

REGIONAL FOOD AND ENERGY TRADE

Evidence from Western Balkan region and Montenegro



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This publication was developed with the support of the "SMART Balkans – Civil Society for Shared Society in the Western Balkans" regional project implemented by the Centar za promociju civilnog društva (CPCD), Center for Research and Policy Making (CRPM) and Institute for Democracy and Mediation (IDM) and financially supported by the Norwegian Ministry of Foreign Affairs (NMFA). The content of the publication is the sole responsibility of the project implementers and does not necessarily reflect the views of the Norwegian Ministry of Foreign Affairs (NMFA) or SMART Balkans consortium partners.

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1. INTRODUCTION

In today's conditions and the globalized world, trade in food and energy represents a key link in maintaining the stability and prosperity of the world economy. The increasing need for food together with the growing need for energy, places these sectors as vital for the growth and sustainability of the economy. Changes and trends in the international market during the previous years have influenced the growth of discussion and research in the field of food and energy trade. The economic instability caused by the pandemic, followed by geopolitical changes in Europe and the war in Ukraine, influenced changes in the food and energy markets. The danger of food and energy shortages was increasingly present. Therefore, the prices of food and energy have also increased, which has affected the position of producers and the population, especially the most vulnerable. In order to improve the situation on the food market and ensure the stability of the food market, the EU adopted various measures aimed at citizens and agricultural producers. Also, the EU adopted an energy support package in order to avoid energy poverty. These trends have not bypassed the countries of the Western Balkans either.

Therefore, a comprehensive analysis of food and energy trade provides insight into the complex network of connections at the regional level, economic dependence and sustainability challenges arising from them. The goal of the analysis is to provide insight and a broader picture of trade relations between the countries of the region, giving an overview of food and energy exchanges and mutual dependence.

Thus, an overview of research and works that dealt with trade exchange in general and exchange of food and energy in the region was given. In the second part, there is an overview of food and energy trade at the regional level, where a comparison of exports and imports between countries is presented, indicating mutual connection and dependence. In the last part, the situation in Montenegro is presented. Specifically, an overview of the current state of international food and energy exchange, the potential that Montenegro possesses in order to improve the situation in this area, is given.

Indicators for cross-country comparisons are selected based on their relevance to the objectives of a study, their comparability across countries, and the availability of data. In the case of the Western Balkan region, indicators such as energy production, exports, imports, and dependency are crucial for understanding the dynamics of regional trade and the interconnectedness of energy markets. These indicators provide a quantitative basis for evaluating the potential for cooperation, competition, and shared challenges among neighbouring countries.

The case study on Montenegro delved into greater detail on certain topics due to the country's unique position and potential within the region. Montenegro's energy export and import patterns, for example, were discussed in depth to explore the country's role in regional energy security and market dynamics. These topics were highlighted to assess Montenegro's trade potential and energy strategy in the context of regional interconnectedness and reliance on imports.

2. LITERATURE REVIEW

Different academic papers, analysis, studies, and reports have been prepared which analysed trade cooperation at the level of the Western Balkan region. In addition to these sources, there are initiatives, trade agreements and projects aimed at promoting and improving trade cooperation. Different national strategies and programs also promote regional cooperation and improvement of trade of goods and services.

All countries of the WB region are signatories to the Central European Free Trade Agreement (CEFTA), which joined the Agreement in 2006 and 2007. The goal of this Agreement is to strengthen regional and trade cooperation through duty-free trade and the liberalization of trade cooperation between CEFTA countries, which contributes to growth of each economy individually. When it comes to the contribution of the CEFTA Agreement to the food trade among WB countries, the paper "How CEFTA Influenced the Competitiveness of Agri-Food Trade in the Western Balkans" (Matkovski, Djokic, Jovic, 2022) shows that CEFTA contributed to the growth of exports of agri-food products in the Western Balkan economies. Through the analysis of the comparative advantages of all the countries of the region, it was determined that all the countries of the region, when it comes agri-food products, have comparative advantages in exporting on the international market. On the other hand, other papers (Leka, Daku, Jusofi, 2022) indicate that free trade agreements signed by WB countries contributed to a greater impact on law reform than economic sustainability and trade promotion.

The paper „Export Competitiveness of Agri-Food Sector during the EU Integration Process: Evidence from the Western Balkans“ (Matkovski, et.al , 2022) explores the comparative advantages in the agri-food sector in WB countries during EU integration process. All WB countries experienced increased agri-food trade and shifts in regional and commodity structures. The paper discusses opportunities for enhancing agri-food exports. The study used revealed comparative advantage indexes for analysis and the findings suggest that all WB countries, except Albania, showed comparative advantages in agri-food exports. Serbia demonstrated the highest comparative advantage in this sector. The paper recommends WB countries optimize their agri-food positions in EU pre-accession negotiations and enhance competitiveness in the EU market.

Also, the paper „Determining Food Security in Crisis Conditions: A Comparative Analysis of the Western Balkans and the EU“ (Matkovski, et.al, 2020) aims to identify factors influencing food security and assess the level of food security in Western Balkans. Four Food and Agricultural Organization (FAO) dimensions—stability, availability, access, and utilization—are analyzed. Results reveal significant disparities in food security levels between these regions, primarily due to the Western Balkan countries' economic development lag compared to the EU. While food security in Western Balkan countries is currently lower than in the EU, it is not under immediate threat, but crises like the COVID-19 pandemic could jeopardize it. High food supply variability, reliance on cereal imports, and lower Gross Domestic Product (GDP) per capita in Western Balkan countries compared to the EU are the main reasons for this disparity.

The paper "The Determinants of Growing Agri-Food Export: the case of CEE countries" (Balaban, Et. al, 2022) reveal that trade liberalization plays a significant role in boosting agri-food exports in CEE countries. Additionally, EU enlargement has an indirect impact on agri-food exports, offering valuable insights for policymakers. Some papers discussed about barriers to trade between WB countries. The paper "Trade Barriers and Exports between Western Balkan Countries" (Gezim&Bashkim, 2019) examines trade patterns in the Western Balkan region and identifies the main drivers of and obstacles to mutual foreign trade cooperation. The paper shows that "political, economic, and social environments in the Western Balkan countries are still weak". There are tariff and non-tariff barriers within Western Balkan countries in order to protect local production, even though these countries are members of CEFTA.

When it comes to the energy trade (Shkurti, 2019) analyses the Western Balkans Power Market Prices within the ENTSO-E framework. This study focuses on the power market in the Western Balkans, encompassing six countries: Albania, Croatia, Bosnia and Herzegovina, Serbia, and Montenegro. The study explores how hydroelectric generators in some countries can strategically utilize their water storage capacities to influence off-peak prices, while heat generators in other countries can manage their capacity strategically to impact peak prices. The paper points to the necessity of greater regulatory alignment in the Western Balkan region to address economic and political barriers among these countries.

The energy market in the Western Balkan region faces numerous challenges, which may represent a limitation in energy trade between those countries. The World Bank Study from 2018 indicates that investments are needed in order to modernize infrastructure at the regional level, limited energy supply mix diversification, delays in the establishment competitive regional energy market etc. The need for greater investments in the energy sector was identified in the study of The Balkan Forum from 2017, where it was stated that additional investments are needed that will affect the energy transition, and to improve the competitiveness of WB economies. The improvement of infrastructure would contribute to greater cooperation between the countries of the region.

The study “The Western Balkan power sector between crisis and transition” (Ciuta & Gallop, 2022) analysed the energy sector in all countries of the Western Balkans, giving an overview and comparative analysis of the situation in this sector in individual countries. The energy export from the countries of the Western Balkans was analysed, indicating net energy exporters and importers.

Therefore, the aim of this paper is to present and analyze food and energy trade at the regional level, in order to provide a more detailed insight into the trade relations between countries and to see the mutual dependence and intensity of cooperation. A special overview is given at the level of Montenegro.

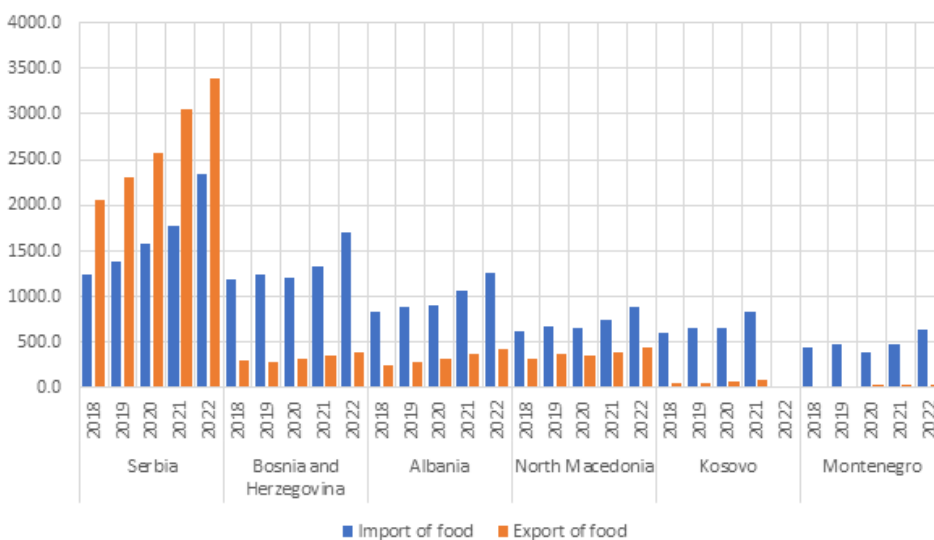
3. REGIONAL COMPARISON

In this section, the trade exchange of food between countries in the region has been analysed to provide an overview and a clearer picture of the country's dependency on its own production and import of food from other countries. Additionally, in the second part of this section, an analysis of energy trade at the regional level and the relationships between countries in the region is provided.

3.1 REGIONAL FOOD TRADE

The volume of export and import of food in the Western Balkan region in the period 2018-2022 recorded growth. On the one hand, there are countries that record a deficit in food foreign trade, especially countries where food imports are many times higher than exports (such as Montenegro and Kosovo, on average 16 and 10 times in 2018-2022, respectively) and countries where this difference is smaller (such as North Macedonia and Albania, on average 2 and 3 times in 2018-2022, respectively). On the other hand, Serbia is the only country in the region that records a foreign trade surplus. In the observed period 2018-2022, the export of food from Serbia is on average 1.6 times higher than the import of food into Serbia.

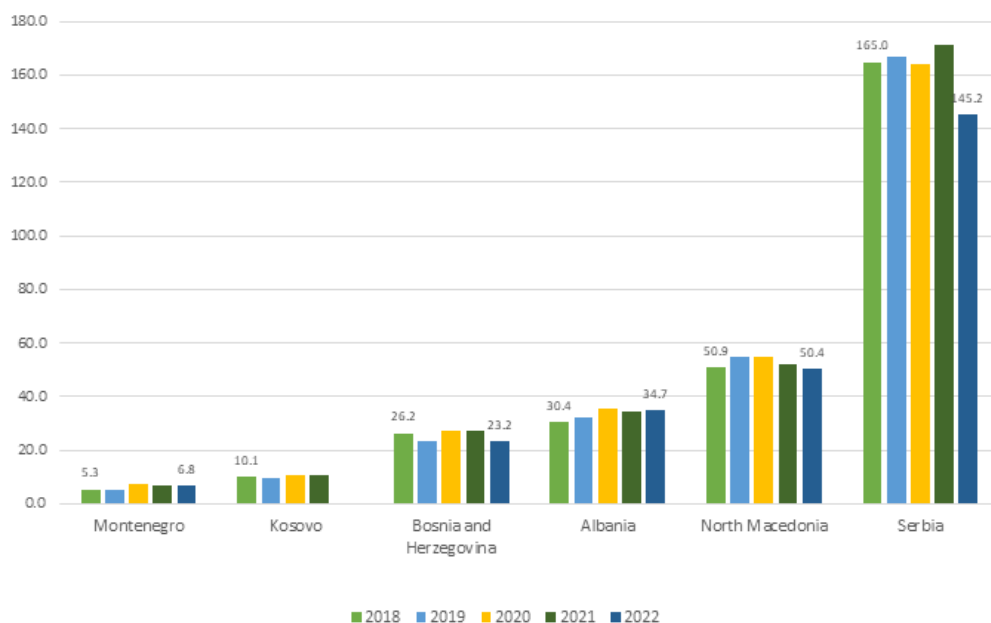
Figure 1: Volume of trade of food in Western Balkan region, 2018-2022, in million EUR



Source: National statistical offices of the regional countries

Therefore, the coverage of food imports by food exports varies significantly among Western Balkan counties. Compared to other countries, Montenegro records the lowest percentage of food imports covered by food exports. The similar coverage is achieved by Kosovo (in 2021 it amounted to 10.5%). About half of North Macedonia's food imports are covered by food exports, while this indicator is less favourable in other countries. On the other hand, Serbian food exports are significantly higher than food imports. In 2022, the coverage of import by export of food amounted to 145.2%, while in 2021 this indicator amounted to 171.4%.

