Supporting Serbia's Transition to Greener and More Resilient Growth

Policy and Institutional Reforms

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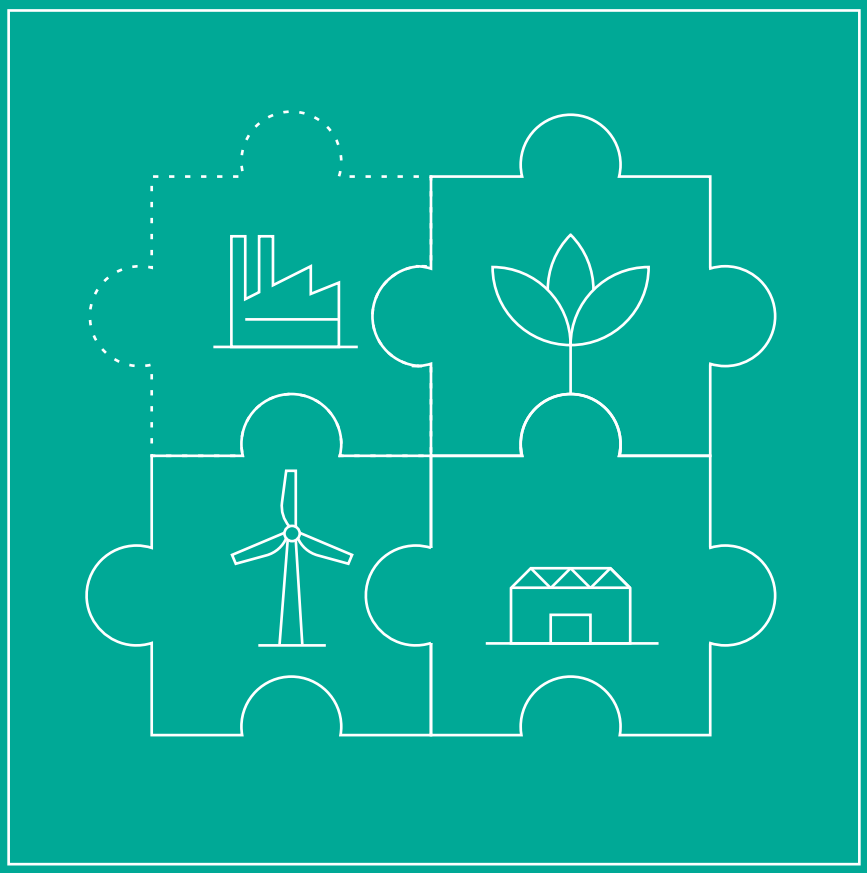

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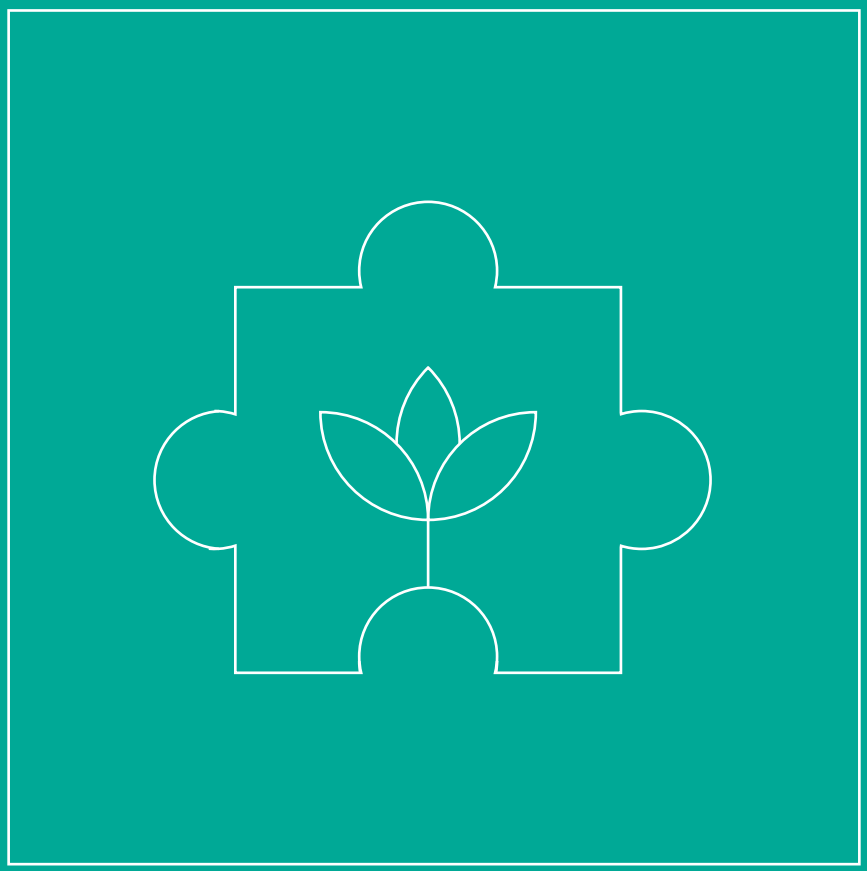

