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# Nuclear energy in the countries of the Three Seas Initiative under the new security architecture and climate policy

**Energetyka jądrowa w państwach Inicjatywy Trójmorza w warunkach nowej architektury bezpieczeństwa i polityki klimatycznej**

**Abstract:** The article presents an analysis of the approach to nuclear energy and prospects for development in the countries that are members of the Three Seas Initiative. The author presents an analysis of the demographic and economic potential of the region in the context of a convergent history, conditioning the current infrastructural deficiencies compared to Western and Northern Europe. The paper employs a comparative analysis of the energy policies of the Initiative countries, concluding that the solution to the decarbonisation of the region is the development of nuclear energy potential and cooperation – due to its emission-free nature and guarantee of stable electricity production, together with the development of renewable energy sources. Such solutions guarantee significant progress towards decarbonisation and the achievement of international and EU climate targets, while ensuring energy security. The energy policy analysis is contextualised in the conditions of the new security architecture in Europe related to Russia's war in Ukraine.

**Keywords:** Central and South-Eastern Europe, Three Seas Initiative; nuclear energy; European energy policy; climate policy; energy transition; regional integration

**Streszczenie:** Artykuł przedstawia analizę polityk w zakresie energetyki jądrowej i perspektyw rozwoju w państwach należących do Inicjatywy Trójmorza. Autor przedstawia analizę potencjału demograficznego i gospodarczego regionu w kontekście zbieżnej historii warunkującej obecne braki infrastrukturalne w porównaniu z Europą Zachodnią i Północną. W opracowaniu zastosowano analizę porównawczą polityk energetycznych państw Inicjatywy, z której wynika, że rozwiązaniem dla dekarbonizacji regionu jest rozwój potencjału i współpracy w zakresie energetyki jądrowej – ze względu na jej bezemisyjność i gwarancję stabilnej produkcji energii elektrycznej, wraz z rozwojem odnawialnych źródeł energii. Takie rozwiązania gwarantują znaczący postęp w kierunku dekarbonizacji i realizacji międzynarodowych i unijnych celów klimatycznych, przy

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jednoczesnym zachowaniu bezpieczeństwa energetycznego. Analiza polityki energetycznej osadzona jest w warunkach nowej architektury bezpieczeństwa w Europie związanej z wojną Rosji na Ukrainie.

**Słowa kluczowe:** Europa Środkowa i Południowo-Wschodnia, Inicjatywa Trójmorza, energetyka jądrowa; europejska polityka energetyczna, polityka klimatyczna, transformacja energetyczna, współpraca międzynarodowa

## Introduction

The war in Ukraine is directly connected to the global climate crisis, intensifying the challenges facing European countries. The political events of recent years' demonstrate, as never before, the importance of energy security and the need to build energy-resilient economies that operate in harmony with international and European climate goals. The level of dependence of the EU on Russian energy resources has been significant, highlighting the need for cooperation and the development of genuine energy solidarity mechanisms in Europe to maintain economic development and competitiveness<sup>1</sup>. As part of the emergence of a new geopolitical order in the world and in Europe, regional cooperation formats are gaining importance. One such format is the Three Seas Initiative (3SI), which was created as a way to strengthen the integration in the Central and South-Eastern Europe region, bounded by the three European sea basins – the Baltic Sea, the Adriatic Sea and the Mediterranean Sea. The basis of the Three Seas Initiative is economic cooperation in the fields of energy, transport and digital communications within with a particular focus on the EU North-South axis. The pathway toward *derusification* and decarbonisation of the energy systems of the Three Seas countries is nuclear energy.

## 1. State of knowledge and methodology

The Three Seas Initiative (3SI) is a new format of cooperation in Europe and is only just beginning to receive wider media attention and academic discourse. Current publications focus on the genesis of the In-

1 M. Siddi, *EU-Russia Energy Relations*, [in:] M. Knodt, J. Kemmerzell (eds.), *Handbook of Energy Governance in Europe*, Cham 2022.

initiative and the level of interest in this format in different countries<sup>2</sup>. There are few book publications on the 3SI<sup>3</sup> and full issues of journals dedicated to it. In the articles included, there is a clear change in recent years in the perception of the region and its importance in the context of the new geopolitical situation. The level of interest in 3SI varies from country to country. Some of them see it as a potential for the development of underdeveloped North-South connections in this part of Europe, while other states view it as competition to existing cooperation formats with which they are more associated, e.g. the Visegrád Group. Other countries, like Austria, do not pay much attention to the 3SI. The Initiative is also becoming increasingly recognised in the academic discussion of other countries<sup>4</sup>.