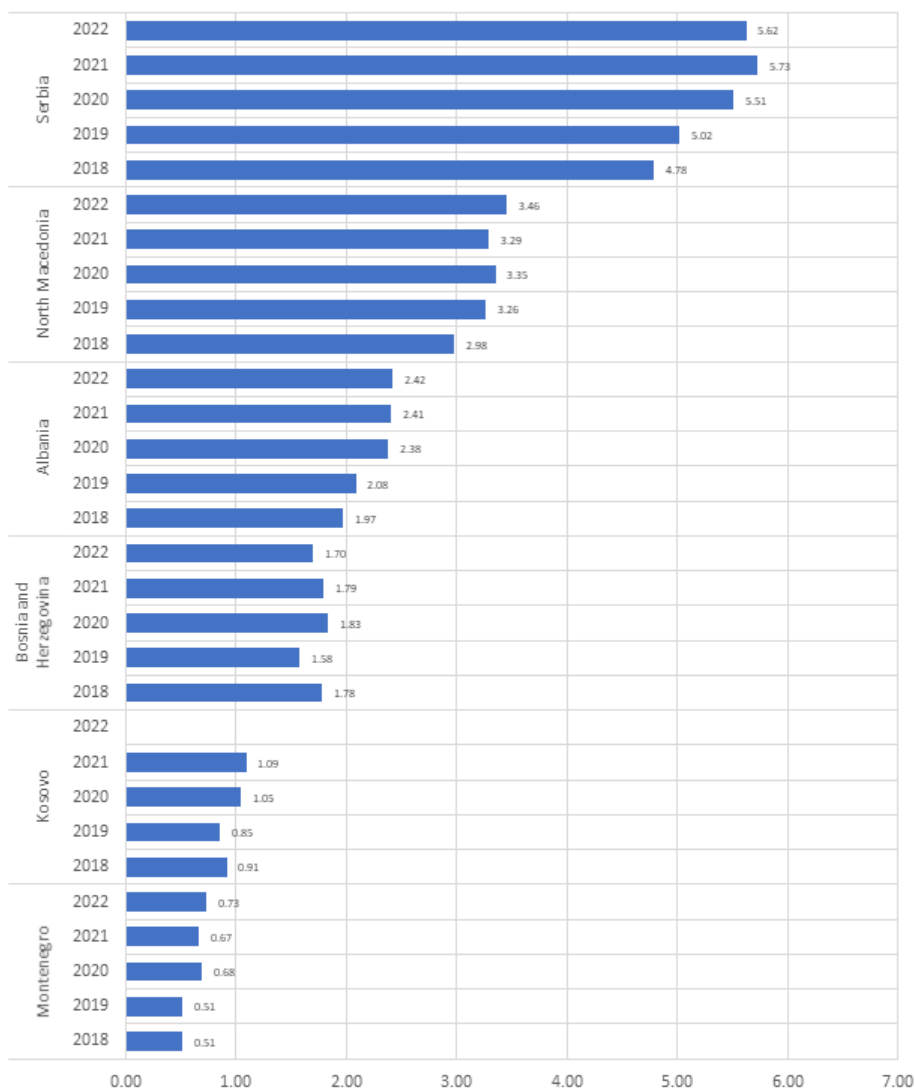
Figure 2: Coverage of food import by food export, by countries



Source: Authors calculations based on the National statistical offices of the regional countries

The tendency to export food, that is, the dependence of the countries of the region on food exports, shows significant differences. The share of food exports in GDP increased in all countries of the region in the period from 2018 to 2022, except in Bosnia and Herzegovina. Significant differences in share also exist between countries. In Serbia, food exports make up 5.6% of GDP in 2022, while that percentage in North Macedonia is at the level of 3.5%, which indicates greater dependence on food exports compared to other countries in the region. The lowest share of food exports in GDP is recorded in Kosovo and Montenegro, 1.1% and 0.7%, respectively. Numerous factors, from the size of the country, the size of producers and capacities, the competitiveness of producers and the economy, available resources, utilization of resources, the structure of the economy affect the differences in these percentages.

Figure 3: Share of export of food in GDP, by countries

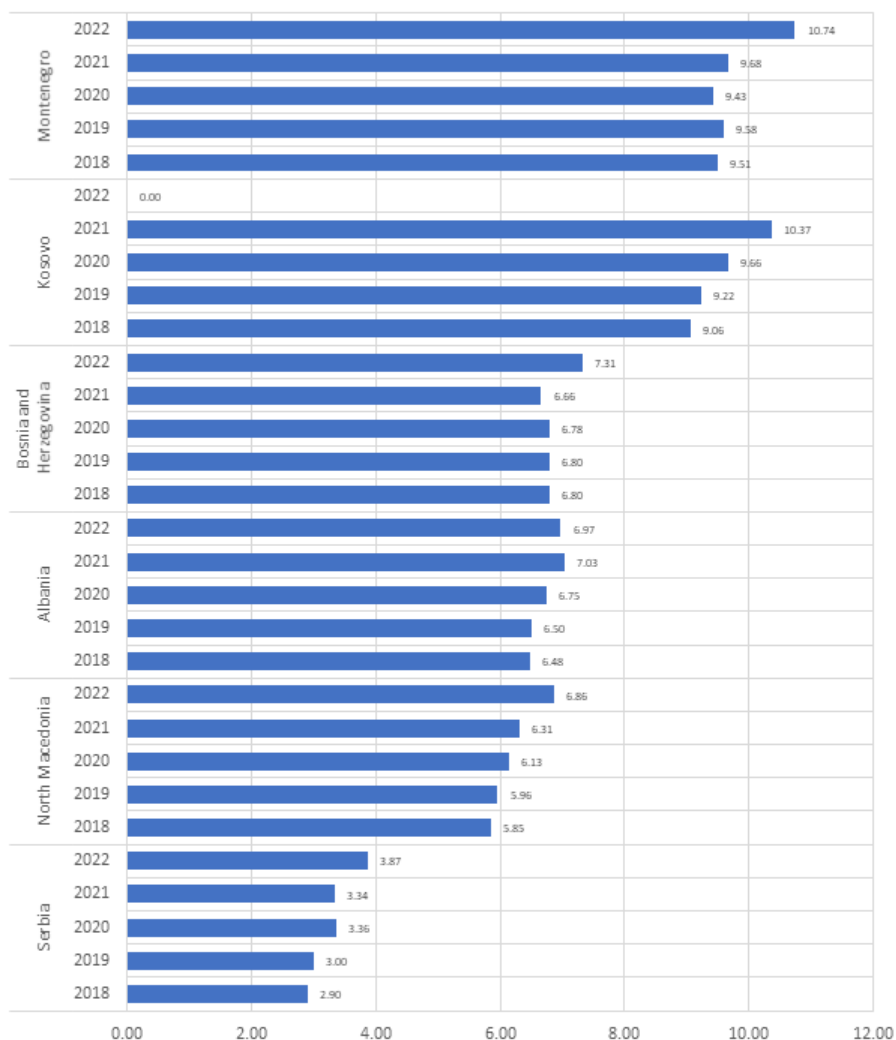


Source: Authors calculations based on the National statistical offices of the regional countries

On the other hand, the dependence of the regional economies on food imports shows the opposite picture. Montenegro has the largest share of food imports in GDP. In 2022, 10.7% of GDP was made up of food imports, while in Kosovo it was a slightly lower percentage (10.4%). In Bosnia and Herzegovina, food imports make up 7.3% of GDP, while almost the same share is recorded in Albania and North Macedonia. The lowest share of food imports in GDP was recorded in Serbia (3.9%).

During the observed period, this participation grew in all countries, where the highest growth was recorded in Kosovo and Montenegro. This indicator additionally indicates the dependence of the Montenegrin and Kosovo economy on other countries for the supply of basic food products. This additionally shows the greater vulnerability and sensitivity of these two countries to the situation on the international market, the impact on the price level, but also the availability of food compared to other countries in the region.

Figure 4: Share of import of food in GDP, by countries



Source: Authors calculations based on the National statistical offices of the regional countries

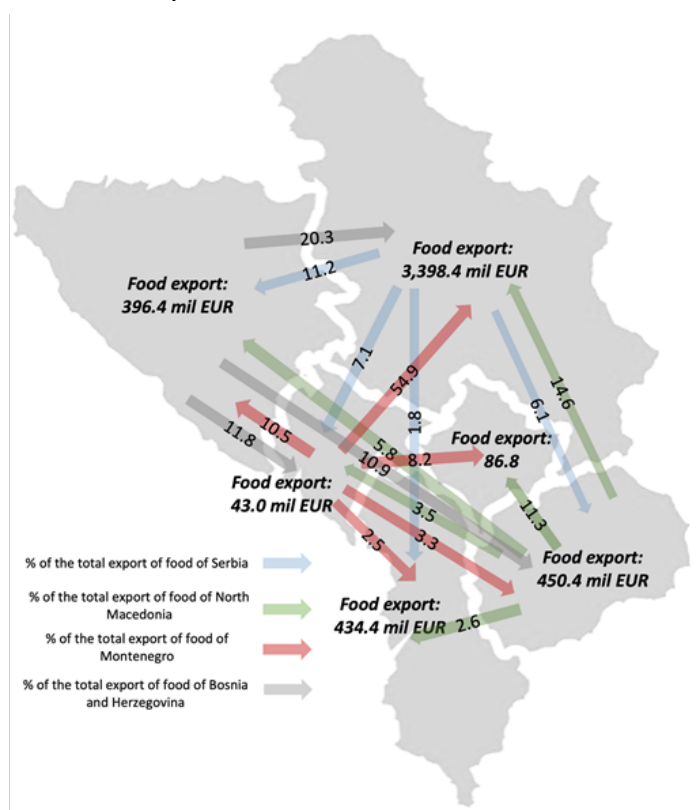
Data on the structure of exports in the countries of the region also show the level of dependence of individual country's exports on the market and demand of other countries. Montenegro is most dependent on the regional market. Of the total food exports in 2022, Montenegro exported almost 80% to the countries of the region. This also indicates the sensitivity of exports to changes in the regional market. The food export of Montenegro is especially sensitive to the situation and changes in the market in Serbia, where Montenegro realizes 55% of the total food export. Montenegro exports a very small amount of food to Albania and North Macedonia (2.5% and 3.3% of total food exports, respectively).

More than 40% of the total food exports of Bosnia and Herzegovina are realized in Serbia, North Macedonia and Montenegro. Bosnia and Herzegovina realizes slightly more than one fifth of the total export of food in Serbia (EUR 80.3 million), while almost 12% of the total food export is realized in Montenegro.

The connection between the countries of the region in terms of food exchange differs between countries. In 2022, of the total food exports of North Macedonia, 37.8% refers to food exports to the countries of the region. The largest trade partner is Serbia, with which North Macedonia achieves 14.6% of total food exports, while EUR 51.1 million or 11.3% of total food exports are exported to Kosovo. North Macedonia exports the least to Albania (2.6% of total food exports) and Montenegro (3.5% of total food exports).

Slightly more than a quarter of the total food exports (26.1%) of Serbia are made with the countries of the region¹, indicating the least dependence on the markets of other countries of the region. The most important market is Bosnia and Herzegovina, where Serbia exported EUR 381.3 million of food or 11.2% of total food exports. Another important trade partner is Montenegro, where Serbia achieves 7.1% of total food exports. The smallest export in 2022 was recorded in Albania (EUR 61.3 million or 1.8%).

Scheme 1: Structure of the export of food



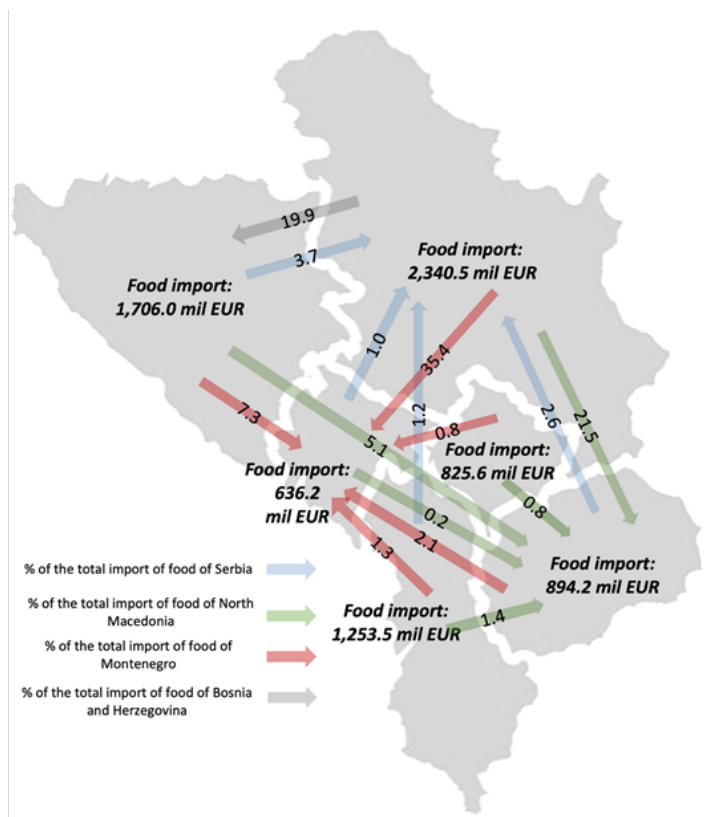
Source: Authors calculations based on official data of National statistical offices²

When it comes to imports and the structure of imports of countries in the region, one can observe different dependence of the domestic economy and demand on other countries. Montenegro is most dependent on food imports from other countries. Of the total food imports in 2022, 47% of food Montenegro imports from the countries of the region. Among this group of countries, Montenegro imports the most from Serbia (35.4% of total imports or 75% of imports from the region), which indicates a high concentration of food imports from one country. A significantly smaller percentage of food imports is from Bosnia and Herzegovina (7.3%), while imports from other countries in the region make up 4.2% of total food imports.

