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PROBLEMS AND PERSPECTIVES OF THE EUROPEAN GREEN DEAL WITH THE FOCUS ON THE SEE COUNTRIES AND SERBIA

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ABSTRACT

Global climate challenges increasingly determine the prospects for world economic development, which entails an increase in the importance of the green transition agenda in the activities of international organisations and national governments. An example of a developed and consistent action programme at the national and supranational levels is the European Green Deal (EGD). The EU member states adhere to an ambitious strategy to reduce greenhouse gas emissions and achieve climate neutrality, solving the problems of introducing eco-friendly technologies (including alternative energy), energy efficiency, the formation of a sustainable industry, and the transition to a circular economy. The EU member states and candidate countries from Southeastern Europe (SEE) have to follow in the footsteps of the European climate policy and implement the developed plans to reduce the anthropogenic pressure on the environment. The key hypothesis of this study is that the states of the region, with rare exceptions, lag behind the average level of the EU in terms of the energy efficiency of their economies, the prevalence of energy-saving technologies, and the usage of renewables. Despite the developed institutional framework, the progress of the green transition in Serbia is very limited: the dynamics of reducing greenhouse gas emissions (including per GDP) is unsatisfactory, and the emissions intensity and energy intensity levels remain among the highest in the region. Using a comparative analysis method, we examined the structure of electricity generation and the place renewable sources take in this structure. We also analysed in detail the differences between the countries of the region in a number of indicators: energy intensity level of primary energy, greenhouse gas emissions (including per GDP), and the volume of carbon dioxide emissions in relation to the unit of electricity generated (emissions intensity). We conclude that institutional maturity, the sufficiency of financial support for the projects, and the availability of economic incentives for green transition are the determining factors for achieving the goals of the EGD in SEE.

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Introduction

According to the prevailing point of view in the scientific literature on ongoing climate change, the responsibility of humans for the emergence of the risks of global warming is undeniable. In order to develop and implement measures for climate change mitigation, the interaction of politicians and experts at the international level is being strengthened within the framework set by the UN and a pool of economically developed countries around the world. Regular UN events within the framework of the United Nations Framework Convention on Climate Change are of great importance for coordinating efforts in the fields of detection, attribution, and regulation of an anthropogenic effect on climate. Among these events, the 21st UN Conference on Climate Change in Paris, held in 2015, stands out. The Paris Agreement was signed to reduce anthropogenic pressure on the climate and limit the increase of the global average temperature below 2°C above pre-industrial levels. The signatory countries have set the ambitious goal of limiting global warming to 1.5°C by the end of this century.

In 2019, the EU adopted the European Green Deal (EGD) as a new growth strategy to address the problems related to climate change and environmental degradation. This comprehensive, evolving, overarching strategy for a carbon-neutral Europe should enable greenhouse gas emissions reduction by over half by the end of the decade, climate neutrality achievement by 2050, boost the economy through green technology, create sustainable industry and transport, and cut pollution (European Commission 2022a). As a set of policy initiatives by the European Commission, it encompasses economic, social, and ecological elements of sustainable development. All member states are expected to implement policies and undergo profound economic, social, and environmental reforms to contribute to the EGD goals. In order to reach net-zero emissions by 2050, with an intermediate commitment to cut emissions by at least 55% of the 1990 level by 2030, the EU has singled out increasing energy efficiency, greater reliance on renewable energy sources (RES) usage, and reduction of greenhouse emissions (the so-called three pillars of its green energy transition).

Since the EU member states from Central, Eastern, and Southeastern Europe follow in the wake of a common European socio-economic policy, an important element of which has become the fight against climate change, they have begun institutional changes aimed at incorporating the provisions of the EGD into

[3] Within the framework of this study, we include the following countries in the Southeastern Europe region: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, North Macedonia, Romania, Serbia, and Slovenia.

national development programmes[3]. Official Brussels also negotiates with the authorities of non-EU Balkan countries (including Serbia) in order to scale up green transition approaches that could reduce the anthropogenic burden on the environment in the region. Most SEE countries lag behind the EU-15 in terms of energy efficiency, the use of energy-saving technologies, the introduction of industrial equipment for carbon capture and storage (CCS), and the spread of electric and hybrid vehicles. Serbia and some other SEE countries are characterised by a traditionally low level of import diversification in the case of energy sources such as natural gas, oil, and thermal coal. The identified problems prove the need for countries in the region to follow the goals of the EGD, despite the challenges that arise.

The motivation for research on this topic is due to the importance of the participation of the SEE countries in the implementation of global and pan-European measures to combat climate change and their inclusion in the programmes of economic modernisation based on the green transition imperatives. The current lag of the SEE countries and Serbia, in particular, in the implementation of the EGD mechanisms in the fields of industry, energy, and transport bears the risk of even greater stratification of European countries in terms of the level of anthropogenic pressure on the natural environment, the quality of life and well-being of the population, and the competitiveness of national economies.

This paper aims to provide a broader perspective on opportunities and challenges related to the implementation of the EGD goals in the SEE countries, as well as reveal intra-regional differentiation in the level of readiness for a green transition through the comparison of statistical indicators. We consider several research questions: a) What are the main features of the EGD? b) What are the challenges and limitations of the EGD principles implementation in the SEE countries? c) To what extent does the structure of the primary electricity production in the SEE countries determine the indicators of energy efficiency and the volume of greenhouse gas emissions? d) Which SEE countries are most prepared to achieve the goals of the EGD? e) What results has Serbia achieved in creating an institutional framework for the green transition, and what factors are making this process less successful?

The novelty of this study is proved by the following fact: so far, very few works have been published on the problems and prospects for implementing the principles of the EGD in Southeastern Europe (while they do not cover nine countries of the region as a whole but, as a rule, are focused only on the national characteristics of the "green transition"). Moreover, there are very few studies that compare all SEE countries in terms of indicators of readiness to achieve green transition goals, such as the relative volume of greenhouse gas emissions, the energy efficiency of the economy, and the level of introduction of renewable

sources of primary electricity. From a methodological point of view, the authors will rely on a comparative method in order to indicate the current situation in the energy sector of the Southeastern European countries, including Serbia.

Literature Review

In the context of counteracting the adverse effects of global warming, the key greenhouse gas emitting countries should be involved in the process of designing and implementing appropriate measures to adapt and mitigate human impact on climate. The EU member states have made the most concrete steps in this field. In order to meet the EU climate goals, the EGD should be strongly anchored in the concepts pertaining to the constitutional framework of the EU legal order, in particular the concepts of solidarity, sustainable development, and a high level of environmental protection (Sikora 2021). It should be promoted as an efficient reallocation mechanism, fostering investment shifts and labour substitution in key economic sectors (Claeys, Tagliapietra, and Zachmann 2019). The successful implementation of the EGD largely depends on an adequate financial endowment, including the shift of public funding from hydrocarbons to renewables and energy efficiency in post-pandemic economic programmes (Siddi 2020).