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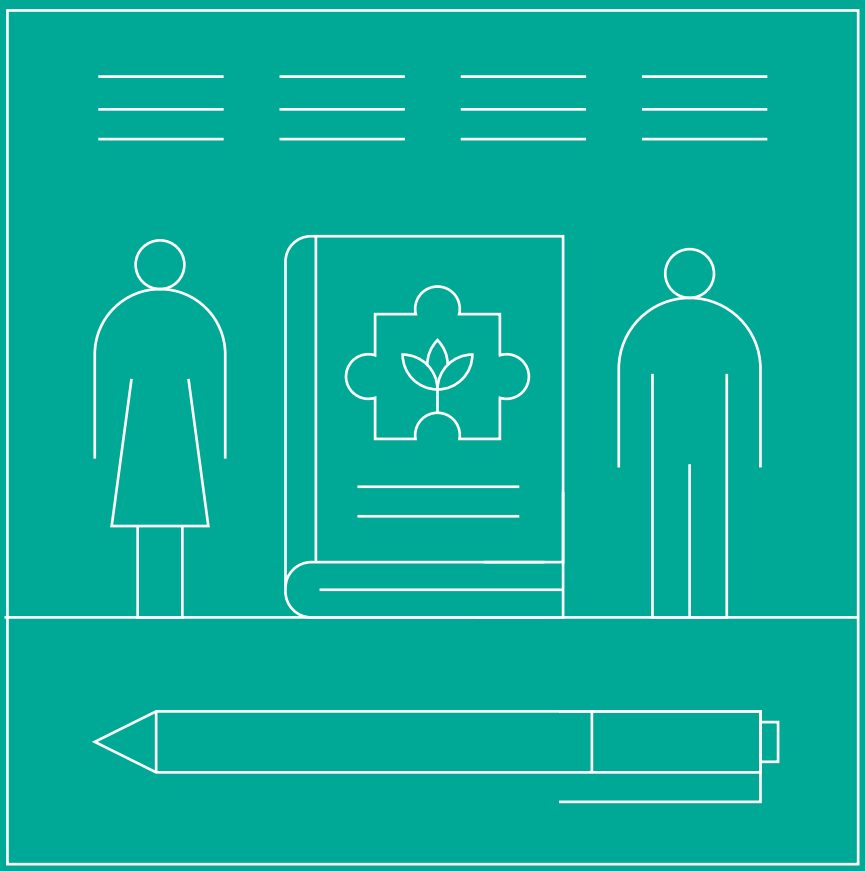

Acknowledgments

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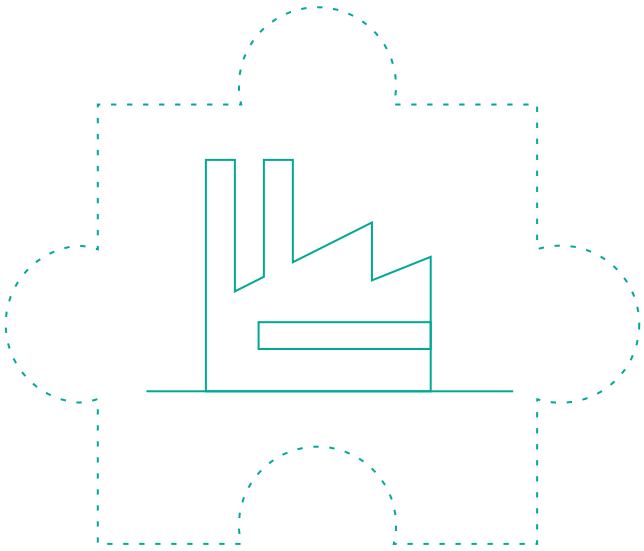
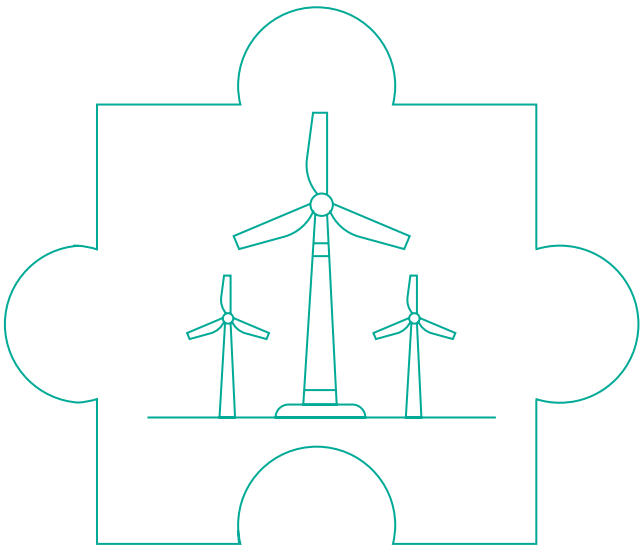
Abbreviations and Acronyms

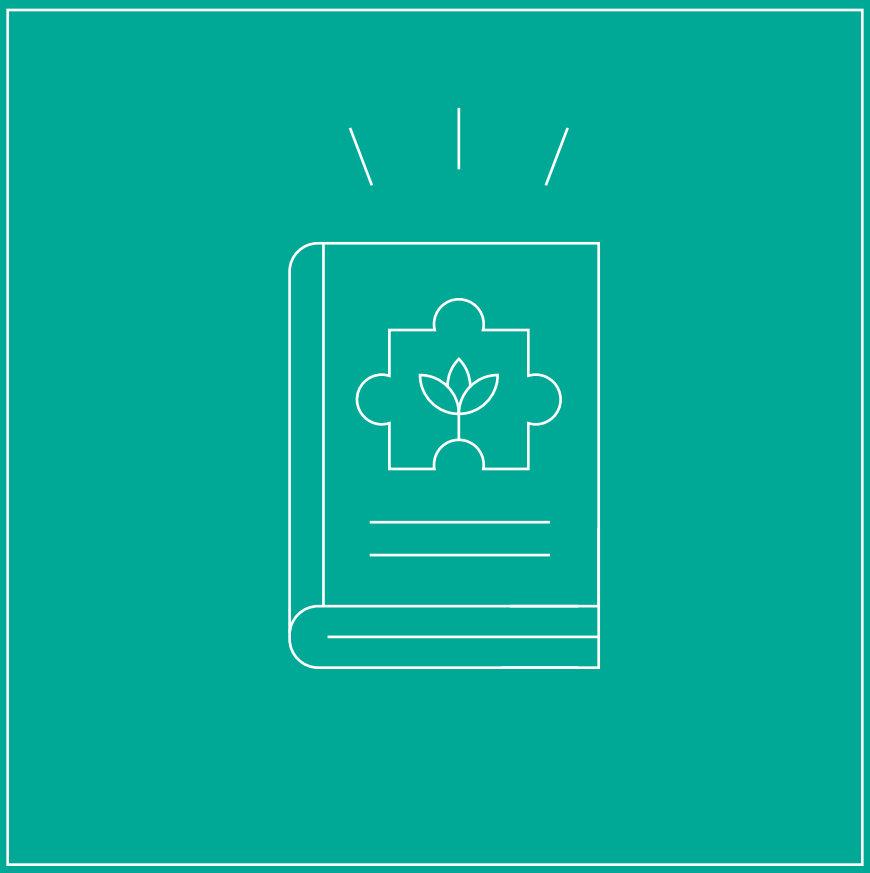
APACD	Action Plan for Administrative Capacity Development
AEL	Achievable Emission Level
AFD	Agence Française de Développement
BAT	Best Available Technique
BAU	Business as Usual
CBAM	Carbon Border Adjustment Mechanism
CEM	Country Economic Memorandum
CGE	Computable General Equilibrium
CO_2eq	Carbon Dioxide Equivalent
DPO	Development Policy Operations
EC	European Commission
EEA	Administration for Energy Efficiency Financing and Promotion
EE	Energy Efficiency
EFR	Environmental Fiscal Reform
EPR	Extended Producer Responsibility
EPS	Elektroprivreda Srbije
ETD	Energy Taxation Directive
ETS	Emissions Trading System
EU	European Union
EUR	euro
GDP	Gross Domestic Product
GHG	Greenhouse Gas Emissions
GNI	Gross National Income
GRID	Green, Resilient, Inclusive Development
GTAP	Global Trade Analysis Project
GVA	Gross Value Added
IMF	International Monetary Fund
IPPC	Industrial Pollution Prevention and Control
KfW	Kreditanstalt für Wiederaufbau
kg	kilogram
LCDS	Low Carbon Development Strategy
LSG	Local Self-Government
MCPs	Medium Combustion Plants
MCPD	Medium Combustion Plant Directive
MoEP	Ministry of Environmental Protection
MoME	Ministry of Mining and Energy
MRV	Monitoring, Reporting and Verification
NAP	National Adaption Program
NAPP	National Air Protection Plan
NCCC	National Climate Change Council
NDC	Nationally Determined Contribution
NECP	National Energy and Climate Plan
NERP	National Emission Reduction Plans
NO_x	Nitrogen Oxides
$PM_{2.5}$	Particulate Matter
RES	Renewable Energy Sources
R&D	Research and Development
RISE	Resilience, Inclusivity, Sustainability, Efficiency
RSD	Serbian dinar
SCP	Small Combustion Plants
SDG	Sustainable Development Goal
SEPA	Serbian Environmental Protection Agency
SO_2	Sulphur Oxide
SOE	State-owned Enterprises
UMI	Upper Middle-income Countries
USD	United States dollar
WHO	World Health Organization