¹ There are no data on trade with Kosovo.

² Data for Albania, Kosovo and Bosnia and Herzegovina are not available

Scheme 2: Structure of the import of food



Source: Authors calculations based on official data of National statistical offices³

In relation to the total food import to North Macedonia, 29% is from the countries of the region. Similar to Montenegro, but in a smaller percentage, the most important trading partner is Serbia. In 2022, North Macedonia imported EUR 193.6 million from Serbia, which represents nearly 22% of the total food supply. Food imports from Kosovo, Albania and Montenegro are at a significantly lower level (2.4% of total food imports come from these three countries).

Serbia has the least dependence on food imports from other countries. Of the total food imports, 8.4% are from the countries of the region⁴. Imports from Bosnia and Herzegovina are the most significant among the countries of the region, while Serbia imports the least food from Montenegro (1% of total food imports) and Albania (1.2% of total food imports).

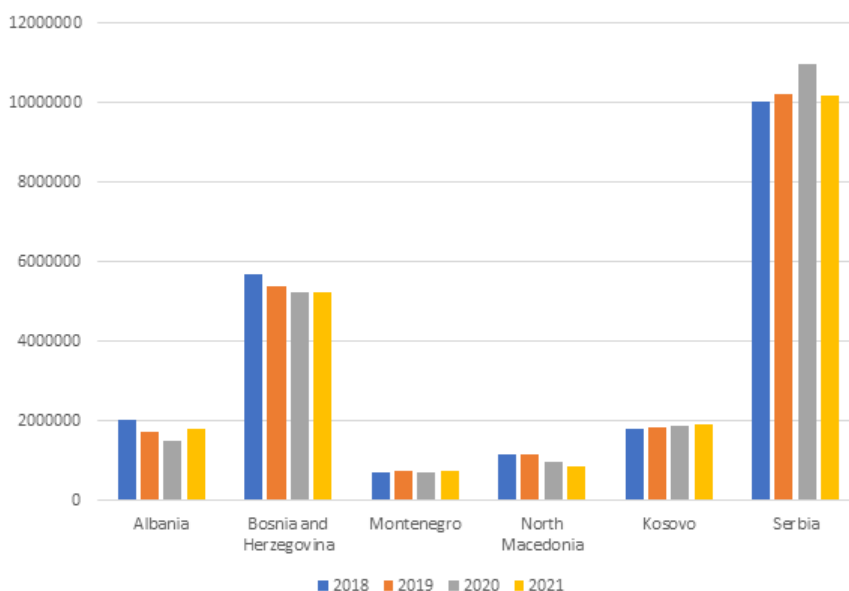
³ Data for Albania, Kosovo and Bosnia and Herzegovina are not available

⁴ There are no data on trade with Kosovo.

3.2 ENERGY TRADE⁵

Western Balkan countries show different performances when it comes to energy production, which affects energy trade flows. Based on the Eurostat's data, primary energy production levels in the Balkan region from 2018 to 2021 show varying trends across different countries. Albania experienced a significant drop in energy production from 2018 to 2020, followed by a recovery in 2021. Bosnia and Herzegovina, as well as Serbia, exhibit a slight decreasing trend over the years, with Serbia showing a notable increase in 2020 before a drop in 2021. Montenegro and North Macedonia's production levels remained relatively stable, with slight fluctuations, whereas Kosovo saw a steady increase each year. The data indicates diverse energy strategies and differences in natural resource exploitation, economic development, and investment in energy infrastructure.

Figure 5: Primary energy production by countries (in thousand tonnes of oil equivalent)

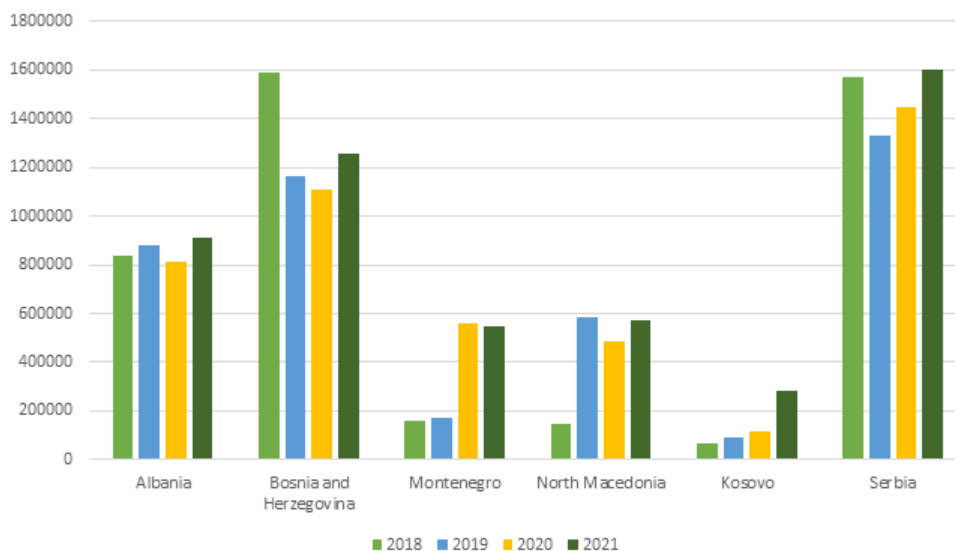


Source: EUROSTAT

Energy export comparison. Energy export levels vary significantly among the Western Balkan countries. Some countries exhibit fluctuations in their export levels, which could be influenced by changes in production capacity, policy shifts, or market demand. Serbia stands out as the leading energy exporter in the region throughout the observed period. Its energy exports are the highest and show an increasing trend, indicating a strong energy production sector. It is followed by Bosnia and Herzegovina. Albania and Montenegro, while exporting energy, do so at much lower levels compared to Serbia. Particularly for Montenegro, there is a notable spike in energy exports in 2020, due to the new infrastructural project becoming functional.

⁵ According to EUROSTAT statistics, energy commodities can be extracted or captured directly from natural resources (primary energy sources), for example in coal mines, crude oil fields, nuclear heat, hydro power plants, or in the fabrication of biofuels derived from biomass . Primary energy sources can be divided into fossil fuels, nuclear and renewable energy from water, wind, sunlight, biomass, etc.

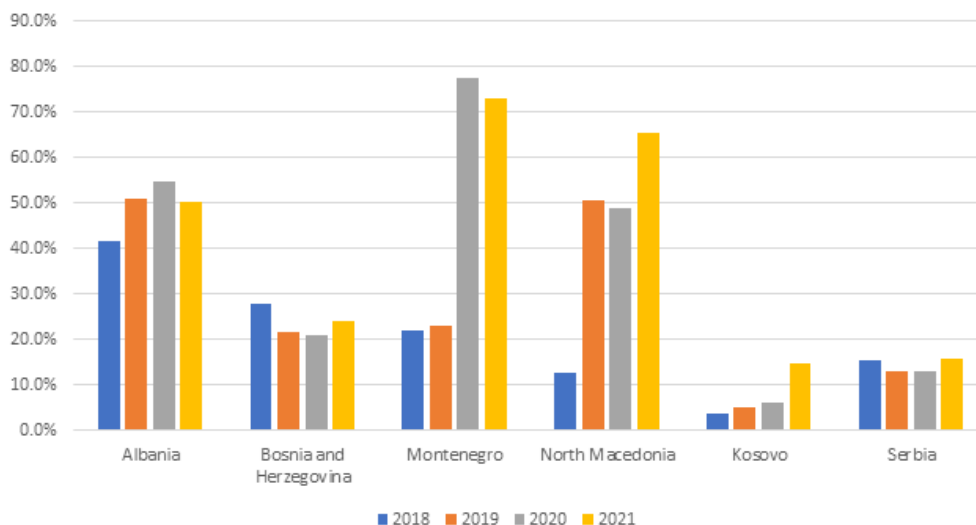
Figure 6: Export of energy by countries (in thousand tonnes of oil equivalent)



Source: EUROSTAT

If we compare the export of energy in relation to primary production, it can be seen that this percentage varies between countries, with the smallest percentage of that production being exported from Kosovo and Serbia, while the highest percentage of export in relation to primary energy production in the country is recorded in Montenegro and North Macedonia.

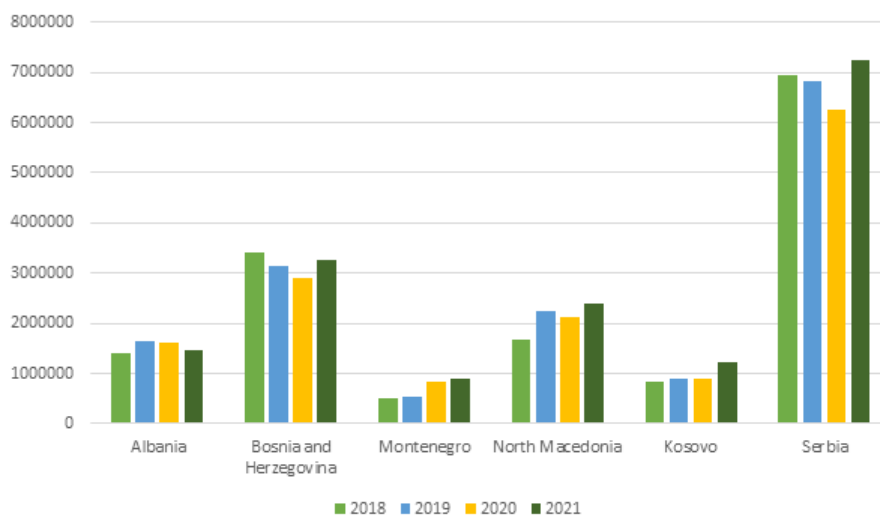
Figure 7: Export of energy as percent of primary energy production



Source: Authors calculations based on EUROSTAT's data

Energy import comparison. All countries in the region rely on energy imports to some extent. This dependency highlights the importance of energy trade within the region for ensuring energy security and meeting domestic demand. Serbia and Bosnia and Herzegovina have high volumes of energy imports, reflecting substantial energy consumption that cannot be met by domestic production alone. The steady or rising import trends indicate growing energy needs or insufficient increases in local production. Montenegro's energy imports are relatively lower than those of other WB countries, but the dependency ratio is significant, which suggests that the country has considerable room for increasing its domestic energy production, especially from renewable sources.

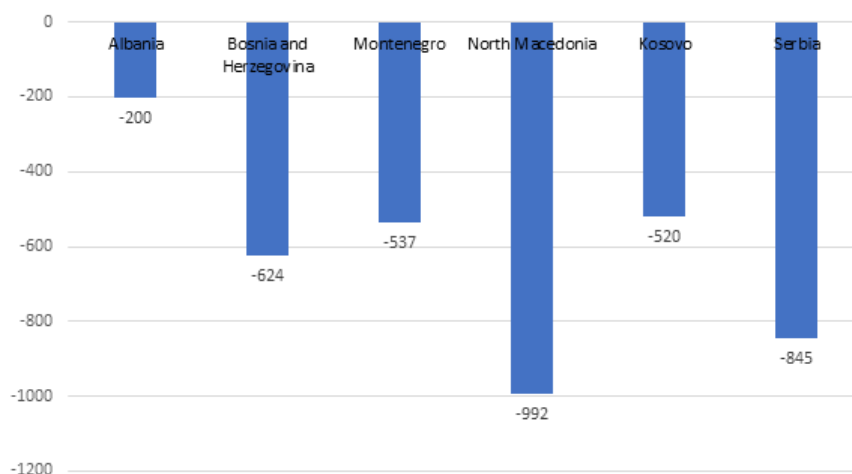
Figure 8: Import of energy by country (in thousand tonnes of oil equivalent)



Source: EUROSTAT

Energy trade balance shows that no regional country is net exporter of energy, while dependence of each country on external energy sources is significant. Consistently negative trade balance for countries is the consequence of limited domestic energy production relative to its consumption, underdeveloped infrastructure, but also due to potentially high energy consumption in specific sectors for some countries. Although some countries continuously register highest energy trade deficit, data on deficit per capita shows more accurate situation. Albania's deficit is the least severe at (200 thousand tonnes of oil equivalent per capita), while North Macedonia has the most substantial deficit per capita (992), followed by Serbia's (845). Bosnia and Herzegovina's deficit is 624 thousand tonnes of oil equivalent per capita, and Montenegro's 537 thousand tonnes of oil equivalent per capita, both indicating still significant gaps between energy exports and imports.