Taking into account all the challenges and opportunities in the implementation of the Sustainable Development Goals (SDGs), raising awareness on green transition, education, and communication are indispensable elements of this process (Schimpf et al. 2022; Komendantova 2021). Energy-related behavioural change could be achieved thanks to awareness programmes in education since small changes in behaviour can have a significant impact on energy efficiency. Through the concepts of energy democracy and citizenship, consumer-producer and energy community institutes have been developed in countries across Europe for more than two decades. In Serbia, for example, such legislative changes appeared in 2021 (Aleksić and Grbić 2022). In addition, the European countries should focus on transformational technologies, such as low-carbon infrastructure and efficient buildings, and lead markets to boost demand for climate-neutral industry (Elkerbout et al. 2020).

Hainsch et al. (2022) point out that high electrification rates are of crucial importance for rapid decarbonisation. These authors also highlight that energy transition acceleration could be achieved if technology development and deployment go hand-in-hand with strong policy enforcement in the short run. Löffler et al. (2022) show that further reductions in demands, an increase in sufficiency, higher carbon prices in the buildings and industrial sectors, hydrogen, and increased power trade capacities, as well as large-scale investments into renewable energies and storages, help to meet climate and

energy targets set by the EU. Wagner (2021) stresses that EU policy should both incentivize an early phase-out of fossil fuels and support cooperative approaches to structural change. He also highlights that implementation of the transition from a fossil fuel-based to a low-carbon economy (based on renewable energies and hydrogen) could be directed with the help of partnerships between local, regional, and national authorities and social partners, NGOs, and research institutes.

Energy policies and efforts to combat greenhouse gas emissions will have an even greater impact on the fossil fuel markets. Natural gas, as the most environmentally friendly fossil fuel with a large potential to supplement the generation of new RES, will be the least impaired by the energy transition. In the next 20 years, its consumption and production are expected to grow significantly (Kulagin, Grushevenko, and Kapustin 2020). Mercure et al. (2021) argue that the accelerated replacement of fossil fuels by renewables implies a profound reorganisation of industry value chains, international trade, and geopolitics, and this process should be carried out very carefully to avoid possible global instability and the rise of inequalities. Their research also stresses that about half of the world's fossil fuel assets will be worthless by 2036 under a net zero transition, while renewables and freed-up investment will more than make up for the losses to the global economy. The majority of countries are unable to simultaneously achieve energy security, sustainability, and sovereignty, and thus they have to choose one of these imperatives in their energy policy strategies (Thaler and Hofman 2022).

According to Dubash (2021), previous experience in addressing climate governance challenges shows that climate institutions have played a modest role. He also points out that emergent climate institutions have been created through processes of layering new responsibilities on older institutions, suggesting that they emerged in path-dependent ways. An additional limitation for climate actions represents the COVID-19 pandemic, which has become an unprecedented phenomenon in the modern history of the world economy, causing the deepest decline in economic activity since the mid-20th century. Given the challenges, policymakers are expected to ensure the compatibility of COVID-19 recovery measures with climate change policy and the priorities of the EGD so that stimulus money will flow to economic activities that have a place in a climate-neutral world. The research by Dupont, Oberthür, and von Homeyer (2020) shows that the COVID-19 crisis has had positive effects on EU climate policy, especially by strengthening and advancing previous policy trends. Their analysis also indicates that the EGD may yet prove to be more transformational and may represent a critical juncture leading to a far-reaching change in EU climate policy that the COVID-19 crisis then reinforced and advanced. However, the COVID-19 lockdown had a negligible effect on climate change mitigation as

the intensive use of fossil fuels continues, which has unforeseeable consequences for the environment and human health. One of the main problems that society is currently experiencing is the emission of carbon dioxide from the combustion of fossil fuels, which results in global warming.

It should be mentioned that one group of authors advocates against the implementation of the green transition. Namely, Dunlap and Laratte (2022) harshly criticise the EGD, suggesting that it represents an exercise in necropolitics; market relationships implicitly depend on increasing energy consumption, spreading and intensifying extraction processes, and infrastructural colonisation. According to them, this strategy reinforces and intensifies socio-ecological destruction in the name of environmentalism. A similar point of view is also present in the research by del Guayo and Cuesta (2022), who argue that the energy transition is not only accompanied by the decline of employment in the coal sector but also by problems related to energy justice. For instance, they have in mind damages caused by the implementation and use of renewable facilities in rural areas (from wind or solar installations), environmental and/or social impacts due to lithium mining, and an increase in energy poverty. The low-income and racialized communities denoted as "sacrifice zones" are shouldering more than their fair share of environmental harms related to pollution, contamination, toxic waste, and heavy industry in the green energy transition (Scott and Smith 2017).

Dunlap (2020) highlights that there is nothing "green" about the "green transition", whose implementation is a necessary competition of transformation of energy generation systems (and use of steel, copper, aluminium, and rare earth mineral components), digitalisation, and use of so-called "smart" technologies. These technologies intertwine and necessitate fossil fuels. Jewell and Cherp (2019) indicate that the costs of required climate actions are too high in relation to capacities to bear these costs in relevant contexts. That is why most emerging economies prioritise growth over environmental quality, making them significant demanders and consumers of fossil fuels (Barua and Aziz 2022). The assessment shows that economic growth decouples with renewable energy consumption over time in the economies, reflecting the countries' lower prioritisation of the sustainable energy transition. A key reason for this is the lack of financial and economic capacity, leading to extensive reliance on overseas development assistance and public sources, with some minor participation from the private sector.

The study by Ciot (2022) shows that the capacity-building potential for EDG implementation in Visegrad countries and Romania is negative despite the high degree of preparedness. One of the possible directions for the EGD principles implementation could be technological innovation in the field of alternative energy. The low implementation of specific activities for climate change

mitigation and green transformation in these countries is due to the insufficient commitment of decision-makers to undertake steps towards resolving climate challenges (Knez, Štrbac, and Podbregar 2022). Catuti, Kustova, and Egenhofer (2020) argue that the SEE countries are burdened with problems in energy markets and the implementation of the EU energy acquis. The authors highlight that the green transformation (in coal regions, in particular) is both technically challenging and politically sensitive due to factors such as relatively low energy efficiency, a low level of GDP per capita (below the EU average), and the significant role of carbon-intensive energy sectors. Fejzić et al. (2023) analyse different development pathways for achieving climate neutrality in Serbia, Montenegro, and Bosnia and Herzegovina. They consider the potential of variable renewable energy (VRE) and its role in the decarbonisation of the power sector. The authors demonstrate that the potential of VRE technologies is sufficient to support the transition to climate neutrality by 2050.

