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Energy Transition in Bosnia and Herzegovina



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CONTENTS

1 Executive Summary 3
2 Energy Transition Context and Strategic Relevance 5
2.1 Energy System Overview 5
2.2 Renewable Energy Sources Deployment 7
2.3 Regulatory Framework for Renewable Energy Deployment 13
2.4 Grid Capacity and Modernization 15
2.5 Energy Transition and EU Integration 16
3 Carbon Border Adjustment Mechanism (CBAM) and Trade Exposure 18
3.1 CBAM Sectoral Exposure 18
3.1.1 Case Study: The Impact of the CBAM on the Operations of Heidelberg Materials Cement BiH d.d. – Kakanj Cement Factory 23
3.1.2 Case Study: The Impact of the CBAM on the Operations of Alternativa d.o.o. 25
3.2 CBAM Readiness and Administrative Capacity 26
3.3 Policy Implications of CBAM 27
4 Just Transition, Employment, and Skills 29
4.1 Regional and Social Impacts 29
4.2 Reskilling and Workforce Development 31
4.3 Social Safeguards and Public Engagement 34
5 Financing the Energy Transition 36
5.1 Investment Needs and Economic Costs of Delayed Investment 36
5.2 Role of Development Banks, International Financial Institutions and Domestic Banks 37
5.3 Spending on Energy Transition–Related Programmes and Recommendations for Improving the Situation 39
6 Policy Recommendations 41
6.1 Short-Term Priorities 41
6.2 Medium-Term Actions 42
6.3 Long-Term Structural Reforms 43
7 References 45

1 Executive Summary

Bosnia and Herzegovina's energy transition is unfolding in a context characterised by a strong historical dependence on coal-based electricity generation, growing obligations stemming from EU climate and energy policies, and increasing exposure of domestic industries to decarbonisation pressures. Although the country possesses substantial renewable energy potential, particularly in hydropower, solar, wind, and biomass, progress toward a low-carbon energy system remains gradual and uneven. Structural constraints, fragmented governance arrangements, infrastructure limitations, and delayed implementation of strategic reforms continue to slow the pace of transition.

The country's electricity system remains dominated by coal and hydropower, while renewable energy sources such as solar and wind have only recently begun to expand more rapidly. Significant progress has nevertheless been recorded in the deployment of renewable energy projects, particularly utility-scale solar and wind investments, supported by falling technology costs, new regulatory frameworks, and financing from international financial institutions. Public electricity utilities, especially Elektroprivreda Bosne i Hercegovine (EPBiH), have also initiated strategic shifts toward renewable energy development, including solar installations on former mining sites, wind power projects, and biomass co-firing initiatives. At the same time, the transition process remains constrained by outdated grid infrastructure, insufficient balancing capacities, lengthy permitting procedures, and fragmented institutional responsibilities across multiple administrative levels.

Bosnia and Herzegovina's energy transition is increasingly shaped by its relationship with the European Union and the Energy Community. The country has adopted several strategic and legislative commitments related to decarbonisation, renewable energy deployment, and climate policy alignment, including obligations under the Paris Agreement, the Sofia Declaration on the Green Agenda for the Western Balkans, and Energy Community governance requirements. However, implementation gaps remain substantial. Bosnia and Herzegovina still lacks a fully operational monitoring, reporting, and verification (MRV) system aligned with the EU ETS, has not adopted a final National Energy and Climate Plan (NECP), and continues to face delays in implementing key energy market reforms and climate governance mechanisms.

The growing economic implications of the EU Carbon Border Adjustment Mechanism (CBAM) for Bosnia and Herzegovina are present. Carbon-intensive sectors such as electricity generation, iron and steel, aluminium, and cement are particularly exposed due to their strong export orientation toward the EU market. Approximately 13.4% of the country's exports are concentrated in CBAM-relevant sectors, with electricity and metals representing the largest shares. Interviews conducted with stakeholders indicate that the effects of CBAM are already materialising in practice. The findings from the interviews suggest that electricity exports to EU markets were effectively suspended in early 2026 because CBAM-related costs made exports commercially uncompetitive, forcing producers to redirect electricity exports toward regional markets.

The report further demonstrates that Bosnia and Herzegovina remains at an early stage of institutional and technical preparedness for CBAM implementation. While some export-oriented companies have independently developed internal systems for emissions monitoring and reporting, institutional support structures, domestic MRV systems, and operational guidance remain underdeveloped. Administrative burdens related to CBAM compliance are significant, especially for exporters integrated into European supply chains. Companies increasingly perceive investments in renewable energy, energy efficiency, emissions monitoring, and digital reporting systems as essential for preserving competitiveness on the EU market.

The transition process also raises important social and labour-market challenges. Coal mining regions and thermal power plants continue to play a major role in employment and regional economic stability, making the transition politically and socially sensitive. Stakeholders emphasised that Bosnia and Herzegovina still lacks a comprehensive and institutionalised just transition framework capable of

supporting large-scale workforce reskilling, labour-market diversification, and social protection for affected communities. Although certain pilot activities linked to renewable energy and biomass projects have begun, current efforts remain fragmented and insufficiently systemic.

Financing remains one of the central determinants of the transition process. International financial institutions and development banks currently play a dominant role in supporting renewable energy projects, grid modernisation, and transition-related investments. However, domestic financial instruments and support schemes remain underdeveloped, limiting broader participation of households, municipalities, and smaller enterprises in the energy transition.

Overall, the report concludes that Bosnia and Herzegovina faces a narrow window of opportunity to accelerate its energy transition and align more closely with EU climate and energy frameworks. Delayed action could increase macroeconomic risks, reduce export competitiveness, deepen exposure to CBAM-related costs, and raise the long-term fiscal and social costs of transition. At the same time, if supported through coherent policies, infrastructure investments, institutional reforms, and socially inclusive transition measures, the energy transition could create significant opportunities for industrial modernisation, renewable energy expansion, regional development, and stronger integration into the European low-carbon economy.

Green Industrial Policy Perspective

This report forms part of the Green Industrial Policy (GIP) Framework for the Western Balkans, which examines how the transition to a low-carbon economy can simultaneously strengthen industrial competitiveness, support economic growth and improve social outcomes. Within this broader framework, energy transition is understood not only as a climate and environmental objective, but also as a driver of industrial upgrading, innovation, investment, EU market integration and job creation. Green industrial policy therefore combines decarbonisation with measures that enhance productivity, develop new skills, support affected workers and communities, and ensure that the transition is economically competitive as well as socially just.

2 Energy Transition Context and Strategic Relevance

2.1 Energy System Overview

The energy system of Bosnia and Herzegovina is characterised by a high reliance on fossil fuels, particularly coal, alongside a significant contribution from hydropower and a still limited but gradually growing share of other renewable energy sources. Historically, the country's electricity sector has been dominated by lignite-fired thermal power plants located near domestic coal mines, which provide the majority of electricity generation. Hydropower represents the second most important source of electricity, while wind and solar energy have only recently begun to expand their role in the energy mix. As a result, Bosnia and Herzegovina remains one of the most coal-dependent electricity systems in Europe, with fossil fuels, especially coal, accounting for the largest share of electricity production, while natural gas plays only a minor role in the overall energy supply.

Table 1 illustrates the structure of electricity generation in Bosnia and Herzegovina between 2018 and 2025 and highlights several important trends in the evolution of the country's energy mix. Overall, the table confirms that the electricity system remains dominated by two main sources, coal and hydropower, which together account for the vast majority of generation, while other renewable sources still play only a marginal role. This pattern reflects the structural characteristics of the energy sector, where coal-fired thermal power plants and large hydropower facilities form the backbone of electricity supply.

Table 1: Electricity production by source, in TWh, 2018-2025

Year	Other renewables	Bioenergy	Solar	Wind	Hydropower	Nuclear	Oil	Gas	Coal
2018	0.00	0.01	0.02	0.10	15,493.00	0.00	0.05	0.03	16,407.00
2019	0.00	0.01	0.03	0.25	46,028.00	0.00	0.05	0.02	35,339.00
2020	0.00	0.01	0.05	0.26	21,276.00	0.00	0.04	0.00	31,352.00
2021	0.00	0.04	0.07	0.38	25,355.00	0.00	0.03	0.00	46,064.00
2022	0.00	0.03	0.11	0.39	26,024.00	0.00	0.05	0.01	46,153.00
2023	0.00	0.04	0.20	0.26	46,332.00	0.00	0.19	0.01	46,183.00
2024	0.00	0.04	0.34	0.27	29,677.00	0.00	0.19	0.01	16,681.00
2025	0.00	0.04	0.56	0.27	23,833.00	0.00	0.19	0.01	13,363.00

Source: https://ourworldindata.org/electricity-mix

The energy transition process has been underway for nearly two decades, with power utilities across the country gradually adapting their production portfolios to meet increasingly stringent environmental and regulatory requirements. In this context, consulted stakeholders from the electricity sector emphasized that the transition efforts are not a recent development, but rather part of a long-term strategy aimed at reducing the environmental impact of the thermal power sector. According to the interview data, one of the earliest steps in this process was the shutdown of approximately 200 MW of outdated thermal power generation capacity in the early 2000s, including several older thermal units in the Federation of Bosnia and Herzegovina. At the same time, modernization measures were implemented across the remaining thermal units, focusing on improving energy efficiency and reducing emissions of harmful pollutants, particularly particulate matter and nitrogen oxides.

In addition to measures explained above, the period between 2018 and 2025 marks the initial expansion of wind power in Bosnia and Herzegovina, starting with the commissioning of the country's first utility-scale wind farm. The Mesihovina wind farm (50.6 MW)[1], inaugurated in 2018 near Tomislavgrad, represented a milestone as the first operational wind power project in the country and demonstrated the technical feasibility of wind energy in the region. Mesihovina Wind Farm includes 22 turbines and can generate around 165 GWh annually. Following this pioneering project, several additional wind farms were commissioned, including Jelovača (36 MW) in 2019 and Podveležje (48 MW) in 2021, significantly expanding the installed wind capacity. By the end of 2024, four wind farms were operating in the country with a combined capacity of around 218.6 MW, which increased further to approximately 243.6 MW in 2025 with the addition of the Ivan Sedlo wind park.[2] These developments indicate a gradual but steady emergence of wind energy as a new component of the electricity system, particularly in the wind-rich areas of Herzegovina.

Solar energy has experienced an even faster expansion in recent years, driven primarily by falling photovoltaic technology costs and increasing investor interest. While solar capacity remained very limited until the early 2020s, around 153 MW installed by the end of 2023, deployment accelerated rapidly afterwards. In 2024 alone, solar capacity tripled to approximately 608 MW, reflecting a surge in new photovoltaic installations and improved regulatory frameworks that enabled small producers and aggregated "virtual power plant" models to participate in the electricity market. This rapid growth has been driven mainly by utility-scale solar parks and smaller distributed installations, particularly in regions with high solar potential such as Herzegovina. Although solar power still represents a relatively small share of electricity generation compared with coal and hydropower, the pace of capacity expansion suggests that solar energy is becoming one of the fastest-growing technologies in the country's energy transition.

Consulted stakeholders from the electricity sector described the energy transition as a process based on the gradual reduction of coal-based electricity generation, the development of renewable energy sources, and the modernization of existing generation assets. According to the interview data, increasing the share of renewable energy sources to approximately 50% of the total generation mix by 2030 has been identified as a strategic objective. However, stakeholders also emphasized that the current pace of renewable energy development remains insufficient to fully compensate for the decline in electricity production from thermal power plants. This challenge is further intensified by limitations in coal production, as well as obligations related to emissions reductions under the framework of the Energy Community and European regulatory requirements.

In addition to the energy mix used in a country, it is important to assess the role of electricity pricing and subsidies provided to final consumers, and how their introduction or removal influences the energy mix. According to the OECD (2025) report on *Energy Prices and Subsidies in the Western Balkans*[3], electricity pricing in Bosnia and Herzegovina is shaped by several subsidy mechanisms, most of which operate indirectly through market regulation rather than through explicit fiscal transfers. The most significant form of support arises from the supply of electricity to regulated customer segments at tariffs below market reference prices, which effectively acts as an implicit subsidy for consumers. By keeping retail electricity prices artificially low, this mechanism shields households from market volatility and reduces the extent to which electricity prices reflect the actual costs of generation. As a result, electricity prices in Bosnia and Herzegovina remain relatively low compared with many European markets, and price signals that would otherwise encourage efficiency improvements or investment in alternative technologies are weakened.

[1] https://ephzhb.ba/en/resursi-detaljno/ve-mesihovina/
[2] https://www.balkanenergyschool.org/wp-content/uploads/Infographic-Bosnia-and-Herzegovinas-energy.pdf
[3] https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/05/energy-prices-and-subsidies-in-the-western-balkans_41eed42b/082ea26a-en.pdf

A second important mechanism is cross-subsidisation between consumer categories within the electricity tariff system. Different tariff groups face different electricity prices, with residential consumers typically benefiting from lower tariffs while other users, such as businesses, bear relatively higher costs. These cross-subsidies redistribute costs within the electricity system and represent an additional form of indirect support for households. Over the period 2018–2023, such mechanisms generated substantial additional support for residential consumers, highlighting the importance of tariff design in shaping the distribution of energy costs across different consumer groups.

Support mechanisms are also present on the supply side of the electricity sector. In particular, feed-in tariffs have been used to encourage the development of renewable energy sources, guaranteeing renewable electricity producers a fixed purchase price for the electricity they generate. This instrument has provided investment certainty for renewable energy projects and supported the gradual expansion of technologies such as wind and solar power. However, when wholesale electricity prices increase significantly, guaranteed tariffs may create opportunity costs for the system, as electricity from renewable sources continues to be purchased at fixed prices regardless of market developments.

In comparison with these indirect mechanisms, direct fiscal support to the energy sector plays a relatively limited role, although existing fiscal measures have historically favoured fossil-fuel-based electricity production. The overall structure of support therefore tends to maintain the current energy mix, where coal-based electricity generation remains dominant. Because regulated prices and cross-subsidies reduce the effective cost of electricity from existing generation sources, they also weaken the competitive position of emerging renewable technologies.

If these subsidy mechanisms were gradually reduced or reformed, electricity prices would more closely reflect market conditions and the full costs of electricity production. In such a scenario, the economic advantages of coal-based generation would diminish, while renewable technologies, particularly wind and solar, would become relatively more competitive due to their low operating costs and absence of fuel expenses. Aligning electricity prices with market signals could therefore improve incentives for investment in renewable energy and contribute to the diversification and decarbonisation of the electricity sector. At the same time, replacing broad price subsidies with targeted support measures for vulnerable households would help mitigate the social impacts of higher electricity prices and ensure that subsidy reform does not increase energy poverty.

2.2 Renewable Energy Sources Deployment

According to IRENA (2023)[4]'s report assessment, Bosnia and Herzegovina has considerable potential for the deployment of renewable energy technologies, including solar, wind, hydropower, biomass and geothermal energy. The country's geographic conditions, natural resource base and climate provide favourable conditions for expanding renewable electricity generation beyond the current dominance of coal and large hydropower. Several international assessments indicate that the technical potential of renewable energy sources in Bosnia and Herzegovina is significantly higher than current utilisation levels, suggesting substantial opportunities for further deployment as part of the country's energy transition.

Solar energy potential is particularly strong, especially in the southern parts of the country such as Herzegovina. Bosnia and Herzegovina receives approximately 2,000–2,500 hours of sunshine per year, with average solar irradiation around 1,300–1,500 kWh/m² annually, which is comparable to or higher than several European countries with well-developed solar sectors. These conditions provide a strong basis for photovoltaic electricity generation, with studies estimating a technical potential of several

[4] https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2023/Sep/IRENA_RRA_Bosnia_Herzegovina_2023.pdf

gigawatts of solar capacity across suitable areas. Despite this favourable resource base, solar energy has only recently begun to expand, indicating that significant potential remains untapped. Within the framework of the conducted interviews, stakeholders from the electricity sector indicated that significant investments in solar energy development are planned as part of broader energy transition strategies. According to the interview data, between 200 MW and 300 MW of new photovoltaic capacity is planned, primarily on degraded mining land. Particular emphasis was placed on projects located in former mining areas, some of which have already entered the tendering phase. Stakeholders highlighted that the utilization of former mining sites for renewable energy projects represents an important opportunity to repurpose degraded industrial land while simultaneously supporting the decarbonisation of the electricity sector and the diversification of Bosnia and Herzegovina's energy mix.