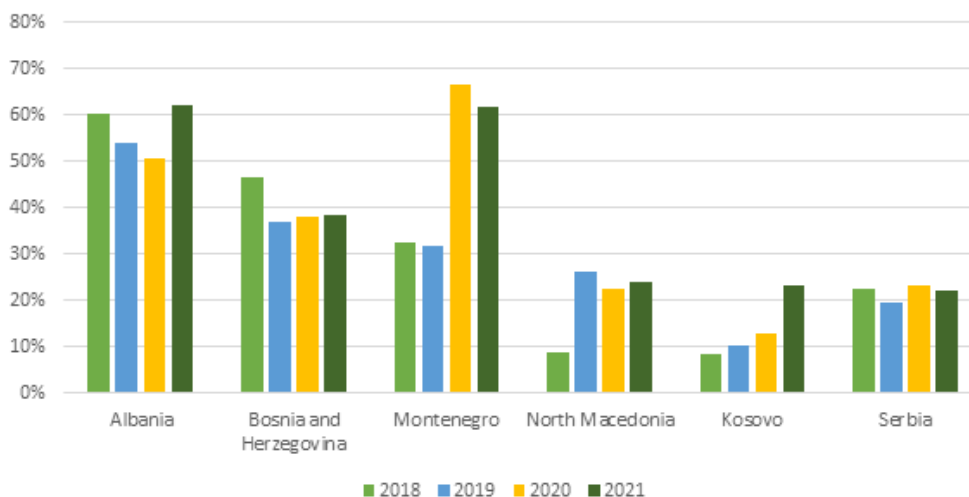
Figure 9: Energy trade deficit per capita in 2021 (in thousand tonnes of oil equivalent)



Source: Authors calculations based on official data of EUROSTAT and National statistical offices (Data on energy import and export are from Eurostat, while population data from national statistical offices)

All countries expressed fluctuations in coverage of import by export of energy. Albania experienced a general upward trend, ending near 40% in 2021 after initial fluctuations. Bosnia and Herzegovina's coverage dipped in 2019 but peaked in 2020 before a slight decrease the following year. Montenegro showed the most dramatic changes, spiking to over 70% in 2019, then plummeting in 2020, with a modest recovery in 2021. North Macedonia saw a steady decline from above 40% in 2018 to around 20% in 2021. Kosovo's coverage remained quite stable, with a slight increase post-2018. Serbia's coverage peaked in 2019 at around 50%, followed by a drop in 2020, stabilizing in 2021. These fluctuations reflect uncertainty at the energy market caused by different internal and external factors.

Figure 10: Coverage of energy import by energy export

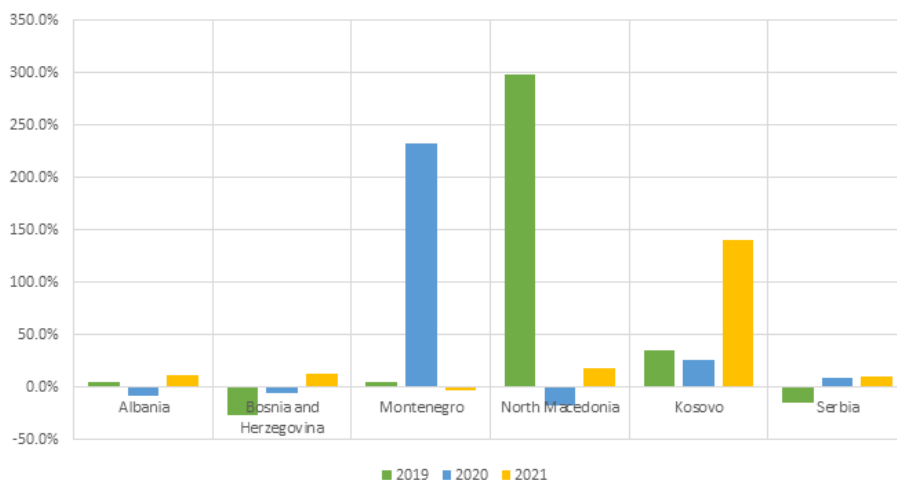


Source: Authors calculations based on EUROSTAT's data

Growth rates of export and import of energy among Western Balkan countries show some trends and shifts in energy trades and production dynamics during recent period. These rates reveal strong vulnerability of certain countries due to significant variations in trade volumes. These variations are caused by different factors including global imbalances and global market conditions that caused strong fluctuations in global economic downturn during 2020, but also affected global energy prices. These developments impacted energy consumption trends in all countries including WB countries. In addition, weather conditions, but also some internal factors such as different dynamics of investments in infrastructure may explain the volatility of trade growth rates.

The calculated growth rates (y-o-y) of energy export among the Western Balkan countries over a three-year period (2019-2021) show distinct trends. Albania experienced fluctuations in its energy export growth rates, starting with a modest increase in 2019, a decrease in 2020, and a strong recovery in 2021. The overall trend suggests Albania's ability to recover and grow its energy exports despite facing challenges such as global market conditions and possibly variable hydrological conditions affecting its hydroelectric power generation. Bosnia and Herzegovina's energy export growth rates showed a decrease in 2019, a minor decline in 2020, and a notable recovery in 2021. Montenegro displayed a unique trend, with a modest increase in 2019, a significant surge in 2020, and a slight decline in 2021. North Macedonia showed a dramatic increase in energy exports in 2019, followed by a decrease in 2020, and growth again in 2021. Only Kosovo demonstrated a strong and consistent growth in its energy exports over the period, with substantial increases each year, while Serbia experienced a decline in energy exports in 2019, followed by a recovery in 2020 and further growth in 2021.

Figure 11: Growth rates of energy export (y-o-y)

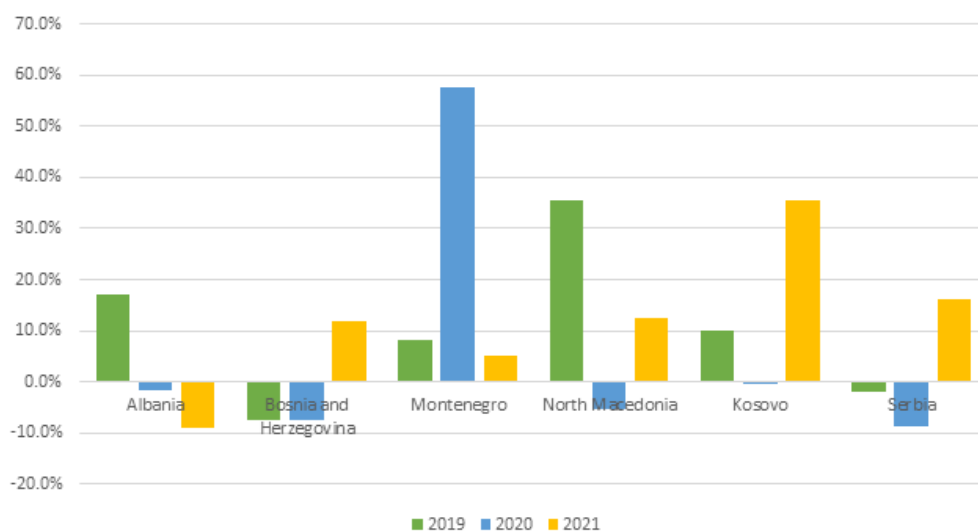


Source: Authors calculations based on EUROSTAT's data

Such distinct trends could be explained by a variety of interrelated factors that these countries differently experienced during observed period, including changes in global market conditions (i.e. the fluctuations in global energy prices and demand, especially during the economic downturn in 2020, that had varying impacts on the countries, with some managing to navigate or even capitalize on these conditions better than others), differences in investment dynamics (investment in energy infrastructure), particularly in renewable energy sources, variations in domestic consumption patterns, weather conditions and hydrological factors (for countries heavily reliant on hydroelectric power, such as Albania, weather conditions could significantly impact energy production and export capabilities), etc.

Similarly, very distinct trends are observed regarding energy import growth rates. Kosovo's figures indicate a steady rise in imports each year, suggesting an increasing demand for energy that is not being met by domestic production. Albania's energy import growth rates show a sharp increase in 2019, followed by negative rates in the subsequent years, while Bosnia and Herzegovina experienced a decrease in energy import in 2019 and 2020, with a reversal to positive growth rate of energy import in 2021. Montenegro's energy imports grew modestly in 2019, followed by a significant spike in 2020 and a return to modest growth in 2021. North Macedonia saw a considerable increase in energy import growth in 2019, a decrease in 2020, and a return to growth of energy import in 2021. Serbia initially saw a negative energy import growth rates but experienced a notable increase in 2021.

Figure 12: Growth rates of energy import (y-o-y)



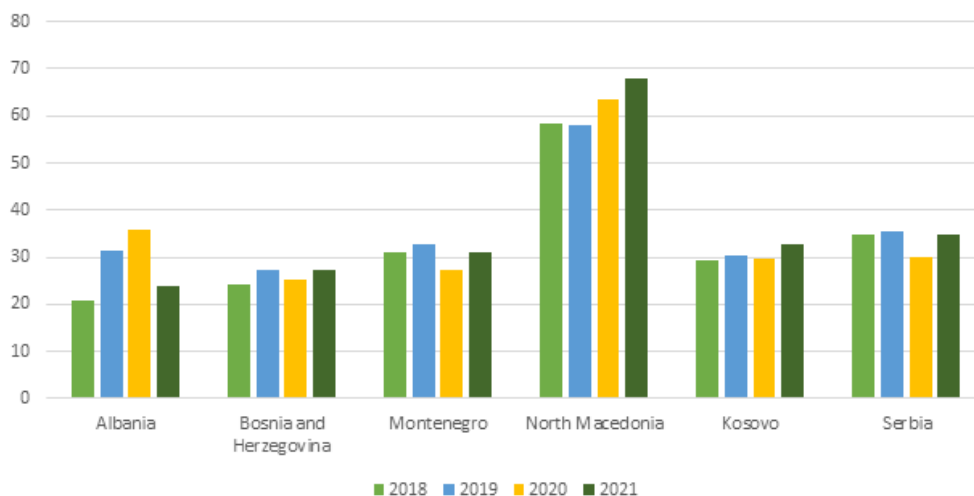
Source: Authors calculations based on EUROSTAT's data

The fluctuations in export and import growth rates of energy among Western Balkan countries can largely be attributed to several interrelated factors. These include variable global market conditions, which saw significant shifts during the economic downturn of 2020, impacting energy prices and demand differently across the region. Investment dynamics, particularly in renewable energy infrastructures, have also played a critical role, with some countries advancing more rapidly than others. Additionally, domestic consumption patterns and reliance on specific energy sources, such as hydroelectric power in countries like Albania, have led to variability in trade volumes. These fluctuations reflect each country's unique economic resilience, policy environment, and ability to adapt to both internal and external pressures, showcasing a diverse landscape of energy trade dynamics within the region.

Montenegro's high growth rates in energy exports and imports are driven by its strategic geographical position, enabling significant engagement in regional energy markets, and substantial investments in infrastructure, particularly the underwater interconnector with Italy. The country's focus on expanding renewable energy sources, such as hydropower and wind energy, aligns with increasing European demand for sustainable energy, enhancing its export potential. Additionally, Montenegro's ability to navigate global market dynamics, including fluctuations in energy prices, coupled with proactive energy policies aimed at market liberalization and EU integration, has effectively boosted its energy trade, illustrating its adaptability in a volatile global energy landscape.

Energy imports dependency⁶ comparison. The dependency on energy imports is a crucial indicator of a country's energy vulnerability. This indicator reveals different resilience of WB countries on imported energy relative to their own total energy availability. This indicates that some countries face more limited domestic production capacities, but also may suggest underuse of such capacities. High dependency ratios are observed in North Macedonia, indicating a strong reliance on energy imports relative to its gross available energy. The varying levels of import dependency across the region highlight the potential benefits of regional integration, where countries can leverage each other's strengths, such as export capacity, to enhance overall energy security. Lack of diversified energy sources is the main driver of higher energy dependency, but as in case of Montenegro, rich energy potential can be exploited in more efficient way and contribute to more domestic production.