Specificities and Limitations of the European Green Deal

The EU has adopted the European Green Deal as a growth strategy that aims to make Europe climate-neutral by 2050, with an intermediate commitment to cut emissions by at least 55% of the 1990 level by 2030. One of the key areas of the Green Transition in the EU is to increase the share of RES in the electricity generation mix and consumption. The Revised Renewable Energy Directive from 2018 established a renewable energy target for the EU of at least 32% by 2030 (Directive [EU] 2018/2001). But in March 2023, the European Council and the European Parliament reached an agreement to raise it to 42.5%. It is noteworthy that the share of renewables in energy consumption in the EU was 21.8% in 2021[4].

It is assumed that about 1/3 of the funds of the EU Multiannual Financial Framework (about 300 billion euros) for the period 2021–2027 will be spent on the implementation of the green transition policy and the creation of the circular economy in the EU member states. An additional source of funding should be the Next Generation EU anti-crisis fund (700 billion euros for 2021–2023) to mitigate the effects of the pandemic and support investments and reforms in the context of developing digitalisation and counteracting climate change.

[4] The EU member states vary widely in terms of the share of RES in energy consumption: for example, the highest proportions of RES in 2021 were in Sweden (62.6%), Finland (43.1%), and Latvia (42.1%), and the lowest were in Luxembourg (11.7%), Malta (12.2%), and the Netherlands (12.3%) (Eurostat 2022).

In March 2022, the European Commission announced the REPowerEU strategy, which focuses on areas such as energy efficiency improvement (solar panels on every new home and electric heat pumps instead of fossil fuel-burning boilers), diversifying trade partners, a massive increase in renewable energy usage (solar and wind power), and investment in liquefied gas terminals. The main aim was to reduce Russian gas imports by two-thirds in 2022 and entirely by the end of this decade. According to the REPowerEU plan, the proposed objectives should be even more ambitious: at least 45% for renewables in the structure of energy consumption and a reduction of energy consumption by 13% by 2030 (compared to 2020). For this package of emergency response measures (denoted as a focused acceleration of some aspects of the EGD), it would be necessary to single out an extra €210bn over the next five years to pay for the phasing out of Russian fossil fuels.

The EGD represents a set of climate policy measures that require economic and social reforms. The EU has defined three approaches to its external dimension: more collaborative (such as the EU regional strategies for the Western Balkans), coercive (worldwide promotion of the green transition initiative), and diplomatic (traditional climate diplomacy) (Teevan, Medinilla, and Sergejeff 2021). However, in addition to numerous positive effects, it is estimated that the transition to green and clean energy could have a negative impact on the EU member states, especially on those that have the largest number of jobs in fossil fuel production and do not have enough financial potential to invest in the green transition. Taking into account different macroeconomic conditions, energy import dependency, and renewable energy potential among the EU member states, there will also be significant differences in energy transformation performance and the pace of reform implementation among the EU member states. That is why the decisions to redesign Europe's energy security must take into account the long-term consequences, not only for the EU but also for neighbouring countries. Denoted as a multidimensional concept, energy security comprises not only the elements of the sustainable development approach but also the security of supply, the technical characteristics of the energy system, and the political aspects (Jovanović 2017). For example, the least negative effects are expected in countries where the majority of the energy produced comes from RES. In addition, it is also estimated that the EU member states, characterised by developed capital markets and significant investments in green technologies and infrastructure, could also be in a much better position compared with others.

In the short term, the green transition will also lead to a decrease in GDP and tax revenues. In order to deal with possible side effects, the European Commission created the Just Transition Mechanism as a part of the European

Green Deal Investment Plan in order to support the most vulnerable member states by addressing skill gaps and energy poverty. It consists of the Just Transition Fund, Invest EU, and the Public Sector Loan Facility as three pillars that could help mitigate the negative social and economic effects of the transition towards a climate-neutral economy. Denoted as just and inclusive, this transition must put people first and pay attention to the regions, industries, and workers who will face the greatest challenges (EC COM [2019] 640 final). In order to ensure a fair, effective, and irreversible transition and provide predictability for investors and other economic participants, the EU adopted the Climate Law as a part of the EGD in 2021. The multiple benefits of the green energy transition could be expected in the long term, and its significant economic advantages would be seen only after 2035.

The achievement of the EGD goals may be called into question due to a risk of carbon leakage that could appear when international partners "do not share the same ambition as the EU" (European Commission 2019). In addition, these problems are further deepened by the hard-hitting sanctions imposed on Russia. Fossil fuels can be denoted as the backbone of the electricity system because their share in global supply amounts to 64% (Gross 2020). Since energy security is imperative, some countries have decided it is not the right time to stop burning coal. However, the longer it takes for the country to stop using coal power, the greater the risk of jeopardising sustainable development and triggering climate change. That is because coal and renewable energy have an offsetting relationship. In addition, in 2021, the EU member states imported from Russia more than 40% of their gas consumption, and the share of Russia in oil and coal imports reached 27 and 46%, respectively (European Commission 2022b). Therefore, to prevent a damaging energy supply crunch, these countries tried to find alternative sources of energy supply. The EGD may have geopolitical consequences that could damage the EU's relations with neighbouring countries as well as with other key global partners. It is simultaneously a source of and response to turbulence, and it operates within a context of turbulence (events such as Brexit, the COVID-19 pandemic, the Green Wave, conflicts over the rule of law, etc.) (Dobbs, Gravey, and Petetin 2021). That is why it is of crucial importance for policymakers and policy actors to appropriately acknowledge, address, and govern turbulence in order to implement transformative actions in a holistic manner.

The EU's transition to renewables could not be accelerated because of the slow or difficult installation of new renewable energy systems and equipment. Since the shortfall in gas supply could not be resolved in the immediate future, the EU released the Taxonomy Complementary Climate Delegated Act. This pragmatic proposal would allow natural gas projects and nuclear energy to be marked as green under certain conditions. For instance, while the use of nuclear

energy does not cause harmful gas emissions, it poses great risks and threats to the environment.

The EU plans a short-term boost for coal and an increase in imports of liquefied natural gas and pipeline gas. The decision to use more coal (approximately 5% more than earlier) is definitely not eco-friendly. In addition, the EU transition to renewables (for instance, building wind and solar farms) could not be achieved quickly due to the limitations in EU legislation. Since it takes several years to obtain a building permit (nine years for wind farms and four years for solar), it is of crucial importance that national and local authorities conduct significant changes in planning laws. The Commission has taken "a step forward" by proposing specially designated "go-to" areas where permission can be obtained in one year. Other key problems standing in the way of the transition towards a climate-neutral economy are setting up new energy generation sources and producing consumer electric vehicles. The successful realisation of these activities largely depends on the use of ores and metals from Russia (for instance, copper, nickel, platinum group metals, etc.), which is necessary for reaching lower-carbon targets.

Green Transition Achievements in the Energy Sector in the SEE Countries

Strategic planning within the climate policy of the European Union is characterised by a large number of national variations. For the purpose of institutional harmonisation in this area, the EU required the member states to develop national energy and climate plans (NECPs), which became a part of the Clean Energy for All Europeans Package in 2019. NECPs provide for the establishment of national objectives, targets, and contributions for 2021-2030, which should correlate with the 2030 EU energy and climate targets.