Abstract

Serbia needs to transition to a greener growth model for internal and external reasons. Internally, Serbia's economy is still characterized by low energy and resource productivity, with significant impacts on health and the environment. As a candidate country for EU membership, Serbia also needs to react to external influences by aligning domestic policies with the EU's energy, environment, and climate legislation, while avoiding negative impacts of the EU's planned Carbon Border Adjustment Mechanism (CBAM). This report draws from a rich analysis to provide recommendations on how the transition to greener and more resilient growth in Serbia can begin. First, environmental fiscal reforms are needed to incentivize the adoption of more environmentally friendly technologies. The implementation of carbon pricing will also enable Serbia to proactively prepare for the upcoming EU CBAM. The proceeds of carbon pricing should be reinvested in innovation and education to further accelerate the green transition. Second, institutional frameworks need to be strengthened to support the government in delivering on reforms. Third, sector-specific reforms will need to address important challenges like energy efficiency, air pollution, waste management, water, and wastewater. Importantly, the transition needs to be based on a coherent and adaptive roadmap, which mitigates the risks of 'brown' growth, protects those adversely impacted, and ensures an equitable distribution of the benefits of increased growth. ■







Brief Summary

Serbia's economy is characterized by low energy and resource productivity, with significant impacts on health and the environment. Serbia's air quality ranks among the worst in Europe, while untreated waste and wastewater continue to pollute the environment. As Serbia looks to the future, it is essential for the government to reduce the country's dependence on the use of heavily polluting lignite, improve energy efficiency, and promote clean and green development across sectors. In addition, as a candidate country for EU membership, Serbia needs to align domestic policies with the EU's energy, environment, and climate legislation, while avoiding the negative impacts of the EU's planned Carbon Border Adjustment Mechanism (CBAM). Hence, the time is now for Serbia to act to achieve greener and more resilient growth. This report draws from a rich analysis to provide broad recommendations on how the transition to greener and more resilient growth in Serbia can begin.

Environmental fiscal reforms are needed to incentivize a shift towards adopting more environmentally friendly technologies. The implementation of carbon pricing will also enable Serbia to proactively prepare for the forthcoming EU CBAM. The results of the macroeconomic modeling in this report show that CBAM could have a small negative impact on Serbia's GDP (0.21 percent below baseline in 2035). Carbon pricing results suggest similarly modest impacts on the economy in the medium term compared to facing CBAM (0.28 percent below baseline). However, adopting a carbon price would exempt Serbia from CBAM costs, as well as generate fiscal revenue that would lead to positive GDP impacts. Reinvesting the proceeds of carbon pricing in innovation and education would help to further accelerate the transition to greener and more resilient growth.

Institutional frameworks need to be further strengthened to support the government in delivering on reforms. It is not enough just to adopt new policies. The authorities will also need to ensure that they have the institutional frameworks to deliver. In the context of the EU accession process, Serbia has made several bold commitments to enhance its capacities in the areas of environmental management and climate change. When Serbia imposes its own domestic carbon pricing system, or even to effectively deal with the terms of the EU's CBAM, it will also need to have in place a robust monitoring, reporting and verification (MRV) framework for greenhouse gas (GHG) emissions.

Certain sectoral policies and regulatory reforms can be initiated quickly to catalyze the transition. While a broad spectrum of reforms is needed to support the transition to greener and more resilient growth, some sectoral reforms are already within reach. The report outlines many such reforms in priority sectors like energy efficiency, air pollution, waste management, and water and wastewater. Furthermore, reforms are needed to finance sectoral interventions. As discussed in this report, through the example of fiscal reforms, additional financing needs can be met by shifting towards making polluters pay in proportion to the environmental damage they cause.

