



EUROPE AND
CENTRAL ASIA

EXECUTIVE SUMMARY SERBIA

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COUNTRY CLIMATE AND DEVELOPMENT REPORT

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Executive summary

Serbia, an upper-middle-income economy with a population of 6.7 million, faced returns to lower growth rates in 2022 and 2023 despite its robust recovery from the COVID-related recession. In addition to modest growth of 2.5 percent in 2022/23, challenges persisted due to domestic and international factors. The national power company (Elektroprivreda Srbije or EPS) crisis and soaring international energy prices widened the current account deficit to 6.9 percent of gross domestic product (GDP), exacerbating inflation to a record high of 16.2 percent by March 2023. However, fiscal deficit and consequently the public debt were on a declining trend, with the deficit reaching 2.2 percent and overall public debt reaching 52.6 percent of GDP at the end of 2023.

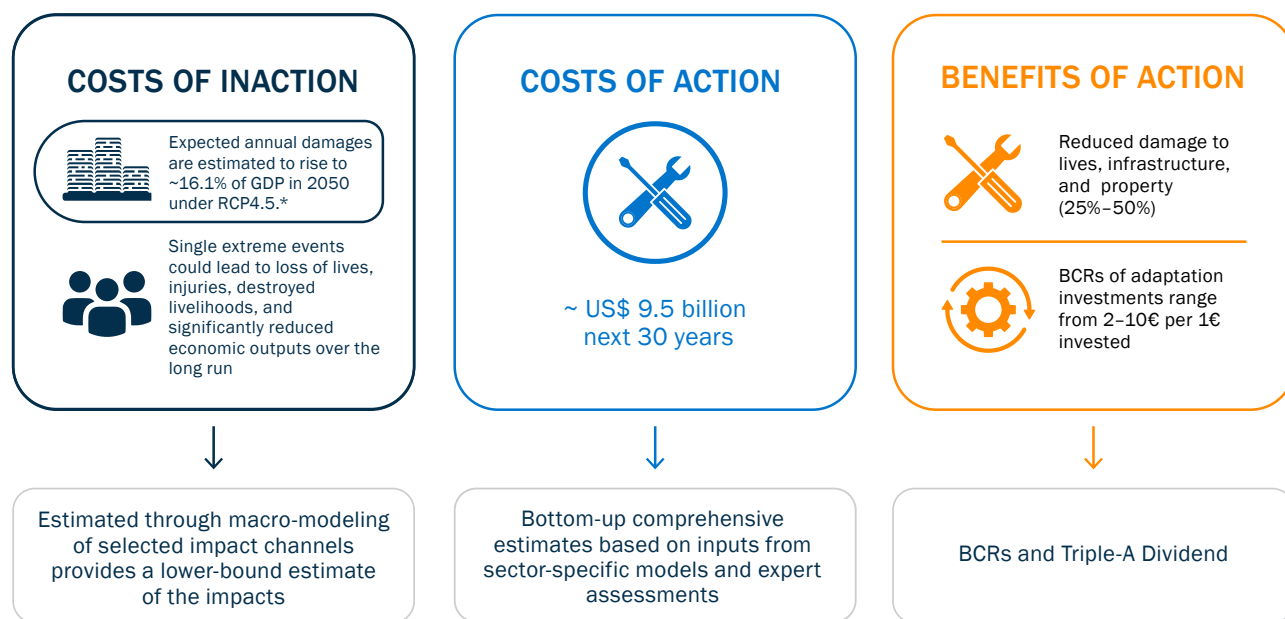
As an EU (European Union) candidate country, Serbia is compelled to align policies with the Aquis communautaire and regional treaties, highlighting the importance of its green transition. However, Serbia's high energy and carbon intensity pose environmental and social risks for the country, driven by its lignite-fired electricity production, energy-intensive industries, and low efficiency in end-use sectors. Mitigation efforts are crucial, especially in the energy sector, where fossil fuels dominate supply, with coal generating 68 percent of electricity. The transition away from coal requires managing impacts on workers and communities in a holistic way, recognizing the potential for economic diversification in coal-dependent communities, such as into renewable energy (RE), other mining operations, or other sectors, and also recognizing recent labor shortages in these sectors. Regulatory improvements as well as full implementation of climate policies are necessary to ensure sustainable growth in mining, alongside efforts to position Serbia as a hub for the Western Balkans 6 (WB6) electricity market and as a facilitator for regional decarbonization through increased trade and RE integration.