Energy cooperation is of particular importance in times of energy crisis, such as the one caused by Russia's invasion of Ukraine. Energy cooperation, which is one of the pillars of the Initiative, has enormous potential, and the needs of the region in this regard are significant. In the academic discussion, energy cooperation is mentioned as a key format for cooperation. However, there is a lack of comprehensive studies treating the 3SI as a subject of energy policy. There are only single studies characterising the energy mixes of the three seas region and its changes<sup>5</sup>. Russia's invasion of Ukraine permanently changed many aspects of European energy and climate policy, including destroying the foundations of Germany's *Energiewende* policy, which envisaged the creation of a German gas hub transporting gas by sea and thus distributing it to the rest of the EU<sup>6</sup>. The war has also changed

- 2 A. Orzelska-Stączek, P. Ukielski, *Inicjatywa Trójmorza z perspektywy jej uczestników*, Warsaw 2020; iowicz, A. Szwed-Walczak, *(Nie)potrzebny format współpracy regionalnej? Inicjatywa Trójmorza w dyskursie publicznym państw Grupy Wyszehradzkiej*, *Prace Instytutu Europy Środkowej* (2022), no. 11, Lublin 2022.
- 3 P. Kowal, A. Orzelska-Stączek, *Inicjatywa Trójmorza: geneza, cele i funkcjonowanie*, Warsaw 2019.
- 4 H. Desuin, *Le multi-multilatéralisme en Europe centrale: théâtre des vieilles rivalités nationales*, *La Revue Politique et Parlementaire* 2018, no. 1087–1088; 1 - P. Kurecic, *"Can the Three Seas bring a new balance to European politics?"*, *"New Eastern Europe Postmodern Geopolitics. The consequences of the emerging multipolar world"* (2019), no. 2 (36), pp. 60–64; K.O. Lang, *"Die Drei-Meere-Initiative: wirtschaftliche Zusammenarbeit in geostrategischem Kontext"*, *"SWP-Aktuell"* 16 (2021), no. 16; Deutsches Institut für Internationale Politik und Sicherheit.
- 5 J. Wilczek, *Energia dla Trójmorza. Zmiany w miksie energetycznym Państw Inicjatywy Trójmorza ze szczególnym uwzględnieniem produkcji energii elektrycznej (1990–2019)*, *"Analizy Międzynarodowe"* 2022, no. 1(3).
- 6 J. Wiech, *Energiewende. Nowe niemieckie imperium*, Warsaw 2019.

many countries' attitudes towards nuclear energy. Member states understand the unquestionable advantages of this technology in terms of security of energy supply and the *derusification* of European energy based on modern and very safe installations. Anti-nuclear attitudes in the EU seem to be losing ground. A completely new geopolitical situation has changed the directions of European energy development and accelerated the energy transition in many respects. Russia's invasion of Ukraine has realised the treaty principles of energy solidarity in the EU. The Union cooperates and develops energy cooperation on a central level through EU institutions, and on a regional level through bilateral or multilateral cooperation between member states. The 3SI, despite its many shortcomings – varying interest, limited funding, lack of consensus – seems to be an increasingly important area of energy cooperation in Europe. The 3SI countries are overwhelmingly pro-nuclear and a study aiming to characterise the existing nuclear energy policies in the 3SI countries – finding common points in these energy policies and presenting prospects for their development – provides a basis for future nuclear energy cooperation in the three seas area.

In this study, a comparative analysis of the energy policies of selected EU countries that are part of the Three Seas Initiative has been applied, as well as a statistical analysis of data on the demographic and economic potential of Three Seas countries and quantitative data on energy and electricity systems, including, in particular, those related to energy production and consumption. The research questions addressed by the author are: What is the attitude of the Three Seas Initiative countries towards nuclear energy? To what extent do the Three Seas Initiative countries plan to develop nuclear energy in the context of European climate and energy policy and the current geopolitical situation in Europe?

## **2. The Three Seas Initiative as a format for cooperation in the Central and South-Eastern European region**

The Three Seas Initiative is a format for economic and political cooperation between thirteen EU countries located in the area of Central and South-Eastern Europe<sup>7</sup>. It was established in 2015 as a regional coop-

7 According to the division of Europe into regions of the German Standing Committee on Geographical Names (Der Ständige Ausschuss für geographische Namen, StAGN),/

eration project. The basis of the Initiative's activities are the summits held annually. The first was held in Dubrovnik on 25–26 August 2016, at which joint declarations of cooperation were adopted in the fields of energy, transport and digital communications within the Three Seas area with a particular focus on the EU North-South axis. According to the adopted assumptions, the 3SI is not meant to be an alternative to the EU, but a complement to integration and cooperation in the region within the EU, and a project co-financed with the support of EU funds. According to the adopted declaration, deepening cooperation in the three seas region will make the region more secure, more competitive, and will contribute to the resilience of the EU<sup>8</sup>.