The country also possesses significant wind energy potential, particularly in mountainous and southern regions such as Herzegovina and the Dinaric Alps. Wind resource assessments indicate favourable wind speeds in several corridors, including areas around Livno, Tomislavgrad, Mostar and Trebinje. Measurements at many potential sites show average wind speeds of around 6–8 m/s at turbine hub height, which are suitable for commercial wind power generation. Estimates of technical potential vary depending on methodology, but studies generally suggest that several gigawatts of wind capacity could be developed in Bosnia and Herzegovina under appropriate regulatory and infrastructure conditions. Consulted stakeholders from the electricity sector highlighted the 48 MW Podveležje Wind Farm as one of the already completed renewable energy projects. According to the interview data, the facility generates approximately 130 GWh of electricity annually, contributing to the diversification of the country's electricity production portfolio and the gradual reduction of dependence on coal-based generation. In addition, stakeholders indicated that preparations are underway for the development of new wind power projects, including the Vlašić Wind Farm with a planned capacity of 50 MW and the Bitovnja Wind Farm with a planned capacity of 90 MW. These projects are viewed as important components of long-term strategies aimed at increasing the share of renewable energy sources in overall electricity generation capacity.

Hydropower remains the most developed renewable resource in Bosnia and Herzegovina, supported by the country's mountainous terrain and dense river network. Hydropower already plays a major role in electricity generation, but additional potential still exists. Technical assessments estimate that only around half of the economically feasible hydropower potential has been exploited, indicating room for further development. However, future expansion is increasingly constrained by environmental considerations, social concerns and regulatory challenges, particularly regarding small hydropower projects. When it comes to hydropower, consulted stakeholders from the electricity sector emphasized that previously planned projects such as Janjići, Vranduk, Kovanići, Ustikolina, and the Upper Neretva hydropower system that are currently paused, have not been entirely abandoned. According to the interview data, hydropower plants are considered a key element of long-term energy transition strategies, not only because of their electricity generation potential, but also due to their important role in balancing the power system and enabling the integration of variable renewable energy sources such as wind and solar power.

Bosnia and Herzegovina also has significant biomass potential, largely due to its extensive forest resources and agricultural residues. Forests cover roughly 50% of the country's territory, making biomass one of the most abundant domestic renewable resources. Biomass is already widely used in the heating sector, particularly in rural households and district heating systems, primarily in the form of firewood and wood residues. Studies suggest that improved utilisation of forestry by-products, wood-processing residues and agricultural biomass could further expand biomass-based energy production, particularly for combined heat and power (CHP) and district heating applications. Existing examples from the electricity sector demonstrate the range of possible transition measures, including the introduction of biomass into energy production portfolios through the partial replacement of coal with environmentally sustainable biomass fuel in thermal power plants. According to the interview

data, biomass currently accounts for up to 5% of the fuel mix, using exclusively waste wood biomass that complies with European Union sustainability criteria. Stakeholders also emphasized plans for the further development of biomass-related projects in the future, including the cultivation of fast-growing biomass plantations on reclaimed mining land. These initiatives are intended not only to support emissions reductions and decarbonisation efforts, but also to create new employment opportunities for workers affected by the gradual transition away from coal-based energy production.

In addition, Bosnia and Herzegovina possesses notable geothermal energy potential, particularly for heating applications. Several geothermal sources have been identified across the country, including areas such as Ilidža, Laktaši, Slatina, Kakanj and Bijeljina, where geothermal waters are already used for balneological, heating and agricultural purposes. While geothermal electricity production has not yet been developed, studies indicate that low- and medium-temperature geothermal resources could support expanded use in district heating, greenhouse agriculture and other direct heat applications, contributing to diversification of the renewable energy mix.

When it comes to green transition towards more diversified energy mix, Bosnia and Herzegovina's decarbonisation framework is defined by a combination of international commitments, Energy Community obligations, EU-alignment requirements and national strategic documents. At the international level, the country signed the Paris Agreement in April 2016 and ratified it on 16 March 2017[5]. Under its updated Nationally Determined Contribution (NDC)[6], Bosnia and Herzegovina committed to reduce greenhouse gas emissions by 12.8% by 2030 compared with the level in 2014 on an unconditional basis, or 17.5% with international support. Expressed relative to 1990 levels, this corresponds a decrease by 33.2% and 36.8% respectively. The same NDC also sets a 2050 objective of a 50% emissions reduction compared with the level in 2014 in the unconditional scenario, with higher ambition possible under favourable international conditions. In parallel, Bosnia and Herzegovina endorsed the Sofia Declaration on the Green Agenda for the Western Balkans in November 2020, which commits the country to align with the European Green Deal and work towards climate neutrality by 2050[7].

At the regional level, Bosnia and Herzegovina is bound by obligations under the Energy Community Treaty, which requires alignment with the EU climate and energy acquis. The most recent Energy Community assessment specifies a 2030 climate target equivalent to 15.65 $MtCO_2$-eq**,** representing a 41.2% reduction in greenhouse gas emissions relative to the baseline used in the Energy Community governance framework. However, this target has not yet been formally defined in national legislation, reflecting broader institutional and governance gaps in climate policy. Bosnia and Herzegovina submitted its Long-Term Low-Emission Development Strategy (LT-LEDS) to the UNFCCC in July 2023, which outlines a pathway towards approximately 80% net emission reduction by 2050 compared with 1990 levels, but it does not formally adopt a climate-neutrality target.[8]

At the national level, the key strategic documents guiding decarbonisation include the Framework Energy Strategy of Bosnia and Herzegovina until 2035[9], the Climate Change Adaptation and Low-Emission Development Strategy 2020–2030[10], the updated NDC, and the still-unfinalised National

[5] https://unfccc.int/node/61024
[6] https://unfccc.int/sites/default/files/NDC/2022-06/NDC%20BiH_November%202020%20FINAL%20DRAFT%2005%20Nov%20ENG%20LR.pdf
[7] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1811
[8] https://www.energy-community.org/dam/jcr:72abf29e-594d-432a-a55d-37b9fa6b2a1a/BIH_IR25CP.pdf
[9] https://fmeri.gov.ba/media/1819/okvirna_energetska_strategija_bosne_i_hercegovine_do_2035_bih_finalna.pdf
[10] https://unfccc.int/sites/default/files/resource/ENG_CC%20adaptation%20and%20Low%20emission%20development%20Strategy%20BiH%202020-2030.pdf

Energy and Climate Plan (NECP)[11]. Under the Energy Community framework, Bosnia and Herzegovina is also expected to align with the 2030 climate and energy architecture, including a 43.6% share of renewable energy in gross final energy consumption by 2030. Indicative sectoral targets in the draft NECP foresee renewable shares of 70.1% in electricity generation, 60.8% in heating and cooling, and 8.4% in transport. The draft plan also sets energy-efficiency ceilings of 6.84 Mtoe for primary energy consumption and 4.34 Mtoe for final energy consumption by 2030[12]. In the EU accession process, obligations related to decarbonisation fall primarily under Chapter 15 (Energy), Chapter 21 (Trans-European Networks) and Chapter 27 (Environment and Climate Change), which require progressive alignment with the EU acquis on energy markets, renewable energy, energy efficiency and climate policy.[13]

Despite these commitments, progress toward implementation remains limited. As of 2025, Bosnia and Herzegovina had still not formally adopted or notified the final NECP, and it failed to submit information for the 17 reporting streams required under the Energy Community governance framework. Institutional gaps also remain significant, including the absence of a state-level climate law, a legally embedded 2030 emission reduction target, and a fully operational system for monitoring greenhouse gas emissions and climate policies. As a result, the Energy Community Secretariat concludes that Bosnia and Herzegovina is not yet on a clear pathway toward meeting its 2030 energy and climate targets. Some progress has nevertheless been made in the renewable energy sector. Between 2022 and 2024, renewable energy legislation was adopted at entity level, introducing frameworks for self-consumption, renewable energy communities and guarantees of origin. According to the Energy Community report, total installed renewable capacity reached 3,127 MW by 2024, including 608 MW of solar, 219 MW of wind, 1,709 MW of large hydropower, 169 MW of small hydropower and 1 MW of biomass capacity, representing an annual increase of about 515 MW. However, several key policy instruments remain incomplete or unimplemented, including renewable energy auctions and sustainability criteria for biofuels and biomass fuels. Overall implementation of policies related to decarbonising the energy sector is assessed at only 27%, highlighting the gap between formal commitments and actual policy implementation.[14]

On the other hand, several large energy transition and infrastructure projects are currently under development or planned in Bosnia and Herzegovina, reflecting the country's gradual shift toward renewable energy and diversification of the energy system. These projects primarily focus on solar and wind power expansion, hydropower development, grid infrastructure upgrades, and the gradual transition away from coal[15].

One of the most important areas of investment is the rapid expansion of solar power capacity, particularly in Herzegovina, which has the highest solar irradiation in the country. Several photovoltaic projects are currently under construction or in the pipeline. For example, the Trebinje 1 solar park (about 73 MW)[16] is one of the largest solar projects currently planned in the country. Additional photovoltaic projects are planned in the same region, including Trebinje 2 (54 MW) and Trebinje 3 (53 MW). In parallel, several smaller solar plants were expected to become operational by 2025 in locations such as Stolac, Mostar, Livno and Međugorje, with a combined capacity of roughly 100

[11] https://secw.ba/wp-content/uploads/2024/10/NECP-BiH-finalni-nacrt.pdf
[12] https://www.energy-community.org/dam/jcr:3d066877-d597-41c7-8b31-f85ba5392ef0/IR2024_BosniaHerzegovina.pdf
[13] https://enlargement.ec.europa.eu/document/download/451db011-6779-40ea-b34b-a0eeda451746_en?filename=Bosnia%20and%20Herzegovina%20Report%202024.pdf
[14] https://www.energy-community.org/dam/jcr:72abf29e-594d-432a-a55d-37b9fa6b2a1a/BIH_IR25CP.pdf
[15] https://www.dei.gov.ba/uploads/documents/single-project-pipeline-bosnia-and-herzegovina-september-2025_1759492394.pdf
[16] https://www.power-technology.com/data-insights/power-plant-profile-trebinje-1-solar-pv-park-bosnia-and-herzegovina/

MW.[17] A major programme for expanding solar generation is also being developed by the state-owned utility EPBiH. The programme foresees the construction of 13 photovoltaic power plants with a total installed capacity of about 195 MW, financed with support from international financial institutions such as the European Bank for Reconstruction and Development (EBRD). The first phase alone includes eight solar plants with a combined capacity of around 84 MW.[18]

Wind energy is another sector experiencing strong investment interest. Several wind projects are planned or under development across the country, particularly in mountainous areas with favourable wind conditions. Examples include the Vlašić wind farm (50 MW)[19] and additional projects such as Borova Glava, Velika Vlajna/Jastrebinka, Bitovnja and Planinica wind farms, which appear in the national infrastructure project pipeline. Together with existing wind plants, these projects are expected to significantly increase the role of wind power in the electricity mix over the coming decade.

Hydropower continues to play an important role in the investment pipeline. One of the ongoing projects is the HE Bistrica system, consisting of three cascading hydropower plants on the Bistrica river near Foča with a combined capacity of about 39 MW, scheduled for completion around 2026. Additional projects include the Janjići hydropower plant (16 MW) and rehabilitation works on existing plants such as Jajce 2.[20]

In addition to generation projects, several initiatives aim to support the structural transition of the energy sector. A notable example is the World Bank–supported Just Transition project for coal regions, which provides financing to repurpose former mining areas such as Banovići, Kreka and Zenica and to install renewable energy systems on reclaimed land while supporting workers and communities affected by coal phase-out.[21]

Another important initiative concerns energy infrastructure diversification, particularly the Southern Gas Interconnection pipeline between Croatia and Bosnia and Herzegovina, for which the two countries have already signed an intergovernmental agreement on construction. The project will connect Bosnia and Herzegovina to the LNG terminal on Croatia's Krk island, providing an alternative gas supply route and reducing dependence on a single supplier and transit corridor.[22]

According to the conducted interviews, the main obstacles to the development of renewable energy projects were identified as lengthy administrative procedures, resistance from local communities, complaints and opposition from non-governmental organizations, and a lack of institutional support. Stakeholders particularly emphasized that public perception of hydropower projects remains highly negative, highlighting the need for stronger institutional communication and broader public education regarding the potential benefits of such projects. It was further noted that energy companies alone do not possess sufficient capacity or societal influence to independently manage these challenges. A more active and coordinated role from governments and other public institutions is considered necessary in order to facilitate the implementation of large-scale renewable energy projects and support the overall energy transition process.

Accelerating the deployment of renewable energy sources (RES) in Bosnia and Herzegovina will require a combination of green industrial policy instruments that address market failures, mobilise

[17] https://www.balcanicaucaso.org/en/cp_article/bosnia-and-herzegovina-the-business-of-photovoltaics/
[18] https://ecepp.ebrd.com/delta/viewNotice.html?displayNoticeId=36633605
[19] https://www.wbif.eu/project-detail/PRJ-BIH-ENE-008
[20] https://balkangreenenergynews.com/three-hydropower-plants-on-bistrica-river-to-be-finished-by-end-2026/
[21] https://www.worldbank.org/en/news/press-release/2025/05/05/bosnia-and-herzegovina-to-boost-energy-security-jobs-with-world-bank-support
[22] https://balkangreenenergynews.com/bih-croatia-signed-agreement-on-southern-gas-interconnection/

investment and support structural economic transformation.[23] As emphasized during interviews with relevant stakeholders, and given the country's continued reliance on coal-based electricity generation, policies that shift incentives toward clean energy while ensuring a just transition for affected regions are particularly important.

A first critical step is reforming fossil-fuel subsidies and introducing carbon pricing mechanisms. Energy subsidies distort price signals and often favour carbon-intensive generation, reducing the competitiveness of renewable technologies. Gradual removal of such subsidies, combined with the introduction of carbon pricing or emissions trading mechanisms aligned with EU frameworks, would internalise the environmental costs of fossil fuel use and improve the relative attractiveness of renewable energy investments. Revenues from carbon pricing could be reinvested in renewable energy deployment, grid modernisation, and targeted social support for vulnerable households affected by rising energy prices.

Second, stable investment frameworks and financial incentives are essential to attract large-scale private investment in renewable generation. These may include competitive renewable energy auctions, contracts for difference (CfDs), investment grants, tax incentives, and concessional financing mechanisms through development banks and international financial institutions. Instruments such as blended finance, combining public funds with private capital, can help reduce financing risks and improve the bankability of renewable projects. In the Western Balkans, international financing sources such as EU pre-accession funds, the Western Balkans Investment Framework, and multilateral development banks already play an important role in supporting energy transition investments.

Third, support schemes for prosumers and distributed renewable generation could accelerate the expansion of solar energy in particular. Incentives such as net-metering or net-billing systems, simplified permitting procedures, and targeted subsidies for rooftop photovoltaic installations can enable households, small businesses and municipalities to invest in renewable energy generation. The development of energy communities and prosumer models can also broaden participation in the energy transition and distribute economic benefits more widely across society.

Fourth, grid infrastructure investment and regional market integration are essential enabling conditions for higher renewable penetration. Renewable energy expansion requires modernised transmission and distribution networks capable of managing variable generation. Investment in grid digitalisation, storage technologies and cross-border electricity interconnections would improve system flexibility and reliability. Regional cooperation within the Western Balkans could further enhance system stability by allowing countries to balance different renewable resources, for example combining wind and solar generation across different climatic zones while using hydropower as a balancing source.