A deliberate step-by-step approach is needed to manage the transition to greener and more resilient growth. Given the potential impacts of the green transition on Serbia's economy and society, the authorities should adopt a deliberate yet cautious approach with robust preparatory work. The war in Ukraine and the associated energy security concerns, together with international price shocks, should not discourage or distract the authorities from pursuing the transition to greener and more resilient growth. In fact, these events may serve as a trigger for even more ambitious and dedicated efforts to facilitate the transition. Serbia needs to be well-prepared with a coherent and adaptive roadmap, which mitigates the risks of 'brown' growth, protects those adversely impacted, and ensures an equitable distribution of the benefits of increased growth. ■

Executive Summary

Serbia faces several key challenges to achieving greener and more resilient economic growth. While 2021 saw a strong economic recovery from COVID-19 (Coronavirus), Serbia's rate of economic growth has been modest in recent years. Further, growth has been accompanied by high environmental costs. On average, Serbian businesses create significantly more pollution and consume more energy and natural resources per value added than most European Union (EU) countries. Serbia also topped the 2019 list of death rates from pollution among European countries and placed 9th globally[1]. As a result, there is increasing public concern regarding environmental degradation. In addition, as a candidate country for EU membership, Serbia needs to align its domestic policies with the EU acquis—the rules and procedures that EU member states commit themselves to. As Serbia's main trading partner, the EU has already embarked on a deep, 'green' structural transformation of its economy and plans to impose a Carbon Border Adjustment Mechanism (CBAM) to protect the EU internal market from 'carbon leakage' stemming from the import of carbon-intensive products from jurisdictions with less stringent climate policies. Most significantly, Serbia's continued dependence on locally extracted, heavily polluting lignite for electric power generation will ultimately decrease its competitiveness and raise the costs of accessing EU markets. Hence Serbia needs to act now.

First, Serbia needs to grow faster and bring living standards closer to the average for the EU. Economic growth in the 10 years prior to COVID-19 averaged just 1.8 percent. As a result, the gap between the living standards of Serbians and of EU citizens has not been closing. Looking forward, building on its hard-won macroeconomic stability, Serbia can now afford to switch gears and strive to become a faster-growing, more sophisticated modern economy. As the World Bank's 2019 Country Economic Memorandum makes clear, the achievement of Serbia's new growth agenda will require a range of actions to boost investment, mobilize financing for growing firms, equip workers with the right skill mix, increase productivity levels, promote competition, and foster a more conducive business environment.

Second, Serbia needs to increase the resilience of its growth by being prepared to address multiple threats, including those related to climate change and environmental degradation. As Serbia looks to the future, it is essential for the government to reduce the country's dependence on the use of heavily polluting lignite, improve energy efficiency, and reduce environmental degradation risks by promoting clean and green development across sectors. To achieve this, it will be vital to strengthen institutions and governance. In particular, gaps related to policy coordination and institutional capacities will need to be addressed and transparency and accountability will need to be further improved. These measures are key to enabling Serbia's private sector, particularly its domestic private enterprises, to thrive and contribute to overall national productivity gains.

Third, Serbia needs commitment to transition to greener and more resilient growth by adopting a roadmap that would help unleash its economic growth potential while decoupling from environmental degradation. Adhering to the roadmap will also make growth more resilient to external shocks and more sustainable over the medium to long term. The transition will provide benefits and create new opportunities; however, it will also have costs and negative impacts on certain groups, which can be mitigated with the appropriate measures. For example, greener and more resilient growth may facilitate shifts from low value-added sectors to those with higher value-added and productivity. This will require additional investment in new technologies, increased education and training of employees, greater investment in research and development, better environmental conditions, and the creation of more high-quality jobs.

Transitioning to greener and more resilient growth will require reforms. Some of these reforms are horizontal in nature (i.e., affecting all sectors, such as tax reforms to alter price signals), while others are sector specific, such as changes in policies and regulations addressing important challenges like energy efficiency, air pollution, waste management, and water and wastewater. While the achievement of this transition involves multiple sectors and a wide range of issues, this report

addresses only a subset of these, including potential costs and benefits of certain aspects of the transition, potential policy reforms in select sectors, and related institutional aspects. For example, the scope of the report does not include several other important issues for the achievement of Serbia's transition to greener and more resilient growth, such as energy pricing, coal transition, the role of carbon sinks, and adaptation priorities, some of which are being addressed through parallel engagements by the World Bank or other development partners.

Environmental fiscal reforms would help initiate a shift towards greener production and consumption. This would mean adopting environmental reforms to existing energy and environmental taxes. These would include a focus on the near-term adjustment of excise policy to achieve greater alignment with the policies of the EU and a medium- to long-term focus on preparations for the introduction of carbon pricing. These reforms could incentivize a shift away from polluting and climate-damaging technologies towards the adoption of more environmentally friendly technologies. The implementation of carbon pricing would also enable Serbia to proactively prepare for the forthcoming EU CBAM. The results of the macroeconomic modeling in this report show that CBAM could have a small negative impact on Serbia's GDP over the medium to long term compared to the baseline of no CBAM, resulting in annual real GDP levels of 0.21 percent below baseline GDP levels in 2035. This marginal shift is due to reduced export volumes (-0.62 percent compared to the baseline of no CBAM in 2035) caused solely by the drop in exports of CBAM sectors, counterbalanced by reduced import volumes (-0.59 percent) and a small decline in private consumption (-0.25 percent). Additional domestic policies are needed to incentivize a broader green transition in Serbia. As such, the report also presents results of modeling the macroeconomic impacts of reforming excise duties in line with the EU Environmental Tax Directive and a carbon pricing system based on the EU Emissions Trading System. Carbon pricing results suggest similarly modest impacts on the economy in the medium term compared to facing CBAM, with annual real GDP of 0.28 percent below baseline levels in 2035. Overall GDP impacts of carbon pricing remain small as the higher reduction in exports (-1.54 percent) are compensated by a reduction in imports (-1.61 percent). In addition, adopting a carbon price would exempt Serbia from CBAM costs, as well as generate fiscal revenue that could be used to incentivize investments in new, more productive economic sectors with lower carbon intensity, leading to positive GDP impacts. While results for both CBAM and carbon pricing show a sizeable potential impact on emission-intensive sectors—affecting net real exports, output, and employment— carbon pricing would incentivize low carbon transition across many more sectors than CBAM.

Reinvesting the proceeds of carbon pricing in innovation and education would help to accelerate the transition to greener and more resilient growth. If the revenues generated through broader carbon pricing reforms were reinvested in innovation and education, this could facilitate both significant positive economic and structural transformation and improved environmental conditions. The carbon-intensive sectors of Serbia's economy currently contribute to only 20 percent of GDP, 10 percent of exports, and only 3 percent of total employment. The imposition of domestic carbon pricing in these sectors could incentivize many businesses to shift to new technologies and to develop the necessary skills to participate in cleaner, more knowledge-intensive economic activities. Where cleaner sectors are able to absorb the labor and capital released from carbon-intensive industries and unlock new markets, this could have a positive impact on employment. Carbon pricing could also help reduce annual greenhouse gas (GHG) emissions in Serbia by 40 percent in 2035 compared to a business-as-usual scenario.