The Three Seas Initiative is the response of the eastern countries of the EU to the need to boost regional cooperation as a result of the beginnings of the emergence of a new world order, proclaimed by the annexation of Crimea by the Russian Federation in 2014 and the start of a *de facto* Russian-Ukrainian war, which escalated to a full-scale conflict in February 2022. Within the framework of the new geopolitical situation in the region, countries reactivated the existing cooperation formats, e.g. the Visegrád Group, or established new forms of cooperation, such as the Slavic Triangle, the Bucharest Nine or the Three Seas Initiative<sup>9</sup>.

The Three Seas Initiative integrates 13 EU countries located, initially, in an area bounded by the basins of three European seas – the Baltic Sea, the Adriatic Sea and the Black Sea. At the recent 3SI Summit in Bucharest on 7-8 September 2023, the decision was taken to accept Greece into the Initiative<sup>10</sup>. With the joining of Greece, the name “Three Seas” signifies cooperation in a broader area with additional access to many of Greece's sea basins, so the Three Seas Region is currently limited by the Baltic, Black, and Mediterranean Sea. The members of the Initiative are: Austria, Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

8 “The Joint Statement on the Three Seas Initiative (The Dubrovnik Statement)”, Dubrovnik, 25 August 2016, <https://3seas.eu/about/past-summits/dubrovnik-summit-2016>.

9 A. Orzelska-Stączek, *Inicjatywa Trójmorza w świetle teorii realizmu. Polityczne aspekty nowej formy współpracy dwunastu państw*, “Sprawy Międzynarodowe” 2019, no. 1.

10 “Joint Declaration of the Eighth Summit of the Three Seas Initiative”, Bucharest, 6–7 September 2023, <https://3seas.eu/media/joint-declaration-of-the-eighth-summit-of-the-three-seas-initiative>.

The 3SI area is inhabited by 27% of the EU population, it represents 32% of the total land area of the EU, and it accounts for 16% of the total nominal GDP of the EU<sup>11</sup>. Table 1. presents a comparison of the area, its demographic potential (population), and its economic potential (nominal GDP) in the countries of the 3SI.

**Table 1. Comparison of area, demographic and economic potential of the states of the Three Seas Initiative. Own study based on Eurostat data for 2022<sup>12</sup>**

	Country	Area (thousands km <sup>2</sup> )	Population (million)	Nominal GDP (billion EUR)
1	Austria	83.88	8.98	446.93
2	Bulgaria	110.91	6.84	84.56
3	Croatia	56.59	3.86	66.94
4	Czechia	78.87	10.52	276.23
5	Estonia	45.34	1.33	36.18
6	Greece	131.96	10.46	208.03
7	Hungary	93.03	9.69	170.25
8	Latvia	64.57	1.88	39.06
9	Lithuania	65.3	2.81	66.79
10	Poland	312.7	37.65	656.91
11	Romania	238.39	19.04	285.89
12	Slovakia	49.04	5.43	109.65
13	Slovenia	20.27	2.11	58.99

The countries of the 3SI are characterised by a common history. After World War II, all countries, except Austria and Greece, were part of the Eastern Bloc. The Baltic States – Lithuania, Latvia and Estonia were directly part of the USSR. Poland, Czechoslovakia, Hungary, Romania and Bulgaria were more or less politically controlled by the USSR and were part of the Warsaw Pact, cooperating economically within the structures of the Council for Mutual Economic Assistance. Croatia and Slovenia, during the Cold War, were part of the Socialist Federal Republic of Yugoslavia, which, despite its socialist character and close relations with the other Eastern Bloc states, displayed

<sup>11</sup> Own study, based on Eurostat data for 2022, Data presented in Table 1,

<sup>12</sup> Ibid.

partial independence and promoted “its own vision of communism”. In the Three Seas area, the earliest to join the EU was Greece (1981), then Austria (1995). Then, as a result of the EU’s largest fifth enlargement in 2004, most of the remaining countries joined – Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, and Slovenia. In 2007, Bulgaria and Romania joined the EU, and in 2013, Croatia.

3SI does not have the character of an international organisation; it does not have its own general secretariat and no international agreements have been concluded to regulate its form of cooperation. The most important place for debate, dialogue, and decision-making is the annual presidential summits. The only format of cooperation within the 3SI framework that has legal standing is the Three Seas Initiative Investment Fund, established in 2019 in Luxembourg. The purpose of registering the fund is to financially support key commercial infrastructure projects implementing the objectives of the 3SI, e.g. projects on renewable energy sources, gas pipelines, LNG infrastructure, gas production and electricity transmission networks, transport cooperation (road and rail infrastructure, sea and river ports and airports), and digital (fibre optic networks, 5G, data centres)<sup>13</sup>.

