

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

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Introduction

With the willingness of the European Union to reduce drastically its dependence on Russian gas, the issues of nuclear energy production came to the fore in the European Union. Some European countries show a renewed interest in nuclear energy and argue for its development while others do not support such initiatives.

This issue is important in the context of the European climate goals. Each member state chooses its own scenario to achieve the goals. “The European Green Deal strategy targets accelerated sustainability transitions, yet the pathways and processes thereto differ markedly across EU member-states, particularly in the energy sector. Politics and institutional contexts largely determine the transition dynamics.” [1]

This article uses the literature on nuclear energy policy and its impact in EU member states, and public opinion. The main data sources are Eurostat, European Commission reports, International Energy Agency data, World Bank data, World Resources institute data, and others to analyse and compare data from 2010 and 2024.

1. Public attitudes towards nuclear energy in historical carousels

“Chernobyl accident in April 1986 had a significant impact on public attitudes to nuclear power. This can be seen in the abrupt change in public opinion in Finland in 1986”. [2] Not only in Finland, but also in other countries, the public support for nuclear power decreased. One of the reasons was that Chernobyl was in the Soviet Union and information about the disaster was hidden. Public opinion polls show that after negative events related to nuclear power, public attitudes tend to decrease, but over time, if the public is informed of the risks and benefits, especially if the benefits outweigh the potential risks, public positive attitudes tend to increase.

An interesting study is that it is not so important what information is presented to the population, but what is important is who delivers this information to the population and through which media. “The public gains most of its information on energy and nuclear power from the media, but does not trust it. Scientists and environmental protection or consumer organisations are the most trusted groups. National governments are, in general, even less trusted on these issues than the media. This presents a clear problem to governments who wish to educate and influence their publics.” [2] This finding is important because it indicates that the opinion expressed by scientists can be crucial in the development of nuclear power.

After the Fukushima tsunami, public support for nuclear power plummeted. But after studies and reports on the causes of death of those who died in the Fukushima disaster, it was determined that the causes of death were not radiation (except for 1 case), but the evacuation plan (the residents died in the evacuation process leaving Fukushima). It is important to remember that other types of disasters with human casualties have not occurred with nuclear reactors, as happened in Chernobyl and Fukushima. Considering this fact, it is interesting to look at society's attitude, its change from positive to negative and back to positive again.

The willingness of most European governments to decrease Russian energy imports as much as possible has caused the opposite change of attitude – sympathy for nuclear energy as a solution for ensuring the stability of the electricity supply. Indeed, the geopolitical context led not only the governments of the countries neighbouring Russia to revise their energy policy, but also most European governments and of the European commission and parliament seek reducing drastically Russian energy imports.

The OECD Nuclear Energy Agency (NEA), Organization for economic co-operation and development, published a report on "Public Attitudes to Nuclear Power" in 2010, which collected survey data on nuclear energy and public attitudes. It is interesting that "In those countries where nuclear already forms a part of the energy mix, the public

tends to show distinctly more supportive attitudes.”[2]. The report mentions that public awareness of mining can reduce public anxiety about the possible risks of nuclear energy. “In the absence of dramatic events, opinion changes slowly and, in a number of countries surveyed, it has become more supportive of nuclear energy. However, a large minority of respondents hold no firm views. The attitude of this middle ground will be critical for any future developments in the role of nuclear energy.”[2] “A recent survey published by the Hungarian Századvég Foundation shows a growing positive perception of nuclear energy in all EU Member States. According to the results of the Project Europe Research conducted by Századvég, in the last year, the share of EU citizens opposing the use of nuclear energy has fallen from 26% (Autumn 2021) to 15% (Autumn 2022). Among the main factors, the Foundation underlines the current energy crisis, which accelerated a trend already ongoing since 2015. The percentage of those in favour of nuclear power – who say the technology should produce very much or much energy – has increased from 26% to 40%. Moderate opinions (not too much or little) remain stable at 35%.” [3] “Some of the member states with renowned negative perceptions of nuclear energy continue to maintain their relative position in country rankings, however, the degree of rejection in these countries has also significantly decreased over the last twelve months. The most instructive example is Germany, where the proportion of those rejecting nuclear technology has dropped from 65% to 20% in six years so today only a fifth of the population represents the previously majority position.” [3] “This is the most significant moment in the relationship between society and energy in 100 years. In the decade, which is decisive in terms of collaborative energy actions worldwide, societies everywhere are reeling from multiple energy price crises and grappling with the interconnected challenges of energy and climate security.”[4] “With Italian Foreign Minister Antonio Tajani in attendance at the 2024 Brussels summit, where Italy was one of 32 countries to sign a declaration stating, “[we] reaffirm our strong commitment to nuclear energy”, Italy's nuclear future remains up for debate once again. There are also barriers to developing nuclear in several other EU member states including Portugal, Denmark and Austria - another strong opposing voice, which in 2022 filed a legal challenge against the EU, claiming its categorisation of nuclear energy as green investment was 'greenwashing'.”[5]