The EU member states from the SEE region (Bulgaria, Croatia, Romania, and Slovenia) submitted their final NECPs in 2019-2020. Their analysis shows that the countries in the region do not take on unnecessary obligations, creating an institutional framework that can hardly be called ambitious. One study comparing all NECPs in the EU across five dimensions shows that Bulgaria and Croatia are among the six member states that have proposed plans that are not compliant with the EGD agenda, including decarbonisation, energy efficiency, and energy security. Slovenia and Romania are slightly better off in this respect: their NECPs are partially compliant with the general targets and objectives (Maris and Flouros 2021).

The European Union is implementing a green transition policy within the five main areas that underpin NECPs: decarbonisation, energy efficiency, energy

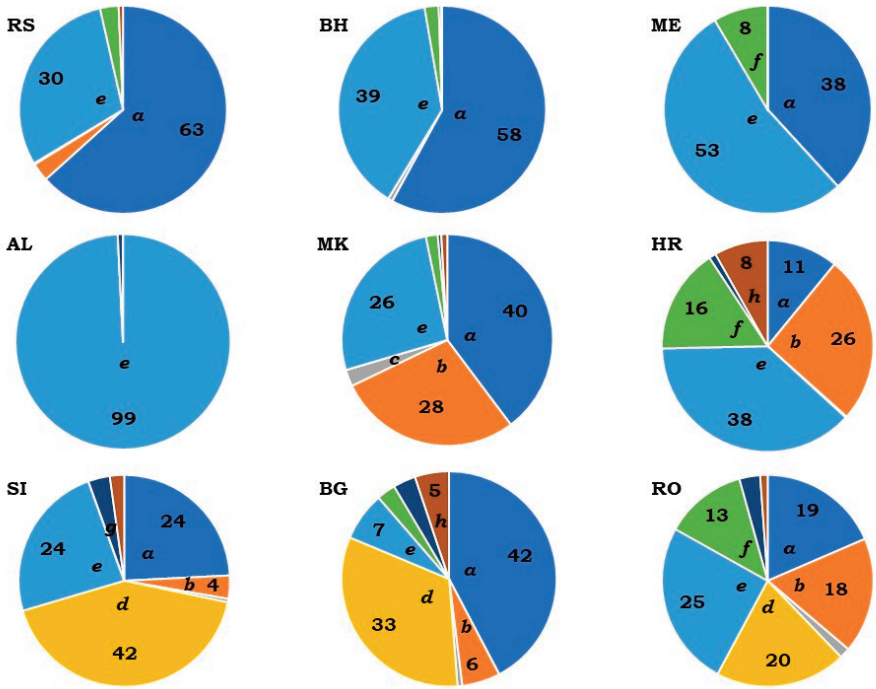
security, the internal energy market, research, innovation, and competitiveness. In this paper, we consider five statistical indicators that characterise the achievements of the SEE countries in reaching carbon neutrality and increasing energy efficiency.

The structure of primary electricity production largely determines the indicators of energy efficiency of the economy and the volume of atmospheric pollution by greenhouse gases; according to the Intergovernmental Panel on Climate Change (IPCC) and Eurostat, 25% of global total greenhouse gas emissions and 75% in the EU come from energy (IPCC 2014). Building a green future in the EU implies increasing the share of renewable energy sources (RES) in the electricity generation mix from 21.8% in 2021 to 45% by 2030[5]. According to the European Commission, the SEE member states, as a whole, are characterised by an average level of RES in energy output structure: in Romania, Bulgaria, and Slovenia, it reaches 23-25%; in Croatia, 31%. Although they have not reached the target of 32%, they are in a much better position than the Benelux countries (12-14%) or the Visegrad group (13-17%) (Eurostat 2022). These results are obviously related to the traditional reliance on hydropower in SEE countries.

According to our analysis based on Ember's data (for 2021 and 2022), the share of renewable energy (including hydropower) was highest in Albania, where there are no other types of power plants other than hydropower, as well as in Croatia and Montenegro (over 60%). In Bulgaria, where the main sources of primary energy are lignite and nuclear fuel, the share of RES is minimal (18%) (see Figure 1).

[5] According to the classification adopted by the European Commission, renewable energy sources include hydropower, wind power, solar power, biofuels, tidal power, geothermal energy, and some other minor sources.

Figure 1: Electricity generation by source in the SEE countries in 2021/2022 (%)[6]



Source: Authors' elaboration based on Ember 2023.

The absence of other types of power plants, except for hydroelectric power stations, makes electricity generation extremely unstable in Albania (the amplitude of interannual fluctuations reaches 30-40%). Similar problems have been experienced by other countries that rely on hydropower since the second half of the 20th century: Serbia (where the share of hydropower in the production structure reaches 30%), Bosnia and Herzegovina (BiH) (39%), Croatia (38%), and Montenegro (53%).

In these countries, both cascades of micro hydropower plants (HPPs) on small mountain rivers and large hydropower complexes (for example, the Iron Gate) are in operation. The energy output structure in Serbia, Montenegro, and BiH is very similar: besides HPPs, they burn local low-grade brown coal at

[6] RS – Serbia, BH – Bosnia and Herzegovina, ME – Montenegro, AL – Albania, MK – North Macedonia, HR – Croatia, SI – Slovenia, BG – Bulgaria, RO – Romania.

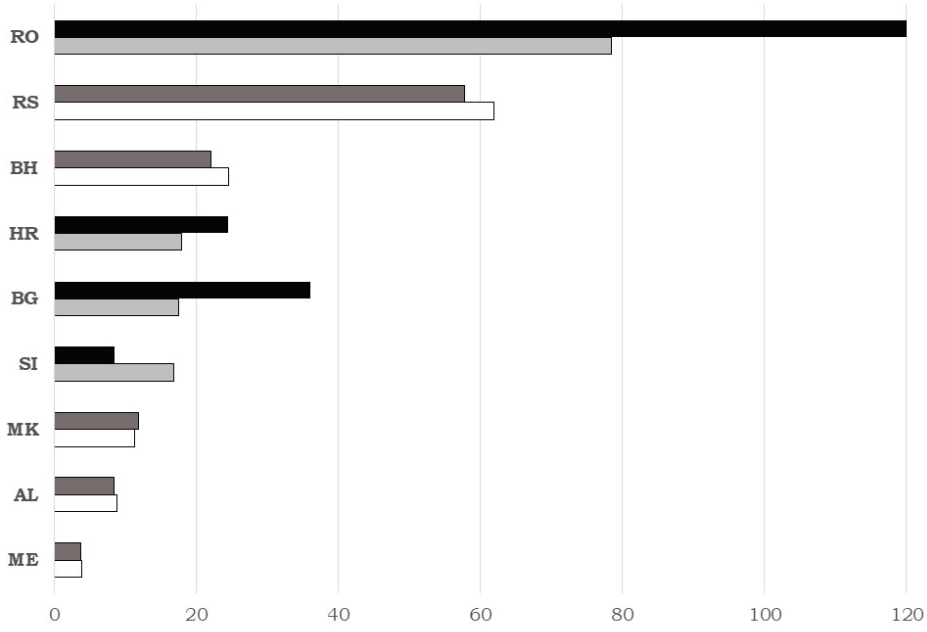
a – coal, b – gas, c – other fossil, d – nuclear, e – hydro, f – wind, g – solar, h – bioenergy