Finally, green industrial policy measures supporting domestic supply chains, skills development and innovation can strengthen the broader economic benefits of renewable deployment. Training programmes for renewable energy technicians, incentives for small and medium-sized enterprises participating in renewable energy value chains, and support for research and innovation in clean technologies can create new employment opportunities and help coal-dependent regions diversify their economies. Such measures are particularly important for ensuring that the energy transition generates high-quality green jobs and economic development opportunities, rather than simply replacing one energy source with another.

On the other side, delays in the energy transition could impose significant macroeconomic and structural costs on Bosnia and Herzegovina. According to the World Bank Country Climate and

23 https://www.institutigap.org/documents/87448_A%20framework%20for%20Green%20Industrial%20Policies%20in%20the%20Western%20Balkans.pdf

Development Report[24], climate-related damages could reduce the country's GDP by up to 14% by 2050 if adaptation and decarbonisation measures are postponed. The report also estimates that Bosnia and Herzegovina will require approximately USD 6.8 billion in investments to support climate resilience and the energy transition, most of which should be implemented during the coming decade in order to avoid higher long-term economic costs. Delaying the transition would also increase the country's exposure to climate-related shocks such as floods, heatwaves and wildfires, which already generate substantial economic losses. For example, the 2014 floods caused damages equivalent to around 15% of GDP, illustrating the magnitude of the economic risks associated with climate vulnerability.

Delayed decarbonisation may also undermine Bosnia and Herzegovina's export competitiveness, particularly in relation to evolving EU climate policies. An OECD analysis[25] highlights that the introduction of the EU CBAM could significantly affect exports from carbon-intensive sectors. Because the country relies heavily on coal-based electricity generation, modelling results suggest that electricity exports could decline by around 15% under CBAM, while energy-intensive industries such as basic metals could also experience substantial losses. Given that electricity exports represent an important source of revenue for the energy sector, such declines could negatively affect both industrial output and export earnings if decarbonisation policies are delayed.

In addition to these macroeconomic and trade risks, delayed transition increases the likelihood of stranded assets in the energy sector. Regional energy transition studies[26] indicate that Bosnia and Herzegovina's continued reliance on coal-based electricity generation raises the probability that thermal power plants and mining infrastructure may become economically unviable as European climate policies tighten and renewable technologies become increasingly cost-competitive. This could lead to premature closure of coal assets and generate financial losses for energy utilities and public finances, further increasing the economic costs of delayed transition.

2.3 Regulatory Framework for Renewable Energy Deployment

The regulatory framework for renewable energy deployment in Bosnia and Herzegovina is shaped by the country's decentralised governance structure, in which energy policy and legislation are primarily defined at the entity and district levels. As a result, renewable energy regulation is governed through separate legal frameworks in the Federation of Bosnia and Herzegovina, Republika Srpska, and Brčko District of Bosnia and Herzegovina. Recent reforms have focused on introducing legal definitions for renewable energy communities, establishing support mechanisms for renewable electricity generation, and enabling participation of prosumers in electricity markets.

In the Federation of Bosnia and Herzegovina, the regulatory framework was significantly updated with the adoption of the Law on the Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of FBiH, No. 82/23) and the Law on Electricity of the Federation of Bosnia and Herzegovina (Official Gazette of FBiH, No. 60/23). These laws introduced the concepts of Renewable Energy Communities (RECs) and Citizen Energy Communities (CECs), granting them the right to generate, consume, store and sell renewable energy. The legislation also established a renewable energy support framework combining feed-in tariffs (FiT) for small renewable installations and feed-in premiums (FiP) allocated through competitive auctions for larger projects, while reserving a share of technological quotas for renewable energy communities. The framework is further operationalised through secondary legislation, including the Rulebook on Renewable Energy Communities (Official

[24] https://www.worldbank.org/en/country/bosniaandherzegovina/publication/bosnia-and-herzegovina-country-climate-and-development-report

[25] https://www.oecd.org/en/publications/energy-prices-and-subsidies-in-the-western-balkans_082ea26a-en/full-report/energy-prices-and-subsidies-in-bosnia-and-herzegovina_b005da3b.html

[26] https://wiiw.ac.at/the-energy-transition-in-the-western-balkans-the-status-quo-major-challenges-and-how-to-overcome-them-dlp-6896.pdf

Gazette of FBiH, No. 65/25) and additional regulations governing technological quotas and auction procedures for renewable energy support schemes.

In Republika Srpska, the regulatory framework is based primarily on the Law on Renewable Energy Sources (Official Gazette of RS, No. 16/22), which introduced renewable energy communities and the legal status of prosumers, allowing final customers to produce renewable electricity for their own consumption and deliver surplus electricity to the grid. The law also established a system of market-based incentives and premiums for renewable electricity generation, with detailed procedures regulated through secondary legislation adopted by the Regulatory Commission for Energy of the Republic of Srpska (RERS), including the Rulebook on Renewable Energy Communities and the Rulebook on Incentives for Electricity Generation from Renewable Energy Sources.

In Brčko District of Bosnia and Herzegovina, renewable energy regulation is governed by the Law on Renewable Energy Sources and Efficient Cogeneration (Official Gazette of Brčko District BiH, No. 22/22). The law introduces the concept of Renewable Energy Communities and provides a legal basis for prosumers to generate electricity for their own consumption and supply surplus electricity to the grid. However, compared with the entity-level frameworks, the regulatory framework in Brčko District remains less developed, as detailed secondary legislation regulating renewable energy communities, energy sharing and operational procedures has not yet been fully adopted.

Despite recent improvements in the legislative framework, renewable energy deployment in Bosnia and Herzegovina continues to face several structural and regulatory barriers that slow down investment and project implementation. One of the most frequently cited obstacles is the fragmented institutional and regulatory structure of the energy sector. Energy policy and renewable energy regulation are largely decentralised. While new legislation has been adopted in recent years, their implementation remains uneven and several elements of EU renewable energy legislation still require further transposition and operationalisation through secondary legislation. Administrative complexity and regulatory uncertainty also represent significant barriers to renewable energy investment. International assessments highlight that renewable energy project development in Bosnia and Herzegovina often involves lengthy permitting procedures, multiple institutional approvals and unclear responsibilities between administrative levels. According to the Energy Community Secretariat, delays in implementing energy market reforms and aligning national legislation with EU energy acquis continue to create uncertainty for investors and slow down the deployment of renewable energy technologies.[27]

In addition, infrastructure and system integration constraints limit the expansion of renewable energy sources, particularly wind and solar power. The electricity system in Bosnia and Herzegovina was historically designed around large centralised generation units based on coal and hydropower, and therefore requires significant investment in grid modernisation and system flexibility to accommodate higher shares of variable renewable energy. Studies on renewable energy readiness also emphasise that limited institutional capacity for project preparation and coordination between authorities can delay the development and financing of renewable energy projects.[28]

Finally, economic and structural factors continue to affect the competitiveness of renewable energy technologies. The electricity sector remains heavily reliant on lignite-based power generation, and historically low electricity prices combined with fossil fuel subsidies have reduced incentives for rapid renewable energy expansion. This legacy energy system creates structural inertia that slows the transition toward cleaner energy sources and increases the need for policy reforms and investment frameworks capable of supporting large-scale renewable energy deployment.

[27] https://www.energy-community.org/dam/jcr:72abf29e-594d-432a-a55d-37b9fa6b2a1a/BIH_IR25CP.pdf
[28] https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2023/Sep/IRENA_RRA_Bosnia_Herzegovina_2023.pdf

Permitting and licensing frameworks in Bosnia and Herzegovina are not yet fully effective for rapid renewable energy deployment. Although the legal basis for renewables has improved, in practice, the permitting burden appears substantial. A dedicated assessment of renewable energy permitting in Bosnia and Herzegovina[29] found that developing a wind project in the Federation of BiH requires around 29 permits, consents or notifications, and that none of these could be obtained online; Republika Srpska had a similar number of steps, although somewhat more digitalised procedures. The same assessment noted that project development is structured around three main permits, each dependent on numerous prior approvals, which makes the process lengthy and procedurally heavy.

Available evidence also suggests that these frameworks do hold investors back and delay green investments. International and sectoral assessments consistently point to slow legislative reform, regulatory uncertainty and grid-connection bottlenecks as factors slowing renewable deployment in Bosnia and Herzegovina. Recent Energy Community and regulatory updates[30] note that support schemes exist in law, but practical rollout has lagged because key elements such as quotas and auctions were still not operational, which weakens investor certainty and postpones project execution.

Another important barrier to renewable energy deployment in Bosnia and Herzegovina, according to conducted interviews with stakeholders, is the absence of a fully operational one-stop shop for permitting and investment procedures in the energy sector. Due to the country's decentralised governance structure, renewable energy developers must interact with multiple institutions across different administrative levels, including authorities responsible for spatial planning, environmental protection, construction permits, grid connection and energy licensing. Although recent legislation has introduced clearer procedures for renewable energy projects, these reforms have not yet established a centralised mechanism that would allow investors to complete all permitting steps through a single administrative interface.

2.4 Grid Capacity and Modernization

Electricity grid capacity in Bosnia and Herzegovina represents an important constraint for the accelerated deployment of renewable energy sources. The national transmission network, comprising approximately 6,500 km of high-voltage lines at 400 kV, 220 kV and 110 kV levels[31], was historically designed to accommodate large centralised generation units, primarily coal-fired power plants and hydropower facilities rather than variable renewable sources such as wind and solar. As renewable energy development has expanded, grid connection requests have increased significantly, yet network infrastructure and operational flexibility have not always kept pace with this growth. Recent assessments by the Energy Community[32] indicate that while several hundred megawatts of wind and solar projects have entered permitting and environmental impact assessment procedures, the capacity of national authorities and supporting infrastructure has not expanded at the same rate, creating bottlenecks for new projects.

According to the conducted interviews, certain constraints exist regarding the connection of new electricity generation capacities to the grid. Nevertheless, stakeholders emphasized that the system still possesses considerable room for expansion through investments in substations and broader grid modernization measures. A particular challenge highlighted during the discussions relates to balancing the power system due to the increasing share of intermittent renewable energy sources. In this

[29] https://bankwatch.org/blog/renewable-energy-permitting-in-bosnia-and-herzegovina-how-to-optimise-the-process-while-safeguarding-the-environment-and-public-participation
[30] https://www.energy-community.org/dam/jcr%3A31258120-6621-4a6d-9dda-1f30ba9107b0/2025_Final_ECRB_RES%26Flex_Update_EnCS_website.pdf
[31] https://www.derk.ba/DocumentsPDFs/Osnovni-podaci-o-EE-sistemu-BiH-en.pdf
[32] https://www.energy-community.org/dam/jcr:72abf29e-594d-432a-a55d-37b9fa6b2a1a/BIH_IR25CP.pdf

context, hydropower plants, especially pumped-storage hydropower facilities, together with future battery energy storage systems, were recognized as critical balancing assets for maintaining the stability and reliability of the electricity system.

As emphasized during interviews, addressing these challenges requires significant investments in transmission and distribution infrastructure, as well as grid digitalisation and system flexibility. Key priorities include strengthening transmission lines in regions with high renewable potential, expanding cross-border interconnections, and upgrading distribution networks to accommodate decentralised generation and prosumers. Large regional infrastructure projects such as the Trans-Balkan Electricity Corridor[33], which connects transmission systems across Southeast Europe, illustrate the type of investments needed to increase system reliability and enable higher shares of renewable electricity in the grid. Modernisation efforts must also include digital monitoring systems, improved grid planning tools and balancing mechanisms that allow system operators to manage the variability of wind and solar generation more effectively.

Infrastructure constraints in the electricity network also have broader implications for industrial transition and economic competitiveness.[34] Reliable access to low-carbon electricity is increasingly important for industrial decarbonisation and for attracting investment in energy-intensive sectors seeking to reduce their carbon footprint. If grid capacity and flexibility remain limited, the ability of Bosnia and Herzegovina to integrate large volumes of renewable energy and supply industry with competitively priced green electricity may be constrained. This could slow the decarbonisation of domestic industries and reduce the country's attractiveness for investment in emerging low-carbon supply chains linked to the European market.

2.5 Energy Transition and EU Integration

Based on the most recent European Commission Bosnia and Herzegovina Report 2025[35], progress under the accession chapters most relevant for the green transition remains limited. In Chapter 15 (Energy), the report assesses Bosnia and Herzegovina as being at an early stage of preparation in the energy sector. Key legislation required for alignment with the EU acquis, such as state-level electricity and gas laws aligned with the Third Energy Package and the Electricity Integration Package, has not yet been adopted, and the country has still not adopted the National Energy and Climate Plan (NECP) 2021–2030. The Commission also stresses that Bosnia and Herzegovina must adopt legislation enabling electricity market integration with the EU and further align renewable energy and energy-efficiency frameworks with Energy Community obligations.

Similarly, in Chapter 27 (environment and climate change) Bosnia and Herzegovina remains between an early stage of preparation and some level of preparation. The country still lacks key framework instruments, including a state-level climate law, countrywide environmental protection and climate strategies, and a new nationally determined contribution (NDC) aligned with EU and Paris Agreement targets. The report also emphasises the urgent need to align with EU requirements on monitoring, reporting, verification and accreditation (MRVA) for greenhouse gas emissions. These gaps significantly slow the country's ability to implement decarbonisation policies and meet Energy Community and EU climate obligations.

Progress in competition policy (Chapter 8) is also limited. Bosnia and Herzegovina remains at some level of preparation but made no progress during the reporting period. The European Commission

[33] https://international-partnerships.ec.europa.eu/policies/global-gateway/trans-balkan-electricity-corridor_en

[34] https://www.trade.gov/country-commercial-guides/bosnia-and-herzegovina-energy

[35] https://enlargement.ec.europa.eu/document/download/5d8fc547-f8f8-456f-84e3-b38998acfafd_en?filename=bosnia-and-herzegovina-report-2025.pdf

highlights structural governance problems in the functioning of the Competition Council and State Aid Council, particularly the continued existence of ethnic-based veto rights, which hinder effective enforcement of EU-compatible state aid rules. Aligning the Law on Competition and the Law on State Aid with EU standards and removing veto-based decision-making procedures remain necessary steps for improving market functioning and ensuring that energy-sector subsidies and investment incentives comply with EU state-aid rules.

EU-driven obligations related to the green transition are also increasingly linked to the EU Growth Plan for the Western Balkans and the Reform and Growth Facility. The 2025 report notes that Bosnia and Herzegovina adopted and submitted a Reform Agenda to the European Commission in September 2025, although delays in earlier reforms led the Commission to reduce the indicative financial allocation by 10%. The Reform Agenda includes measures directly linked to the energy transition, such as adopting electricity and gas legislation aligned with the EU acquis, implementing the electricity market integration package, adopting the NECP, and aligning renewable-energy legislation with Energy Community requirements.

