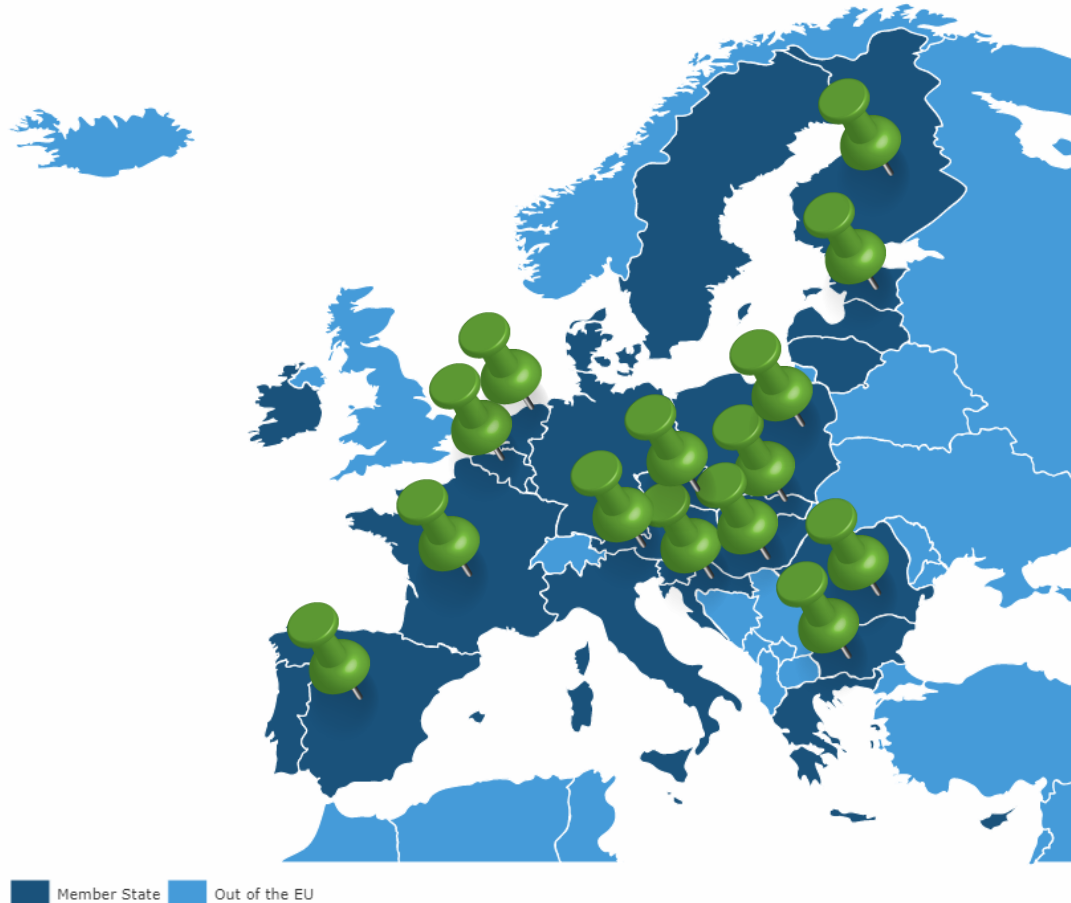
Mainstreaming sustainability in all EU policies





National Energy and Climate Plans

National Energy & Climate Plans



EU Member States with nuclear in their NECPs
(existing reactors, R&I or new build plans)

	Nuclear Discussed in NECP positively to meet part of 2030 plan (existing power, new build or R&I)	Ongoing Nuclear Operations or LTO mentioned	Energy security includes existing or future nuclear power in the energy mix	Nuclear considered as part of objective of increasing the flexibility of the national energy systems	Nuclear R&I (inc SMRs, advanced reactors, innovative use of nuclear, R&D for LTO or SET Plan Action 10)
Belgium	✓				✓
Bulgaria	✓	✓	✓	✓	✓
Croatia	✓	✓	✓		
Czechia	✓	✓	✓	✓	✓
Estonia	✓				✓
Finland	✓	✓	✓	✓	✓
France	✓	✓	✓	✓	✓
Hungary	✓	✓	✓	✓	✓
Lithuania					✓
Holland	✓	✓	✓	✓	✓
Poland	✓		✓	✓	✓
Romania	✓	✓	✓	✓	✓
Slovakia	✓	✓	✓	✓	✓
Slovenia	✓	✓	✓	✓	✓
Spain	✓	✓	✓	✓	✓
Sweden	✓		✓	✓	✓



ENERGY SECTOR INTEGRATION (HYDROGEN & HEAT)

Hydrogen & ESI developments at EU level



European Commission:

„The **EU Hydrogen Strategy** addresses how to transform the potential of hydrogen in supporting decarbonisation of industry, transport, power generation and buildings across Europe the into reality, through investments, regulation, market creation and research and innovation”



European Commission:

The **EU Strategy for Energy System Integration** will provide the framework for the green energy transition. The current model cannot deliver climate neutrality by 2050 in a cost-efficient way. The changing costs of innovative solutions have to be integrated in the way we operate our energy system. New links between sectors must be created and technological progress exploited.