thermal power plants (TPPs) (the share of such TPPs reaches, for example, 63% in Serbia and 58% in BiH). In North Macedonia, TPPs function not only on coal but also on natural gas (40 and 28%). Definitively, this has a negative impact on the absolute and relative carbon emissions of these Balkan countries. From the mid-2010s, these states began to partially replace traditional sources with wind energy; in most of them, the share of wind farms in 2022 did not exceed 2-3%, and only Montenegro reached 8%.

Croatia has achieved a high share of renewable energy (over 60%) not only through hydropower (38%, 26 small and medium HPPs) but also with the help of wind (16%), solar (1%), and biomass energy (8%). The first wind farms were installed in Croatia in the 2000s, while the three largest wind farms in the country, with a total installed capacity of over 350 MW, were commissioned into service in 2021 (in Senj, close to Zadar and Knin). Thus, the total installed capacity of wind farms has reached 1000 MW. In addition, there are about 20 biogas power plants in the country; their installed capacity has been growing rapidly since the early 2010s.

The structure of electricity production in Slovenia, Bulgaria, and especially Romania is also characterised by a high degree of diversification. These countries are drawn together by the presence of nuclear power plants (NPP), which are the largest objects of the electric power industry: the Kozloduy NPP plant in Bulgaria (33% of national production, operating since 1974, with a capacity of 2176 MW), the Krsko NPP in Slovenia (42%, since 1983, 730 MW), and the Cernavoda NPP in Romania (20%, since 1996, 1300 MW). The share of TPPs using coal is also high in these three countries: 20-25% in Slovenia and Romania and over 40% in Bulgaria. Romania also makes extensive use of natural gas imported from abroad and natural gas produced in Transylvania. As in other countries in the region, alternative energy in Romania and Slovenia is based on the use of hydropower resources (up to 1/4 of the generation structure). Particularly large HPPs operate in Romania, such as the Iron Gate I and Iron Gate II hydro complexes with a total capacity of over 1,700 MW, as well as the Lotru HPP plant with a capacity of 510 MW. The solar power industry develops gradually (3-3.5% in the structure of energy production in all three countries), as does bioenergy (5% in Bulgaria). Favourable conditions for wind farm construction in Eastern Romania (the historical regions of Moldova and Dobruja) have increased the share of wind energy to 13%, and it has been growing since the beginning of the 2010s. The total installed capacity of wind farms in Romania (over 3,000 MW) is several times greater than in neighbouring countries in the region. It is noteworthy that it has stopped growing since the mid-2010s.

Figure 2: Greenhouse gas emissions in the SEE countries in 2000 and 2019 (MtCO2e)[7]



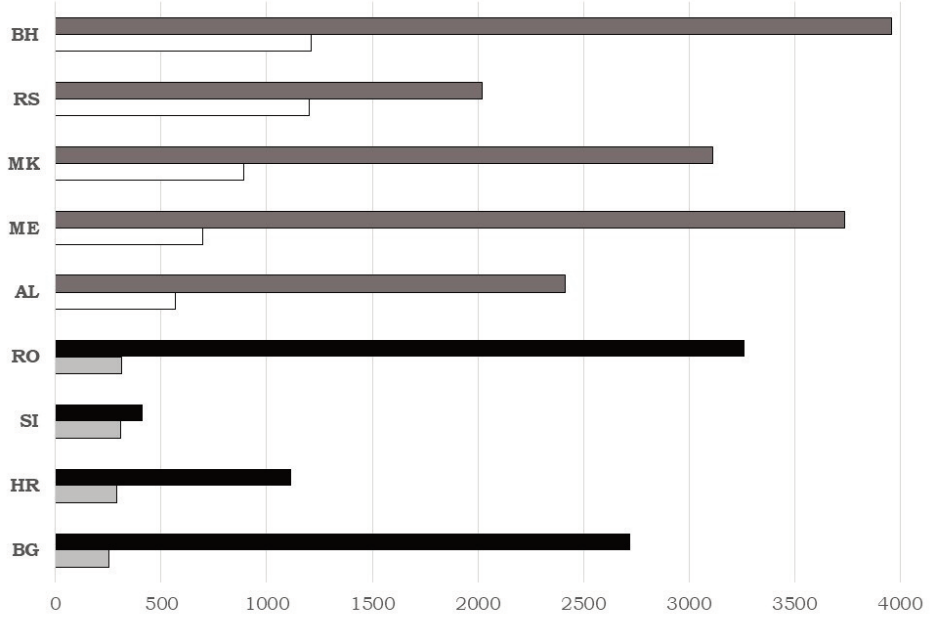
Source: Authors' elaboration based on Climate Watch 2023.

The results of the alternative energy implementation obviously affect the volume of greenhouse gas emissions by the SEE countries (see Figure 2). Emission reduction in the 21st century was recorded in Romania by a third (from 122 to 78 MtCO2e), in Bulgaria by half (from 36 to 17 MtCO2e), and in Croatia by a quarter (from 24 to 18 MtCO2e). Such a decrease likely became possible thanks to the implementation of green transition measures developed for the EU member states. Slovenia is off this list since greenhouse gas emissions in 2000-2019 have doubled. In the Western Balkans, characterised by slow energy sector reforms, emissions have remained the same or even increased, influenced by industrial production growth in manufacturing industries, which are the main emitters of greenhouse gases. Romania is still the key emitter in SEE, but if current trends continue, Serbia (62 MtCO2e in 2019), which still relies on coal energy, may catch up and overtake it over the next decade. At the other extreme are Montenegro, with an underdeveloped manufacturing industry and

[7] The upper bar corresponds to 2000, the lower one to 2019. The EU member states (Bulgaria, Croatia, Romania, and Slovenia) and non-EU countries are distinguished by the colour of the bars.

low-power energy (4 MtCO2e), and Albania, where energy is generated by HPPs (9 MtCO2e).