### **3. Nuclear energy in the countries of the Three Seas Initiative**

Nuclear energy is based on energy derived from the fission reaction of the nuclei of heavy chemical elements. Currently, the vast majority of the electricity produced in nuclear reactors comes from the nuclear fission reaction of the isotope Uranium-235. The principle of generating electricity in a nuclear power plant is similar to that of conventional fossil-fuel power plants, apart from the initial stage in conventional fossil fuel power plants. The difference between a nuclear power plant and a conventional power plant is the different source of heat used to heat the water. The energy generated in nuclear reactions is used to heat the water, causing a phase transition to steam. This superheated steam then drives a turbine that generates mechanical work, which is converted to electricity. Undisputably, the greatest advantage of nuclear

13 J. Wilczek, A. Rudowski, *Fundusz Trójmorza. W stronę instytucjonalizacji Inicjatywy?*, [in:] *3 Seas Initiative Insight*, vol. 3, Warsaw 2021.

energy is that it generates a large amount of heat in a non-combustion process, and therefore does not emit any environmentally damaging combustion products, such as carbon dioxide—one of the main gases responsible for the greenhouse effect, or sulphur and nitrogen oxides, the gases responsible for the formation of acid rain by reacting with water in the atmosphere.

Nuclear power accounts for 4% of the world's primary energy consumption and 9.4% of primary energy consumption in the EU. However, when considering the production of electricity itself, 9.2% of the world's electricity and 23.6% of the EU's electricity is produced by nuclear power plants<sup>14</sup>. The first European nuclear power plants were built in the 1960s in France, Germany, Belgium, Sweden, Italy, and the UK. The development of European nuclear power was decisively slowed down by the Chernobyl disaster. The peak of nuclear power development in Europe was in the 1980s, mainly in France. Since 2000, the capacity and number of reactors in Europe has steadily declined. 13 of the 27 EU countries have nuclear reactors. After a series of nuclear accidents at the Fukushima-Daiichi power plant in Japan in 2011, a very emotional debate on the future of European energy began. Public pressure and an intensified anti-nuclear movement resulted in political decisions to leave or severely curtail nuclear power. In addition, comprehensive risk and safety assessments were carried out on all 132 nuclear reactors operating in the EU, followed by the most stringent safety standards for nuclear power plants in the world under EU secondary legislation – EU Regulations and Directives<sup>15</sup>.

The Three Seas Initiative countries consumed 3,742 TWh of primary energy in 2022. Poland consumed the most – 1,198 TWh (32%), Czechia 464 TWh (12.4%) and Austria 382 TWh (10.2%). 78.7% of primary energy came from fossil fuels (oil, natural gas and coal), and 14.9% from renewable energy sources (hydro, solar, wind, geothermal and biofuels). Primary energy obtained with nuclear energy amounted to 240 TWh, which is 6.4% of primary energy. Considering electricity production, the Three Seas in 2022 acquired 596 TWh of electricity,

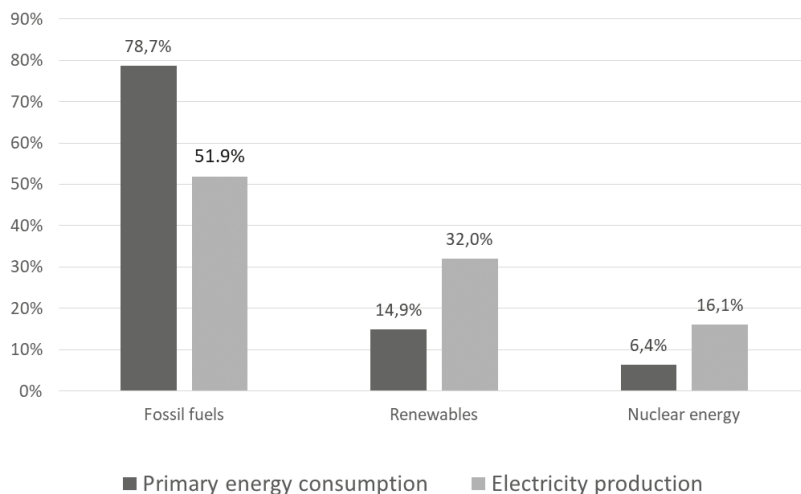
14 Data from: H. Ritchie, M. Roser P. Rosado, *Our World in Data, Energy, data for 2022, 2023*, <https://ourworldindata.org/energy> [1.12.2023].

15 A. Januszewska, *Reakcja Unii Europejskiej na katastrofę w elektrowni jądrowej w Fukushimaie*, [in:] T. Kamiński (ed.), *Polityka Unii Europejskiej wobec partnerów azjatyckich*, Łódź 2019.