Serbia has made significant strides in aligning its legislative framework with EU standards, particularly in the realm of climate change and energy policy. The adoption of a comprehensive set of climate- and environment-related laws in early 2021, aimed at harmonizing domestic policies with EU regulations, marked a pivotal step toward transitioning to a lower-carbon development trajectory. Notably, Serbia is in the process of transposing the full EU "Clean Energy for All Europeans" package, focusing on climate change governance and regional electricity market integration. In terms of adaptation, the country has established a national adaptation program with a three-year action plan to address climate change impacts across various sectors. However, challenges persist in fully implementing and enforcing strategies and laws, which can be attributed to weak enforcement mechanisms and limited capacities. While progress has been made, strategic policy documents lack ambition in terms of coal phaseout and a net zero target, necessitating further action to accelerate decarbonization efforts. Additionally, institutional capacities and coordination mechanisms require enhancement to effectively drive climate action and investments. The presence of state-owned enterprises, particularly in high-emitting sectors, poses challenges to market dynamics and climate adaptation, necessitating stronger accountability and stakeholder engagement mechanisms.

Serbia is exposed to several natural and climate-related hazards, and the potential costs of inaction are high. Past extreme weather events have caused extensive physical damage, financial losses, and fatalities in Serbia, greatly affecting its economy. Serbia faces exposure to a range of hydro-meteorological hazards, such as floods, landslides, droughts, heat waves, wildfires, and earthquakes. Increasing risk from these climate-induced hazards impact water and energy security, agriculture, and rural and low-income communities, as well as disrupt transportation and road infrastructures. Shocks are highly localized and amplify vulnerabilities with downstream consequences on the nation's services and productive value chains. Serbia could suffer major economic damages from climate change under all the greenhouse gas (GHG) representative concentration pathways (RCPs). In the absence of any investments to adapt to a changing climate, the potential reduction in GDP is between 14.7 to 17.8 percent in 2050 under trend growth (from RCP 8.5 to RCP 2.6), which can be considered a lower-bound estimate. It should be emphasized that modeling the effects of natural hazards and climate change on GDP is not straightforward, and focusing on expected average impact can hide how dramatic the impact of individual events may be. For instance, the 2014 floods caused €864 million in damages and €648 million in losses.

The costs of action to adapt to climate change are high, but the benefits of this action can be even higher. Serbia would need to invest US\$9.5 billion (in 2020 dollars, undiscounted) in the next 30 years 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 0.4-0.6 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 at the national level 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 16.1 percent of GDP under RCP 4.5 in 2050 for Serbia.

Adaptation investments can be a precursor to employment growth, improvement of skills, and increased trade opportunities, further bolstering the case for a proactive approach to climate resilience. Relatedly, while investments in education serve as economic drivers, they also inform pro-climate behaviors, beliefs, and green voting.¹ Enhancing climate resilience in urban and transportation sectors unlocks economic and trading opportunities and supports employment. The integration of risk information into the planning, design, and maintenance stages of all infrastructure investments should thus 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 that are generally greater than 2, and that can be up to 12 for peatland restoration or 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.

¹ Angrist, Noam, Kevin Winseck, Harry A. Patrinos, and Joshua S. Graff Zivin. 2023. “Human Capital and Climate Change.” Working Paper no. 31000, National Bureau Of Economic Research, Cambridge.

Accelerating the energy transition to achieve economy-wide net zero emissions in Serbia by 2050 is feasible, but it would require radical transformations and decisive action. The energy system modeling analysis conducted as part of the WB6 Country Climate and Development Report (CCDR) aimed to assess sectoral decarbonization pathways for Serbia and other WB6 countries. Using the KINESYS-WB6 (Knowledge-Based Investigation of Energy System Scenarios for the WB6) model, various scenarios were developed, including an unconstrained reference scenario (RS)² and a net zero emissions scenario (NZE) by 2050. The modeling shows that Serbia could meet its 2030 target (40.3 percent emissions reduction versus 1990 levels) by implementing all measures outlined in its “with additional measures” (WAM) scenario in the Serbian National Energy and Climate Plan (NECP), namely through scaling up solar photovoltaic (PV) and wind capacities and building additional natural gas capacity to support the phasedown of coal. Interestingly, the gas-fired generation capacity required in the RS and NZE scenarios is similar, which highlights the fact that Serbia should pursue a significantly larger penetration of natural gas in power generation regardless of its climate goals. Beyond 2030, significant transformations would be required in Serbia’s energy system to achieve net zero GHG emissions by 2050. The NZE scenario indicates the need to decommission coal-fired generation by 2040 and substantially increase the penetration of renewables (solar, wind, and hydro). The transport and buildings sectors would also require substantial changes, with a focus on electrification, energy efficiency (EE) improvements, and the adoption of cleaner fuels. Additionally, the industrial sector would need to undergo significant shifts, including the installation of carbon capture and storage (CCS) systems and transitioning away from coal and oil products. Overall, achieving net zero emissions by 2050 necessitates ambitious policies and investments across all sectors of Serbia’s economy.