Figure 13: Energy import dependency



Source: EUROSTAT

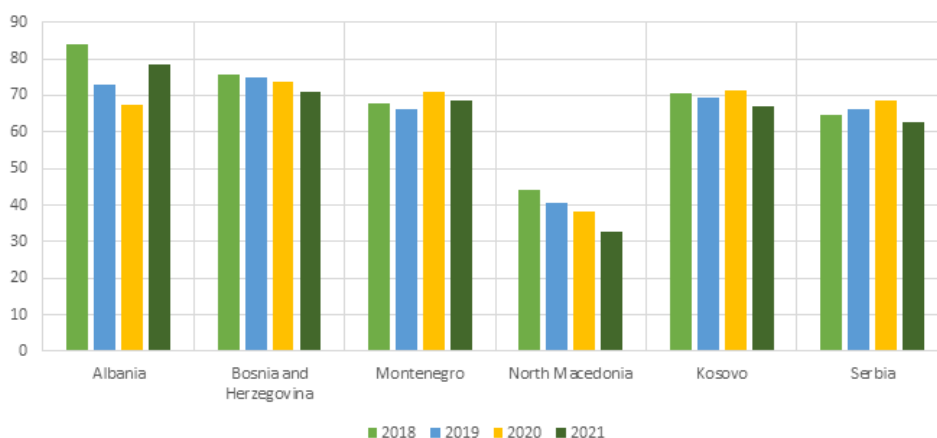
Gross available energy vs Primary energy production comparison. Comparing gross available energy to primary energy production offers insights into the extent to which countries are self-sufficient in energy. Serbia has the highest gross available energy and primary energy production, indicative of a well-developed energy sector. Potential for growth exists. Montenegro, while having a lower gross available energy and primary energy production compared to some neighbours, has a stable production profile. This stability, combined with its renewable energy potential, suggests an opportunity for Montenegro to increase its share of the regional energy market. Renewable energy should be in focus for many countries. For countries like Albania and Kosovo, where primary energy production is close to the gross available energy, there is potential to explore renewable energy sources to further increase production and reduce import dependency.

Additional indicators on energy trade. Some indicators that reflect energy trade dynamics and energy security in the region are calculated based on the available data on energy trade, gross available energy and primary energy production. These indicators, such as energy self-sufficiency index, energy trade intensity index offers some insight into the trade dynamics, trade potentials, and potential reasons for current state.

⁶ According to Eurostat, energy imports dependency shows the share of total energy needs of a country met by imports from other countries. The rate shows the proportion of energy that an economy must import. It is defined as net energy imports divided by gross available energy, expressed as a percentage.

Energy self-sufficiency index as a ratio between primary energy production and gross available energy indicates that there are some discrepancies among countries regarding the portion of the countries' energy demand that can be met by their own production. Although this indicator varies across the Western Balkan countries, it reveals that all countries face a need for improvements, either when it comes to technological advancement, investment in new energy sources such as renewable energy, or changes in internal energy policies aimed at enhancing country's energy self-sufficiency (such as economic incentives for domestic energy production that already existed in some countries)

Figure 14: Energy self-sufficiency index



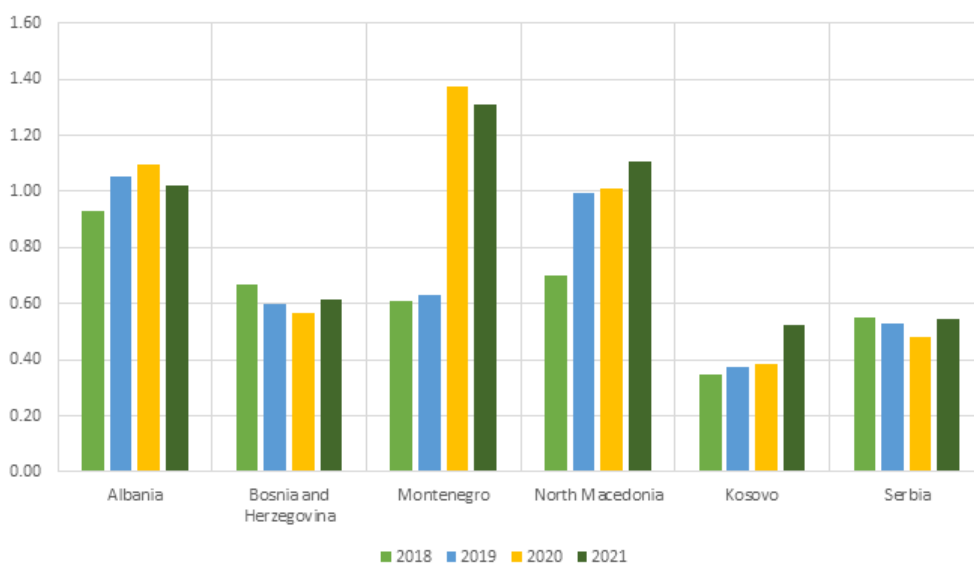
Source: Authors calculations based on EUROSTAT's data

Albania has highest self-sufficiency index. However, it shows a fluctuating trend, starting with a high index of 84.02% in 2018, dropping to 67.46% in 2020, and then recovering to 78.33% in 2021. Albania's performance suggests variability in its ability to meet its energy needs domestically. This is due to changes in domestic energy production, especially from hydroelectric power sources⁷, which were significantly affected by hydrological conditions during recent years (primary energy production varied). Similarly, a fluctuating trend registers Serbia with an initial decrease from 64.49% in 2018 to 62.68% in 2021, but with a peak at 68.68% in 2020. Serbia's energy production is diverse, including coal, hydro, and renewable sources. The fluctuations reflect changes in production efficiency and varying energy consumption. Bosnia and Herzegovina's index starts high at 75.85% in 2018 and experiences a gradual decline to 70.83% by 2021. This steady decline reflects a slow, but continuous decrease in domestic energy production during observed period. However, this index might be changing in the future, since Bosnia and Herzegovina's energy mix, heavily reliant on coal and hydro power, may face challenges due to environmental concerns. On the other side, Montenegro's index shows a stability over the observed period. It amounted 67.8% in 2018 and 68.53% in 2021, with a temporary increase in 2020. This indicates a relatively stable level of self-sufficiency, with fluctuations possibly due to investment in renewable energy sources. Kosovo displays a decrease from 70.50% in 2018 to 67.05% in 2021. Given Kosovo's heavy reliance on coal, this decrease indicates increasing energy demand. North Macedonia has the lowest starting index at 44.30% in 2018, which further decreases to 32.74% by 2021. This low index and significant decline suggests increasing challenges in meeting domestic energy needs from local production. Primary production decreased during 2018-2021, while import increased. Current North Macedonia's efforts to diversify its energy sources and improve efficiency are not sufficient to offset rising consumption or reduce dependency on energy imports.

⁷ Hydroelectric power plants constitute the overwhelming majority of Albania's electricity generation capacity.

Energy trade intensity index measures how much of the energy available is involved in international trade. The best performance is achieved by Montenegro, North Macedonia, and Albania. However, Montenegro shows a significant increase in its index from 0.61 in 2018 to a peak of 1.37 in 2020, slightly decreasing to 1.31 in 2021. This dramatic increase could be explained by due to significant investments in energy infrastructure (the energy cable that connects Montenegro and Italy is put into operation at the end of 2019), but also due to the shift towards renewable energy sources attracting international trade (wind power plant Mozura with a capacity of 46 MW was put into operation in November 2019). Similar trend had North Macedonia. North Macedonia's index increased from 0.70 in 2018 to 1.11 in 2021, indicating a growing involvement in energy trade. Albania shows more stability in its energy trade intensity index which amounted 0.93 in from 2018 and reached a peak in 2020 (1.09) before slightly decreasing to 1.02 in 2021. This increase suggests that Albania has been slightly improving its involvement in the international energy trade.

Figure 15: Energy trade intensity index



Source: Authors calculations based on EUROSTAT's data

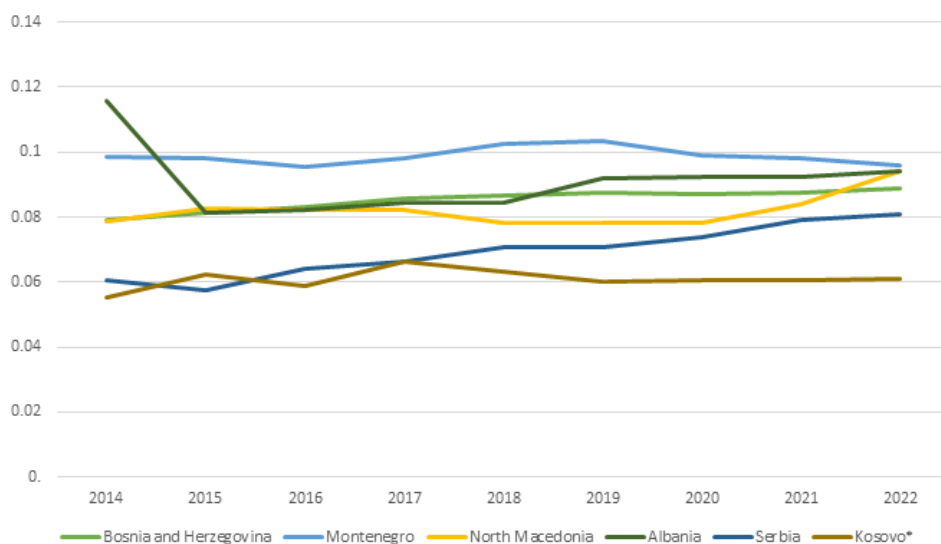
On the other hand, Kosovo, Serbia and Bosnia and Herzegovina have low values of this index. Kosovo had the lowest index among the countries but showed improvement from 0.35 in 2018 to 0.52 in 2021. The low index is due to limited energy production capabilities. The improvement could be achieved through efforts towards increasing energy trade, possibly through regional cooperation or developing renewable energy projects.

The value of index for Serbia decreased from 0.55 in 2018 to 0.48 in 2020 before slightly recovering to 0.54 in 2021. This indicates a low Serbia's involvement in the international energy trade, which could be due to increased domestic energy consumption. Bosnia and Herzegovina have a fluctuating index, starting at 0.67 in 2018, decreasing to 0.57 in 2020, and slightly recovering to 0.61 in 2021. These fluctuations may reflect changes in domestic energy production, consumption patterns, or variations in international energy market dynamics. Hence, the performance of each country in the energy trade intensity index can reveal the complex interplay between numerous factors such as investments in energy infrastructure, international trade dynamics, but also each country's specific context, including its energy production capabilities, policy decisions, and international relations.

3.3 ELECTRICITY PRICES VOLATILITY IMPACT ON TRADE⁸

The trade of energy could be impacted by price level as well and stability of prices. Western Balkan countries had the cheapest electricity for households during recent years with the cheapest electricity in Kosovo, and most expensive in Montenegro. However, these prices are still significantly lower than the EU average which stood at 0.2525 EUR/kWh.

Figure 16: Electricity prices for households among WB countries in EUR per kWh (2014-2022)



Source: EUROSTAT

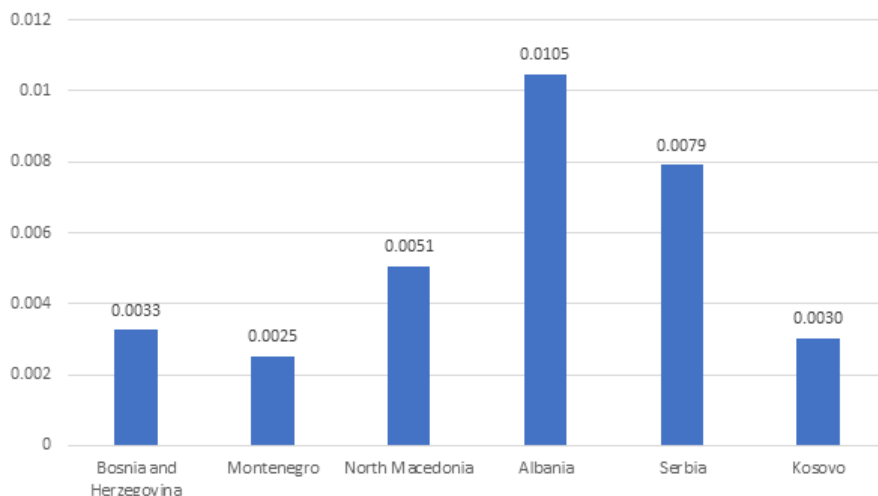
However, during the previous period these prices experienced different volatility across the observed states that might influence the trade of energy outputs in these countries, since it impacts the predictability and risks associated with energy trade, i.e. countries with lower volatility are likely to be seen as more stable and predictable markets, which could attract investments and foster long-term trading relationships. Conversely, countries with higher volatility might face challenges in attracting stable trade partnerships and may need to adopt risk management measures to mitigate the impact of price fluctuations on trade agreements.