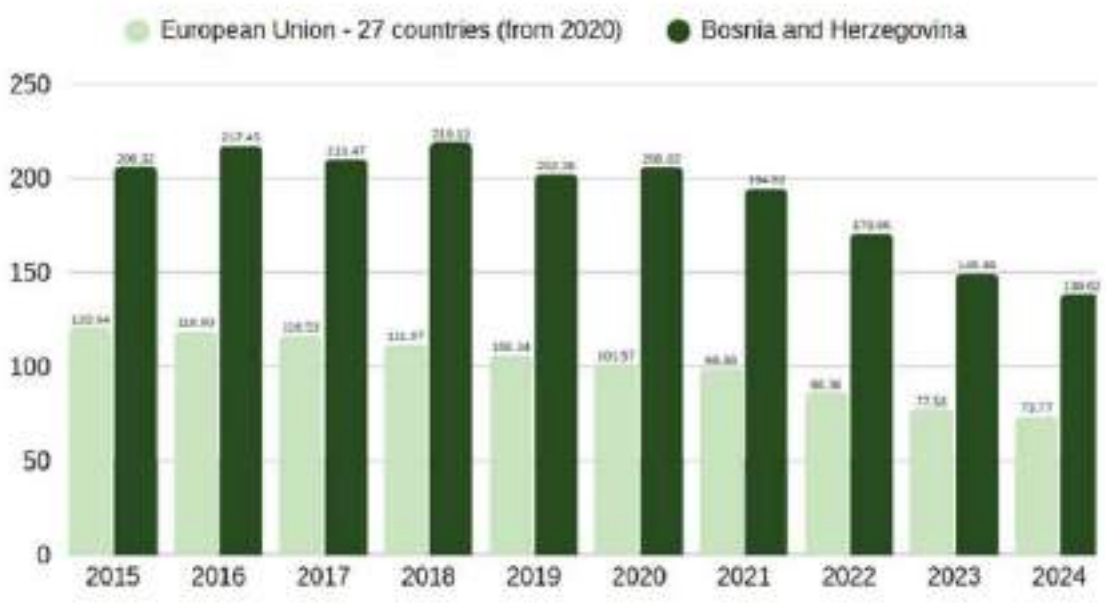
Consulted stakeholders assess the progress of Bosnia and Herzegovina's energy transition as gradual but uneven, shaped by a combination of increasing alignment with EU energy and climate policies and persistent structural, institutional, and infrastructural constraints. Representatives from both the electricity sector and public institutions emphasized that significant steps have already been taken, including the modernization of thermal power plants in line with EU Industrial Emissions Directive standards, the expansion of wind and solar energy projects, the introduction of legislation enabling prosumers and energy communities, and the preparation of strategic decarbonisation plans. At the same time, stakeholders stressed that the pace of transition remains slower than required to meet long-term EU climate objectives due to delays in hydropower development, insufficient grid digitalization and balancing capacities, fragmented institutional responsibilities, and the absence of fully operational carbon pricing and MRV systems aligned with the EU ETS. Several interviewees also highlighted that EU policies, particularly CBAM and Energy Community obligations, are increasingly acting as external drivers accelerating domestic reforms and forcing both public institutions and companies to adapt more rapidly to the requirements of the European Green Deal.

3 Carbon Border Adjustment Mechanism (CBAM) and Trade Exposure

3.1 CBAM Sectoral Exposure

Several energy-intensive and carbon-intensive industrial sectors in Bosnia and Herzegovina face the greatest competitiveness risks as energy prices rise and carbon pricing mechanisms such as the EU CBAM take effect. From an energy-consumption perspective, heavy industry remains a major electricity consumer in the country. Official statistics indicate that within the industrial sector the iron and steel industry alone accounted for around 18.8% of total industrial electricity consumption in 2024, highlighting the very high energy intensity of this sector.[36] Bosnia and Herzegovina remains significantly more energy-intensive than the EU average. According to Eurostat data presented at Figure 1, the country's energy intensity of GDP declined from 206.3 kilograms of oil equivalent (kgoe) per €1,000 of GDP (PPS) in 2015 to 138.6 kgoe in 2024, indicating gradual improvements in energy efficiency. However, energy intensity remains substantially higher than the EU-27 average of 73.8 kgoe per €1,000 of GDP in 2024, meaning that Bosnia and Herzegovina still uses almost twice as much energy per unit of economic output as the EU. This relatively high energy intensity reflects the continued importance of energy-intensive industries and coal-based electricity generation in the country's economic structure, which increases the exposure of domestic industries to rising energy prices and carbon-pricing mechanisms such as the EU CBAM.

Figure 1: Energy intensity of GDP in purchasing power standards (PPS), EU-27 and BiH, 2015-2024



Source: Eurostat (https://doi.org/10.2908/NRG_IND_EI)

Building on the structural characteristics of energy intensity and the exposure of heavy industry to rising energy costs, the table below provides a more granular view of the enterprise structure and employment distribution across CBAM-relevant sectors in Bosnia and Herzegovina. It shows that a total of 13,637 enterprises operate in these sectors, employing 214,629 workers, which confirms the systemic importance of CBAM-exposed industries for the domestic economy. In relative terms, this

[36] https://bhas.gov.ba/data/Publikacije/Saopstenja/2025/ENE_03_2024_Y1_1_BS.pdf

corresponds to approximately 15.7% of all enterprises (out of 86,920) and 34.8% of total employment in industrial sectors (out of 617,109 employees in industrial sectors), indicating that more than one-third of the workforce is directly employed in sectors potentially affected by CBAM.[37]

Table 2: Number of enterprises and employees affected by CBAM, 2024

Sector	Enterprise size	Number of enterprises	Number of employees
B – Mining and quarrying	Small (0–49)	193	1,455
	Medium (50–249)	15	1,883
	Large (250+)	13	11,412
	Total	**221**	**14,750**
C – Manufacturing	Small (0–49)	11,767	59,224
	Medium (50–249)	514	53,703
	Large (250+)	113	55,136
	Total	**12,394**	**168,063**
D – Electricity, gas, steam and air conditioning supply	Small (0–49)	541	1,152
	Medium (50–249)	12	1,214
	Large (250+)	18	15,638
	Total	**571**	**18,004**
E – Water supply, waste management and remediation activities	Small (0–49)	374	4,044
	Medium (50–249)	72	6,879
	Large (250+)	5	2,889
	Total	**451**	**13,812**
TOTAL CBAM sectors		**13,637**	**214,629**

Source: Agency for Statistics of Bosnia and Herzegovina

A key insight emerging from the table is the dual structure of exposure. On the one hand, CBAM-relevant sectors are dominated numerically by small enterprises, particularly in manufacturing, where small firms account for the overwhelming majority of companies. However, on the other hand, employment is much more evenly distributed across firm sizes, and in some sectors strongly concentrated in large enterprises. This is especially evident in mining (B) and energy (D), where large companies employ the majority of workers (e.g. over 75% in mining and close to 87% in energy). These sectors are typically characterised by capital-intensive production and high emissions, meaning that CBAM-related costs will be concentrated in a relatively small number of large, systemically important companies.

[37] At the same time, this analysis is subject to important limitations. Due to the lack of sufficiently disaggregated official data, the estimates necessarily include all enterprises within broad NACE sectors (B, C, D and E), even though only a subset of firms, particularly within manufacturing, are directly covered by CBAM (e.g. iron and steel, aluminium, cement, fertilisers, and electricity). As a result, the figures presented here should be interpreted as an upper-bound approximation of potential exposure. While this approach likely overestimates the number of directly affected firms, it remains analytically relevant, as a large share of companies within these sectors are expected to be indirectly affected through supply chains, input cost increases, and market linkages with CBAM-covered industries.

In contrast, manufacturing (C), which represents by far the largest share of both enterprises and employment, exhibits a more balanced structure. While small enterprises dominate in number, medium and large firms together account for the majority of employment, indicating that the impact of CBAM will be transmitted across the entire value chain. This includes not only direct exporters of CBAM-covered goods (such as metals or cement), but also a broad base of suppliers and subcontractors that are indirectly exposed through input prices, compliance requirements, and reduced competitiveness in EU markets. Similarly, in sector E (water and waste management), employment is more concentrated in medium-sized enterprises, pointing to a different but still relevant channel of exposure linked to environmental services and circular economy activities.

Taken together, these patterns suggest that the impact of CBAM in Bosnia and Herzegovina will be both concentrated and diffuse: concentrated in a relatively small number of large, energy-intensive firms that face direct carbon-cost pressures, but diffuse across a much wider ecosystem of small and medium-sized enterprises that are indirectly affected through supply chains and market linkages.

Several difficult-to-decarbonize industrial sectors are present in the country. Steel and aluminium production remain among the most difficult-to-decarbonise industries in Bosnia and Herzegovina. The Zenica steel complex (formerly ArcelorMittal Zenica) and the associated iron-ore mine in Prijedor together employ around 2,700 workers, which illustrates their importance for regional employment and industrial activity. However, these facilities have also faced persistent financial and market pressures in recent years. ArcelorMittal decided to sell both operations to the Bosnia-based Pavgord Group in 2025 after reporting combined losses of about BAM 276 million (EUR 141.12 million) in 2023–2024[38], reflecting structural competitiveness challenges. Recent developments highlight the deepening crisis facing Bosnia and Herzegovina's heavy industry sector. In April 2026[39], the company announced the shutdown of blast furnace operations and the suspension of integrated steel production due to prolonged financial difficulties, weak market conditions, and unresolved trade protection measures.

The situation in the aluminium sector is similarly complex. The historic aluminium smelter Aluminij d.d. Mostar halted production in 2019 due to unpaid electricity bills and accumulated debts, and its production assets have since been leased to Aluminij Industries. Nevertheless, the original company continues to experience financial difficulties, reporting losses in recent years, while the sector remains highly sensitive to electricity prices and global aluminium market conditions.[40] Both industries therefore face structural competitiveness challenges even without CBAM, and CBAM may add additional pressure in the future through carbon pricing on exports to the EU. In addition, Bosnia and Herzegovina remains a major exporter of electricity generated from coal-based thermal power plants, which also places the energy sector itself among the carbon-intensive industries exposed to future carbon pricing.

Efforts to decarbonise these industries in Bosnia and Herzegovina have so far been limited and largely indirect, rather than representing a systematic or large-scale transition. There is no clear evidence of substantial investments in low-carbon production technologies. Instead, developments have been dominated by financial restructuring and ownership changes, mainly following significant financial losses.

In addition to assessment of the impacts of CBAM on the employment, in should be also closely analysed in relation to exports to the EU, as not all companies in the analysed sectors are export-oriented. Based on official 2025 data from the Agency for Statistics of Bosnia and Herzegovina[41], the

[38] https://www.reuters.com/world/europe/arcelormittal-signs-deal-sell-its-steel-mill-iron-ore-mine-bosnia-2025-06-20/

[39] https://forbes.n1info.ba/aktuelnosti/industrijski-alarm-u-bih-gasenje-proizvodnje-u-zenici-pokrece-talas-neizvjesnosti/

[40] https://seenews.com/news/bosnias-aluminij-2024-net-loss-widens-to-6-3-mln-euro-in-2024-1272468

[41] https://bhas.gov.ba/data/Publikacije/Saopstenja/2026/ETR_01_2025_12_1_HR.pdf

country recorded total exports of BAM 16.97 billion (EUR 8.68 billion), of which BAM 12.41 billion (EUR 6.35 billion) (73.1%) were exported to the EU, confirming the dominant role of the EU as the main export destination. Within this structure, a significant share is concentrated in sectors covered by the EU CBAM. Using SITC-based approximations aligned with CBAM product categories, the total export value of CBAM-relevant sectors amounted to approximately BAM 2.28 billion (EUR 1.17 billion), or around 13.4% of total exports. As shown in the Table 3, electricity, non-ferrous metals (as a proxy for aluminium), and iron and steel dominate this exposure, while cement-related products and fertilisers play a comparatively smaller role.

Table 3: Exports in CBAM sectors, 2025

CBAM sector	SITC category	Export value (EUR)	Share of total exports (%)
Electricity	35	444,216,000	5.1%
Non-ferrous metals (incl. aluminium)	68	321,687,000	3.7%
Iron and steel	67	231,588,000	2.7%
Non-metallic mineral products (incl. cement)	66	164,747,000	1.9%
Fertilisers	56	1,421,000	0.02%
Total CBAM sectors		**1,163,666,000**	**13.4%**

Source: Agency for Statistics of Bosnia and Herzegovina

The comparison between CBAM-covered sectors[42] and total exports highlights a structurally significant exposure of Bosnia and Herzegovina's export base to EU carbon pricing. Although CBAM sectors account for roughly one-seventh of total exports, their effective exposure is likely even higher given that the majority of exports are directed to the EU market. This implies that CBAM is likely to have a targeted but potentially high-impact effect, particularly on a relatively small number of large industrial exporters rather than across the entire economy. The electricity sector alone accounts for over 5% of total exports, while metals (iron, steel, and aluminium proxies) together account for more than 6%, indicating that carbon pricing could directly affect some of the most competitive export segments.

According to the conducted interviews, electricity exports to the EU market were effectively suspended from the beginning of 2026 following the introduction of the CBAM. Stakeholders indicated that the additional CBAM-related costs rendered electricity exports from Bosnia and Herzegovina commercially uncompetitive on EU markets, leading not only domestic electricity producers, but also other regional utilities, to halt exports to the European Union. As a result, electricity exports were redirected primarily toward regional markets, particularly Serbia. Interview data further suggest that this development had a significant negative impact on the financial position of electricity producers, as revenues from electricity exports had previously helped compensate for lower regulated prices on the domestic market and supported the financing of future investments.

[42] The presented estimates should be interpreted with caution due to several methodological limitations. First, the analysis relies on SITC categories, which are broader than the specific CN codes used under CBAM (e.g. non-ferrous metals include more than aluminium alone). Second, publicly available data do not allow for a precise disaggregation fully aligned with CBAM product definitions. Third, the statistics do not provide a direct cross-tabulation of exports by both product and destination (EU), limiting the ability to isolate EU-bound CBAM exports. As a result, the figures should be considered as an upper-bound estimate of exposure, while remaining consistent with the latest official 2025 data.

A more detailed overview of the export structure to the EU of products affected by CBAM was developed using statistics from the International Trade Centre.

Table 4: Bosnia and Herzegovina's CBAM-relevant exports to the EU and the world, 2025, USD thousand

Product label	Bosnia and Herzegovina's exports to European Union (EU 27)	Bosnia and Herzegovina's exports to world	Percentage of exports to EU out of total exports to the world
Articles of iron or steel	513,885	674,230	76.22%
Aluminium and articles thereof	449,277	511,256	87.88%
Iron and steel	103,183	300,490	34.34%
Cement, incl. cement clinkers, whether or not coloured	44,294	47,612	93.03%
Fertilisers	1,391	1,690	82.31%

Source: ITC Trade statistics for international business development (https://www.intracen.org/)

The Table 4 shows that Bosnia and Herzegovina's exports in CBAM-relevant sectors are strongly oriented towards the EU market, although the degree of dependence varies across products. Aluminium and cement exhibit the highest exposure, with 87.9% and 93.0% of total exports respectively directed to the EU, indicating a particularly high vulnerability to CBAM-related costs and regulatory requirements. Articles of iron and steel also show a substantial EU orientation (76.2%), while fertilisers, although small in absolute value, are similarly EU-focused (82.3%). In contrast, primary iron and steel exports are more diversified, with only 34.3% destined for the EU, suggesting relatively lower direct exposure. Overall, the data confirm that a significant share of Bosnia and Herzegovina's carbon-intensive exports is closely tied to the EU market, amplifying the potential impact of CBAM on key industrial sectors.

Building on this export structure, it is important to note that most micro, small and medium-sized enterprises (MSMEs) are likely to be only indirectly affected by CBAM in the short term. This is because CBAM applies specifically to a limited set of carbon-intensive goods exported to the EU and is therefore primarily relevant for large, export-oriented firms in sectors such as electricity generation, metals, and cement. As shown in Table 2, while MSMEs dominate numerically within CBAM-relevant sectors, they are less likely to be directly engaged in exporting CBAM-covered products to the EU. Instead, their exposure is expected to materialise indirectly through supply-chain linkages, including higher input costs (e.g. electricity, materials), reduced demand from large exporters, and increased compliance requirements passed down the value chain. In this sense, the immediate impact of CBAM is concentrated among a relatively small number of large firms, while MSMEs face more gradual and indirect adjustment pressures.

However, a broader and more systemic impact on MSMEs can be expected through the introduction of the EU Emissions Trading System for buildings, road transport and additional sectors (ETS2). Unlike CBAM, which targets specific traded goods, ETS2 expands carbon pricing to fuels used in buildings, road transport, and parts of small industry not covered by the existing EU ETS (Directive (EU) 2023/959). At present, there is very limited empirical or modelling evidence specifically quantifying the impact of EU ETS2 on MSMEs in Bosnia and Herzegovina. Existing analyses tend to focus either on CBAM or on broader energy transition and carbon pricing frameworks. However, regional studies provide important insights into expected impacts. For instance, discussions within the Western Balkans policy and research community consistently highlight that SMEs, representing over 90% of

enterprises in the region, face structural constraints in adapting to rising energy and carbon costs, including limited access to finance, technology, and technical capacity.[43]

The following section presents two case studies aimed at illustrating the types of impacts that the CBAM has had on exporters from the cement industry sector and metal industry sector in Bosnia and Herzegovina.

