



EUROPE AND
CENTRAL ASIA

EXECUTIVE SUMMARY BOSNIA AND HERZEGOVINA

World Bank Group

COUNTRY CLIMATE AND DEVELOPMENT REPORT

October 2024

Public Disclosure Authorized

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Executive summary

Bosnia and Herzegovina (BiH) has maintained economic stability in the past decade despite significant shocks, but its development has come with major environmental and health impacts. BiH has maintained stable macroeconomic conditions, even during the COVID-19 and post-COVID periods, with single-digit inflation, fiscal surpluses, and low external current account deficits. Its reliance on fossil fuel technologies, however, has had devastating natural and human health consequences. The cities in BiH are hotspots for air pollution, with low air quality standards leading to related mortality rates being 140 percent higher than the European Union (EU) average. It is the second highest emitter in the six Western Balkan countries (WB6), accounting for 22 percent of the total emissions of the region. BiH is one of the most carbon- and energy-intensive nations in Europe, with a carbon intensity almost three times the EU average. The high energy intensity indicates an economy highly reliant on energy for its development, which exacerbates energy poverty concerns for disadvantaged households. Part of BiH's economic stability can be attributed to its energy exports of cheap, lignite-fired electricity, but aging infrastructure and declining coal reserves present concerns about the future viability of this industry. Together, these negative environmental and health impacts highlight the need for a green transition, but strategic implementation is necessary to ensure that this is a Just Transition for all.

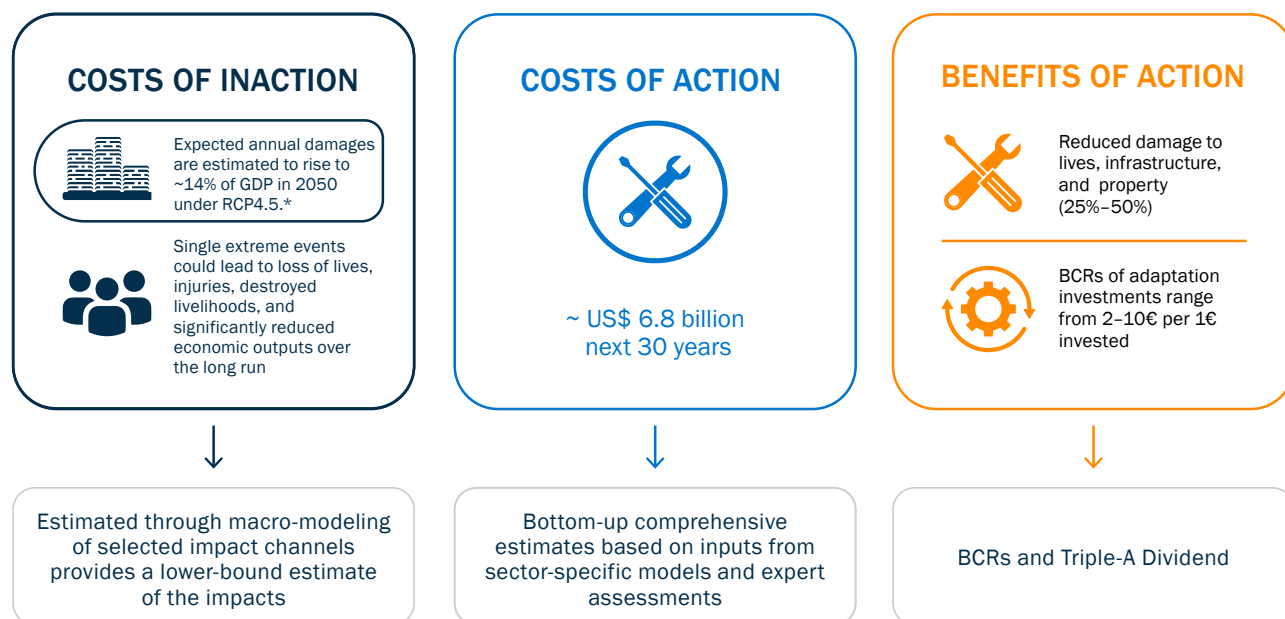
External drivers and international commitments shape BiH's climate change policies, but further progress is needed to step up the country's climate ambition as well as its capacity to actualize this ambition. The country is party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, and as it is a contracting party to the Energy Community Treaty, BiH has committed to harmonizing its energy and climate legislation with the EU Acquis communautaire, thus contributing to the ambition of continent-wide climate neutrality. BiH has explicitly listed a "net zero by 2050" objective in its draft National Energy and Climate Plan (NECP), but this has not yet been included in any primary legislation. Long-term strategies outline BiH's commitment to climate change mitigation and adaptation, and the legal bases for this action are being developed and enacted at the entities' level. Regarding adaptation, while work has been done to understand the potential flood risk and adaptation measures, little has been done for other climate and environmental risks. According to the World Bank's Climate Change Institutional Assessment (CCIA), while BiH's public finance and accountability measures are more advanced than most WB6 countries, its overall institutional maturity in addressing climate change is still nascent. While individual institutions address specific aspects of climate action, coordination between ministries and political entities is lacking. The importance of human capital should also be highlighted, as low educational outcomes and persistent inequalities in education undermine BiH's ability to smoothly implement a green transition. Developing its human capital will be critical in ensuring it has the skills necessary to respond to changing demands on the path toward net zero.