51.9% of which was from fossil fuels, 32% from renewable sources, and 16.1% using nuclear energy. Figure 1 shows the energy mix of the Three Seas Initiative countries.

**Figure 1. Energy mix of the Three Seas Initiative countries (primary energy consumption and electricity production)**

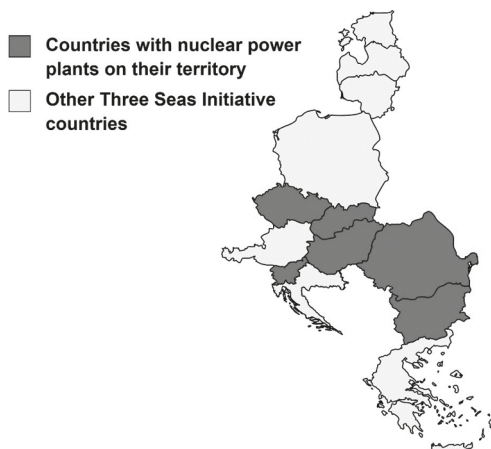


Source: own analysis based on H. Ritchie, M. Roser P. Rosado, *Our World in Data, Energy, data for 2022, 2023*, <https://ourworldindata.org/energy>.

Six out of the thirteen Three Seas Initiative countries have operating nuclear power plants on their territory: Bulgaria, Czechia, Hungary, Romania, Slovakia and Slovenia (Fig. 2). Czechia generates the most nuclear power in volume terms in the Three Seas with 78 TWh (16.7% of primary energy), Bulgaria 41 TWh (17.8%), Slovakia (20.8%) and Hungary (14.9%) equally with 40 TWh each, followed by Romania 28 TWh (7.7%), and Slovenia 14 TWh (19.2%). Among the above-mentioned countries, the share of nuclear power in the electricity consumption mix of countries without their own energy resource extraction is particularly high (Slovakia 59.5%, Hungary 44.6% and Slovenia 42.1%). In the remaining countries – Czechia, Bulgaria, and Romania, the share is lower due to their own coal and gas extraction or alternative raw material options. In each of the countries with nuclear power plants, the share of nuclear power in the national electricity generation mix is higher than 1/5. Slovakia produces the largest share of nuclear energy in the national energy mix in 3SI – 20.8% of primary

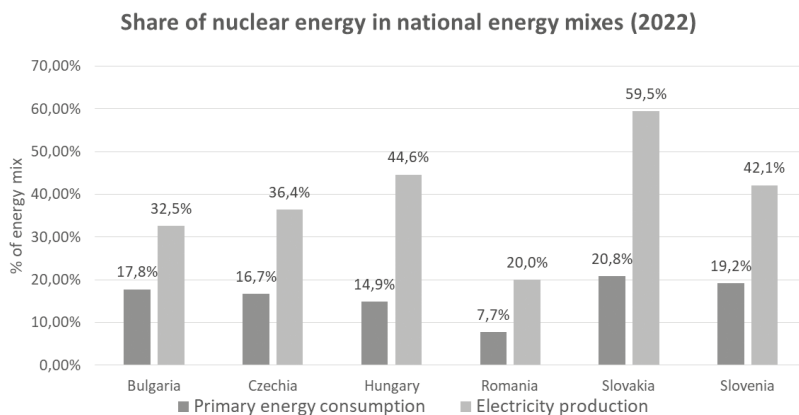
energy consumption and as much as 59.5% of electricity production (all the data in Fig. 3).

**Figure 2. The share of nuclear energy in the national energy mixes of the 3SI countries (only those with nuclear power in their electricity system are listed)**



Source: own analysis based on H. Ritchie, M. Roser P. Rosado, *Our World in Data, Energy, data for 2022, 2023*, <https://our-worldindata.org/energy>.

**Figure 3. Nuclear power plants in the Three Seas Initiative countries**



Source: own study. Map created with mapchart.net (CC BY-SA 4.0 DEED Licence).

## 4. Plans for nuclear power development in the Three Seas Initiative countries

Nuclear power, which for many years was a source of disagreement in Europe, is clearly regaining favour<sup>16</sup>. The Russian aggression against Ukraine strengthened the coalition of pro-nuclear states in the EU and undermined the arguments of the opponents. Nuclear-supporting states emphasise the importance of nuclear power as part of EU climate policy and as a way of deregulating the EU's energy sector, making Europe less dependent on Russian oil and gas imports. Anti-nuclear policy was the basis of the German energy transition policy *Energiewende*. The nuclear bipolarity in the EU was particularly evident in the strongest German-French tandem, which plays a key role in the EU's decision-making mechanism. Germany, together with its anti-nuclear allies, lobbied at every possible opportunity for the abandonment of nuclear energy in Europe, for the non-financing of investments in the nuclear sector under EU funding, and for the recognition of the atom as an "unsustainable" energy source. On the other hand, France is a nuclear power in Europe and the world, and one of the largest distributors of technology and know-how for the nuclear industry. Finally, on the basis of a European Commission proposal, the atom was included as a "sustainable" source in the EU taxonomy, i.e. *Regulation (EU) 2020/852 of the European Parliament and of the Council establishing a framework to facilitate sustainable investment*<sup>17</sup>. This regulation is crucial for energy projects in the EU, as it defines the rules under which projects can be financed. The inclusion of nuclear energy in the taxonomy will enable nuclear projects to be co-financed by EU funds, including those earmarked for the energy transition<sup>18</sup>.

