Change of attitudes about nuclear energy in the European Union Countries between 2010 and 2024

H2020 project «Twinning in Environmental Data and Dynamical Systems Modelling for Latvia»

TED4LAT workshop and doctoral school,
Institut des Systèmes Complexes Paris – Ile de France 113, rue Nationale, 75 013 Paris
October 21-25, 2024.
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In order to understand today's energy and especially nuclear energy policy in the Baltic States and in the European Union, it is important to understand the public's attitude and shift of attitudes

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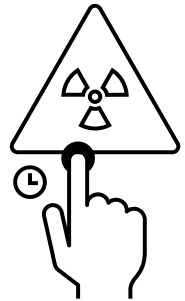
The Aim of research

The aim of this research is to determine whether Europe is indeed experiencing a nuclear energy renaissance, identify the factors that have influenced this shift, and examine how attitudes toward nuclear energy have evolved across different EU countries



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Source: https://news.europawire.eu

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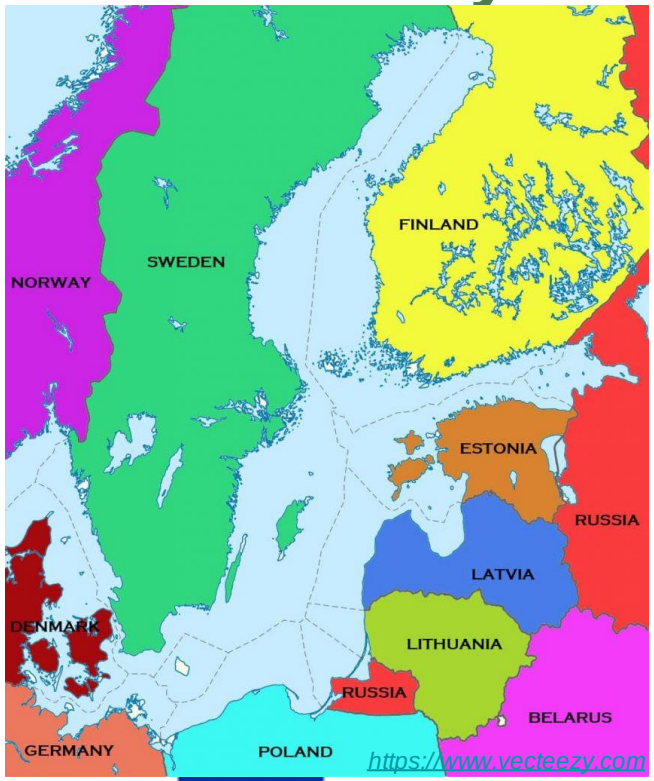
Nuclear energy in the Baltic States today:

Currently, the Baltic countries (Estonia, Latvia, Lithuania) do not produce nuclear energy

But the population's support for nuclear energy is increasing every year



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Public support for nuclear energy in the Baltic States today:

Estonia 60%

Latvia 50%

Lithuania 52%

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Nuclear energy policy in the EU today :

EU climate targets

The EU’s aim to reduce dependency on Russian gas

Some EU countries support expanding nuclear power, others remain opposed

For analyzes nuclear energy policies, using data from Eurostat, European Commission, IEA, World Bank, and others to compare trends from 2010 to 2024.