BiH is exposed to several natural hazards due to its geographical location and climate. These hazards, including floods, landslides, earthquakes, wildfires, and heat waves, have significantly impacted the nation over the past few years. Notably, the devastating floods of 2014, caused by record-breaking rainfall, impacted 1 million people across 70 administrative units, resulting in 25 fatalities and US\$2.14 billion in damages, equivalent to 15 percent of the country's gross domestic product (GDP). In 2014, BiH ranked third globally in terms of total losses and damages incurred by climate events, as per the Climate Risk Index. Subsequent floods in 2020, 2021, and 2023 underscore the persistent risk and potential devastation from flooding. Similarly, wildfires have surged in frequency and intensity, affecting approximately 350,000 hectares of land (7 percent of the country's territory), with losses totaling tens of millions of dollars. These climate-induced hazards exacerbate challenges across vital sectors. Agriculture, contributing to 7.6 percent of GDP and employing 20 percent of the workforce, faces substantial losses due to extreme temperatures and heat stress, with the 2012 drought resulting in US\$1.65 billion in agricultural losses, destroying nearly 70 percent of vegetables and corn in inland regions and reducing energy production by about 25 percent. Water resources and management are also under strain, with increasing temperatures and decreased precipitation leading to more frequent droughts and floods, disrupting electricity generation and the tourism sector. BiH could

suffer substantial economic damages from climate change under all greenhouse gases (GHGs) representative concentration pathways (RCPs). In the absence of any investments to adapt to a changing climate, the potential impact to GDP of the combined damages from riverine foods, drought impact on wheat and maize, and impact of heat stress on labor is expected to be around 14 percent of GDP in 2050 under RCP 4.5 with trend growth and 13 percent of GDP under the same RCP in 2050 with optimistic growth. The damages in 2050 GDP under RCP 2.6 and RCP 8.5 are 16 percent of GDP and 14 percent of GDP respectively under trend growth and 15 percent and 13 percent respectively under optimistic growth. In all cases, more than 90 percent of the combined damages come from riverine flooding. In looking at damages under RCP 2.6 and RCP 8.5, damages from labor heat stress increase with the higher RCPs, damages from riverine flooding decrease with higher RCPs, and damages from droughts vary across RCPs. It should be emphasized that modeling the effects of natural hazards and climate change on GDP is not straightforward, and expected average impacts can hide how dramatic individual events can be. Finally, this vulnerability to climate change is compounded by the backdrop of depopulation and the predominantly rural landscape, creating socioeconomic vulnerabilities impacting the populations capacity to address climate change.

The costs of action to invest in adaptation are high, but the benefits of action can be even higher. BiH would need to invest in US\$6.8 billion (in 2020 dollars, undiscounted) over the next decade to protect people and property from the damaging and escalating impacts of climate change (Figure ES.1). This initial comprehensive adaptation investment package would cost equivalent to around 0.6–1 percent of GDP per year until 2050. Investments in adaptation will yield a “Triple-A Dividend,” which includes three types of benefits: avoided losses, accelerated economic potential, and amplified social and environmental co-benefits. Implementing adaptation climate actions in Bosnia and Herzegovina greatly reduces human and economic losses from disasters and climate events and facilitates human capital development.

FIGURE ES.1. Summary of adaptation investment narrative



Source: World Bank analysis

Note: GDP = gross domestic product, RCP = representative concentration pathway, BCR = benefit-cost ratio.

* The macroeconomic model yields annual estimates for damages based on the expected annual loss from each climate hazard. The expected damages are projected to grow over time, reflecting increasingly unpredictable and volatile climate conditions. Combined damages from the drought impact on maize and wheat, heat stress on labor productivity, and riverine floods, are estimated to be 14 percent of GDP under RCP 4.5 in 2050 for BiH.

Adaptation investments can be a precursor to employment growth and improvement of skills, and increased trade opportunities often follow in the wake of these adaptation projects, further bolstering the case for a proactive approach to climate resilience. In BiH, the implementation of climate resilience

initiatives has yielded significant returns. Notably, each Euro invested in these measures translates into returns ranging from €1.06 to €14.15, underlining the robust economic viability of climate adaptation. These strategic investments not only stimulate economic growth but also foster employment opportunities and promote the cultivation of sustainable and climate-resilient urban centers. The integration of risk information into the planning, design, and maintenance stages of all infrastructure investments should be encouraged. Moreover, investing in nature-based solutions (NBS) promotes adaptation while yielding substantial co-benefits for the ecosystem and local communities, especially the vulnerable and those in the mountainous and downstream areas. NBS for flood prevention can yield high net benefits, with benefit-cost ratios (BCRs) that are generally greater than 2 and can be up to 12 for peatland restoration and up to 18 for floodplain restoration. Lastly, investing in human capital helps adapt systems through improved education and productive skills, identifying health issues early, and protecting vulnerable populations from impoverishment.