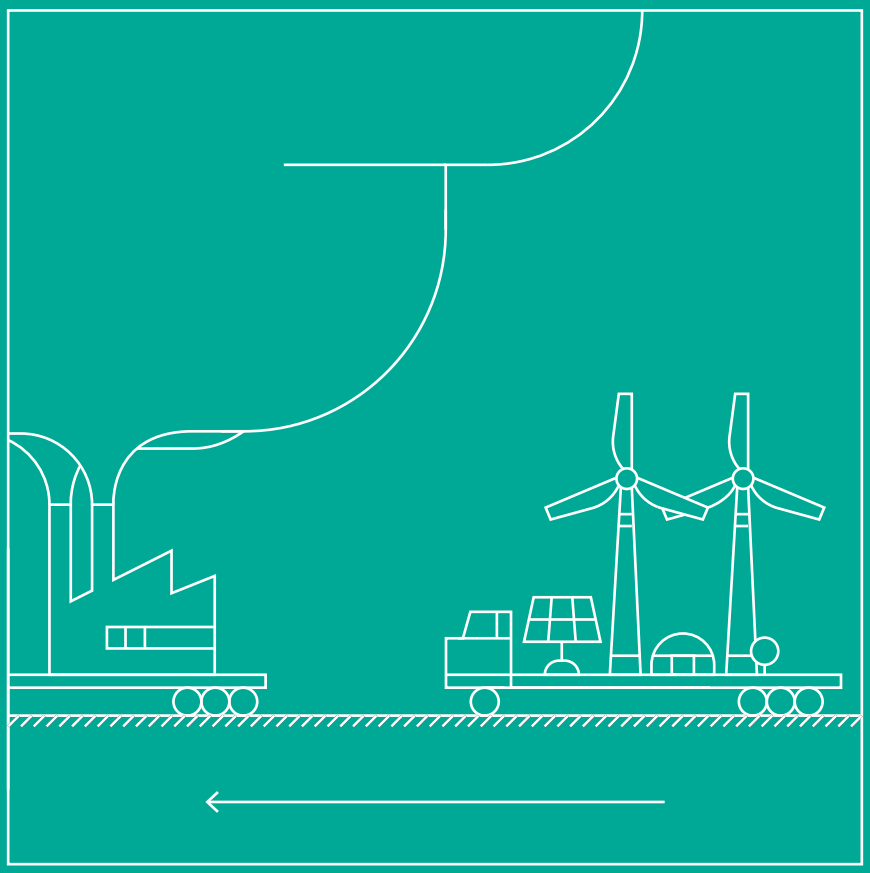
Institutional frameworks need to be further strengthened to support the government to deliver on reforms. The lack of institutional capacities in the areas of environmental management and climate change is a frequently cited issue in the European Commission's annual EU accession progress reports for Serbia. As part of Chapter 27 negotiations on issues related to the environment, Serbia has made several bold commitments to enhance its capacities in these areas. It is not enough just to adopt new policies. The authorities will also need to ensure that they have the

institutional frameworks to deliver. In addition, Serbia's obligations under the Paris Agreement, the Energy Community, and the EU-supported Green Agenda for the Western Balkans also require the authorities to take action to strengthen the country's institutions. When Serbia imposes its own domestic carbon pricing system, or even to effectively deal with the terms of the EU's CBAM, it will need to have in place a robust monitoring, reporting and verification (MRV) framework for GHG emissions.

Certain sectoral policies and regulatory reforms can be initiated quickly to catalyze the transition. While a broad spectrum of reforms is needed to support the transition to greener and more resilient growth, some sectoral reforms are already within reach. For example, to scale up energy efficiency programs, there is a need to make the new Law on Energy Efficiency fully operational by formulating and implementing regulations, introducing consumption-based billing in district heating systems, and increasing energy tariffs while implementing measures to protect the most vulnerable. In the waste management sector, there is a need for a greater shift towards recycling and the circularity of resources. The Action Plan for National Waste Management Program 2022-31 needs to be adopted and implemented, as does the Circular Economy Development Program 2022-24. Furthermore, several new approaches, including Extended Producer Responsibility programs, also need to be adopted. Similarly, a new Water Law is needed to improve tariff setting and to achieve greater alignment with the EU acquis. Additionally, the legislative framework for air quality needs to be strengthened, including through the adoption of a new Law on Air Protection, with measures to support the achievement of emissions reduction targets in the energy, industrial, and agricultural sectors. Furthermore, reforms are needed to finance green sectoral interventions. As discussed in this report, through the example of fiscal reforms, additional financing needs can be met by shifting towards making polluters pay in proportion to the environmental damage they cause.

A deliberate step-by-step approach is needed to manage the transition to greener and more resilient growth. Given the potential impacts of the transition on Serbia's economy and society, the authorities should adopt a deliberate yet cautious approach, with robust preparatory work. The war in Ukraine and the associated energy price shocks and energy security concerns, together with international commodity price shocks, may serve as a trigger for even more ambitious and dedicated efforts to facilitate the transition. However, Serbia needs to be well-prepared with a coherent and adaptive roadmap to mitigate the risks of 'brown' growth and to make sure that the transition is effective and 'just,' to protect those who could be adversely impacted and to ensure that the benefits of increased growth are equitably spread.