2. Public opinion in the EU about nuclear energy before Fukushima disaster.

The 2010 OECD survey on nuclear energy found that “Across Europe, people expect the share of nuclear energy to stay approximately the same in the future as it is today, with 14 EU states expecting it to be in the top three future energy sources in their country.”[2] “To explore perceptions of energy dependency, citizens were asked to what extent their country and the EU as a whole is dependent on energy coming from abroad. Spanish citizens stand out as thinking their country is more energy independent than it truly is. Only 42% believe Spain is dependent on imported energy whereas the country actually imports 81% of its needs.”[2] “Countries where citizens appear to be more aware than the average about new energy technologies are France, Germany, Finland, Luxembourg and Sweden.”[2] “On question about nuclear security, it was found that 69% of people agree that nuclear power makes their country less dependent on energy imports and thus increases security of supply, 50% agree that it ensures lower and more stable energy prices and 46% agree that nuclear power helps. To limit global warming. In all cases, respondents who agree with these three statements are in the largest group.” [2] “The risks of nuclear power as an energy source were judged to outweigh its advantages by 53% of respondents overall, whilst only 33% judge that the advantages outweigh the risks it poses.” [2] “However, in only six countries do respondents who consider that the advantages of nuclear energy are greater than the risks it poses outnumber those who are of the opposite view. These are Sweden, where 61% of respondents think this (despite their Government’s policy at the time to phase out nuclear energy), Bulgaria, the Czech Republic, Estonia, Finland and Slovakia. Estonia is unusual in this regard, as it does not have nuclear power.”[2] “People who feel informed about nuclear safety tend to perceive less risk than those who feel uninformed. This is particularly the case In Sweden. The feeling of being Informed appears to play a more significant role than does personal experience when people form opinions on the advantages and risks of nuclear energy.”[2] “In addition, where nuclear plants operate, the majority of people trust the companies that run them – except in Germany.”[2] “In France, 65% of citizens do not believe that radioactive waste can be managed safely even though the French Government has made firm decisions on the matter and 80% of French electricity comes from nuclear plants. Although the Eurobarometer poll did not directly address views on the cost of nuclear energy, it seems likely that people would be less opposed if it were clear that nuclear would reduce the price they paid for electricity”[2] “Support for building new nuclear plants is one third or more in the United Kingdom. In France, country with significant fleets of nuclear power plant, only 25% support building new nuclear plants. However, 50% respectively want to keep existing plants running. Support for closing all nuclear plants is highest in all countries without nuclear power.” [2] “Europeans are less well disposed to nuclear energy than are their counterparts in the 18 countries sampled by Globescan.” [2] “In the EU Bulgaria had the highest level of public acceptance before the accident. Greece had the lowest public acceptance.”[6]

3. Attitude of the EU countries towards nuclear energy after the Fukushima disaster.

“A survey conducted shortly after the accident with more than 23,000 respondents from 41 countries has shown that geographical distance from the accident mattered: Contradicting a previous study, the decrease in support for nuclear energy was stronger in countries closer to Fukushima. In addition, support for nuclear energy decreased more in countries where new nuclear reactors were under construction.”[7] “A decrease in support was observed not only in Japan, but also in countries such as Switzerland, Belgium and Italy. Yet in other countries, such as the UK, no drastic change occurred.”[7] “Contrary to expectation, they found that support for nuclear energy decreased more if distance to the accident was greater.”[7] “The Fukushima nuclear accident reduced public support for nuclear energy in all countries studied in this paper, with the exception of Spain.”[7] “The changes in the public acceptance of nuclear energy as an electricity source in 42 countries after the Fukushima nuclear accident. Of the 24,556 respondents, 52.7 percent favored the use of nuclear energy before the accident, and only 45.4 percent favored it after the accident.”[6] “The general citizens and the doctors outside of Fukushima were anxious about health problems and food and soil pollution. We concluded that a high level of education about radiation decreased the anxiety about the radiation effects. It is important to spread knowledge about radiation.”[8] Germany, Spain and Switzerland opposed nuclear power. “The Belgian twin-units Doel 1 and Doel 2 were initially planned to be phased out in 2015, reaching their maximum life time of operation of 40 years as per their initial design.”[9] “However, for energy security, the Government decided in the same year to extend the life time of operation of the two units, which raised the need to resume their operation”[9] “Almost linear relationship existed between age and support for nuclear power, as the level of support for nuclear power increased with age”[10]