The vast majority of the 3SI countries support the construction of nuclear power plants. Central and South-Eastern Europe have

16 F. Scarpa, K. Michalikova, *Unlocking the Potential: Decarbonizing the European Union through Uranium*, *Mondo Internazionale*, 25 May 2023, <https://mondointernazionale.org/en/focus-allegati/unlocking-the-potential-decarbonizing-the-european-union-through-uranium> [15.12.2023].

17 J. Wiech, *Parlament zadecydowal: atom i gaz zostaja w taksonomii*, *Energetyka24.com*, 6 July 2022, <https://energetyka24.com/atom/analizy-i-komentarze/parlament-zadecydowal-atom-i-gaz-zostaja-w-taksonomii-komentarz> [15.11.2023].

18 D. Czyżewski, *Wiceprezes EDF dla E24: Polska i Francja mają wspólny interes w tym, żeby utrzymać energię jądrową w taksonomii*, *Energetyka24.com*, 30 June 2022, <https://energetyka24.com/atom/wiadomosci/wiceprezes-edf-dla-e24-polska-i-francja-maja-wspolny-interes-w-tym-zeby-utrzymac-energie-jadrowa-w-taksonomii> [15.11.2023].

a common and consistent approach to nuclear energy development. The only anti-nuclear exception is Austria. Within the informal coalition of pro-nuclear EU states led by France, there are talks on transnational cooperation on the nuclear issue and, above all, on the creation of a coalition of states that could jointly try to push “pro-nuclear” solutions through the EU legislative procedure. On 28 February 2023, the first meeting of the energy ministers of the European “nuclear coalition” took place in Stockholm. The meeting, followed by a joint statement, was attended by representatives of France, Poland, Croatia, Bulgaria, Czechia, Finland, the Netherlands, Romania, Slovakia, Slovenia, and Hungary<sup>19</sup>. 8 out of 11 countries (73%) of the “nuclear coalition” are 3SI countries. The same countries were also signatories of the declaration signed at the COP28 Dubai Summit in December 2023 on tripling nuclear power capacity by 2050 and recognising nuclear power as a key technology to achieving international climate goals<sup>20</sup>.

Analysing the plans and policies of the 3SI countries with regard to nuclear energy, one can observe both great ambitions in this field, as well as various problems, which result, among others, from the economic situation, insufficient infrastructure, political dependence on Russia on technology or fuel supply, and internal divisions. In addition to the four VVER 440 reactors, Slovakia launched the third unit of the Mochovce NPP in 2023. On 22 September 2023, the power plant reached 100% power output. According to current estimates, with the addition of another unit of the Mochovce NPP, the share of nuclear power in electricity generation has increased to around 70% – making Slovakia the region’s leader in decarbonising the electricity sector<sup>21</sup>. The expansion of the Paks NPP in Hungary is one of the main projects of Viktor Orbán’s government. The expansion is led by Russia’s Rosatom, making 80% of the investment a Russian loan. Hungary is therefore blocking EU sanctions on Russian fuel and nuclear technology and intends to continue cooperation with Russia

19 D. Héjj, M. Sommer, *Sojusz na rzecz atomu w UE powoli się konsoliduje*, Dziennik Gazeta Prawna, 1 March 2023, <https://serwisy.gazetaprawna.pl/energetyka/artykuly/8670090,unia-europejska-energia-atomowa-sojusz.html#zwiększaja-moce> [16.11.2023].

20 *Dubai COP28 Declaration to Triple Nuclear Energy*, <https://www.energy.gov/articles/cop28-countries-launch-declaration-triple-nuclear-energy-capacity-2050-recognizing-key> [17.01.2024].