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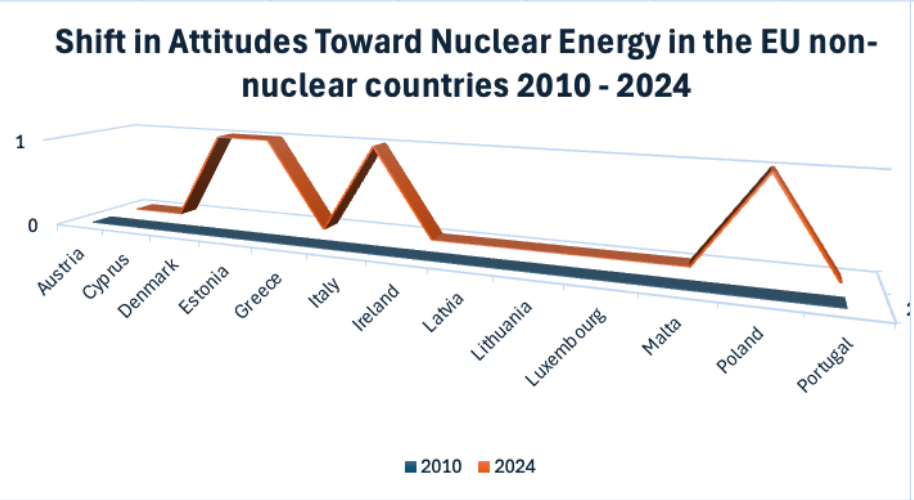
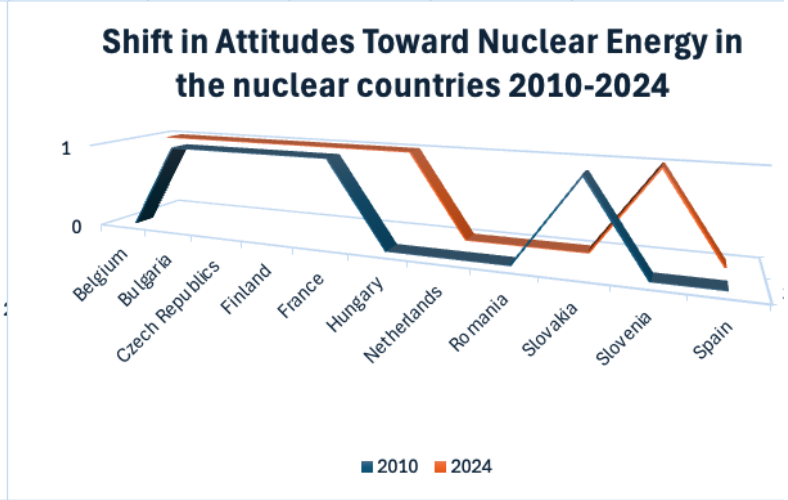
Fig. 1 - The increase in the positive attitude of EU countries towards nuclear energy from 2024 compared to 2010.





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Factors influencing attitude change:

Past disasters (Fukushima (2011), Chernobyl (1986))

Energy security of the EU countries (tensions between EU and Russia since 2014)

EU common energy policy course (also nuclear) - *climate and environmental goals for transition from solid or liquid fossil fuels climate neutral future (2022)*

Technological innovations (SMR)

Climate change and need to decrease carbon emissions

High electricity prices

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Change of attitudes about nuclear energy :

The OECD's 2010 report on "Public Attitudes to Nuclear Power" found that countries already using nuclear energy tend to have more supportive public views. Opinions shift slowly without major events, and a significant portion of the population remains undecided, making their stance crucial for future policy changes.

Interesting that increasing support for nuclear energy across the EU, with opposition dropping from 26% to 15% from 2021 to 2022, largely due to the ongoing energy crisis. Germany, once a strong opponent, saw opposition fall from 65% to 20% in six years. However, resistance remains in countries like Austria, Denmark, and Portugal, complicating nuclear energy's future in the EU.

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Public opinion in the EU about nuclear energy before Fukushima disaster:

Only six countries, including Sweden, Finland, and Slovakia, believe nuclear's advantages surpass its risks.

Feeling informed reduces perceived risk, and countries with existing nuclear plants tend to trust operators—except in Germany.

Support for new plants is limited in France (25%) and the UK (33%), while non-nuclear countries support closing all plants.

(2021 OECD survey data)

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Attitude of the EU countries towards nuclear energy after the Fukushima disaster:

A survey of over 23,000 respondents from 41 countries showed that support for nuclear energy decreased more in countries closer to Fukushima, especially where new reactors were under construction.

Support dropped in Japan, Switzerland, Belgium, and Italy, but remained stable in the UK and Spain. Before Fukushima, 52.7% supported nuclear energy, dropping to 45.4% after.

Public anxiety was higher among less-informed groups, highlighting the need for better education about effects of radiations.

Germany, Spain, and Switzerland remained opposed, while Belgium extended the lifetime of its reactors for energy security.

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Policies and Regulations: Policy changes that have taken place in period from 2010 till 2024. regarding nuclear and renewable energy (1)

Nuclear energy promotion is a national competence, but state aid can be approved under Article 107(3)(c) TFEU if it meets necessary and proportionate criteria.

Since July 2024, nuclear compliance must also align with the new CfD design principles.