This report sets out the key challenges that Serbia faces, along with broad recommendations on how the transition to greener and more resilient growth in Serbia can begin. Chapter 1 describes the factors driving greener growth in Serbia, including the strong demand by the public for improved environmental conditions, and examines the government's strategies and plans for achieving this process. Chapter 2 consists of three sections, respectively describing the significance of price signals for the achievement of greener and more resilient growth, selected sectoral interventions, and the need for strong institutional frameworks. Chapter 3 draws conclusions from the preceding chapters, finding that for Serbia to successfully achieve the transition, it will be vital to get prices right, formulate and implement the appropriate sectoral policies and regulations, and establish a strong institutional framework. ■



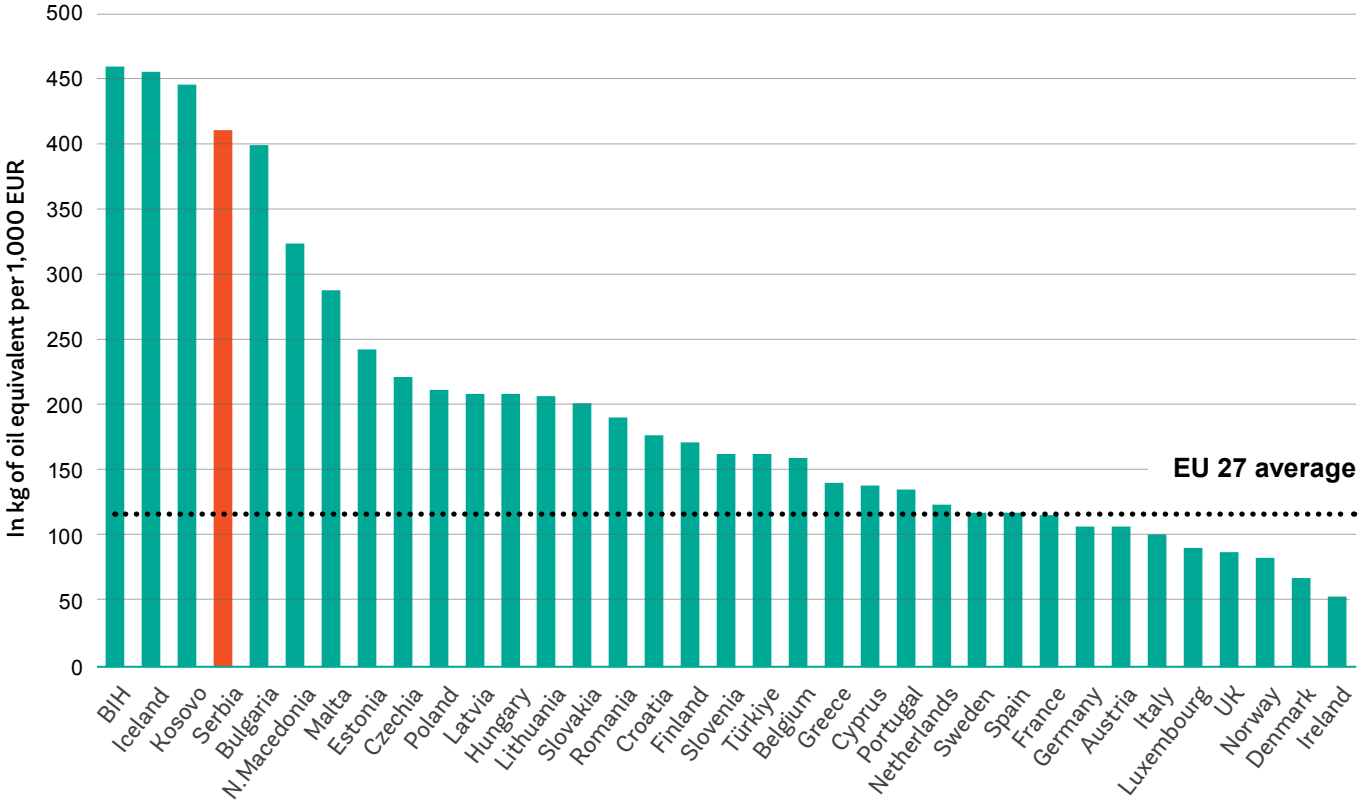
1. What are Serbia's drivers for pursuing the transition to greener and more resilient growth?

1.1 Deteriorating environmental sustainability and economic growth

After strong growth in the early 2000s, Serbia's economic growth has decelerated in recent years, largely due to remaining structural constraints. Following Serbia's political reopening in the early 2000s, it experienced relatively strong growth, benefiting from broad-based structural reforms and massive capital inflows from abroad. However, during the decade prior to the COVID-19 pandemic, in the period from 2009 to 2019, its average annual economic growth rate had declined to a modest 1.9 percent, down from an average annual rate of 6.2 percent in the preceding period. The decline in growth rates has been largely due to structural economic issues, particularly low levels of productivity and investment but also due to the impact of natural disasters.

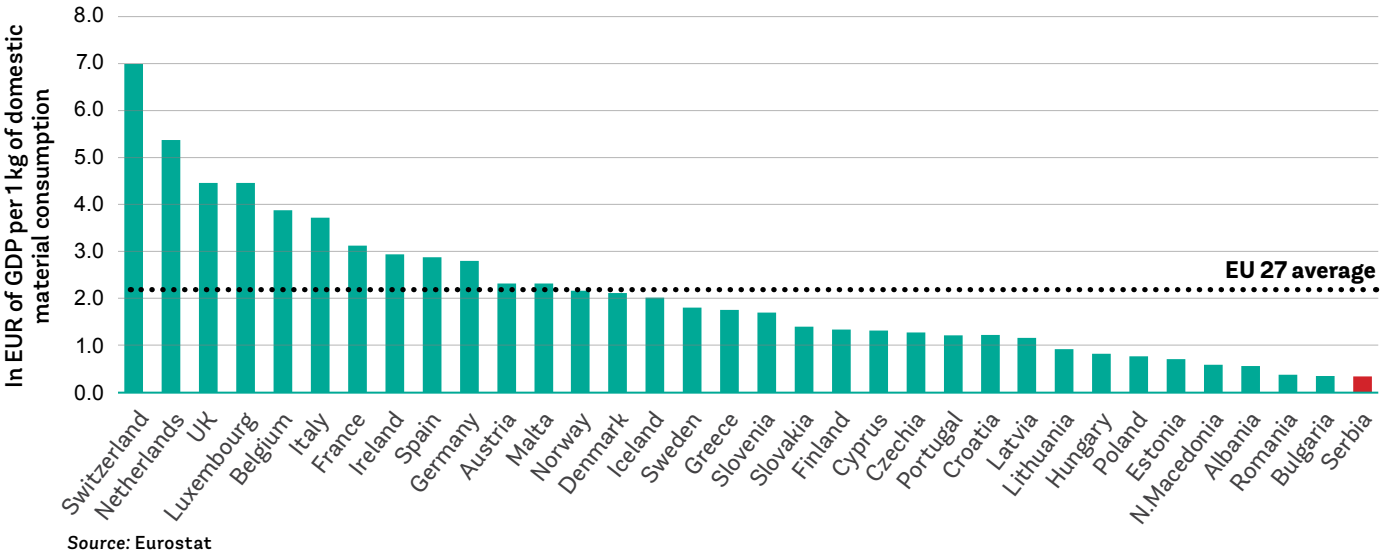
Serbia is one of the most energy-intensive economies in Europe, with a high carbon footprint and a high degree of vulnerability to energy price fluctuations. Serbia's economy is four times more energy intensive as compared to the EU27 average (see Figure 1). In other words, Serbia's businesses use much more energy to produce a unit of output or add much lower value to their energy use, than do their European peers. In addition, the source of energy is heavily dominated by domestic, low-quality lignite. In turn, this directly increases the carbon footprint of Serbia's economy. With narrowly concentrated energy supplies, this high level of energy intensity also increases Serbia's vulnerability to energy crises, such as the one that occurred in the winter of 2021–2022, giving rise to energy security concerns.