21 *Power commissioning of Mochovce 3 completed*, Slovenské elektrárne a.s., 17 October 2023, <https://www.seas.sk/en/press-releases/mochovce-3-commissioning-trial-run/> [15.12.2023].

in this regard. Czechia is dependent on Russia for the supply of nuclear fuel. From 2024, fuel for the Temelin NPP will be supplied by the US company Westinghouse and the French Framatome. The Czech government announced a tender in 2022 for the construction of two more reactors with a total capacity of 2,400 MWe at Dukovany, which are due to begin operations in 2036. Additionally, it wants to extend the operation of the Temelín NPP until 2050. It is also planning projects to build two more units at Temelín NPP, with a total capacity of 2,400 MWe. It is noteworthy to mention here that the development of nuclear energy and low-emission hydrogen as effective decarbonisation tools, along with their role in the EU, was a priority and of special importance to Czechia, which chaired the Council of the EU during the second half of 2022, i.e., during the time of shaping the “update” of the European energy policy<sup>22</sup>. Slovenia began work for the extension of the Krško NPP (co-owned by Slovenia and Croatia) with a second unit in 2021 and extended the use of the current units until at least 2043. The selection of a supplier for the new technology and the signing of the contract for the extension of the Krško NPP are planned for 2027<sup>23</sup>. The energy issue strongly divides the Bulgarian public and political class. Bulgaria’s energy sector is heavily dependent on Russia. According to the Bulgarian government’s latest strategy for 2023–2053, Bulgaria will expand the Kozloduy power plant<sup>24</sup>. Romania is betting on SMR Reactors. In November 2021, Romania’s Nuclearelectrica and US NuScale Power signed an agreement for the advanced deployment of NuScale’s SMR technology in Romania by the end of the decade. The first European SMR is to be built on the site of the former thermal power plant in Doicești. Romania is currently working on upgrading Unit 1 of Cernavodă NPP by another 30 years and is also planning the construction of unfinished Units 3 and 4.

22 *Programme of the Czech Presidency of the Council of the European Union*, <https://czech-presidency.consilium.europa.eu/media/ddjjqozh/programme-cz-pres-english.pdf> [10.12.2023].

23 R. Ralev, *Slovenia to make investment decision on NPP Krsko second unit by 2027 – report*, News, 20 December 2021, <https://news.com/news/slovenia-to-make-investment-decision-on-npp-krsko-second-unit-by-2027-report-766361> [10.12.2023].

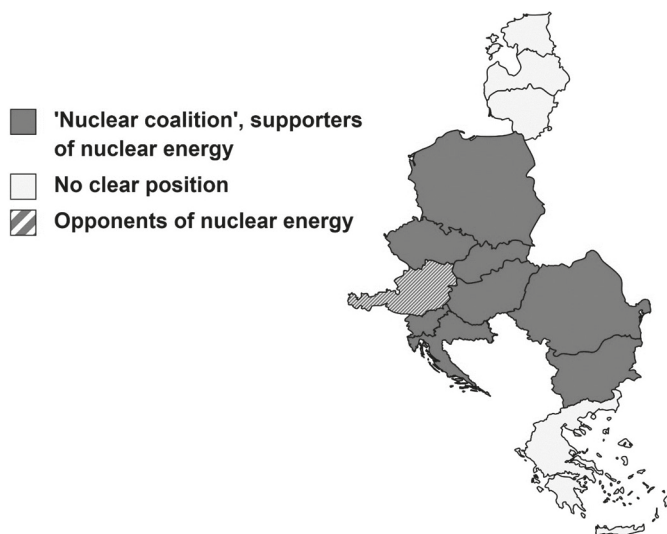
24 *Bulgaria to begin work on two reactors at Kozloduy nuclear site*, Reuters, 25 October 2023, <https://www.reuters.com/world/europe/bulgaria-begin-work-two-reactors-kozloduy-nuclear-site-2023-10-25/> [10.12.2023].

Poland is one of the few EU countries that does not have and has never had a nuclear power plant in operation. The history of Poland's nuclear power programme dates back to the 1970s, when in 1971, the Government of the People's Republic of Poland decided to build a nuclear power plant. In 1982, the construction of the Żarnowiec NPP in Pomerania began, which was to consist of two Soviet-made power units of the VVER-440 type. Commissioning of the units was to take place in the late 1980s and early 1990s. The Chernobyl disaster in 1986 caused a sharp decline in confidence in nuclear investment and many public protests were organised at the time. However, it was not the Chernobyl disaster that directly contributed to the dismantling of the Polish nuclear programme. At the time of the political transformation in Poland, as a result of the strong political position of the mining trade unions and the institutional weakness of the state, further development of nuclear power was abandoned. The necessity to build a nuclear power plant has been raised in Poland many times since then, but implementation has been limited to illusory actions that have not turned into hard decisions on the matter. In 2020, an updated version of the Polish Nuclear Power Programme was adopted by the Government. Based on this document, Poland plans to build two nuclear power plants with a total capacity of 6 to 9 GW. The first unit of the first power plant is to be commissioned in 2033, with subsequent units to be built successively until 2043, at which time they are to account for 20% of domestic electricity production. In 2023, the construction of the first Polish power plant in Pomerania was granted a fundamental environmental and location approvals, and a design contract was signed with the Westinghouse-Bechtel consortium.