3.1.1 Case Study: The Impact of the CBAM on the Operations of Heidelberg Materials Cement BiH d.d. – Kakanj Cement Factory

The company Heidelberg Materials Cement BiH, specifically the Kakanj Cement Factory, represents one of the few positive examples of timely preparation for the implementation of the CBAM in Bosnia and Herzegovina. Unlike many companies that were unprepared for the new European climate and regulatory requirements, this company has been dealing with the calculation and reduction of CO_2 emissions for more than two decades, thanks to the fact that it operates within the international Heidelberg Materials group.

The first system for calculating and reporting CO_2 emissions in the company was introduced back in 2005, when the parent group established a unified global emissions monitoring system for all its cement plants worldwide. Since then, the company has continuously developed internal capacities for emissions monitoring, reporting, energy efficiency, and carbon footprint reduction. Precisely because of this long-term approach, the company entered the CBAM era institutionally, technically, and professionally prepared, with established procedures, experience, and expertise that can now serve as a valuable example for other companies in Bosnia and Herzegovina.

In addition to adapting its own operations to the new rules, company representatives actively participate in educational programs and professional conferences in Bosnia and Herzegovina, providing support to other companies, chambers of commerce, and the academic community in understanding the CBAM and CO_2 emissions accounting. In this way, Heidelberg Materials Cement BiH represents a kind of “bright spot” within the domestic industry in the process of green transition and adaptation to European climate policies.

The company is engaged in cement production, which is both its primary export product and a product directly covered by the CBAM. It currently employs 194 workers, while approximately 30% of total production is exported to the European Union market, primarily to Croatia. During 2025, more than 800,000 tons of cement were produced, representing the highest production result in the company’s history, with a profit of BAM 61 million (EUR 31.19 million) achieved.

During the CBAM transitional period, the company was obliged to submit quarterly CO_2 emissions reports, while financial obligations had not yet been activated. Reports are submitted through an authorized representative in Croatia, who will also formally participate in the future CBAM payment process. As the company explained, although the formal obligation for quarterly reporting no longer exists during 2026, it has continued internally monitoring emissions in order to timely plan future costs and assess the financial effects of the mechanism.

One of the key challenges for the company relates to emissions verification. The company’s actual CO_2 emissions amount to approximately 540 kg of CO_2 per ton of cement, while the use of default CBAM values without authorized verification would result in a calculation of around 1,012 kg of CO_2 per ton of cement. In such a case, costs per ton of cement would be almost three times higher. The company estimates that with proper verification, the additional cost could amount to around EUR 6–7 per ton of cement, whereas without verification it could exceed EUR 20 per ton, which would seriously threaten export competitiveness.

[43] https://enb.iisd.org/western-balkans-empowering-smes-COP29

The impact of CBAM on the company's operations is already visible through increased uncertainty in cost planning and product pricing. Additional uncertainty stems from the fact that the price of emission allowances on the European ETS market fluctuates significantly. After a sharp increase during the energy crisis caused by the war in Ukraine, prices have recently stabilized at around EUR 70 per ton of CO_2, but the company still needs to plan additional reserves due to possible market changes.

The company states that it currently does not expect a significant decline in exports if adequate emissions verification is ensured. However, in a less favourable scenario involving substantially higher costs, there could be a partial loss of competitiveness on the European Union market. A particular challenge lies in the fact that cement is a regional product, and due to high transportation costs, the company has limited alternative markets outside the immediate region.

Regarding technical capacities, the company already possesses a developed continuous emissions monitoring system for the rotary kiln, including monitoring of CO_2, sulphur dioxide, nitrogen oxides, and dust. In addition to direct emissions from the production process, indirect emissions related to electricity consumption and other energy sources are also monitored. Emissions calculations are performed according to the GCCA methodology of the global cement industry association, which represents the international standard for emissions accounting in the cement industry.

The most significant aspect of adaptation to CBAM relates to reducing emissions through increased use of alternative fuels. Currently, around 12% of the total energy used in the production process comes from alternative fuels such as RDF/SRF fuels and waste automobile tires, while the company plans to increase this share to 20% during 2026 and 40% by 2030. The use of alternative fuels simultaneously enables a reduction in CO_2 emissions and production costs, as dependence on expensive imported coal is reduced.

The company also considered the use of solar power plants but emphasizes that their effect in the cement industry remains limited because the largest portion of energy demand is related to thermal energy required for operating rotary kilns at temperatures exceeding 1,400°C. Nevertheless, the installation of smaller solar systems on administrative and auxiliary company buildings is planned.

CBAM has also affected the company's value chain management. During periods of increased demand, the company was forced to import clinker from Hungary and Turkey. In the case of suppliers from Turkey, it was necessary to obtain data on actual CO_2 emissions so that these emissions could be properly included in the calculation of the product's overall carbon footprint. The company states that Turkish suppliers were willing to provide the required data and documentation.

Regarding institutional support, the company assesses that systematic state support practically does not exist. Positive examples include the activities of the Chamber of Commerce, the Foreign Trade Chamber of Bosnia and Herzegovina, and individual experts who organize educational activities and prepare technical guidelines for companies. At the same time, it is emphasized that Bosnia and Herzegovina still lacks a developed ETS system and accredited emissions verifiers, which represents one of the greatest challenges for exporters.

The company particularly emphasizes the need for regulatory support in the process of issuing environmental permits that would enable increased use of alternative fuels. In their opinion, accelerating administrative procedures and establishing a clearer institutional framework would represent significant support for industry in the decarbonisation process.

The experience of Heidelberg Materials Cement BiH demonstrates that CBAM will, in the long term, favour companies that already possess developed emissions management systems, technical monitoring capacities, and clear decarbonisation strategies. At the same time, the case indicates that the lack of domestic institutional infrastructure, especially verification systems and an ETS mechanism, will represent a serious challenge for the competitiveness of exporters from Bosnia and Herzegovina in the coming period.

3.1.2 Case Study: The Impact of the CBAM on the Operations of Alternativa d.o.o.

Alternativa d.o.o. operates in the metal industry sector and specializes in the production of thermal insulation panels, sheet metal, and sheet metal accessories, with sandwich panels representing the company's main export product covered by the CBAM. The company employs 146 workers, while exports constitute the dominant component of its business operations. Approximately 70% of total production is intended for export markets, with around 50% of overall production being directly placed on the European Union market.

CBAM has been recognized within the company as a significant regulatory and market challenge, primarily due to its potential impact on the competitiveness of exports to the EU market. Activities related to compliance with the mechanism's requirements began approximately two to three years ago through the continuous participation of employees in trainings and workshops, as well as through the development of internal procedures for emissions monitoring and the preparation of reports for European customers. The company developed a dedicated module within its existing information system that enables emissions tracking by product, customer, and quarter, thereby significantly systematizing the reporting process. As the company explained, the administrative burden nevertheless remains considerable, as the preparation of quarterly reports requires several days of employee involvement.

The most significant effects of CBAM relate to the price competitiveness of the company's products on the European Union market. Larger EU customers have already initiated negotiations regarding the sharing of additional costs that will arise from the implementation of CBAM, while some have openly indicated that, in the long term, sourcing from producers located within EU member states could become more economically viable. Although the company emphasizes that its products are of higher quality compared to certain EU competitors, it is estimated that the additional costs associated with CBAM could gradually reduce exports to the European market.

The company also points to a pronounced level of uncertainty in its relations with EU customers, stemming from the insufficient understanding of the mechanism among European companies themselves. Customers frequently request estimates of future costs and operational clarifications from exporters, even though the rules and methodologies remain subject to ongoing changes. Additional uncertainty is created by various online CBAM cost calculators, which often display extremely high estimates of future obligations for importers.

The impact of CBAM has also extended to the company's supply chain. Alternativa d.o.o. sources certain raw materials from China and was therefore required to intensify cooperation with suppliers in order to obtain data on the actual embedded emissions in products. The company notes that the use of actual values represents a crucial element in reducing calculated emissions, as the application of default values would result in significantly higher costs for EU customers. However, experiences with suppliers varied: while some suppliers were willing to provide the necessary documentation, others lacked established procedures for delivering emissions-related data, forcing the company to apply default values for certain products.

As part of its adaptation process, the company intensified activities aimed at reducing indirect emissions. A particularly important measure was the installation of solar panels in order to reduce the emission factor of electricity used in production. The implementation of the entire project required approximately three months, while the installed plant capacity amounts to 990 kW. Although investments in renewable energy sources had previously been considered, CBAM represented the key factor influencing the final investment decision. At the same time, the possibility of sourcing raw materials from the European Union with lower emissions and guarantees of origin was also

considered, but it was concluded that such an approach would significantly increase production costs and further reduce the price competitiveness of products.

Over a period of three years, the company succeeded in developing a relatively high level of internal capacity for compliance with CBAM requirements without engaging external consultants. At the same time, experiences related to training and expert support were assessed as partially unsatisfactory. It was noted that workshops and trainings organized by domestic institutions and local experts generally provided only general information and basic guidance, while specific and operational company-level questions often remained unanswered. In particular, the perception was highlighted that some consultants conditioned more detailed explanations and practical solutions on additional commercial engagement. As a positive example, the company pointed to a workshop involving foreign lecturers, who were assessed as having demonstrated a higher level of understanding of the mechanism and provided more concrete and operationally applicable answers to exporters' questions. Nevertheless, the need for stronger institutional support was emphasized, particularly in the areas of continuous education, updated guidance, and technical assistance for exporting companies. The establishment of a domestic ETS system and access to financial instruments supporting decarbonisation and the transition of exporters toward lower-emission products were highlighted as especially important issues.

The experience of Alternativa d.o.o. demonstrates that CBAM does not affect only individual exporters, but also generates broader impacts across the entire value chain, including raw material suppliers, EU customers, and corporate investment decisions in Bosnia and Herzegovina. At the same time, this case illustrates that the ability to adapt, invest in energy efficiency, and develop internal capacities will represent key factors for preserving the competitiveness of exporters from Bosnia and Herzegovina on the European Union market in the coming period.

3.2 CBAM Readiness and Administrative Capacity

Bosnia and Herzegovina is still at an early stage of institutional and technical readiness for implementing monitoring, reporting, and verification (MRV) systems aligned with EU CBAM requirements. While certain elements of environmental reporting exist, there is no fully operational, unified national MRV system for greenhouse gas emissions at installation level comparable to the EU ETS. According to Energy Community and regional assessments, Bosnia and Herzegovina has only partially developed MRV frameworks and is still in the process of aligning with EU ETS-related requirements, including monitoring and reporting rules.[44] With support from the Energy Community, a working group was formed to prepare a roadmap for introducing carbon pricing (covering MRV, economic impact analyses, ETS infrastructure and platform, and legal and regulatory aspects). This effort produced a draft roadmap, but the document was not adopted by the expected deadline at the end of 2024. Bosnia and Herzegovina has started reporting on its national system for policies, measures and projections, but it has yet to submit a report to Reportnet.[45]

Interviews with companies from the metal industry and electricity sector suggest that CBAM preparedness currently depends largely on the internal capacities and resources of individual companies rather than on a coordinated institutional framework. Export-oriented manufacturers reported that they had gradually developed internal systems for emissions monitoring and reporting, including dedicated digital modules integrated into existing enterprise management systems. These efforts were supported through continuous participation in trainings, workshops, and self-learning processes, enabling some companies to build relatively advanced compliance capacities without extensive reliance on external consultants. However, the administrative burden associated with CBAM compliance remains considerable, particularly due to the need for collection of emissions data across

[44] https://www.energy-community.org/dam/jcr%3Aee52fae5-11ae-49f5-b731-3f82f9178e73/ECS_IR2025.pdf
[45] https://cdn.ceps.eu/wp-content/uploads/2025/05/2025-05_ERCC_GHG-Balkans.pdf

supply chains, and the need to continuously adapt to evolving EU methodologies and regulatory requirements.

At the same time, interviews revealed significant operational and institutional gaps in overall CBAM readiness. Companies highlighted persistent uncertainty among EU buyers regarding the practical implementation of the mechanism, while exporters themselves often faced difficulties obtaining reliable emissions data from non-EU suppliers. In the electricity sector, the absence of a domestic ETS system aligned with EU rules was identified as a major structural constraint, directly affecting export competitiveness and contributing to the suspension of electricity exports to EU markets. Both sectors emphasized that adaptation efforts have so far been driven primarily by companies themselves, while institutional support, technical guidance, and operationally focused training provided by domestic stakeholders were viewed as limited and insufficiently practical. As a result, companies increasingly perceive investments in internal expertise, digital reporting systems, renewable energy projects, and emissions monitoring capacities as essential prerequisites for maintaining competitiveness on the EU market under the CBAM framework.

3.3 Policy Implications of CBAM

As emphasized during interviews with relevant stakeholders, the risks of delayed compliance with CBAM for Bosnia and Herzegovina are significant. In the short term, firms that fail to establish adequate monitoring, reporting, and verification (MRV) systems may face higher default emission values, which are typically conservative and result in overestimated carbon costs for exports to the EU. This directly undermines price competitiveness, particularly in sectors such as electricity, iron and steel, and aluminium, where margins are already under pressure. Over the medium term, delayed alignment increases the risk of market loss in the EU, as buyers may shift towards suppliers with lower verified emissions or more reliable reporting systems. There is also a broader systemic risk: if Bosnia and Herzegovina fails to align with EU carbon pricing frameworks, its exporters will effectively pay the carbon price at the EU border without capturing any fiscal revenues domestically. This represents a loss of potential public revenue that could otherwise be reinvested in decarbonisation and industrial transition.

CBAM also has important interactions with domestic carbon pricing and energy policy. At present, Bosnia and Herzegovina does not have a national carbon pricing mechanism equivalent to the EU ETS, which means that carbon costs will be externalised through CBAM rather than internalised domestically. This creates a structural asymmetry: domestic producers bear the cost of carbon when exporting to the EU, but without a domestic price signal that would incentivise low-carbon investment across the economy. In the electricity sector, this issue is particularly pronounced, as Bosnia and Herzegovina remains a net exporter of coal-based electricity, making it highly exposed to CBAM charges. At the same time, domestic energy prices, often influenced by regulated tariffs and legacy generation structures, do not fully reflect carbon costs, which may delay the transition towards renewables and energy efficiency. Without policy alignment, CBAM risks acting as a pure cost burden rather than a driver of structural transformation.

To address these challenges, a set of targeted policy interventions is required, many of which can be supported through Green Industrial Policy (GIP) tools. Stakeholders emphasized that Bosnia and Herzegovina should prioritise the establishment of a domestic MRV system and gradual introduction of carbon pricing, aligned with EU ETS principles. This would allow part of the carbon revenue to be retained domestically and reinvested in industrial decarbonisation. Second, there is a need for targeted financial support mechanisms, such as green investment funds, concessional loans, and guarantees, to enable firms, particularly in energy-intensive sectors, to invest in low-carbon technologies (e.g. electrification, energy efficiency, renewable integration). Third, industrial policy

instruments should be used to support technological upgrading in key export sectors, including steel, aluminium, and cement.

In addition, GIP tools should explicitly address SMEs and supply chains, which are indirectly exposed to CBAM. This includes support for energy audits, verification of CBAM accounting, digitalisation of energy and emissions data, and capacity-building for MRV compliance. Supplier development programmes could help SMEs integrate into low-carbon value chains by meeting the reporting and emissions standards required by larger exporters. Finally, horizontal measures, such as grid modernisation, renewable energy deployment, and energy market reform, are essential to reduce the carbon intensity of the entire economy and improve long-term competitiveness.