Role for nuclear energy



Nuclear reactors are capable of delivering heat for use in applications such as district heating, industrial processes, **hydrogen production**, chemicals refinement and seawater desalination.

Hydrogen

- ✓ Nuclear power plants can **produce low-carbon hydrogen in a variety of methods** that would reduce the GHG emissions.
- ✓ A single 1,000-megawatt nuclear reactor could produce though electrolysis **more than 200,000 tonnes of low-carbon hydrogen each year**.
- ✓ It can be provided by the **existing fleet of nuclear reactors** and from **new innovative and advanced reactors**.

In FORATOM's opinion, it is essential that the EU adopt a technology-neutral approach based on the impact of each technology on the CO2 emission reduction targets, and leveraging all the mature low-carbon energy sources that can support the production of hydrogen within Europe.

FORATOM urges the EU to acknowledge the important role that the nuclear energy sector will provide in this context.

Energy System Integration

- ✓ Nuclear energy is a source of **process heat for various industrial applications**
- ✓ It can help other industries by offering alternative sources of decarbonised energy such as hydrogen and heat (**sector coupling**).
- ✓ Use of nuclear heat would save large amounts of European forests, decrease habitat loss and improve carbon sinks as less biomass would be needed for heat decarbonisation.

In FORATOM's view, the EU should include the many applications which nuclear technologies are able to work in synergy with sector coupling such as district heating and industrial process heat.

The **European Green Deal** and **Horizon Europe** should fund projects that enable the SET Plan technologies to advance sector coupling R&I between low carbon energy sources and end users such as industrial heat.

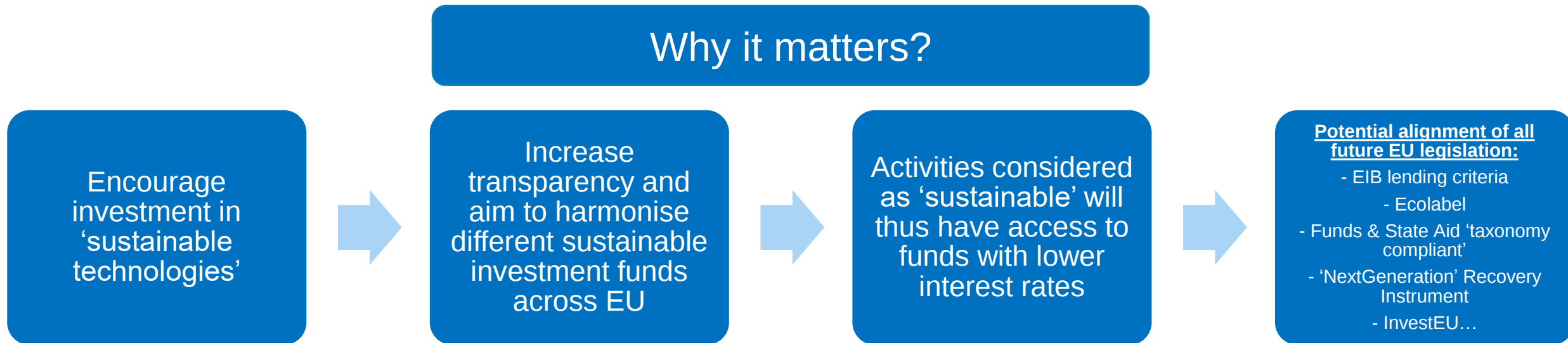


SUSTAINABLE FINANCE

Legislation Overview



- March 2018: Commission adopts Action Plan on Financing Sustainable Growth
- May 2018: Commission presents 3 legislative proposals on sustainable finance:
 - [Proposal for a regulation on disclosures relating to sustainable investments and sustainability risks and amending Directive \(EU\) 2016/2341](#)
 - [Proposal for a regulation amending Regulation \(EU\) 2016/1011 on low carbon benchmarks and positive carbon impact benchmarks](#)
 - [Proposal for a regulation on the establishment of a framework to facilitate sustainable investment](#) (Taxonomy)



Sustainable Finance Initiatives – Taxonomy

Financing Sustainable Growth

The European Commission adopts an Action Plan on Financing Sustainable Growth in March 2018

With a regulation on the establishment of a framework to facilitate sustainable investment

Establishes a series of Technical Experts Group (TEG) of which one on Nuclear and another one on Do No Significant Harm



Nowadays situation

Confirms that nuclear is low-carbon and therefore contributes to climate mitigation. BUT (on the DNSH criteria)

- TEG believes that there are significant data gaps
- TEG finds that existing evidence is complex and difficult to evaluate
- TEG notes that nowhere in the world has a viable, safe and long-term underground repository been established

Conclusion: nuclear not in, nor out...

JRC to establish report on radioactive waste management – expected mid-Nov

Depending on the outcome the Commission could potentially consider including nuclear under the taxonomy in the future (but it is not obliged to...)

LET'S BE CLEAR: it is not a technical problem, it is a political one!

- Currently not included under the taxonomy as did not have the right experts to assess nuclear (but not excluded either)
- Joint Research Centre mandated by Commission to review all existing studies.
 - Report to be produced and review by 2 expert groups + potentially the Member States
- Depending on the outcome the Commission could potentially consider including nuclear under the taxonomy in the future (but it is not obliged to...)

Thank you