Accelerating the energy transition to achieve economy-wide net zero emissions in BiH by 2050 is feasible, but it would require radical transformation and decisive action. An energy system modeling analysis was carried out as part of the WB6 Country Climate and Development Report (CCDR) to assess sectoral decarbonization pathways for the WB6 countries. BiH's existing climate policy measures listed in the National Energy and Climate Plan (NECP) are already somewhat ambitious, but much more needs to be done to reach net zero by 2050. In a net zero world, lignite power plants would be decommissioned by 2050, solar and wind capacities would require large investments in the short-term, and hydropower and battery storage would support balancing the intermittency of renewable energy sources (RES). In addition, energy efficiency improvements across the transport, building, and industrial sectors will be critical to reducing energy demand, coupled with electrification, and switching to cleaner energy sources.

In terms of macroeconomic fiscal impact, the net zero by 2050 target can be achieved, but given BiH's current economic trends, it will have some dampening effects on the economy. The GDP growth rates for BiH average about 2.2 percent per annum up till 2050 under trend growth and 3.5 percent per annum under optimistic growth for the same period. Compared to the reference energy scenario,¹ an additional US\$0.5 billion (in 2020 US\$ terms) until 2030 and US\$5.8 billion (in 2020 US\$ terms) until 2050 (expressed in present values) would be needed to achieve economy-wide net zero emissions, which is equivalent to about 1.8 percent of GDP per year on average until 2050. The investment would be primarily in the power sector, with the development of additional solar and wind capacity. Investment in electric vehicles (EVs) will largely substitute investment in new combustion engine vehicles. The impact of decarbonization investments on domestic output would be modest relative to the significant emissions reductions caused by the investments, with GDP per capita being approximately 1.2 percent lower in 2050 compared to the reference scenario under both trend growth and optimistic growth.

At the private sector level, commercial banks and firms have much to contribute on supporting both mitigation and adaptation action in BiH. Under a net-zero emissions trajectory for BiH, the private sector is expected to do most of the investment in decarbonization (88.3 percent), especially in the transport, buildings, and power sectors. In terms of supporting investment in adaptation, BiH needs to build better capacity in the public sector to assess risks and to leverage private finance, while strengthening its capacity to access EU and international donors, such as the Adaptation Fund, the Green Climate Fund, and the Special Climate Change Fund. International financial institution (IFIs) and domestic development banks could work in partnership with commercial banks on the creation of special credit lines to invest under favorable conditions in low-carbon technologies. For instance, international banks with subsidiaries in the BiH could use capital optimization instruments and guarantees to reduce the regulatory risk weighting applied to their mandatory and voluntary reserves at the consolidated level, freeing up capital to finance climate mitigation and adaptation projects. Additionally, through public-private partnerships, BiH can promote private investment in municipal

¹ This modeling scenario represents an unconstrained least-cost evolution of the energy system. No specific assumptions are made on the introduction of new policies supporting decarbonization, and the evolution of the energy system is purely driven by economic considerations. This scenario is incompatible with the WB6 countries' aspirations of EU integration and their existing climate change commitments, but it provides a comparable baseline across the six countries for the other decarbonization scenarios.

services (such as pilot projects for district heating) and seek international technical assistance from IFIs for structuring these projects.

BiH needs to ensure competitive neutrality and incentivize climate actions within state-owned enterprises (SOEs). BiH has the second largest state footprint in high-emitting sectors across the Western Balkans, after Serbia. The strong participation of the state was found to be associated with lower business dynamism, discouraging new firms from entering markets, curbing private investment, and potentially slowing the transition to a greener, more sustainable economy. By strengthening the competition framework and ensuring competitive neutrality, BiH can level the playing field between public and private companies and attract private investment on climate. Furthermore, BiH can incentivize climate action within SOEs by improve their corporate governance and by fostering collaborations between SOEs and private firms.

BiH needs to develop its green debt market to support climate investment. The market for thematic (green, social, sustainable, and sustainability-linked) bonds in the Western Balkans, especially in BiH, is still at an early stage. The first green bond in BiH was issued by Naša Banka on the Banja Luca Stock Exchange for US\$2.3million in 2023 (BAM 4.2 million). For this market to scale up and have a significant impact, BiH needs to implement a sustainable finance framework (in alignment with the EU) with a green taxonomy that can help investors to identify green investment opportunities unambiguously and enable financial institutions to develop new instruments at scale.

The green transition will have to be designed and implemented in a just manner. The net zero transition will have a distributional impact on household consumption due to variations on generation and supply costs, potentially leading to changes in the prices of energy and non-energy products. The government should focus on targeted support to households, incorporating revenue recycling, to soften potential effects on those who are less well-off. Therefore, careful consideration is needed to ensure a Just Transition for all and to prevent the worsening of energy poverty.

The note ends with a summary of detailed recommendations for policy reforms and investments, along with the associated complexities and timelines for implementation. The recommendations focus on what could and should be done in the short term (until 2030), with an eye to laying the groundwork for the scale-up of climate action in the subsequent decades. The recommendations span across resilience and adaptation, decarbonization and mitigation, macroeconomy and financing, and institutional and regulatory readiness for climate action.