Hence, the annual price volatility for each country over the period from 2014 to 2022 is calculated.⁹ Highest variability in energy prices during the specified period is observed in Albania, followed by Serbia and North Macedonia. Lowest price volatility is registered in Montenegro. This suggests a mixed impact on energy trade within the Western Balkan region, with some countries positioned more favorably than others due to the stability of their energy prices.

⁸ This is only an illustrative exercise, bearing in mind that prices for households may be subject to different factors compared to prices applied to exports. However, various papers indicate that these prices can affect trade chains through demand elasticity, energy policy adjustments, etc. Thus, some possible effects, such as of inflation, or different national policies and market conditions are not taken into account.

⁹ For each country, the standard deviation of the energy prices across the years 2014 to 2022 was calculated.

Figure 17: Electricity price volatility during 2014-2022



Source: Authors calculations based on EUROSTAT's data

The stability of energy prices in Montenegro, Bosnia and Herzegovina and Kosovo can make these countries as an attractive partners for energy trade since the wider energy market could expect less surprises in energy costs. This could also attract investments in energy infrastructure and encourage cross-border energy trade. However, some price stability in Western Balkan countries (such as in Montenegro) is rather the consequence of political decisions. In addition, although predictable energy prices could foster more secure and long-term energy trading partnerships, the question is whether this stability will remain. Some papers indicate rising volatility in energy prices across Europe. For instance, the IMF's study (Cevik and Ninomiya, 2022) show that European electricity markets are in the midst of unprecedented changes, with a record-breaking surge in energy prices. Similarly, ACER's Final Assessment of the EU Wholesale Electricity Market (2022) indicates that the global energy crisis caused by geopolitical events affects the high volatility of electricity prices, which has an impact on consumers, retail suppliers, market participants and other stakeholders. This study also points to significant price volatility in the coming period.

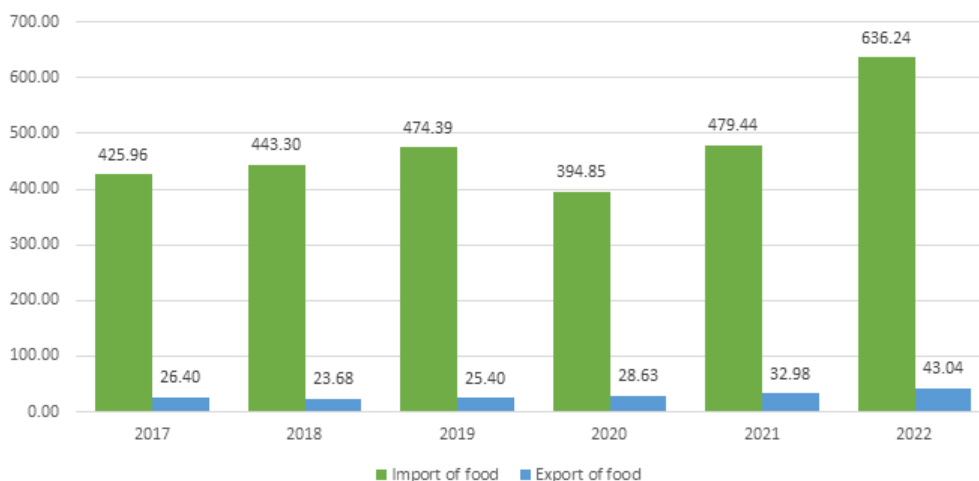
Albania and Serbia have already experienced higher price volatility which could make energy trade more speculative in these countries affecting the (un)predictability of energy costs and willingness of foreign investors or partners to engage in trade. Hence, more sophisticated risk management strategies are needed. This primarily refers to the increase in the size of renewables in total energy production. Namely, the abovementioned IMF's study shows that increasing prices of energy could be stabilized or reduced by the increase of share of renewable energy. The study finds out that renewable energy is associated with a significant reduction in wholesale electricity prices in Europe, with an average impact of 0.6 percent for each 1 pp increase in renewable share.

The analysis of indicators on trade of energy in the Western Balkans shows a present mix of import dependency and varying levels of domestic production. The comparative analysis indicates that there is significant potential for enhancing regional cooperation in energy trade, diversifying energy sources, and investing in renewable energy to increase domestic production and reduce reliance on imports.

4. TRENDS IN THE EXPORT AND IMPORT OF FOOD IN MONTENEGRO

The Montenegrin economy is import-dependent, so the total import is many times higher than the export of goods. In 2022, the import of goods was five times higher than the export, and the coverage of import by export is 20%. A similar trend can be observed in the foreign trade exchange of food, with a more pronounced difference between the export and import of food. Total food exports grew on average in the period from 2017 to 2022 at a rate of 10.2%, so that in 2022 it was at the level of EUR 43.04 million. On the other hand, the import of food in 2022 compared to 2017 was higher by 63%, i.e. it grew by 8.4% on average in the observed period. The coverage of import by export of food is at a low level (6.8% in 2022, while in the period before the pandemic, the coverage of import by export was slightly more than 5%). In relation to the total export of goods, the export of food accounts for slightly more than 6%, while the import of food represents close to 20% of the total import.

Figure 18: Export and import of food in Montenegro, mill EUR



Source: MONSTAT

The countries of the Western Balkan region are the countries with which Montenegro exchanges food the most. About 80% of the total food exports of Montenegro are exported to the countries of the region. That percentage is slightly lower in 2022 (79.3%) compared to 2019-2022 when it averaged 84%. The total export of food in 2022 was at the level of EUR 43.04 million, which is 30.5% more compared to 2021, i.e. 81.8% compared to 2018.

Food exports from Montenegro are not significantly diversified, where exports to Serbia make up 69% of total food exports to the countries of the region (data for 2022). Almost a quarter of the total food exports go to Bosnia and Herzegovina (13.2%) and Kosovo (10.3%). During 2018-2022, the structure of exports by country changes slightly, where the share of exports to Serbia increased by 15.4 percentage points, where this increase came at the expense of a decrease in the share of exports to Bosnia and Herzegovina, North Macedonia and Kosovo.

Figures 19: Structure of food exports by country, in mill EUR

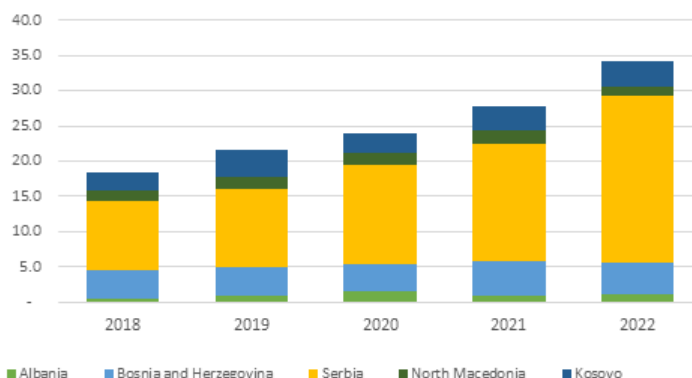
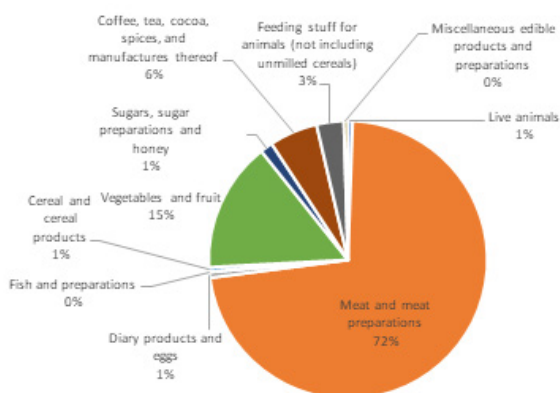


Figure 20: Structure of food exports from Montenegro, 2022



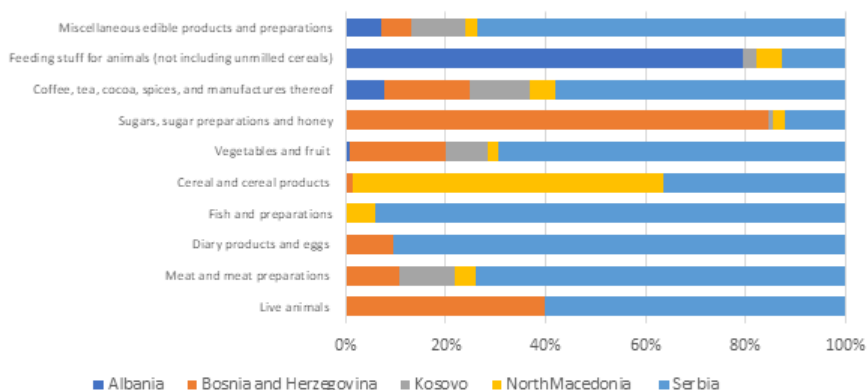
Source: MONSTAT

The detailed structure of food exports shows that the most important item in the export of food from Montenegro is bacon, ham and other salted, dried or smoked meat of swine, which is exported in the largest volume to the countries of the Western Balkans (97.1%), among which the most important is Serbia, where exports 88% of these products. In relation to the total export of food to Serbia, 54% of exports are bacon, ham and other salted, dried or smoked meat of swine. This may also indicate insufficient diversification of food exports. Another important product that is exported to the countries of the region are sausages and similar products, of meat, meat offal or blood; food preparations based on these products, which accounts for 11% of the total food export to this group of countries (40% of the export of these products refers to Kosovo, and 35% to Bosnia and Herzegovina). Among the products exported to the countries of the region, fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter, which make up 8% of food exports to Western Balkan countries, are significant.

Significantly less export than import is due to constraints and limitations on the side of agricultural production. Agricultural production in Montenegro is characterized by the fragmentation of agricultural land and farms, a large number of small producers, and slow development of technology. Mechanization and equipment used in agricultural production is limited. Due to weak organization and insufficient connection between agricultural producers, small businesses and producers are oriented towards the domestic market. An additional problem is the lack of competitiveness of agricultural producers. In the observed period from 2017, on the one hand, there was a decrease in milk production and livestock, while on the other hand, there was an increase in

the production of some agricultural products, as well as an unchanged structure of agricultural land use, where permanent crops and arable land represent 4.8% of the total agricultural land.

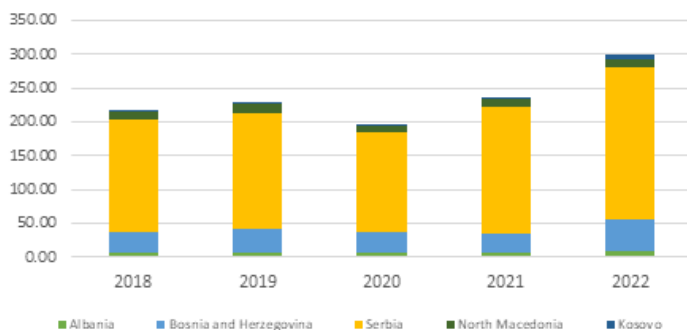
Figure 21: Structure of food exports, by products and by countries, 2022



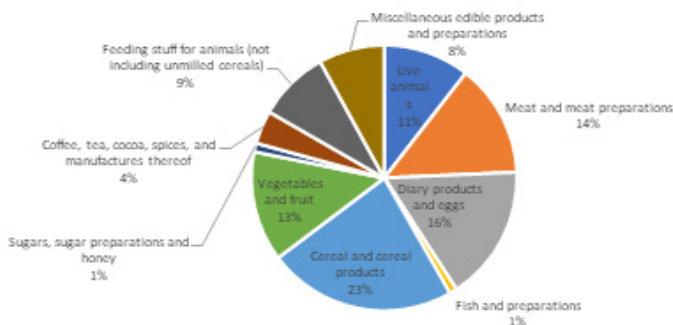
Source: MONSTAT

On the other hand, the total food import from the countries of the region amounted to EUR 298.4 million in 2022, which is 27% more compared to 2021 and 38% more compared to 2018. In contrast to food exports, where the countries of the region are dominant in which Montenegro exports, in total food imports, the countries of the Western Balkans take part in less than 50%. Among the countries of the region, the most important trade partner is Serbia.