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Policies and Regulations: Policy changes that have taken place in period from 2010 till 2024. regarding nuclear and renewable energy (2)

The EU Taxonomy, effective since July 2020, guides sustainable investments and supports activities aligned with net-zero by 2050.

The Green Deal, integrated into the 2022 REPowerEU plan, emphasizes renewable energy and energy efficiency.

New 2024 regulations have strengthened nuclear safety standards, covering the full life-cycle of installations, and promote the development of small modular reactors (SMRs) and highly enriched uranium (HALEU) for safer nuclear power.

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Theoretical Framework

Theories from interdisciplinary fields of science:

- Theories of public opinion formation
- Risk Perception Theories
- Environmental Attitudes and Energy Preferences
- Public Engagement and Trust

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Theoretical Framework - Theories of public opinion formation

- Agenda-Setting Theory [McCombs, M., 2004]

Germany, Spain, Austria

- Framing Theory [Entman, R. M., 1993]

Belgium, Netherland, (UK)

- Social Influence Theory [Cialdini, R. B., & Goldstein, N. J., 2024]

Germany, Austria, Estonia, Latvia, and Lithuania

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Theoretical Framework - Risk Perception Theories

- Cultural Theory of Risk [Douglas, M., & Wildavsky, A. , 1982]

Hierarchical countries:

France, Poland, and the Czech Republic tend to have stronger acceptance of centralized decisions about nuclear power.

Egalitarian countries:

Sweden, Denmark, and the Netherlands are more likely to engage in public discourse and may show more skepticism toward nuclear energy in favor of renewables.

- Psychometric Paradigm: [Slovic, P., 1987]

Germany - Emotional Responses to Nuclear Energy after Fukushima nuclear disaster. Italy.

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Theoretical Framework - Environmental Attitudes and Energy Preferences

- Value-Belief-Norm Theory (VBN): [Stern, P. C., Dietz, T., & Guagnano, G. A.,1995]

highly applicable to Sweden

- Technology Acceptance Model (TAM): [Davis, F. D., 1989]

is highly applicable to France in the context of nuclear energy, (Poland), Bulgaria, Slovakia, and Romania, where nuclear energy is viewed as both useful and necessary to meet energy needs and climate goals.

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Theoretical Framework - Public Engagement and Trust

- Trust in Institutions Theory: [Earle, T. C., & Siegrist, M. , 2008]

Germany and Distrust of Nuclear Energy, Hungary, Luxembourg, Malta, Latvia, Czech Republic, Finland, and Slovakia.

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Conclusions based on theory

Upon reviewing the theoretical aspects, analysing political documents, and examining media reports, I conclude that the theory aligns well with the current situation and broader trends.

It is evident that signs of a nuclear energy renaissance are indeed emerging across the EU. This resurgence is driven by the EU's strategic focus on reducing carbon emissions and energy dependence, as well as the evolving public discourse surrounding energy security and sustainability.

The renewed interest in nuclear energy reflects a significant shift in policy priorities, indicating that nuclear power is regaining relevance as a viable part of the EU's future energy mix.

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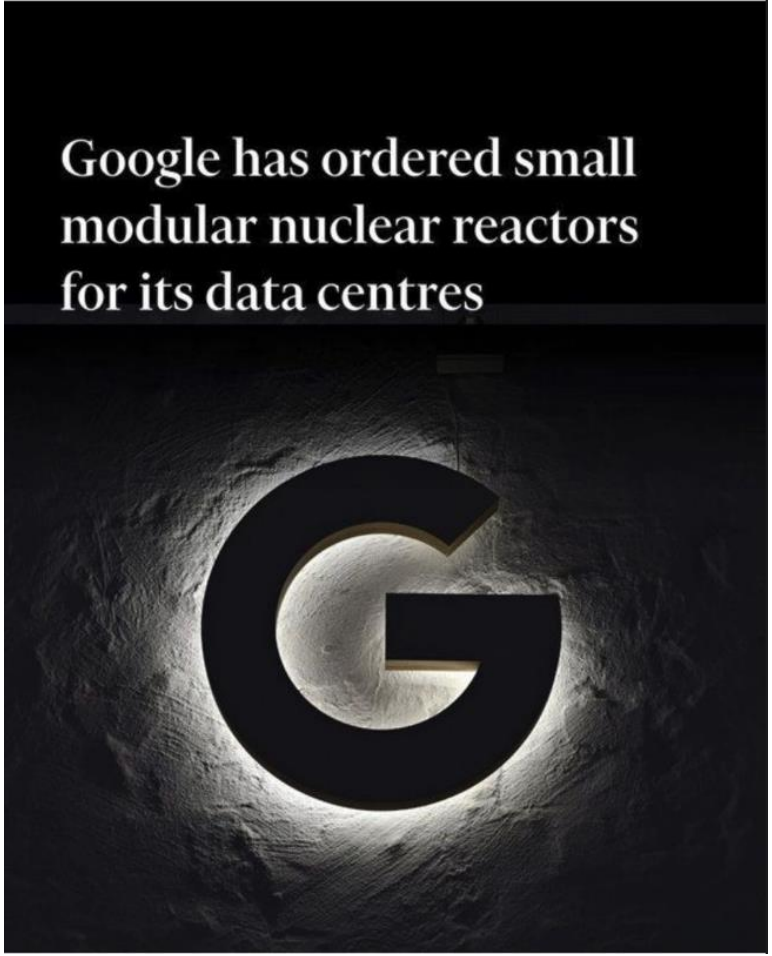