Figure 1. **Overview of energy intensity in European countries, 2019**



Source: Eurostat

Figure 2. **Overview of resource productivity in European countries, 2019**



Source: Eurostat

In 2001–2019, the volume of materials used by Serbia's economy, including extracted and imported natural resources, increased by 30 percent. Although its GDP grew by 80 percent over this period, the country still uses its material resources less efficiently than any other EU and Western Balkan country, generating the lowest output value per kilogram (kg) of domestic material consumption (see Figure 2). Serbia's low resource productivity can be explained by its relatively high degree of dependence on the extraction of material resources (e.g., mining and quarrying) and by its ageing and inefficient industrial infrastructure, a legacy characteristic of economies in transition.

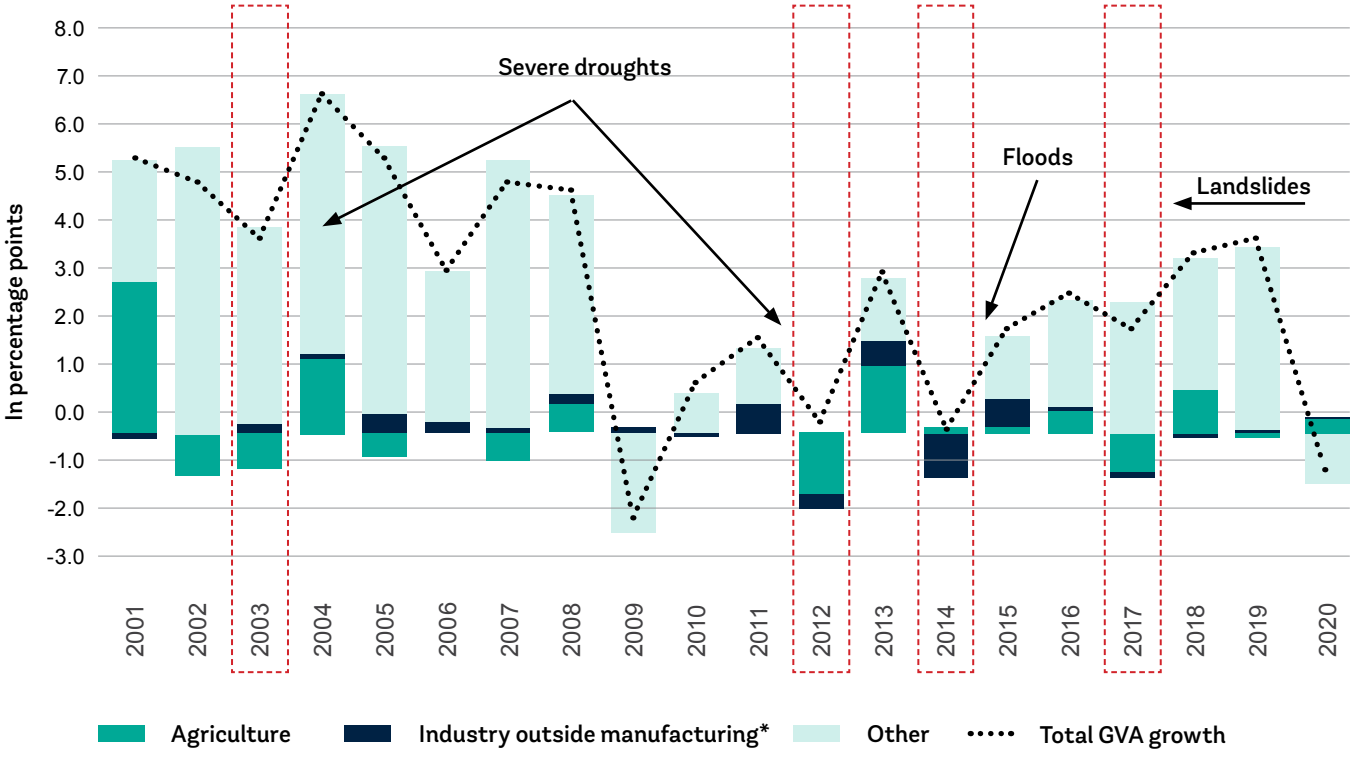
Not only is the level of productivity of Serbia's production factors lower than average for the EU, but the gap has been widening too. As the World Bank's 2019 Country Economic Memorandum (CEM) showed, on average, a Serbian manufacturing enterprise needs three times as many workers to produce the same output as a business in the European Union (EU)[2]. Furthermore, productivity growth has been slow, limiting income convergence and stifling the creation of well-paid jobs. In particular, the poor performance of state-owned enterprises (SOEs) acts as a drag on the productivity of sectors that have real potential for growth. Increased firm-level productivity would enable Serbia to achieve higher value-added production and create a greater number of better-paid jobs.

Serbia needs to implement a new growth agenda to bring the country closer to the average living standards in the EU while also ensuring that it pursues a greener trajectory. Looking forward to the post-COVID-19 phase, building on hard-won macroeconomic stability, Serbia can focus on becoming a sophisticated modern economy like other EU member states. As identified in the CEM, the new growth agenda for Serbia will require action to further boost investment, mobilize financing for growing firms, equip workers with the right skill mix, raise productivity levels, and promote competition and a better business environment. However, the new growth will also need to be greener for Serbia's firms to stay competitive in the EU market. It will require Serbia to deliver on its growth ambitions while reducing dependency on polluting lignite, improve energy efficiency, and promote green development across sectors. Experience and literature show that better environmental performance is associated with higher productivity, innovation, and higher export competitiveness. Strengthening policies and institutions in support of greener and more resilient growth will be one of the key factors for the success of the new growth agenda.