Figures 22: Structure of food imports by country Western Balkan region, in mill EUR



Figures 23: Structure of food imports in Montenegro, 2022

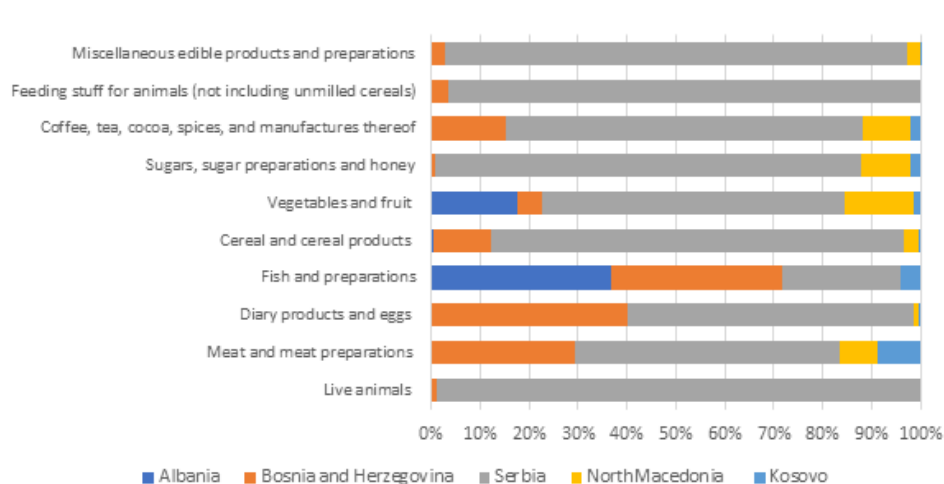


Source: MONSTAT

Of the total food imports from the region, three quarters are imported from Serbia, while 15% are from Bosnia and Herzegovina. About 9% of imports come from Albania, Kosovo and North Macedonia. Such a structure of imports, with very small oscillations, was recorded during the analysed period.

The most important products that are imported are flour of wheat or of meslin, of which 95% is imported from the countries of the region (mainly from Serbia, 80%), as well as bread, pastry, cakes, biscuits, and other bakers' wares (of which 58 % import from neighbouring countries, mainly from Serbia). Other important products imported from the countries of the region are milk and yogurt, buttermilk, curdled, fermented, or acidified milk and cream and ice-cream (over 80% of imports are from the countries of the region).

Figure 24: Structure of food imports, by products and by countries, 2022



Source: MONSTAT

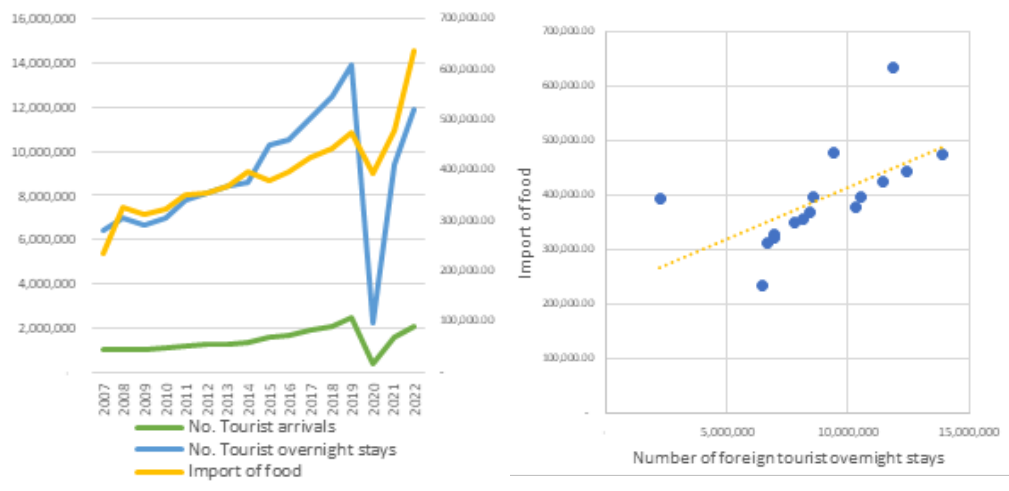
During the observed period, domestic food production is not sufficient to cover the demand on the market. Food imports are mainly stimulated by factors on the domestic demand side, but also by traffic in the tourism sector. The growth in the number of foreign tourist arrivals also affects the growth of food imports, especially during the summer tourist season. Macroeconomic forecast model of Institute for Strategic Studies and Prognoses shows that there is a significant connection and influence between the import of goods and the number of foreign tourists overnight stays in Montenegro.

The growth in the number of tourists usually results in an increased demand for food, both by tourists and by catering facilities and restaurants. Consequently, this leads to a greater need to import food, in order to meet the needs of the market. In addition, the growth in the number of tourism arrivals affects the growth of demand for fresh food, such as fruits, vegetables and other fresh foods in order to satisfy the needs of tourists. During the observed period from 2017 to 2022, the number of tourists varied, especially due to the impact of the pandemic. In the period before the pandemic, the number of foreign tourists was at the level of 2.5 million, who spent an average of 6 nights. After a sharp drop in the number of tourists and overnight stays by foreign tourists during 2020, the tourism industry recorded a recovery in 2021 and 2022.

The correlation coefficient between food imports and the number of foreign tourist arrivals is 0.65, and between food imports and the number of overnight stays by foreign tourists is 0.60, which indicates a moderate positive relationship between these two variables¹⁰.

¹⁰ The coefficient was obtained on the basis of data from 2007 to 2022. Source of data MONSTAT

Figure 25: Correlation between import of food and number of foreign tourists overnight stays and arrivals



Source: MONSTAT

The decrease in the number of tourists was followed by a decrease in food imports in 2020, but the decrease was smaller than the decrease in the number of foreign tourists, and during 2021 and 2022 it would increase with the increase in the number of tourists. However, the value of food imports during 2022 was also affected by the increase in prices on the international market, which is why a high growth rate and a significant increase in the value of food imports was recorded in the last period.

Given that Montenegro imports most of the food, it is important to look at the relationship with household consumption. Based on the data from the Population Consumption Survey, it is possible to observe the increase in the dependence of food imports on personal consumption in the period 2017-2022. Therefore, the percentage of personal food consumption that is satisfied through imports was 88.1% in 2021, which is more than in 2017, when this dependency rate was at the level of 80.2%. This indicator indicates the high dependence of the population's personal food consumption on food imports, that is, that a significant part of the domestic demand for food is imported.

5. ENERGY TRADE POTENTIAL OF MONTENEGRO IN THE WESTERN BALKAN CONTEXT

5.1 OVERVIEW OF MONTENEGRO'S ENERGY SECTOR POTENTIAL

The energy sector in Montenegro plays a pivotal role in its socio-economic development, intertwining closely with environmental considerations to ensure a balance between energy development and ecological preservation. The country's strategic documents on energy development (such as Energy Development Strategy of Montenegro until 2030) emphasize energy security as a critical component of national security, highlighting the significance of a secure, economical, and environmentally friendly energy supply.

Montenegro possesses a unique energy profile, characterized by a less diversified energy mix alongside a rich potential in renewable energy sources (RES), positioning it as a potential future electricity export hub within the Western Balkans. Despite its current reliance on imports for oil derivatives and a portion of its electricity needs, there is a noticeable shift towards renewable sources, aiming to reduce this dependency and enhance energy security through diversification.

Montenegro's energy potential is characterized by a mix of renewable and non-renewable resources, with a significant emphasis on the development and utilization of renewable energy sources (RES) to meet its energy needs and potentially become a net exporter of electricity in the region.

The country's energy resources include coal, and notably, renewable sources such as hydropower, wind, solar, and biomass. This diverse energy palette not only supports domestic needs but also presents opportunities for regional energy trade, particularly in electricity generated from renewable sources. When it comes to the coal there are significant reserves of lignite and brown coal in the Pljevlja and Berane areas. Coal is primarily used for electricity production in the Thermal Power Plant (TPP) Pljevlja.

However, the hydropower is considered as one of the most important energy resources of Montenegro. Significant hydro potential refers to both large and small river flows. The technical hydro potential is estimated at 4.1-5.0 TWh.

Table 1: Theoretical and technical hydro potential in Montenegro

Theoretical potential	Technical potential
Large flows: 9.8 TWh	Large flows: 3.7 TWh
Small flows: 0.8-1.0 TWh	Small flows: 0.4 TWh
Total: 10.6 – 10.8 TWh	Total: 4.1-5.0 TWh

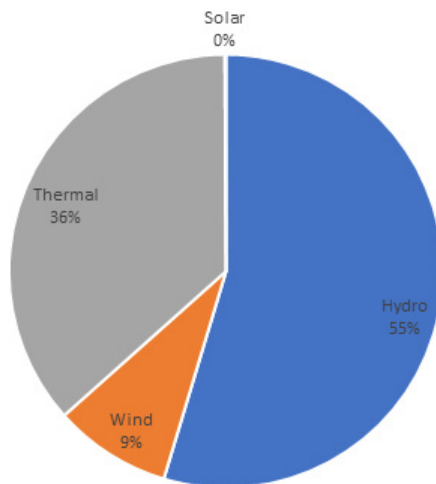
Source: *Energy Development Strategy of Montenegro until 2030*

When it comes to the other renewable energy sources potential, there is growing interest and investment in wind energy with an estimated technical potential of approximately 900 GWh/year from potential installations of around 400 MW. In addition, there is high solar potential given Montenegro's favourable sunshine hours, with an insolation rate suggesting strong potential for photovoltaic (PV) energy production. Notable potential from wood biomass, agricultural residues, and waste is also registered, with an estimated energy value of approximately 1900 GWh/year from wood biomass alone.

From the other side there is complete import dependence of Montenegro when it comes to the oil and oil derivatives, due to the lack of domestic production. The oil derivatives market includes several operators, with the largest being AD Jugopetrol Podgorica. Similarly, Montenegro does not have domestic natural gas production or infrastructure but recognizes its importance for diversifying the energy mix. There are plans for natural gas supply through the Ionian-Adriatic Pipeline (IAP) which would connect Montenegro with regional gas sources.

Hence, regarding current infrastructure, Montenegro operates thermal, hydro, wind, and solar power plants, with renewables making up a significant and growing share of electricity production. The total installed capacity of all power plants in Montenegro at the end of 2021 was 1,050,812 MW. In 2021, electricity production of 3,655.66 GWh was achieved. The share of renewable energy sources and highly efficient cogeneration in the total electricity production in 2021 was 63.55%.

Figure 26: Structure of electricity production by type of power plant in 2021



Source: Report on the realisation of the energy balance for 2021

It is important to emphasize that the realization of electricity production in Montenegro primarily depends on hydroelectric power plants. The country is expected to expand micro-production, especially through the prosumer model (buyer-producer), leveraging small-scale solar photovoltaic installations.

5.2 MONTENEGRIN REGIONAL TRADE OPPORTUNITIES AND CHALLENGES

The potential for energy trade between Montenegro and its Western Balkan neighbours hinges on several factors, including resource availability, infrastructure readiness, and regulatory harmonization. Montenegro's strategic location and renewable energy capabilities offer a foundation for becoming an energy-exporting country, particularly in electricity, to neighbouring countries in the Western Balkans.

Montenegro's significant renewable energy potential, especially in hydropower and wind energy, can be harnessed not just for domestic consumption but also for export. The development of additional renewable energy projects could enable Montenegro to supply clean electricity to neighbouring countries, fostering regional energy security and supporting the Western Balkans' transition to green energy.

For effective energy trade, robust infrastructure and interconnectivity are paramount. Montenegro's power grid infrastructure, characterized by its extensive connections with surrounding systems, offers a platform for energy exchange. However, further investments in grid expansion and modernization are essential to facilitate larger volumes of cross-border energy trade.

Aligning regulatory frameworks and advancing market integration within the Western Balkans are crucial for realizing the full potential of energy trade. Efforts towards harmonizing energy policies, adopting EU energy standards, and enhancing cooperation among Western Balkan countries could streamline energy transactions and ensure a stable, reliable energy supply across the region.

Expanding energy trade, particularly in renewables, aligns with global and regional sustainability goals. It offers environmental benefits by reducing reliance on fossil fuels and contributes to economic development through investment opportunities, job creation, and enhanced energy security.

Addressing challenges such as investment requirements, regulatory harmonization, and infrastructure readiness is essential for tapping into the energy trade potential. Additionally, considerations around energy affordability, security of supply, and the socio-economic impacts of transitioning to renewable energy sources need careful management.

Montenegro's energy sector, with its emphasis on renewable sources and environmental considerations, positions the country as a potential key player in regional energy trade within the Western Balkans. By capitalizing on its renewable energy potential, enhancing infrastructure and interconnectivity, and fostering regional cooperation, Montenegro can contribute significantly to the Western Balkans' energy security, sustainability, and economic development. The journey towards realizing this potential will require collaborative efforts, strategic investments, and a shared vision for a greener, more interconnected energy future in the region.

Regarding future potential and strategic importance and development, Montenegro's renewable energy resources, especially hydropower, wind, and solar energy, offer the potential to significantly enhance its energy security, reduce dependence on imports, and contribute to environmental sustainability. The country's focus on renewable energy development aligns with regional and global trends towards clean energy transitions, offering opportunities for investment, technological advancement, and regional cooperation in energy trade.