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Conclusions (1):

1. Nuclear disasters initially reduce public support for nuclear energy, but attitudes tend to recover over time.

2. Rising energy prices, energy security concerns, and the green transition have led to growing support for nuclear power.

3. Non-nuclear countries are more sceptical, while nuclear-producing nations show higher support. However, recent global events have created a trend towards an increasing positive attitude towards nuclear energy in countries that do not currently produce it.

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Conclusions (2):

4. Educated and informed people tend to be more positive, trusting scientists over politicians.

5. Political context and party positions shape nuclear policy.

6. Addressing waste disposal concerns could further increase public acceptance, as nuclear energy plays a key role in meeting EU climate goals.

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Work in progress..

My aim is to use these concepts to analyse the situation and build the agent model.

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Shift in Attitudes Toward Nuclear Energy in the EU and Agent-based modeling

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Thank you for your attention!

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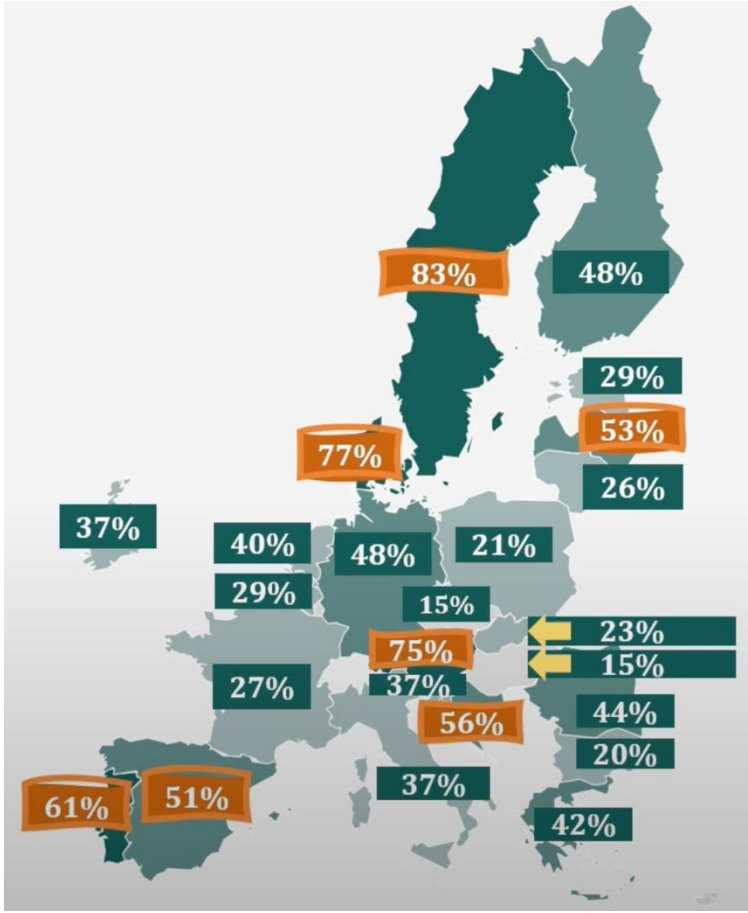
Eurostat (2022), Renewable energy resources on average in Europe 41%



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