Figure 3: Greenhouse gas emissions per GDP in the SEE countries in 2000 and 2019 (tCO2e/ million $ GDP)[8]



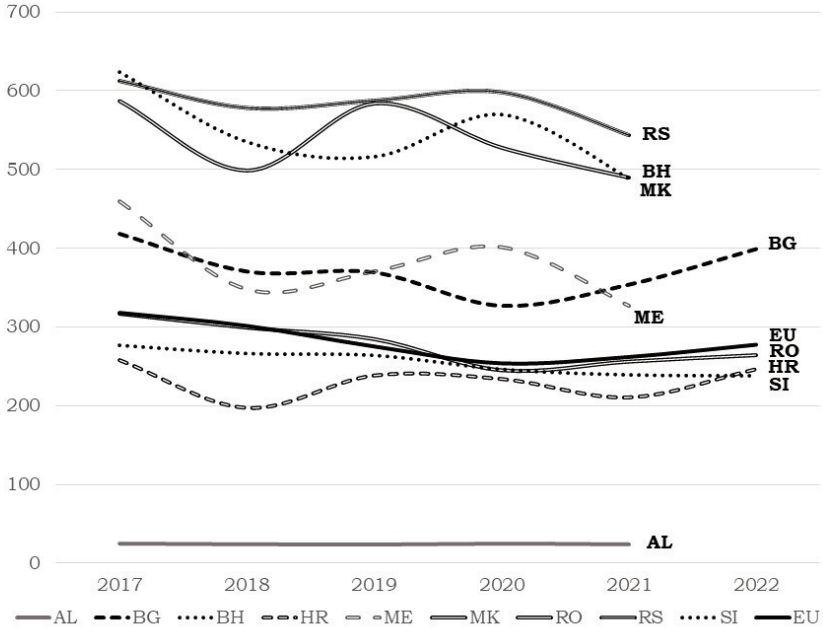
Source: Authors' elaboration based on Climate Watch 2023.

More indicative are the values of greenhouse gas emissions per unit of GDP, which characterise the level of the economy's "climate footprint" in a particular country. It is noteworthy that in the 21st century, in all SEE countries, this indicator decreased, and in some countries (Bulgaria, Romania), it dropped by more than ten times (see Figure 3). While it reached 3000-4000 tCO2e/million $ GDP in several countries of the region in 2000, it dropped to 250-300 tCO2e/million $ GDP in 2009, which indicated a serious structural modernisation of their economies. The worst performers are Slovenia (however, the indicator was already extremely low in 2000) and Serbia, where the volume of greenhouse gases per unit of GDP has decreased by only 40% over twenty

[8] The upper bar corresponds to 2000, the lower one to 2019. The EU member states (Bulgaria, Croatia, Romania, and Slovenia) and non-EU countries are distinguished by the colour of the bars.

years. It is noteworthy that the lowest values of the indicator (250-300 tCO2e/million $ GDP) were recorded in the SEE countries that became EU member states. For example, in BiH and Serbia, the "climate footprint" of economic entities is several times greater: 1200 tCO2e/million $ GDP.

Figure 4: Emissions intensity in the SEE countries in 2017-2022 (gCO2e per kWh)

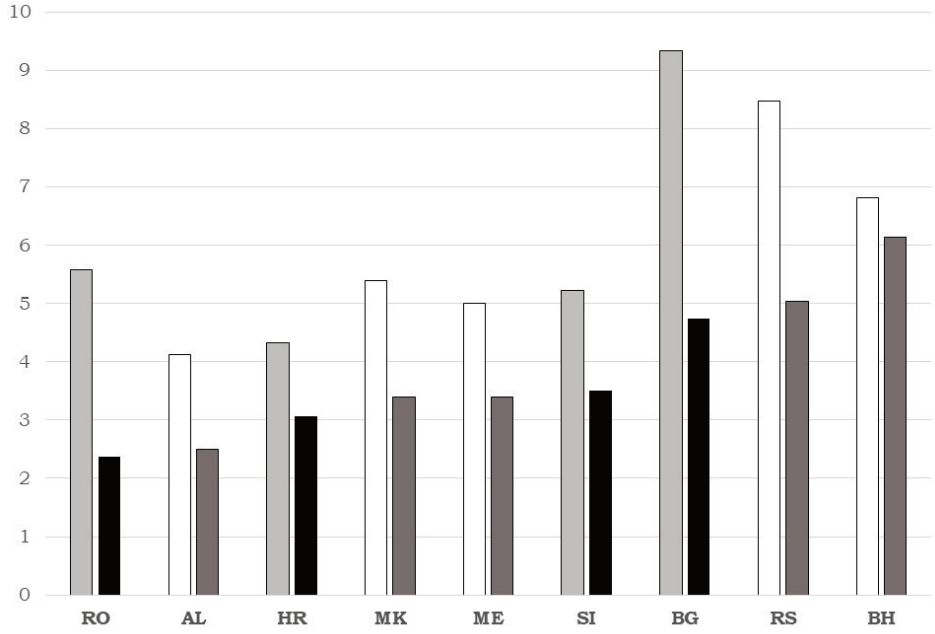


Source: Authors' elaboration based on Ember 2023.

Another indicator is the volume of greenhouse gas emissions (including carbon dioxide) per unit of electricity generated (see Figure 4). In combination with the electricity generation structure, it is a convenient indicator of the compliance of the national energy sector with the challenges of the "green transition". It is clear that in Albania, where almost all energy is produced by HPPs, the relative amount of carbon dioxide emissions is extremely low (circa 25 gCO2e per kWh). In Romania, Croatia, and Slovenia, this indicator is comparable to the EU average of 235-265 gCO2e per kWh in 2022. It should be emphasised that the return of individual EU member states to the use of local fuel resources in 2021-2022 (for example, low-quality lignite), due to the reorientation of import supplies and their high cost, led to an increase in the considered indicator. For example, in 2020–2022, the relative volume of carbon

dioxide emissions increased in the EU countries by almost 10% (up to 277 gCO2e per kWh). A similar adverse trend is typical for lignite-rich Bulgaria and Romania. In Serbia, North Macedonia, and BiH, the indicator under consideration continues to decline (by 15-20% in 2017-2021) but remains extremely high. Serbia records the worst results, where relative emissions are twice as high as the EU average (545 gCO2e per kWh).

Figure 5: Energy intensity level of primary energy in the SEE countries in 2000 and 2019 (MJ/$2017 PPP GDP)[9]



Source: Authors' elaboration based on World Bank 2023.

The energy intensity level of primary energy also shows that Serbia and BiH lag behind other SEEs (see Figure 5). In BiH, the energy efficiency indicator was more than 6 MJ/$2017 PPP GDP in 2019, and it has hardly decreased in twenty years. Bulgaria (4.7 MJ/$2017 PPP GDP) and Serbia (5 MJ/$2017 PPP GDP), on the contrary, achieved significant success in the 21st century; energy efficiency has almost doubled. However, the case of Romania deserves the most attention

[9] The left bar corresponds to 2000, the right one to 2019. The EU member states (Bulgaria, Croatia, Romania, and Slovenia) and non-EU countries are distinguished by the colour of the bars.

because it became the country with the lowest energy intensity level of primary energy in Southeastern Europe (only 2.4 MJ/$2017 PPP GDP). Compared to 2000, Romania managed to reduce the value of this indicator by 2.3 times.