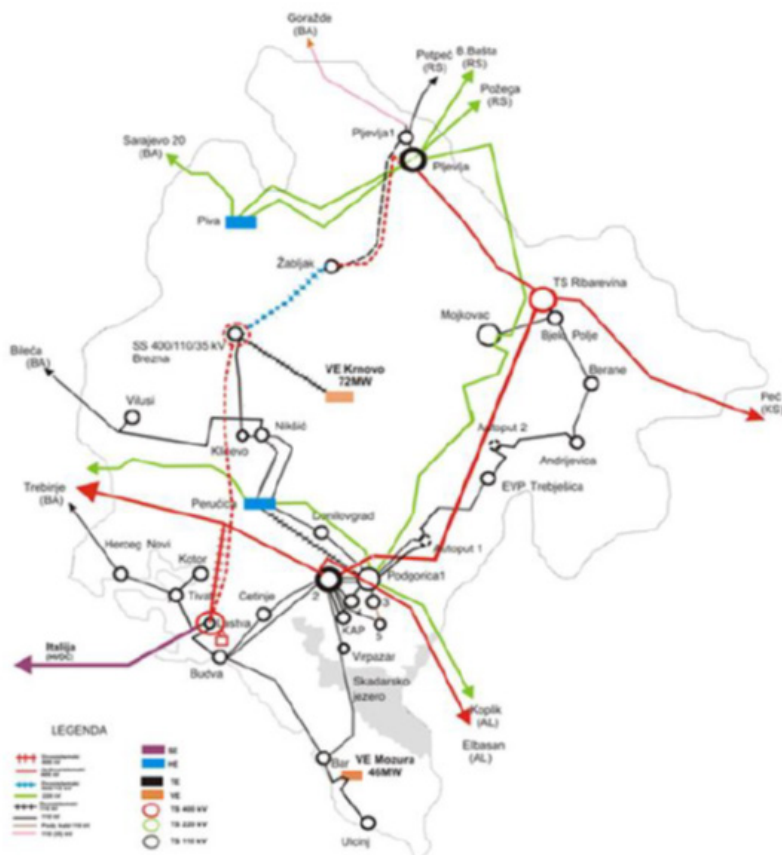
Hence, Montenegro's energy potential is marked by a significant shift towards renewable energy sources, with considerable investments and development plans aimed at exploiting its hydro, wind, and solar potential. This could not only enhance its domestic energy security and sustainability but also position Montenegro as a potential leader in renewable energy within the Western Balkans.

Montenegro's infrastructure potential for energy trade with regional countries

is underscored by its strategic interconnections and membership in the European Network of Transmission System Operators for Electricity (ENTSO-E). This membership not only aligns Montenegro with European energy standards but also enhances its role in the regional energy market. However, Montenegro's infrastructure supports its potential for energy trade within the region. Montenegro's transmission system is well-integrated with neighbouring countries through a series of high-capacity overhead lines and a submarine HVDC (High Voltage Direct Current) cable, which include connectivity with:

- Serbia: Connectivity through two 220 kV and one 110 kV overhead lines enables bilateral energy trade and grid stability.
- Kosovo: A 400 kV overhead line facilitates significant energy exchanges, enhancing regional energy security.
- Albania: The presence of a 400 kV and a 220 kV line supports cross-border electricity flows, crucial for balancing and emergency support.
- Bosnia and Herzegovina: Multiple connections (one 400 kV, two 220 kV, and two 110 kV lines) enable a robust energy trade framework.
- Italy: A 500 kV HVDC cable significantly increases Montenegro's capacity to engage in energy trade with the broader European market, not just for importing but also for exporting energy, especially from renewable sources.

Scheme 3: Montenegrin power system connections



Source: Energy Development Strategy of Montenegro until 2030

These interconnections are instrumental in ensuring energy security, enabling Montenegro to act as a regional energy hub that can import or export electricity depending on regional demand and supply dynamics. This capability is crucial for optimizing the use of renewable energy resources and enhancing grid stability across the region.

The distinction between Montenegro's transmission and distribution systems underlines the country's comprehensive approach to energy management. Managed by CGES, transmission system plays a pivotal role in long-distance electricity transmission and in facilitating cross-border energy trade. The system's integration into ENTSO-E ensures adherence to European standards for grid operation and development. On another side, distribution system is operated by CEDIS and focuses on distributing electricity within Montenegro, connecting the transmission grid with end consumers and distributed energy resources. This system's efficiency and reliability are crucial for local energy markets and for supporting small-scale renewable energy generation. The maintenance and development of Montenegro's energy infrastructure are crucial for sustaining and expanding its energy trade capabilities. The procurement of materials and equipment, often sourced internationally due to the lack of domestic production, is vital for keeping the network up to date. Investments in modernizing and expanding the grid will be necessary to support the increasing volume of energy trade, integrate more renewable energy, and comply with evolving European energy policies.

Montenegro's strategic interconnections and robust transmission and distribution infrastructure present significant opportunities for enhancing regional energy cooperation and trade. By serving as a bridge between the Balkans and the broader European energy market, Montenegro can facilitate the efficient flow of electricity across borders, support the integration of renewable energy, and contribute to regional energy security and sustainability. Continued investment in infrastructure and adherence to European standards will be key to realizing these opportunities and strengthening Montenegro's role in the regional and European energy landscape.

Data analysed in previous chapter show that Montenegro imports a significantly higher amount of energy compared to what it exports. There is a noticeable peak in energy imports in 2021 compared to 2020, which also sees a substantial amount in energy exports. Since Montenegro's imports of energy consistently surpass its exports, this indicates a reliance on imported energy to meet domestic demand. The country's energy import dependence suggests an opportunity for growth in domestic energy production, particularly from renewable sources, to achieve a more balanced trade and enhance energy security.

The use of correlation analysis in studying the relationships between different variables is a well-established method which helps in identifying potential relationships between different indicators, such as exports and imports of energy, consumption, production, and dependency rates across different countries or regions. Literature on energy economics frequently employs correlation matrices to draw preliminary conclusions about how energy markets of different countries might be interconnected. Use of correlation analysis might suggest potential trade patterns or dependencies between the states. Correlation does not imply causation, but it can provide valuable insights, especially when it's robust and consistent across several indicators or over time.

Hence, the following correlation matrix indicates the relationship between Montenegro's energy indicators and those of other Western Balkan countries. Montenegro's export of energy has a moderate negative correlation with BiH's exports, and a moderate positive correlation with Kosovo and Serbia's exports. This suggests that when Montenegro increases its energy exports, BiH tends to export less, while Kosovo and Serbia may also increase their exports. Import of energy shows a positive correlation with Kosovo and North Macedonia, suggesting that when Montenegro's energy imports increase, these countries also tend to import more energy. A very high positive correlation is observed in energy imports dependency between Montenegro and Serbia, indicating that both countries' reliance on energy imports tends to change in tandem. Montenegro's gross available energy has a strong positive correlation with

Albania's and North Macedonia's gross available energy, which might imply that available energy resources in these countries are affected by similar factors. There is a negative correlation between Montenegro's primary energy consumption and that of BiH and North Macedonia, while a positive correlation is observed with Kosovo.

Here is the correlation matrix showing how each of Montenegro's energy indicators correlates with the corresponding indicators of other Western Balkan countries:

Table 2: Corelation matrix

	Albania	BiH	North Macedonia	Kosovo	Serbia
Export of energy	-0.346647	-0.545952	0.461267	0.689415	0.324140
Import of energy	0.135390	-0.505515	0.645100	0.720972	-0.118470
Energy imports dependency	-0.472292	0.471908	-0.373204	0.348931	0.978828
Gross available energy	0.829417	0.462283	0.767445	0.273573	-0.328341
Primary energy production	0.245260	-0.426592	-0.588155	0.597324	-0.451911

Source: Authors calculations based on EUROSTAT's data

Based on the correlation matrix Montenegro's trade potential seems to be quite interconnected with the energy markets of other Western Balkan countries. The moderate negative correlation with Albania's energy indicators suggests that Montenegro might find trade potential in expanding exports when Albania's energy production is lower. The strong positive correlations with North Macedonia's and Kosovo's import dependencies indicate a potential for coordinated or joint efforts in energy import strategies. Also, the positive correlation between Montenegro's exports and Kosovo and Serbia's exports indicates complementary trade opportunities, where increases in exports from one country do not adversely affect the others. This could be leveraged to foster regional cooperation in energy trading.

Montenegro's gross available energy being highly correlated with Serbia's suggests that both might benefit from collaborative energy policies or the development of shared energy resources. Moreover, the strong positive correlation between Montenegro's gross available energy and that of Albania and North Macedonia suggests that regional energy availability is subject to similar factors. On the other side, negative correlations with Bosnia and Herzegovina's (BiH) energy indicators implies competitive dynamics, where Montenegro might need to strategically manage its energy exports and production in relation to BiH's market moves. Hence, there are opportunities for both competitive and cooperative strategies in order to increase the Montenegro's trade potential.

Over recent period, Montenegro's import dependency fluctuated but did not show a clear trend towards reduction over the period. This implies that efforts to increase domestic energy production or diversification of energy sources are yet to significantly impact the overall energy import dependency. The variation in these figures could be attributed to changes in domestic energy production, fluctuations in energy demand, or alterations in energy import patterns. A future decrease in dependency suggests better utilization of domestic resources. Enhancing domestic energy production, especially from renewable sources, could help Montenegro reduce this dependency further. Leveraging its renewable energy resources could lead to a more balanced energy trade, contribute to regional energy security, and align with broader European energy and climate goals. Also, the gross available energy and primary energy production figures suggest that Montenegro has a potential to increase its energy exports, particularly if it leverages its renewable energy sources more effectively. Investment in energy infrastructure and the development of renewable energy sources could help reduce dependency on energy imports and potentially position Montenegro as a regional energy exporter in the Western Balkans.

CONCLUSION

At the regional level, an increase in the volume of trade was recorded in the previous period. Serbia represents the most important trading partner, when it comes to food trade, and it is the only country that achieves a surplus in foreign food trade. Montenegro and Kosovo, on the other hand, are the countries with the largest deficit, where food imports are many times higher than food exports. The analysis showed that regional cooperation and the food market represent a significant factor in the economic progress of the region, considering the volume of trade that is realized.

In addition to the fact that Montenegro achieves a significantly smaller export of food compared to food import, Montenegrin food export is undiversified when it comes to the structure of the products that are exported, but also from the aspect of the countries to which food is exported, where most of the exports are made to the Western Balkan region, mainly in Serbia. On the other hand, food imports are more diversified. The same is very important for satisfied household consumption, where the largest part of consumption is satisfied from imports. A small market, inconsistency of agricultural producers, fragmentation of agricultural land and farms, poor capacity utilization contribute to such a situation. However, there is potential for the substitution of imports with domestic production, where one of the possibilities is the association of producers and the development of clusters.

The potential of Western Balkan countries could be used in more efficient ways through the faster transition towards low-carbon electricity generation. However, this would mean a paradigm shift for the power system and market in the Western Balkans, which, however, imposes numerous challenges. The shift of Western Balkan countries towards renewable energy is expected to lead to numerous exits of carbon-intensive power plants (also aligned with EU agenda) and entries of renewable generation and demand through increased electrification. This could increase price volatility since the introduction of a large share of intermittent renewable generation, coupled with the phase-out of some dispatchable technologies like coal generation, means electricity prices will fluctuate significantly, with low prices during periods of abundant renewable resources and high prices when these resources are scarce. This imposes necessity for coordinated management to ensure a balanced supply-demand throughout the transition.

Policy reforms in the Western Balkan countries should be designed in order to be able to significantly expedite the green transition while also reducing the volatility of electricity prices. Stronger market integration would contribute to maintaining lower price volatility than would otherwise occur, which is also confirmed by ACER's study for the EU level. This integration within the Western Balkan countries and with regional markets would increase the volume of trade, but also result in more affordable electricity and promote the growth of renewable energy, thereby enhancing the overall welfare of the region. This would enable easier electricity flows from areas with lower prices to those with higher prices, while in times when local generation of wind and solar power is insufficient in one of the countries, that country could benefit from cheaper or renewable energy, produced in neighbouring country. Additionally, policies aimed at stronger market integration would facilitate Western Balkan countries in leveraging the flexibility and adequacy solutions of their neighbours, such as backup generation, storage, or demand-side response, which are increasingly vital for balancing the variable generation patterns of renewable energy plants (wind and solar).

Analysis shows that Montenegro, while currently reliant on energy imports, possesses a significant renewable energy potential, particularly in hydropower, wind, and solar, which could be transform Montenegro into a net electricity exporter. The Montenegro's energy sector, underpinned by a mix of renewable and non-renewable resources, is marked by a transition towards renewables, aiming to reduce import dependency and enhance energy security through diversification. Strategic interconnections and

membership in ENTSO-E position Montenegro to play a key role in regional energy trade and transition towards a low-carbon generation. However, this could include challenges such as increased price volatility during the integration of renewable sources.

Energy trade potential of Montenegro is closely linked to regional markets, with correlations suggesting opportunities for both competitive and cooperative trade strategies. These opportunities are seen in potential for coordinated energy import strategies and complementary trade opportunities with other WB countries. However, it seems that all Western Balkan countries should be aware of the importance of investment in infrastructure, regulatory harmonization, and leveraging renewable resources to achieve a balanced energy trade, improve regional energy security, and align with broader European energy and climate goals.

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