The Three Seas Initiative countries that do not explicitly support nuclear energy (the Baltic States and Greece) are not opposed to it. Since Russia's invasion of Ukraine in February 2022, there have been increasing announcements of joining a pro-nuclear coalition in the EU. The only nuclear power plant in the Baltic States is the Ignalina NPP, which housed two RBMK-1500 type reactors, one of which was shut down in 2004 and the other in 2009. Prior to 2004, Ignalina NPP produced 74% of Lithuania's electricity. Ahead of the pack is Estonia, which has recently selected technology for its BWRX-300 SMRs, of which

it plans to build four, each with a capacity of 300 MW<sup>25</sup>. Greece does not have nuclear power plants. There is widespread concern about ensuring the safety of nuclear facilities, due to the frequent earthquakes in the region. Despite this, Greece does not and will not oppose the development of nuclear power in the rest of the EU<sup>26</sup>. Figure 5 brings together the 3SI countries in terms of attitudes towards nuclear power.

**Figure 4. The approach to nuclear energy in the Three Seas Initiative countries**



Source: own study. Map created with mapchart.net (CC BY-SA 4.0 DEED Licence).

## Conclusions

The Three Seas Initiative countries are linked by a common history, as well as common economic, geopolitical and infrastructural challenges. In the context of the new geopolitical situation related to, among other things, Russia's full-scale attack on Ukraine, the status of the Central and Eastern European region is changing. The countries of the region are gaining importance not only in terms of security, but also for economic reasons. Integration of the region can be

25 D. Radomski, *Estonia stawia na reaktory jądrowe BWRX-300*, Biznesalert.pl, 8 February 2023, <https://biznesalert.pl/estonia-fermi-energia-reaktory-jadrowe-bwr-300-smr/> [10.12.2023].

26 *Greece will never turn to nuclear Energy*, Euractiv.com, 25 October 2021, [https://www.euractiv.com/section/politics/short\\_news/greece-will-never-turn-to-nuclear-energy/](https://www.euractiv.com/section/politics/short_news/greece-will-never-turn-to-nuclear-energy/) [10.12.2023].

an attractive way to increase independence, security, competitiveness, and resilience to future crises and market disruptions. The integration within the Three Seas Initiative is in keeping with the values of the EU and is not a competing format to it, but a complementary one.

Densely interconnected transport and energy links in the countries of the “old EU” increase the efficiency and competitiveness of these economies. The need to expand these in the three seas area in Europe and to strengthen cooperation are the pillars on which the Three Seas Initiative was established. Cooperation in the 3SI countries in the field of energy, in the context of international security threats, is gaining importance. Nuclear energy is the region’s response to the international energy crisis and aligns with EU and international climate goals.

6 out of 13 3SI countries have operating nuclear power plants. In each of them, the share of nuclear power in the national electricity generation mix is higher than 1/5. The vast majority of the 3SI countries support the construction of nuclear power plants; only Austria is clearly opposed. The 3SI countries represent 73% of the informal “nuclear coalition” within the EU (which is 2/3 of the 3SI). 8 out of 13 3SI countries plan to expand or build new nuclear power plant units (including investments in small modular reactors – SMRs). Despite the involvement of the 3SI countries in the development of nuclear energy, they are still dependent on Russian uranium supplies. However, modern technology, the appropriate political will, and the involvement of allies – suppliers of technology and raw materials to the 3SI states – allows the diversification of sources of supply of nuclear fuel and technology from non-Russian directions.

The lobbying for nuclear energy in the EU and the involvement of the majority of the 3SI states in an informal “nuclear coalition” shows that in countries with limited mining potential and limited capital, nuclear energy can be an effective way to ensure energy security; meet national energy needs with a stable, emission-free and safe source of energy; and effectively *derusify* the supply of nuclear fuel and technology.

Central and South-Eastern Europe can become an important region in the context of the “nuclear renaissance” that is currently taking place worldwide. An increasing number of nuclear technology export countries (USA, South Korea, France) want to make long-term investments in this region. Some of the 3SI countries may even become regional



technology and logistics hubs for the nuclear industry. The extensive electrification associated with the decarbonisation of their economies brings with it the need for the intensive development of large-scale power generation capacity. At the moment, no other energy source guarantees the generation of such large amounts of low-carbon and stable energy as nuclear power. Nuclear power represents the most optimal method of energy production for stabilising an electricity system based on renewable energy sources, which are weather-dependent, while the capacity for efficient energy storage is limited by economic and technological conditions.

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