The Peculiarities of the Green Transition Process in Serbia

The question that inevitably arises is whether Serbia is able to adopt the EU development strategy aimed at creating a fair and prosperous society with a modern, resource-efficient, and competitive economy while protecting biodiversity and reducing all types of pollution. As a candidate for EU membership, Serbia is expected to implement certain actions in order to reduce the emission of harmful gases. Namely, in October 2020, the Western Balkans leaders signed the Sofia Declaration of the Green Agenda for the Western Balkans as a concrete plan for expanding the EGD to Southeastern Europe[10]. In order to achieve long-term energy security, the Agenda implies the phasing out of coal-powered plants from the energy system and their replacement with RES, as well as the allocation of investment aimed at increasing energy efficiency. In addition to the inevitable transformation of the power sector in Serbia, the Declaration also foresees the reduction and gradual abolition of subsidies for coal[11].

At the end of 2020, the Guidelines for the Implementation of the Green Agenda for the Western Balkans and the Investment Plan for the Western Balkans were adopted. A significant step forward was made with the adoption of the Law on the Use of Renewable Energy Sources and the new Law on Energy Efficiency and Rational Use of Energy, as well as amendments and additions to the Energy Law and the Law on Mining and Geological Explorations. The law provides for the formation of the Directorate for Financing and Encouraging Energy Efficiency within the Ministry of Mining and Energy and various subsidy programmes. The main aims are to increase energy efficiency, achieve energy security, strengthen the competitiveness of the economy, and manage the adverse environmental side-effects of the energy sector. The state, together with the local governments, implemented a national programme and approved

[10] The Green Agenda for the Western Balkans, as a part of the EGD, has five pillars: climate action, circular economy, sustainable agriculture, biodiversity, and fighting pollution of air, water, and soil.

[11] As a result of the adaptation of the Green Agenda Declaration at the Conference in Sofia and commitment to the Regional Action Plan adopted at the summit in Slovenia, the Serbian authorities were allocated 8 million euros for the implementation of the "Green Agenda in Serbia" programme within IPA 2020. In December 2022, it also became known about the grants by the EU banking structures for the development of seven green energy projects in Serbia (263 million euros in total via the Western Balkan Investment Framework).

subsidies to increase energy rehabilitation, which implies rising energy efficiency at the household level (including solar panel installation). The Ministry of Mining and Energy is working on the preparation of the Integrated National Energy and Climate Plan of the Republic of Serbia from 2021 to 2030, with a vision until 2050. This plan is being developed within the Instrument for Pre-Accession Assistance project "Further Development of Energy Planning Capacity", and it should define appropriate ways to increase the participation of RES in the production of electricity. According to the Bankwatch report from 2021, thermal power plants in Serbia were denoted as the biggest polluters in Europe since their sulphur dioxide emissions were almost six times higher than those permitted by the National Plan to reduce emissions of major pollutants from old large combustion plants[12] (there are 16 large combustion plants whose rated thermal input is equal to or greater than 50MW).

Consequently, the Energy Community initiated the procedure against Serbia in January 2020 for non-compliance with the requirements of the Large Combustion Plants Directive. After the dispute procedure's initiation, the government passed the updated National Plan for the Reduction of the Main Pollutant Emissions from Old Large Combustion Plants, which includes an obligation to reduce the total annual emission of sulphur dioxide, nitrogen oxides, and explosive materials from old and large energy combustion plants. Significant progress in the field of green transition and sustainable development is impossible to achieve in the short term since certain industrial branches and sectors will need a longer time to adapt to the requirements set out in the EGD.

Lower-quality coal (lignite) is largely used for the production of electricity in Serbia. This type of coal ensures relatively high energy independence for the country and electricity production at relatively low and stable costs. However, its disadvantage is that it contributes to environmental pollution by causing a greenhouse effect. It is also planned to shut down coal power plants that are not equipped with systems for reducing emissions and carbon capture and storage. According to some views, increasing the proportion of renewable energy not only in Serbia but also in the region was impossible due to inconsistent development of RES, political developments, and weak institutional arrangements (Dunjic, Pezzutto, and Zubaryeva 2016).

In order to preserve energy stability and security, the Serbian authorities decided to continue with the exploitation and use of coal. A new coal-fired

[12] The Western Balkan countries were obliged to prepare national Emsssions Reduction plans in accordance with the Large Combustion Plants Directive, which defines the limits of emission of dust, nitrogen oxides, and sulphur dioxide. This directive should be implemented from January 2018 to December 31, 2027.

power station, Kostolac B3, has been under construction by Chinese companies, and its inclusion in the energy grid is expected by the end of 2023. This lignite power unit should provide an additional 350 megawatts (MW) for the energy system. In addition, the construction of the Buk-Bijela HPP on the Drina River (a joint project with BiH) (115 MW) and the gas interconnector between Serbia and Bulgaria are also underway. The national project that will also significantly contribute to the increase in the share of RES production in the total production of electricity is the construction of the reversible HPP Đerdap 3 (2400 MW).

By signing the Declaration of the Green Agenda for the Western Balkans, Serbia has committed to completely phase out coal by 2050, which may lead to an increase in unemployment. However, it may be avoided by providing adequate conditions for demand-oriented, practical vocational skills training and quality specialised education. Bearing in mind the current problems and imposed challenges, Serbia is not in a position to simply diversify its energy resources, and, therefore, it is forced to postpone its plan to phase out coal-fired power plants in the coming period. It should be noted that the EU energy and climate legislation is impossible to be transposed by Serbia and other WB countries since they are burdened with problems caused by weak institutional settings, outdated energy infrastructure, and the limited influence of grassroots environmental movements (Ćetković 2022).

Conclusion

The implementation of the European Green Deal principles in the SEE countries has a number of features. The member states and candidate countries from the region have committed themselves to following the plans of official Brussels to reduce anthropogenic emissions and switch to renewable energy sources. Our study shows that most countries in the region are still characterised by insufficient efforts to achieve the designated goals in the fields of decarbonisation, energy security, and energy efficiency.

Greenhouse gas emissions and energy efficiency indicators depend to a great extent on the structure of primary electricity production, which remains inertial in many SEE countries. The formation of the institutional framework for the green transition does not guarantee visible progress towards the goals of the green transition. Taking hydropower into account, the share of RES in the structure of electricity generation ranges from 18% in Bulgaria and 30% in North Macedonia and Slovenia to 99% in Albania. However, the level of development of solar and wind energy is low (the only exceptions are Romania and Croatia). The possible (but unlikely) classification of nuclear energy as a RES would be an important asset for Slovenia, Bulgaria, and Romania. The key challenge for diversifying the structure of electricity production and consumption is the

significant role of coal as the cheapest source for local energy systems; in Serbia and Bosnia and Herzegovina, for example, its share in electricity generation reaches 60%.