4 Just Transition, Employment, and Skills

4.1 Regional and Social Impacts

The socio-economic impacts of the energy transition in Bosnia and Herzegovina are expected to be geographically concentrated in a limited number of coal-dependent local communities where mining and coal-fired electricity generation remain major sources of employment. Coal extraction in the country is closely linked to nearby thermal power plants, forming several distinct coal basins. The most affected regions are the Tuzla coal basin (Tuzla, Banovići, Živinice) supplying the Tuzla power plant, the Central Bosnia / Zenica basin (Breza, Zenica, Travnik and Kakanj) connected to the Kakanj power plant, and several municipalities in Republika Srpska (Gacko, Ugljevik and Stanari) where coal mining is integrated with electricity production. These areas host the majority of coal mines and power plants and therefore face the highest labour-market exposure to decarbonisation policies and the gradual phase-out of coal-based energy production. Studies on coal transition in Bosnia and Herzegovina[46] emphasize that employment losses associated with mine closures are likely to be highly localized and concentrated in these regions, where coal companies are often the largest industrial employers and key contributors to municipal budgets and local economic activity.

Overall, the coal sector in Bosnia and Herzegovina still employs around 12,000 workers across coal mines and thermal power plants, representing roughly 1% of total national employment, although its importance is much higher in specific local economies. The dependence of individual municipalities on coal employment is illustrated in Table 5, which presents the share of mining employment in total local employment based on available municipal-level data. The table shows that in several municipalities coal mining accounts for a very large share of local employment, reaching more than 50% of total employment in Banovići, Stanari and Gacko. Even in larger cities such as Tuzla and Zenica, where the economic structure is more diversified, coal mining still represents a significant source of industrial employment.

Table 5: Employment in mines and thermal power plants in affected municipalities, 2024

Municipality	Total employed in municipality	Employed in Mines and TPPs	Dependency Ratio (%)
Banovići	5,122	2,469	48.20%
Tuzla	39,325	2,261	5.75%
Breza	2,698	930	34.47%
Zenica	27,248	607	2.23%
Travnik	12,993	298	2.29%
Kakanj	6,731	498	7.40%
Gacko	3,212	1,969	61.30%
Stanari	1,703	1,157	67.94%
Ugljevik	3,717	2,043	54.96%

Source: Statistical Institutes of Federation of Bosnia and Herzegovina and Republic Srpska for total employment in municipality; Financial reports of companies for employment in mines and TPPs

Municipalities such as Banovići, Breza, Gacko, Stanari and Ugljevik are particularly vulnerable because coal mining and coal-fired electricity production represent the backbone of the local economy. In

[46] https://zenodo.org/records/13141871

these areas, mine closures or reductions in coal production would have significant direct and indirect labour-market impacts, affecting not only miners and power plant workers but also contractors, transport companies, and local service providers[47].

Addressing the socio-economic consequences of coal phase-out in Bosnia and Herzegovina requires a broader policy response, including labour market policies, social protection measures, and regional economic development strategies. The GreenForce study[48] emphasizes that coal mine closures will have strong localized employment and fiscal impacts, particularly in communities that are highly dependent on mining activities. Because coal-related economic activities tend to be geographically concentrated, the negative effects of decarbonisation are expected to be asymmetric across regions, with some municipalities experiencing significantly larger labour market shocks than others. The study also highlights that the creation of new jobs in renewable energy or other sectors may not occur in the same locations as coal mines, meaning that workers will face barriers to transitioning into new employment even when training programmes are available. For this reason, policies should not rely solely on reskilling programmes but should also include targeted regional development strategies and economic diversification in coal-dependent areas. Understanding the local labour market context is therefore essential when designing transition policies, as the availability of alternative employment opportunities varies significantly across municipalities. Effective just transition strategies should therefore combine labour market interventions with broader regional planning measures to mitigate the economic shocks associated with mine closures.

Consulted stakeholders perceive the concept of a just transition primarily through the lens of balancing decarbonisation objectives with social stability, energy security, and the protection of workers and local communities dependent on the coal sector. Interviewees emphasized that Bosnia and Herzegovina's energy transition cannot be reduced solely to the closure of coal-fired generation capacities, but must include long-term strategies for retraining workers, preserving employment opportunities in coal regions, and gradually integrating new renewable energy industries into local economies. Representatives of the electricity sector highlighted that the transition is already underway through the phased shutdown of older thermal power units, modernization of remaining plants to comply with EU environmental standards, and the development of renewable energy projects on degraded former mining sites. At the same time, stakeholders stressed that the process remains politically and socially sensitive due to fears of job losses in mines and thermal power plants, insufficient institutional coordination, and limited public understanding of the broader benefits of transition projects. Several interviewees underlined that achieving a truly "just" transition requires stronger government involvement, targeted financial mechanisms, public communication, and support for local communities, rather than leaving the burden of transition solely to energy companies.

Current policies addressing the social impacts of the energy transition and energy poverty in Bosnia and Herzegovina are still developing and remain relatively fragmented. While some measures targeting vulnerable households exist, the country does not yet have a comprehensive national programme specifically designed to address energy poverty as a systemic policy area. Instead, support measures are mainly implemented through general social protection programmes, temporary subsidy schemes, and energy efficiency initiatives, often supported by international partners.

First, Bosnia and Herzegovina has introduced financial support programmes for vulnerable households to mitigate energy costs, particularly during periods of rising energy prices. For example, the Government of the Federation of Bosnia and Herzegovina adopted a programme providing subsidies for electricity bills for socially vulnerable categories[49], including low-income households and recipients

[47] https://openknowledge.worldbank.org/server/api/core/bitstreams/70ac9ecd-7f20-46b9-8959-145b78852fca/content
[48] https://zenodo.org/records/13141871
[49] https://sarajevotimes.com/the-fbih-government-made-a-decision-on-subsidies-for-electricity-bills

of social assistance. These measures were designed to reduce the burden of electricity costs on vulnerable populations and are financed through entity budgets and targeted social programmes.

In addition, Bosnia and Herzegovina has received international financial support aimed at addressing energy vulnerability and improving energy efficiency, particularly through EU and international financial institution programmes. One example is the EU Energy Support Package[50], which provides financial assistance to vulnerable households through social protection institutions across the country. The programme includes direct cash transfers for vulnerable families and funding for energy efficiency improvements in residential buildings and small businesses. The total support package amounts to approximately EUR 70 million, including EUR 50 million for energy efficiency subsidies for vulnerable households, as well as additional funds to support residential buildings and small and medium-sized enterprises affected by energy price increases.

A complementary policy approach focuses on improving energy efficiency in the residential sector, which is considered one of the key structural measures to address energy poverty. For instance, the EBRD Green Economy Financing Facility (GEFF)[51] programme supports households in investing in energy-efficient technologies such as improved insulation, efficient heating systems, and renewable energy solutions. Through EU-funded incentives and grants covering up to 20% of the investment cost, thousands of households in Bosnia and Herzegovina have been able to improve energy efficiency and reduce energy bills. More than 4,000 households in Bosnia and Herzegovina have benefited from this programme as part of a wider regional initiative supporting energy-efficient housing improvements.

Despite these initiatives, Bosnia and Herzegovina does not currently have a formal legal definition of "energy poverty" in its energy legislation. Instead, the policy framework generally refers to "vulnerable customers" or socially vulnerable households, typically defined through social welfare eligibility criteria such as low income, disability status, pension entitlement, or receipt of social assistance benefits. As a result, energy poverty is addressed indirectly through social protection mechanisms rather than through a dedicated legal concept within the energy sector.

4.2 Reskilling and Workforce Development

Skills shortages represent a growing challenge for the green transition in Bosnia and Herzegovina. Although the country has begun expanding renewable energy capacity, particularly solar and wind, its education and training system has only partially adapted to the emerging demand for specialised technical skills such as solar photovoltaic (PV) installers, wind turbine technicians, heat-pump installers, and energy-efficiency specialists. Renewable energy deployment has accelerated recently, however, the supply of workers with relevant green skills has not expanded at the same pace. Available estimates indicate that up to 10,000 workers may be employed in the renewable energy sector in Bosnia and Herzegovina by 2030.[52]

Current labour-market evidence suggests that the green workforce remains relatively small. Estimates indicate that only about 1–2% of total employment in Bosnia and Herzegovina can be classified as "green occupations"[53], including jobs related to renewable energy, energy efficiency, environmental protection, and sustainable construction. These occupations are concentrated mainly in technical

[50] https://intera.ba/en/podrska-europske-unije-energetskoj-efikasnosti-poduzeca-i-domacinstava-strucna-diskusija-osnazivanje-poduzeca-i-domacinstava-kroz-poboljsanje-energetske-efikasnosti

[51] https://ebrdgeff.com/ba/in-bih-over-4000-households-have-improved-their-energy-efficiency-through-the-ebrd-geff-programme

[52] https://energypedia.info/images/6/6e/Labor_Market_Effect_Analysis_-_Energy_Transition_and_Jobs_in_the_Western_Balkans.pdf

[53] https://gfeb.org/mk/blog/2025/07/08/the-future-of-the-green-economy-in-bosnia-and-herzegovina/#

sectors such as construction, energy engineering, and environmental services, highlighting the importance of engineering and vocational training for the green transition.

In terms of education supply, it is difficult to determine precisely how many graduates in Bosnia and Herzegovina are trained for occupations directly related to green energy, as official statistics do not track graduates by these specific "green" occupations. As a result, available data only allow an indirect assessment of the potential supply of graduates with relevant skills. The most recent internationally comparable data available for Bosnia and Herzegovina come from the World Bank education indicators and refer to 2019, showing that 23.5% of tertiary graduates completed programmes in Science, Technology, Engineering and Mathematics (STEM)[54]. These programmes include fields such as electrical engineering, mechanical engineering, civil engineering, and information technology, which form the main educational pipeline for skills relevant to renewable energy technologies and energy-efficient infrastructure. However, only a portion of these graduates specialise in energy-related fields, and even fewer receive training specifically focused on renewable energy technologies, which makes it difficult to estimate the exact number of graduates entering green-energy occupations.

In addition to tertiary education, vocational education and training (VET) is particularly important for producing the workforce required for installation and maintenance jobs in renewable energy systems. In the 2024/25 school year, around 83,000 students, approximately 77% of all secondary school students in Bosnia and Herzegovina, were enrolled in VET programmes, many of them in technical fields such as electrical engineering, mechanical engineering, and construction.[55] These programmes provide the main training pathway for occupations such as electricians, electro-energy technicians, mechatronics technicians and mechanical installers, which represent the closest occupational profiles to solar installers, wind technicians and heating-system installers. However, specialised qualifications directly focused on renewable energy technologies remain relatively new and are still being introduced gradually in technical schools. Only recently have some schools begun formally introducing profiles specifically oriented toward renewable energy technologies, such as the "Installer of Photovoltaic Systems – Electronics Technician" programme[56], which has been introduced in certain vocational schools in Tuzla Canton and "Electrical Power and Solar Systems Technician" programme[57] in Posavina Canton.

Analyses of the education system also indicate that green skills development in Bosnia and Herzegovina is still at an early stage, with limited policy initiatives specifically designed to integrate sustainability and renewable energy competencies into curricula across education levels.[58] As a result, many training programmes provide only general engineering or electrical skills rather than specialised knowledge related to renewable energy technologies or energy-efficient construction. In addition, studies of the VET sector show that the alignment between education outcomes and labour market demand remains imperfect: historically, only around half of employed VET graduates worked in occupations directly related to their field of study[59], reflecting structural mismatches between training programmes and labour market needs.

Because specialised programmes in formal education are still limited, part of the skills gap is currently addressed through non-formal training providers, including specialised training centres, private

[54] https://databank.worldbank.org/source/education-statistics-%5E-all-indicators#
[55] https://www.oecd.org/en/publications/assessing-bosnia-and-herzegovina-s-reform-agenda-for-private-sector-development_12b64ce6-en/full-report/improving-the-connection-between-vocational-education-and-training-and-the-private-sector-in-bosnia-and-herzegovina_1e62890a.html
[56] http://cms.pztz.ba/userfiles/pztz/files/SrednjeObrazovanje/Dokumenti/NPP/Elektro/NPP-InstalaterFNsistema_elektronicar_web_opt.pdf
[57] https://ekologija.ba/view-more/poziv-za-roditelje-i-buduce-maturante/160
[58] https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/06/western-balkans-competitiveness-outlook-2024-bosnia-and-herzegovina_bcc1529d/82e0432e-en.pdf
[59] https://dual4edu.ba/wp-content/uploads/2025/03/SITUATIONAL-ANALYSIS-OF-TECHNICAL-AND-VOCATIONAL-EDUCATION-AND-TRAINING-SECTOR-TVET-IN-BIH_web.pdf

companies, industry associations and projects implemented by international organisations. Although no official registry exists, mapping exercises of training providers suggest that roughly 25–40 institutions in Bosnia and Herzegovina currently offer short courses or specialised training related to renewable energy technologies, energy efficiency, or energy management, providing additional opportunities for workers and technicians to acquire green energy skills outside the formal education system.

Available evidence suggests that Bosnia and Herzegovina still has more plans and pilot initiatives than fully operational reskilling programmes at scale, especially for coal workers moving into renewable energy source (RES) occupations. The most concrete current framework is the World Bank–supported Just Transition in Select Coal Regions of Bosnia and Herzegovina project[60], approved in 2025, which is designed to support Banovići, Zenica and Kreka through social protection, labour transition support, land repurposing and renewable energy investments. Its project documents foresee Labour Transition Units (LTUs) in Banovići and Zenica, plus a focal point at EPBiH headquarters for Kreka, to provide workers with information on rights, support programmes, labour market information, career counselling, non-technical skills training, and project-funded upskilling/redeployment measures. The same package also includes support for renewable power generation on former mine sites, showing that labour transition and RES development are being designed together. However, these are projected and early-stage interventions; the public documents reviewed do not yet provide verified output data on how many coal workers have already completed such retraining or what exact RES qualifications they obtained.

When looking at existing practice inside the coal-producing companies themselves, the picture is more limited. The most detailed evidence comes from the Banovići case study in the GreenFORCE research report[61], based on stakeholder interviews. It shows that RMU Banovići already cooperates with the Secondary School Centre in Banovići, provides on-the-job training within the mine, and occasionally supports employees' further education for relevant certificates, but it also concludes that cooperation between the mine, the public employment service and education institutions is limited, and it does not document a structured RES training stream for coal workers.

For the largest public electricity producer in the Federation of Bosnia and Herzegovina, EPBiH, publicly available company material confirms that employee training exists in general, but not yet in a way that demonstrates a mature coal-to-RES reskilling system. EPBiH's 2024 annual reporting[62] refers to staff development, training and education of employees, and it indicates that the majority of training activities in 2024 were carried out through participation in seminars, conferences and other forms of training. At the same time, EPBiH is clearly expanding its RES pipeline, including solar and wind assessments and the planned solar installations linked to the just transition project. Interview findings nevertheless suggest that the company has begun recognising the need for a more structured just transition approach. The company already operates an internal education centre and conducts internal training sessions for employees, including some training programmes for miners connected to new transition-related activities. According to the interview, part of the planned solar photovoltaic projects is intentionally located on former mining sites in order to redirect a portion of the workforce towards maintenance and operational activities linked to renewable energy infrastructure. The company also described pilot activities related to biomass plantations and biomass co-firing, where some mine workers have reportedly participated in training for planting, maintenance and biomass management activities supported by international financial institutions. However, interviewees themselves acknowledged that these efforts remain largely ad hoc and "far from a systemic solution," emphasizing that Bosnia and Herzegovina still lacks a comprehensive institutional framework,

[60] https://www.worldbank.org/en/news/press-release/2025/05/05/bosnia-and-herzegovina-to-boost-energy-security-jobs-with-world-bank-support
[61] https://zenodo.org/records/13141871
[62] https://www.epbih.ba/upload/documents/Godisnji_izvjestaj_2024_bh_en-KONACNI.pdf

budgeted programmes, and coordinated policies for large-scale retraining and redeployment of workers from coal-dependent regions.