Net zero emissions by 2050 can be achieved within the potential growth of the economy. Compared to the RS, Serbia would need to invest an additional US\$10.4 billion (in 2020 US\$ terms) until 2050 (expressed at present values) to achieve economy-wide net zero; this is equivalent to an average of 1.6 percent of GDP a year until 2050. These investments, which are incremental to those needed in the RS, would primarily focus on the power sector, with investments in wind, hydro, and solar PV capacities being the main areas of expenditure. However, the higher investment required would be at least partially compensated by lower operating costs, estimated at -0.6 percent of GDP per year on average. While the investments required until 2030 would be similar in both the NZE and RS scenarios, significant regulatory and policy efforts would be needed in the short term to create an enabling environment for future decarbonization investments and put Serbia on the pathway towards net zero emissions by mid-century. The impact of decarbonization investments on domestic output would be modest relative to how significantly it would reduce emissions, as GDP per capita would be only 0.4 percent lower in 2050 in the NZE scenario compared to the RS.

Serbia needs to develop its green debt market, and leverage guarantees and public-private partnerships to boost climate investment. Serbia can tap into EU pre-accession financing and international finance institution financing to support climate action. However, under a net-zero emissions trajectory, the private sector is expected to do most of the investment in decarbonization (88 percent), especially in the transport, buildings, and power sectors. Raising capital to finance climate change-induced investments will require an enabling regulatory environment, as the green finance landscape in the country is at an early stage. The country needs to implement a sustainable finance framework in alignment with the EU, that can support the issuance of thematic debt instruments such as green, social and sustainability-linked bonds. Some international banks operating in Serbia are already using capital optimization guarantees against the risk of expropriation of mandatory reserves, freeing up capital to finance climate mitigation and adaptation projects. Going forward, guarantees could be used for public and public-private partnership (PPP) projects to mobilize significant cross border investments, deepen the credit markets and to foster green finance in Serbia. Serbia would also benefit from implementing a centralized, climate-focused, multisectoral PPP strategy, aimed at maximizing mitigation and adaptation impacts on key sectors, including power, transport, and buildings.

² 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.

The green transition will have to be designed and implemented in a just manner. While aggregate employment impacts of the green transition may be manageable, shifts are likely to occur between sectors, firms, occupations, and regions. Low-educated workers and men, on average, are expected to be disproportionately affected by the change in the nature of work associated with the green transition in Serbia. In general, it is also expected that 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. Such impacts highlight the need to prepare for social and labor transformations due to the decarbonization of the power sector, which should include supporting a just transition in coal regions and workforce reskilling.

Adaptation and mitigation can be part of a sustainable growth strategy that delivers higher productivity. Adaptation and mitigation investments require concerted effort towards bolstering private investment. Higher investment rates could be achieved by reforming the financial sector to better serve small enterprises and startups; enhancing labor skills through quality education and training; and fostering competition and innovation. Expanding investment also requires improved infrastructure and improved regulatory frameworks (by simplifying regulations, curbing corruption, and promoting transparency). Moreover, Serbia can unleash competition and growth thereafter in several markets by reducing state intervention and preferential treatment of SOEs. This relates primarily to some of the key industries such as energy, transport, telecommunications, pharmaceuticals, and professional services. These reforms collectively represent a transformative agenda that can unlock Serbia's full economic potential.

Fiscal policy and public financial management will need to be strengthened. First, there is a need to adopt policies that mitigate the economic and social impact of climate change by incentivizing private sector and household action (i.e. zoning, insurance, financing instruments, carbon pricing, incentives for research and innovation, etc.). Second, strengthening efficiency of public spending and public investment management, including management of state-owned enterprises. Third, increase fiscal space by bolstering domestic revenue mobilization, while reducing tax expenditures and increasing the tax base by reducing the informal economy.

A summary of detailed recommendations for policy reforms and investments, along with the associated complexities and timelines for implementation are presented at the end of this compendium. 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 regulatory and institutional framework, and education and labor.