Greenhouse gas emissions per GDP and emissions intensity (gCO2e per kWh) remain very high in Serbia, Bosnia and Herzegovina, and North Macedonia. On the contrary, in Romania, Croatia, and Slovenia, emissions intensity is even slightly lower than in the EU as a whole, not to mention Albania, where this indicator is close to zero. The energy intensity level of primary energy (MJ per GDP unit) confirms the fact that Serbia and BiH lag behind other SEE countries, while Romania has achieved the greatest success in improving the energy efficiency of the economy in the 21st century.

The countries of Southeastern Europe, including Serbia, face a significant number of challenges in implementing green transition policies. Although these challenges can be considered universal, they are of crucial importance for the states of the region because of institutional immaturity, the peculiarity of political regimes, and existing structural imbalances.

- The expenditures planned by the European Commission for the implementation of the EGD under the 2021-2027 Multiannual Financial Framework will not be able to cover the needs of the EU member states to provide subsidies and finance capital-intensive projects dealing with modernisation in the energy sector and manufacturing. The countries of the region themselves, especially those outside the EU, are characterised by a lack of foreign and local investment in the green economy and direct free funds to traditional industries that provide economic growth.
- The volume of private investment in the development of a green economy in the SEE countries remains small, which is associated with the unwillingness of businesses to invest in risky projects with a long payback period. At the same time, the European Commission estimates that the private sector in all member states needs to cover a supplementary gap of 160 billion euros per year, which cannot be achieved without incentives that will induce businesses to realise green projects.
- The households in the SEE countries can hardly count on compensation for the introduction of expensive technologies to improve energy efficiency in residential housing. The same applies to other loans for transition projects, such as replacing vehicles with internal combustion engines with electric cars.
- Uncertainty about the classification of nuclear energy as renewable energy (France and other EU countries with nuclear power plants are in difficult negotiations about this) affects the scale of potential reforms in the energy sectors of Slovenia, Bulgaria, and Romania. Recognising nuclear energy as

"green energy" will make it much easier for these SEE countries to achieve the EGD goals.

- The prospects for the Concept of Open Strategic Autonomy remain vague, so the ability of the EU to ensure the achievement of the EGD goals in the face of heavy dependence on imports of critical raw materials and industrial intermediates is questionable.
- Replacing traditional primary energy sources with alternative ones in the context of limited subsidy opportunities will lead to an increase in the cost of electricity for households and producers, which will negatively affect the competitiveness of their products.
- The green agenda is not a priority in the SEE countries; a significant part of society is not ready for large-scale and costly reforms, and increasing their popularity in the near future is arguable. The initial stages of these reforms will most likely be accompanied by an increase in unemployment and societal polarisation, which is not in the interest of political elites that usually lean towards measures with short-term benefits.
- The SEE countries may have low motivation to set ambitious national targets, as there are many examples of reserved attitudes towards pan-European climate policy targets among the EU member states (e.g., Benelux). In conditions when the largest emitters of greenhouse gases do not assume any obligations, the countries of the region may be inclined towards demonstrative image projects rather than effective ones (greenwashing).
- The COVID-19 crisis has had a dual impact on the prospects for achieving the EGD goals. On the one hand, the reduction in industrial activity and restrictions on the movement of people led to a decrease in greenhouse gas emissions, but on the other hand, a sharp increase in government spending on anti-crisis measures pushed the implementation of green transition projects into the background. In order to return the EGD to the focus of policymakers' attention, experts called for the principles of the green transition to be the basis for recovery and growth.
- One of the key challenges of promoting the EGD in the SEE countries (and in Serbia in particular) is related to the destabilisation of the global energy markets caused by the crisis in Ukraine and sanctions against Russia. First, the countries of the region have to reconsider plans to reduce the use of low-quality local brown coal in the energy sector due to energy security considerations. Thus, the phasing out of coal and the transition to imported natural gas and then to renewable energy sources are being postponed. Secondly, reducing dependence on Russian energy sources in a short time is costly due to higher prices from alternative suppliers and the financing of

infrastructure projects (LNG regasification terminals, pipeline networks, etc.)[13]. In general, two development scenarios are possible for the SEE countries: conservative (due to the high cost of diversification, reliance on local energy sources will increase and the structure of electricity production will not change drastically) and progressive (volatility in prices for traditional energy sources will stimulate the transition to renewables and the realisation of energy efficiency projects).

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ПРОБЛЕМИ И ПЕРСПЕКТИВЕ ЕВРОПСКОГ ЗЕЛЕНОГ ДОГОВОРА СА ФОКУСОМ НА ЗЕМЉЕ ЈУГОИСТОЧНЕ ЕВРОПЕ И СРБИЈУ

Апстракт: Глобални климатски изазови све више одређују изгледе светског економског развоја, што подразумева повећање значаја зелене агенде у активностима међународних организација и националних влада. Пример развијеног и доследног акционог програма на националном и наднационалном нивоу је Европски зелени договор (ЕЗД). Земље чланице ЕУ придржавају се амбициозне стратегије смањења емисије гасова стаклене баште и постизања климатске неутралности, решавања проблема увођења еколошки прихватљивих технологија (укључујући у алтернативној енергији), енергетске ефикасности, формирања одрживе индустрије и преласка на циркуларну економију. Земље чланице ЕУ и земље кандидати из Југоисточне Европе (ЈИЕ) морају да крену стопама европске климатске политике и имплементирају развијене планове за смањење антропогеног притиска на животну средину. Кључна хипотеза овог рада је да државе региона, уз ретке изузетке, заостају за просеком ЕУ у погледу енергетске ефикасности привреде, распрострањености технологија за уштеду енергије и коришћења обновљивих извора енергије. Упркос развијеном институционалном оквиру, напредак зелене транзиције у Србији је веома ограничен: динамика смањења емисије гасова стаклене баште (укључујући по БДП-у) је незадовољавајућа, а интензитет емисије и нивои енергетског интензитета остају једни од највиших у региону. Користећи методе компаративне анализе истражили смо структуру производње електричне енергије и место обновљивих извора у њој, а такође смо детаљно анализирали разлике између земаља региона према низу индикатора – степену енергетског интензитета примарне енергије, емисије гасова стаклене баште (укључујући и по јединици БДП-а), обим емисије угљен-диоксида у односу на јединицу произведене електричне енергије (интензитет емисије). Закључујемо да су институционална зрелост, довољна финансијска подршка пројектима и доступност економских подстицаја за зелену транзицију одлучујући фактори за постизање циљева ЕЗД-а у ЈИЕ.

Кључне речи: Европски зелени договор; зелена транзиција; климатска неутралност; енергетска ефиканост; енергетска интензивност; емисија гасова стаклене баште; обновљиви извори енергије; Југоисточна Европа; Србија.