Ensuring a just energy transition in Bosnia and Herzegovina, in terms of human development, will require coordinated actions across education, labour market policy and regional development. Available evidence from desk research and interviews suggest that education and training systems need to be better aligned with future labour market needs by expanding specialised programmes in renewable energy technologies within both tertiary education and vocational education and training (VET), building on existing technical profiles in electrical engineering, mechanical engineering and construction. Recently introduced programmes should be expanded to additional schools to increase the supply of specialised green skills. Second, reskilling and upskilling programmes for workers currently employed in coal mining and coal-based power generation need to be scaled up. While presented initiatives represent an important step, most measures are still in early stages and should be complemented with structured training pathways enabling coal workers to transition into renewable energy, electrical installation, construction and energy-efficiency sectors. Third, non-formal training providers should be more systematically integrated into the national skills framework through certification systems and stronger cooperation with employers. Finally, the transition must also include broader regional development strategies for coal-dependent regions, combining workforce reskilling with investments in renewable energy projects and other green industries to ensure that new employment opportunities are created locally and that workers and communities most affected by the coal phase-out are not left behind.

4.3 Social Safeguards and Public Engagement

Ensuring effective social safeguards and public engagement is a critical component of the energy transition, particularly in countries such as Bosnia and Herzegovina where coal mining and coal-based electricity generation remain important sources of employment and regional economic activity. The transition toward renewable energy sources (RES) and the gradual phase-out of coal require transparent decision-making processes, inclusive stakeholder participation, and targeted support for affected workers and communities. International experience and EU policy frameworks increasingly emphasise the importance of just transition principles**,** which require that affected communities are consulted and that social impacts are addressed through coordinated labour market, social protection, and regional development policies.

Public consultation procedures for energy infrastructure projects, including renewable energy installations, are generally embedded within environmental impact assessment (EIA) and spatial planning procedures in Bosnia and Herzegovina. These procedures are aligned with the principles of the UNECE Aarhus Convention[63]**,** which guarantees public access to environmental information, participation in decision-making, and access to justice in environmental matters. Under these procedures, citizens, local authorities and civil society organisations have the opportunity to participate in public hearings and consultations before permits are granted for energy projects. However, policy assessments in the Western Balkans suggest that consultation often occurs relatively late in the decision-making process and may remain largely formal rather than substantive, limiting the ability of affected communities to meaningfully influence project design or location.[64] In addition, assessments of environmental governance in the country show that the practical implementation of these consultation mechanisms remains uneven. While legal procedures exist, citizens and local organisations often face difficulties obtaining timely information or influencing decisions related to energy projects. Reports on the implementation of the Aarhus Convention note that although

[63] https://unece.org/environment-policy/public-participation/aarhus-convention/introduction
[64] https://www.energy-community.org/dam/jcr%3A2229718d-018e-4643-858f-3765129f8c04/ECS_Report_on_Declaration_WB6.pdf

progress has been made since ratification, citizens in many local communities still encounter obstacles when attempting to exercise their rights to participate in environmental decision-making.[65] Civil society organisations and environmental advocacy groups have played an increasingly visible role in facilitating local engagement. Aarhus Centres operating in cities such as Sarajevo, Tuzla and Banja Luka help citizens access environmental information and support them in participating in decision-making processes related to environmental and energy projects.[66]

When it comes to the protection of workers and communities affected by decarbonisation policies, it remains limited and is largely addressed through general labour market policies and social protection systems rather than targeted just-transition programmes. Currently, workers affected by restructuring or potential mine closures primarily rely on existing instruments such as unemployment benefits, pension schemes, and employment services.[67] However, comprehensive transition frameworks, such as those implemented in some EU coal regions, have not yet been systematically developed at the national level. As a result, the protection of workers often depends on ad-hoc measures or enterprise-level restructuring programmes rather than a coordinated national just-transition strategy.

To make public consultation and social safeguard processes more effective in Bosnia and Herzegovina, several improvements are needed[68]. First, consultation with affected communities should take place earlier in the decision-making process, rather than only during formal environmental impact assessment procedures when many key project decisions have already been made. This would allow local stakeholders to meaningfully influence project design, location and mitigation measures. Second, access to information and transparency should be strengthened, as citizens and local organisations often face difficulties obtaining timely documentation about energy projects or policy plans. Third, engagement with coal-dependent municipalities and workers should be institutionalised through structured dialogue platforms, such as regional transition councils or multi-stakeholder forums that include local governments, workers, businesses and civil society organisations. Fourth, support for affected workers should move beyond general social protection instruments toward a comprehensive just transition framework that combines retraining, job placement, income support and economic diversification measures in coal-dependent regions. Finally, stronger coordination between national, entity and local institutions is necessary to align energy transition policies with labour market and regional development strategies. Together, these improvements would help ensure that public participation becomes more meaningful and that social safeguards effectively support workers and communities affected by the energy transition.

[65] https://arnika.org/en/news/citizens-of-bosnia-and-herzegovina-still-face-barriers-to-exercising-environmental-rights

[66] https://bih.osce.org/sites/default/files/f/documents/5/0/468426_0.pdf

[67] https://zenodo.org/records/13141871

[68] Reccomendations developed based on the findings of community events organised within the first phase of the project „Empowering the Western Balkans Through Green Industrial Policies“.

5 Financing the Energy Transition

5.1 Investment Needs and Economic Costs of Delayed Investment

The energy transition in Bosnia and Herzegovina requires substantial long-term investment across generation, grid infrastructure, energy efficiency, and just transition measures. Estimates from national strategic documents and international financial institutions suggest that several billions of euros will be needed by 2030–2035 to modernize the energy system and align it with EU climate and energy targets.

The Framework Energy Strategy of Bosnia and Herzegovina until 2035[69] identifies large investment needs related to modernization of the power system, expansion of renewable energy sources, rehabilitation of aging infrastructure, and improvements in energy efficiency. The strategy emphasizes investments in new renewable generation (hydropower, wind, solar), transmission and distribution network upgrades, and modernization or gradual phase-out of coal-based generation capacity. These investments are necessary both to maintain energy security and to support decarbonisation in line with EU and Energy Community obligations.

International estimates also tried to quantify the scale of required investment. According to World Bank assessments[70], Bosnia and Herzegovina's energy sector would require over USD 6 billion in investment to modernize generation capacity, extend the life of existing assets where necessary, develop renewable energy, and upgrade coal and mining regions during the transition. Draft scenarios prepared for Bosnia and Herzegovina's National Energy and Climate Plan (NECP)[71] estimate that €6.7–8 billion of investment would be needed to implement the energy transition by 2030. This includes investments in renewable energy deployment, grid upgrades, energy efficiency and measures for the just transition of coal regions, for which between €465 million and €1.4 billion may be required.

Delaying energy-transition investment in Bosnia and Herzegovina raises costs on at least four fronts. First, it increases direct macroeconomic and climate damages: the World Bank estimates that climate-related damages could reduce GDP by up to 14% by 2050 if resilience and transition investments are not accelerated. The same assessment notes that each euro invested in adaptation can yield returns of up to ten euros.[72]

Second, delay increases CBAM-related exposure and competitiveness losses. The EBRD[73] notes that BiH needs to accelerate energy-sector reforms, including a domestic power exchange and a state-level carbon-pricing framework, to address the financial effects of the EU CBAM, which entered its definitive phase in 2026. However, it should be noted that the financial obligations under CBAM effectively begin from 2027, when payments for embedded emissions become due. The Energy Community[74] further warns that, beyond the direct carbon cost on electricity exports to the EU, delayed market integration can lead to fewer arbitrage opportunities, lower market attractiveness, delayed or cancelled renewable projects, and lower consumer welfare.

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69 https://www.mvteo.gov.ba/data/Home/Dokumenti/Energetika/19042022_Framework_Energy_Strategy_of_BiH_until_2035_ENG_FINAL.pdf

70 https://www.reuters.com/business/environment/bosnia-needs-invest-68-bln-tackle-climate-change-impact-world-bank-says-2024-11-20/

71 https://balkangreenenergynews.com/bihs-necp-coal-power-plants-to-be-shut-2-gw-of-renewables-installed

72 https://www.worldbank.org/en/news/press-release/2024/11/20/investments-in-resilience-can-help-protect-bosnia-and-herzegovina-from-climate-shocks

73 https://www.ebrd.com/content/dam/ebrd_dxp/assets/pdfs/office-of-the-chief-economist/transition-report-archive/transition-report-2025/country-assessments/South-eastern-Europe/transition-report-2025-26-CA-Bosnia-and-Herzegovina.pdf

74 https://www.energy-community.org/dam/jcr%3A78740bd6-dba0-4e8b-855c-69f00c84bc73/25343_EC_CBAM_v09_AU_pages_LQ.pdf

Third, delayed reform prolongs the burden of artificially low prices and implicit subsidies. OECD finds that electricity prices in BiH remain artificially low and that between 2018 and 2023 this price regulation generated EUR 3.6 billion in indirect support, while fiscal support to the energy sector totalled another EUR 95.3 million.[75] In other words, postponing tariff reform and investment does not avoid costs; it shifts them into utility balance sheets, public finances and underinvestment in modern infrastructure.

Fourth, delay locks in unpriced carbon liabilities. The Energy Community[76] estimates that in 2024 the avoided carbon cost for electricity production across the Contracting Parties reached EUR 2.4 billion at average EU ETS prices, illustrating the scale of the externality that will increasingly have to be internalised. For BiH, this means the longer carbon pricing, MRV systems and market integration are postponed, the sharper the eventual adjustment for exporters and utilities will be.

5.2 Role of Development Banks, International Financial Institutions and Domestic Banks

Development banks and IFIs are central to the transition because they are doing more than lending: they are structuring the investment pipeline, blending grants with loans, de-risking projects, financing just transition, and pushing policy reform. The World Bank[77] approved USD 90.7 million loan plus USD 3.3 million in grant financing in 2025 to support coal-region transition, land repurposing, renewables and worker support. The World Bank also remains active on energy efficiency and resilience, while its CCDR frames the overall scale of investment needed.

The EBRD[78] plays a major role in renewable-energy and SME decarbonisation finance. In late 2024 it launched the SME Go Green programme in BiH and the wider Western Balkans, with EUR 120 million in initial targeted SME financing for the region, scaling up over time, plus EUR 25 million in grant support through WBIF. The EBRD also states that it has invested more than EUR 3.2 billion through 239 projects in BiH to date.

The EIB[79] and WBIF[80] are equally important in scaling larger infrastructure. WBIF reports that BiH received more than EUR 1.1 billion in grants in 2008–2025, supporting an estimated EUR 7.2 billion in investments, including renewable energy and interconnections. In 2025, the EIB signed a EUR 103 million loan for the Poklečani wind farm, while in the wider Western Balkans it continued to prioritise climate action and sustainable connectivity.

The available credit data presented in Table 6 indicate that financing conditions in Bosnia and Herzegovina have improved over the past several years, but they remain insufficient relative to the scale of investment required for the green transition and industrial decarbonisation. According to Central Bank of Bosnia and Herzegovina (CBBH) statistics, total bank lending increased from BAM 19,485.8 million (EUR 9,962.9 million) in 2018 to BAM 27,791.8 million (EUR 14,209.8 million) by the third quarter of 2025, representing an expansion of approximately 43% over the observed period. Long-term loans followed a similar upward trend, increasing from BAM 15,196.1 million (EUR 7,769.7

[75] https://www.oecd.org/en/publications/energy-prices-and-subsidies-in-the-western-balkans_082ea26a-en/full-report/energy-prices-and-subsidies-in-bosnia-and-herzegovina_b005da3b.html
[76] https://www.energy-community.org/dam/jcr%3A78740bd6-dba0-4e8b-855c-69f00c84bc73/25343_EC_CBAM_v09_AU_pages_LQ.pdf
[77] https://www.reuters.com/business/energy/world-bank-support-bosnias-energy-transition-with-907-million-loan-2025-05-05
[78] https://www.ebrd.com/home/news-and-events/news/2024/ebrd-and-eu-support-green-and-sustainable-transition-in-bosnia-and-herzegovina.html#
[79] https://seenews.com/news/eib-invests-822-mln-euro-in-w-balkans-in-2025-transport-leads-way-1289189
[80] https://www.wbif.eu/beneficiaries/bosnia-and-herzegovina

million) to BAM 22,247.5 million (EUR 11,374.9 million). Long-term loans consistently accounted for the majority of bank lending, around 77–80% of total loans throughout the period, indicating that the banking sector in Bosnia and Herzegovina predominantly provides longer-maturity financing that can support investment activities rather than short-term liquidity needs. Nevertheless, the overall scale of credit growth remains relatively limited when compared with the multi-billion-euro investment requirements associated with the decarbonisation of the energy system, expansion of renewable energy capacity, and energy-efficiency improvements in industry and buildings.

Table 6: Structure and trends of bank lending in Bosnia and Herzegovina, 2018–Q3 2025 (amounts in BAM million; EUR equivalents shown in parentheses)

Year	Long-term Loans	Loans to Non-financial Public Enterprises	Loans to Non-financial Private Enterprises	Total Loans
2018 Q4	BAM 15,196.1 (EUR 7,769.7)	BAM 421.3 (EUR 215.4)	BAM 8,623.0 (EUR 4,408.8)	BAM 19,485.8 (EUR 9,962.9)
2019 Q4	BAM 16,121.5 (EUR 8,242.8)	BAM 497.6 (EUR 254.4)	BAM 9,034.0 (EUR 4,619.0)	BAM 20,772.8 (EUR 10,620.9)
2020 Q4	BAM 16,052.3 (EUR 8,207.4)	BAM 535.7 (EUR 273.9)	BAM 8,588.4 (EUR 4,391.1)	BAM 20,347.4 (EUR 10,403.5)
2021 Q4	BAM 16,680.4 (EUR 8,528.5)	BAM 510.7 (EUR 261.1)	BAM 8,776.8 (EUR 4,487.4)	BAM 21,077.3 (EUR 10,776.7)
2022 Q4	BAM 17,445.0 (EUR 8,919.4)	BAM 626.3 (EUR 320.2)	BAM 9,155.5 (EUR 4,681.1)	BAM 22,068.0 (EUR 11,283.2)
2023 Q4	BAM 18,599.1 (EUR 9,509.5)	BAM 617.1 (EUR 315.5)	BAM 9,767.7 (EUR 4,994.1)	BAM 23,524.1 (EUR 12,027.7)
2024 Q4	BAM 20,570.3 (EUR 10,517.4)	BAM 696.8 (EUR 356.3)	BAM 10,648.5 (EUR 5,444.4)	BAM 25,825.9 (EUR 13,204.7)
2025 Q3	BAM 22,247.5 (EUR 11,374.9)	BAM 725.1 (EUR 370.7)	BAM 11,303.2 (EUR 5,779.2)	BAM 27,791.8 (EUR 14,209.8)

Source: Statistical Bulletin of the Central Bank of Bosnia and Herzegovina

CBBH's standard published tables do not isolate MSMEs in the regular monetary statistics, so the closest official proxy is private non-financial enterprises as a whole.[81] The sectoral structure of lending also shows that private non-financial enterprises remain the primary recipients of corporate credit**.** Loans to this group increased from BAM 8,623.0 million (EUR 4,408.8 million) in 2018 to BAM 11,303.2 million (EUR 5,779.2 million) by Q3 2025, representing growth of about 31% over the period. At the same time, loans to non-financial public enterprises are considerably smaller but have also expanded, from BAM 421.3 million (EUR 215.4 million) to BAM 725.1 million (EUR 370.7 million). Taken together,

[81] CBBH has begun to fill some of the information gap through its WE Finance Code work, including a new dashboard on lending and deposits for SMEs by gender ownership structure, but even that currently relies on a sample of four commercial banks and one microcredit organisation**,** which shows that the data architecture for targeted green-MSME finance is still incomplete.

lending to private enterprises accounts for roughly 40% of total bank loans, highlighting the important role of the banking sector in financing business investment, including companies potentially affected by EU carbon-pricing policies such as the CBAM. However, the relatively moderate pace of corporate lending growth suggests that bank financing alone will not be sufficient to support the large capital investments required for industrial decarbonisation, renewable energy deployment, and technological upgrading.