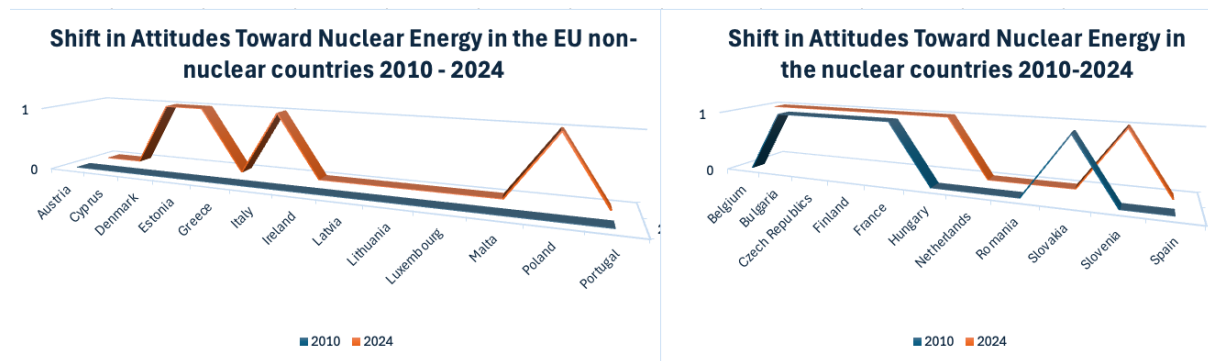


Fig. 1 - The increase in the positive attitude of EU countries towards nuclear energy from 2024 compared to 2010.

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

The decision to promote nuclear energy is a national competence. State aid for nuclear energy can be assessed and approved directly under Article 107(3)(c) TFEU, which enables Member States to support the development of certain economic activities under certain conditions. The support should remain necessary and proportionate and not adversely affect trading conditions to an extent contrary to the common interest.”[11] “Following the entry into force of the new electricity market design rules in July 2024, the Commission also assesses compliance with the CfD design principles set out in Regulation 2024/1747.”[11] EU taxonomy for sustainable activities- “The Taxonomy Regulation entered into force on 12 July 2020. It establishes the basis for the EU taxonomy by setting out the 4 overarching conditions that an economic activity has to meet in order to qualify as environmentally sustainable.”[12] “The EU taxonomy is a cornerstone of the EU’s sustainable finance framework and an important market transparency tool. It helps direct investments to the economic activities most needed for the transition, in line with the European Green Deal objectives. The taxonomy is a classification system that defines criteria for economic activities that are aligned with a net zero trajectory by 2050 and the broader environmental goals other than climate.”[12] Green Deal - “Firstly, the Green Deal has become a robust instrument to the extent that it is now part of the May 2022 REPowerEU plan. This means, on the one hand, that renewable energies (RE) are clearly presented as one of the solutions to be developed; on the other, that the issue of energy demand is once again gradually becoming a priority, with objectives for efficiency and the reduction of consumption”[13] Regulation (EU) 2020/852 states that, “by providing a stable baseload of energy supply, nuclear energy facilitates the deployment of intermittent renewable sources and does not hamper their *development*.”[14] In 2024, the EU has strengthened nuclear safety standards, especially for the life-cycle management of nuclear installations, from construction to decommissioning. In 2010, these standards were less strict.[15] More stringent regulations have been introduced for the safe and responsible management of radioactive waste and spent nuclear

fuel. These rules of 2010 were less detailed.[15] In 2024, the EU actively promotes the use of small modular reactors (SMRs) and highly enriched uranium (HALEU) to improve the efficiency and safety of nuclear energy.[16] In 2010, these technologies were not yet so developed and widely discussed. In December 2023, the European Commission proposed and established the existing Euratom security framework, which was established in 2005. In 2010, this regulation was still valid without significant changes. [16]

Conclusions

The main conclusions from the data analysis are that nuclear disasters affect the public's attitude towards nuclear energy negatively, but after some time the attitude tends to change to the positive side. Due to the impact of energy security, rising electricity prices and the transition to green energy, society is moving more positively towards nuclear energy. Countries that do not produce nuclear energy are more sceptical of nuclear energy, while countries that produce nuclear energy are more positive. More educated and informed people are more positive about nuclear energy. As well as the public, when it comes to nuclear energy, they trust the opinion of scientists the most, but often question what politicians say. Political parties and the global political background influence countries' decisions regarding nuclear power generation. “When the climate change benefits of nuclear energy are explained, the support for nuclear energy amongst respondents increases significantly.”[2]

“In summary, the Eurobarometer poll shows that respondents are rather more concerned about the “by-products” of nuclear energy than about the operation of the nuclear plants themselves.”[2] “It is immediately clear that opposition to nuclear energy would reduce considerably if the matter of waste disposal were resolved.” [2] Nuclear power has a positive impact on climate goals as it helps the EU achieve its decarbonisation targets. The changes in public opinion triggered by the war in Ukraine and its consequences in the European and national public debates do not show any marked differences between the left and the right: overall, support for nuclear energy is increasing everywhere.[17] This study is a preliminary step for a possible agent modeling.

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