Consulted stakeholders assessed development banks and international financial institutions as the primary drivers and enablers of Bosnia and Herzegovina's energy transition, both in terms of financing and technical assistance. Interviewees from the electricity sector emphasized that a large share of renewable energy projects, environmental modernization measures, just transition activities, and worker retraining initiatives are currently financed through loans, grants, and support programmes provided by institutions such as the World Bank, EBRD, and various EU-supported programmes. Stakeholders noted that domestic public utilities often lack sufficient internal financial resources to independently finance large-scale transition investments, particularly in a context of regulated electricity prices and deteriorating financial performance linked to coal phase-out and CBAM-related pressures. At the same time, representatives of public institutions stressed that international financial institutions have played an important role not only through financing, but also by supporting pilot projects, technical studies, capacity-building programmes, and the development of regulatory frameworks related to renewable energy, energy communities, prosumers, and just transition policies. However, several interviewees also highlighted that Bosnia and Herzegovina remains heavily dependent on external financing sources, while domestic financial instruments and support schemes, particularly those targeting households, prosumers, and local transition projects, remain underdeveloped. Stakeholders therefore emphasized the need for stronger involvement of domestic banks and public funding mechanisms in order to ensure broader and socially inclusive financing of the energy transition process.

5.3 Spending on Energy Transition–Related Programmes and Recommendations for Improving the Situation

Annual spending on energy transition–related programmes in Bosnia and Herzegovina is difficult to quantify precisely because there is no single central database that systematically tracks public expenditures on energy transition, energy efficiency, and green industrial investments across all levels of government. Responsibilities are divided among the state, entity governments, cantons, and specialised environmental funds, while a significant share of financing is delivered through donor-supported programmes and development banks. Consequently, the available evidence only provides partial insights into the magnitude of annual spending, but several examples of recent programmes illustrate the scale and structure of current support mechanisms.

In the Federation of Bosnia and Herzegovina, the Environmental Protection Fund manages one of the key domestic financing instruments for energy-efficiency investments. Under the EU-supported programme addressing the energy crisis and supporting the green transition, the Fund launched a public call for micro, small and medium-sized enterprises (MSMEs) to implement energy-efficiency measures. The programme allocated BAM 5.3 million (EUR 2.71 million) in grant funding, with BAM 3.1 million (EUR 1.58 million) reserved for micro enterprises and BAM 2.1 million (EUR 1.07 million) for small and medium-sized enterprises. Eligible measures include building insulation, replacement of windows and heating systems, installation of photovoltaic systems for self-consumption, and improvements in energy efficiency in production processes.[82] At the broader policy level, these

[82] https://fzofbih.org.ba/wp-content/uploads/2024/02/JP-BPEU-MMSP-2024-1_Final-1.pdf

programmes form part of the EU Energy Support Package for the Western Balkans[83], which provided EUR 70 million in grant assistance to Bosnia and Herzegovina, including EUR 20 million dedicated to energy-efficiency measures for households and businesses. In the Federation of BiH, the programme aims to support around 2,600 residential buildings and at least 264 MSMEs through energy-efficiency investments and renewable energy installations.

As already emphasized, international financial institutions also play a central role in financing the energy transition in Bosnia and Herzegovina. The European Bank for Reconstruction and Development (EBRD) provides credit lines and technical assistance through facilities such as the Green Economy Financing Facility (GEFF), which channels financing through local commercial banks for investments in renewable energy and energy-efficient technologies. These programmes support investments such as solar panels, insulation, heat pumps, and efficient heating systems in households and businesses. In parallel, the European Investment Bank (EIB) and KfW Development Bank finance larger infrastructure projects, including renewable energy plants, electricity grid upgrades, and municipal energy-efficiency programmes. These initiatives complement domestic funding mechanisms and help mobilise private investment in the green transition.

Improving the financing conditions for the energy transition in Bosnia and Herzegovina requires a combination of regulatory reforms, stronger financial instruments, and better coordination of domestic and international funding sources. The interviews with stakeholders, reveal that, first, it is essential to accelerate energy market reforms, including the establishment of a domestic electricity market and power exchange, the introduction of a transparent carbon-pricing and MRV (monitoring, reporting and verification) framework, and the gradual alignment of energy regulations with EU market rules. These measures would reduce regulatory uncertainty, strengthen investor confidence, and help domestic industries prepare for the financial implications of the EU CBAM. Second, Bosnia and Herzegovina should expand the use of blended finance instruments, guarantee schemes, and risk-sharing mechanisms in cooperation with development banks and international financial institutions in order to mobilise private capital and enable domestic banks to provide larger volumes of long-term lending for renewable energy projects, energy-efficiency investments, and industrial decarbonisation. Third, it is important to strengthen targeted financial support and technical assistance programmes for SMEs, particularly in CBAM-exposed sectors, by expanding credit lines, investment grants, and advisory programmes for energy audits, carbon accounting, and technology upgrades. Fourth, the country would benefit from establishing a centralised monitoring system for energy-transition spending and investment flows, which would improve transparency, allow policymakers to identify financing gaps, and enable better coordination between entity-level environmental funds, state institutions, and international donors. Finally, Bosnia and Herzegovina should scale up predictable multi-year public funding programmes for energy efficiency, renewable energy deployment, and just transition measures, while leveraging EU financial instruments such as the Western Balkans Investment Framework, the EU Growth Plan, and other climate-finance initiatives to attract additional private and international investment. Together, these measures would help close the existing financing gap and create a more stable investment environment for the country's energy transition.

[83] https://fzofbih.org.ba/2024/10/25/priopcenje-za-medije-uz-podrsku-evropske-unije-i-fonda-za-zastitu-okolisa-federacije-bih-gradjani-federacije-bih-dobili-su-priliku-da-neposredno-iskoriste-prednosti-mjera-energijske-efikasnosti

6 Policy Recommendations

The findings of this report indicate that Bosnia and Herzegovina's energy transition is progressing, but at a pace that remains insufficient to meet the country's long-term decarbonisation objectives, Energy Community obligations, and growing pressures arising from EU climate policies such as the CBAM. While important legislative and strategic steps have been taken in recent years, implementation gaps, fragmented governance structures, infrastructure constraints, and limited institutional capacities continue to slow the transition process. At the same time, increasing exposure of the electricity sector and energy-intensive industries to EU climate regulations demonstrates that delayed transition could generate significant economic, fiscal, and social costs. In this context, the following recommendations focus on immediate, medium-term, and long-term priorities necessary to accelerate decarbonisation, strengthen competitiveness, and support a socially sustainable transition process in Bosnia and Herzegovina.

It should be noted that the recommendations presented in this report are based on a desk review of available literature, policy and regulatory documents, as well as consultations conducted with a limited number of stakeholders and companies through semi-structured interviews. Consequently, the findings and recommendations should be interpreted as indicative insights intended to support further policy discussion and analysis.

6.1 Short-Term Priorities

Bosnia and Herzegovina should urgently accelerate the implementation of key policy and regulatory measures necessary for both the energy transition and alignment with European Union climate and energy requirements. A first priority is the rapid adoption and operationalisation of the National Energy and Climate Plan (NECP), alongside the establishment of a functional monitoring, reporting, and verification (MRV) system aligned with EU ETS requirements. At the same time, preparatory activities for the introduction of a domestic carbon pricing mechanism should begin without delay in order to strengthen CBAM preparedness and retain future carbon revenues within the country. Without these mechanisms, Bosnia and Herzegovina risks further delays in meeting Energy Community obligations and increasing exposure to the economic impacts of the Carbon Border Adjustment Mechanism (CBAM), particularly in electricity exports and carbon-intensive industries.

Immediate efforts should also focus on establishing a coordinated governance framework for energy transition policies across state, entity, cantonal, and local levels. The current fragmented institutional structure creates regulatory uncertainty, slows investment procedures, and reduces implementation capacity. In this context, Bosnia and Herzegovina should introduce a functional "one-stop-shop" system for renewable energy permitting and licensing procedures in order to reduce administrative barriers, improve investor certainty, and accelerate project implementation, while strengthening coordination among competent institutions and ensuring more predictable decision-making processes.

Given the already visible effects of CBAM on electricity exports and industrial competitiveness, public institutions should urgently accelerate the implementation of a national CBAM preparedness framework and practical support measures focused on the most exposed sectors, including electricity generation, metals, cement, and other energy-intensive industries. This should go beyond strategic planning and include support for companies in emissions reporting, carbon accounting, energy efficiency improvements, the adoption of best available technologies (BAT) and gradual alignment with EU climate standards. At the same time, Bosnia and Herzegovina should intensify negotiations and coordination with EU institutions and the Energy Community in order to secure financial and technical support for transition-related reforms.

Short-term measures should additionally prioritise the operationalisation of renewable energy support mechanisms already foreseen in legislation, particularly renewable energy auctions, feed-in premiums, and support schemes for prosumers and energy communities. Although legal frameworks have been adopted in both entities, implementation remains incomplete. Simplifying procedures for rooftop solar installations and strengthening incentives for households, municipalities, and small businesses to participate in renewable energy generation could significantly accelerate distributed renewable deployment and broaden public support for the transition. These measures should be complemented by targeted awareness-raising activities and technical assistance for municipalities, homeowners' associations, building managers and citizens to improve understanding of available support schemes and encourage wider participation in the transition.

Finally, the government should begin the gradual reform of fossil-fuel subsidies and electricity pricing structures while simultaneously introducing targeted social protection measures for vulnerable households. Current subsidy mechanisms distort market incentives, weaken the competitiveness of renewable energy sources, and delay decarbonisation. At the same time, greater emphasis should be placed on improving energy management practices and promoting more efficient energy consumption across households, public buildings and industry, recognising that reducing demand is as important as expanding clean energy supply. However, reforms must be carefully designed to avoid increasing energy poverty and social vulnerability.

6.2 Medium-Term Actions

In the medium term, Bosnia and Herzegovina should prioritise large-scale investments in electricity grid modernisation and energy infrastructure in order to enable higher penetration of renewable energy sources and improve system stability. Existing transmission and distribution networks were designed primarily for centralised coal and hydropower generation and are insufficiently prepared for large-scale integration of variable renewable energy sources such as solar and wind power. Investments should therefore focus on grid digitalisation, smart-grid technologies, advanced energy management systems, balancing mechanisms, substations, battery storage systems, and cross-border electricity interconnections.

Particular attention should be given to the development of balancing capacities, including pumped-storage hydropower facilities and battery energy storage systems, which are essential for maintaining system reliability as renewable generation expands. The development of additional flexible generation capacity, where justified as a transitional measure to support system stability, should also be considered alongside investments in storage technologies. At the same time, Bosnia and Herzegovina should continue supporting strategic renewable energy projects, including utility-scale solar and wind power plants, while ensuring stronger environmental safeguards, greater stakeholder engagement, and improved communication with local communities.

The country should also strengthen financing mechanisms for the energy transition by combining international financial support with domestic financial instruments. Development banks and international financial institutions currently play a dominant role in financing renewable energy and transition-related projects, but greater participation of domestic financial institutions is needed in order to ensure broader and more sustainable financing. Public authorities should therefore develop dedicated green financing schemes, concessional credit lines, guarantee mechanisms, and blended-finance instruments targeting renewable energy projects, energy efficiency investments, prosumers, and small and medium-sized enterprises. Additional efforts should focus on mobilising domestic private capital through instruments such as green bonds and public-private partnerships, thereby broadening the range of financing sources available for the transition.

In parallel, Bosnia and Herzegovina should immediately begin implementing comprehensive just transition and workforce development programmes for regions and sectors affected by

decarbonisation, particularly coal mining and thermal power generation. Existing transition policies remain insufficiently linked to labour-market measures, education systems, and regional development strategies. Reskilling and upskilling programmes should therefore focus on renewable energy technologies, energy efficiency, electrical engineering, digital skills, and environmental services. Pilot retraining programmes should be introduced before significant workforce displacement occurs, allowing workers and young people to acquire the skills needed for emerging green industries. Partnerships between public institutions, educational institutions, development agencies, and the private sector will be essential for creating new employment opportunities and supporting labour mobility.

Additional efforts are needed to support industrial decarbonisation and improve the competitiveness of domestic firms. Medium-term industrial support programmes should encourage investments in energy efficiency, low-carbon technologies, electrification of industrial processes, and cleaner production methods, particularly in sectors exposed to CBAM and EU climate regulations. Support programmes should also promote the adoption of best available technologies (BAT), digital energy management solutions, industrial innovation, and circular production practices to strengthen long-term competitiveness while reducing emissions.

6.3 Long-Term Structural Reforms

Over the long term, Bosnia and Herzegovina should pursue a comprehensive green industrial transformation aligned with the objectives of the European Green Deal and the country's EU accession process. This requires moving beyond isolated renewable energy projects toward a broader economic restructuring based on decarbonisation, technological upgrading, enhanced energy security, and integration into emerging European low-carbon value chains.

A key structural reform should be the full implementation of a domestic carbon pricing mechanism aligned with the EU ETS framework, building on preparatory activities initiated in the short term. Establishing a transparent and predictable carbon pricing system would improve long-term investment certainty, reduce future CBAM-related costs, and create fiscal space for reinvestment into renewable energy, infrastructure modernisation, social protection, and industrial transition programmes. Revenues generated through carbon pricing should be strategically directed toward supporting vulnerable regions, workers, and industries affected by the transition.

Bosnia and Herzegovina should also develop an active green industrial policy aimed at strengthening domestic supply chains linked to renewable energy technologies, energy infrastructure, environmental services, circular economy activities, and low-carbon manufacturing. Public investment incentives, innovation support, and targeted industrial policies could encourage the development of domestic production capacities and reduce dependence on imported technologies while supporting domestic innovation, technology transfer, and higher value-added production, creating higher-value employment opportunities.

Long-term reforms should further strengthen regional energy integration and alignment with EU internal energy market rules. This includes completing electricity market liberalisation, aligning state-aid frameworks with EU competition policy, strengthening institutional capacities, and fully implementing Energy Community obligations. Greater regional cooperation in electricity balancing, renewable energy integration, and infrastructure development across the Western Balkans could also improve system resilience and reduce transition costs. At the same time, continued cooperation with the Energy Community and EU institutions should support knowledge exchange, regulatory convergence and access to technical and financial assistance.

Finally, Bosnia and Herzegovina's long-term transition strategy must place greater emphasis on climate resilience and sustainable regional development. Climate-related risks, including floods,

droughts, heatwaves, and wildfires, are expected to generate increasingly significant economic costs in the coming decades. Integrating climate adaptation measures into energy, industrial, infrastructure, and spatial planning policies will therefore be essential for ensuring the long-term sustainability and resilience of the country's economic transformation. Long-term success will also depend on sustained public engagement, strengthened societal awareness, and greater participation of citizens, local communities and businesses in shaping and implementing the energy transition.

Connection to the Regional Green Industrial Policy Framework

The findings and recommendations presented in this report contribute directly to the priorities of the Green Industrial Policy (GIP) Framework for the Western Balkans. By identifying measures to accelerate renewable energy deployment and grid modernisation, the report supports the region's clean energy transition. Recommendations related to carbon pricing, emissions monitoring and institutional preparedness strengthen CBAM readiness and help preserve industrial competitiveness in EU markets. Proposed actions to expand green finance, develop workforce skills, support coal-dependent regions and strengthen social protection advance the pillars of green investment, skills development and just transition. Finally, the emphasis on regulatory reform, implementation of the NECP, and alignment with EU climate and energy legislation reinforces the objective of EU integration, ensuring that Bosnia and Herzegovina's energy transition contributes to the broader regional agenda for sustainable and competitive economic development.

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