While addressing energy intensity and emissions concerns, Serbia could improve productivity as well, thus improving the growth outlook. The recent CEM showed that aggregate productivity improves when firms adopt better technologies, enhance their management and organizational practices, and rely on workers with higher skills (the within-firm growth strategy); or new firms enter and less successful firms exit (the dynamic growth strategy). The shift to a greener and more resilient growth agenda could enable Serbia to benefit from both strategies for higher productivity. In particular, SOEs, including in the energy sector, would benefit from measures that boost within-firm growth. Adoption of new technologies and innovation could also lead to an increase in the creation of new businesses; young firms created 96 percent of new jobs (net) over recent years.[3]

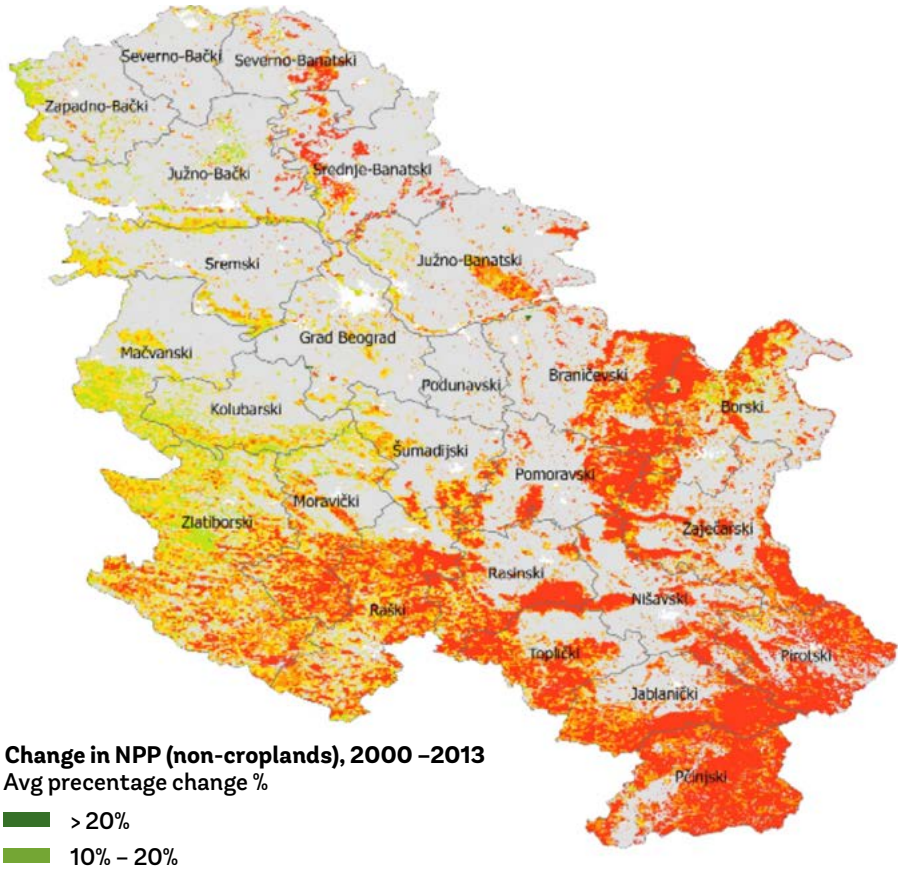
Severe weather events associated with climate change have also acted as a drag on Serbia's economic growth. Figure 3 shows the volatility in growth rates because of external shocks, with significant adverse impacts in the years with climate-related disasters. Areas of the country that have been particularly affected by droughts and weather variability have also experienced significant land degradation, increasing the risk of other natural disasters, including landslides. As Figure 4 shows, there is a high degree of variability in the extent of land degradation across the country, with the effects tending to be concentrated in areas with already high levels of poverty and vulnerability. The decline in GDP associated with these impacts of climate change is expected to be associated with declines in employment and thus with increases in poverty unless timely and appropriate mitigation measures are put into effect.

Figure 3. **Growth rates in Serbia by sectors and external shocks**



Note: *Consisting of mining, supply of electric energy, gas, steam and acclimatization.
Source: Statistics Office of Republic of Serbia.

Figure 4. **Change in net primary productivity (2000-2013) as a measure of land degradation**[4]



Source: Perovic et al. (2021).

With respect to indicators related to resilience, sustainability, and efficiency, Serbia's performance is considerably worse than the average for EU member states, particularly in terms of those related to water and sanitation, waste management, air pollution, and GHG emissions. The World Bank's *Green, Resilient, and Inclusive Development* (GRID) diagnostic, which is based on the *Resilience, Inclusion, Sustainability, and Efficiency* (RISE) framework, shows Serbia's performance in terms of a number of key indicators compared to the EU mean (see Table 1), with red colored cells showing areas where Serbia's performance lags behind the EU mean, while green colored cells indicate areas where it records stronger than average performance, and grey cells show similar performance to the EU. While the government has recognized the need to address at least some of the identified issues in the short term, much additional work is needed to reduce the gap between Serbia and the EU[5].

Table 1. **Selected indicators from the World Bank's GRID/RISE diagnostics for Serbia**

Indicator Name	Serbia	EU mean
Resilience Indicators		
Natural disaster risk to assets (% of GDP)	1.4	0.3
Natural disaster risk to wellbeing (% of GDP)	1.7	0.4
Population exposure from disasters (% of total population exposed)	0.3	3.5
Population exposure from dry rainfall shocks (% of total population exposed)	20.1	13.0
Inclusion Indicators		
People Using Safely managed sanitation (% of total population)	18.4	87.4
People Using Safely managed drinking water (% of total population)	75.0	97.5
Belief that "Most people can be trusted" (% agreeing)	16.3	33.0
Human capital index (from 0 to 1)	0.68	0.70
Sustainability Indicators		
Total renewable water resources per capita (m^3 per capita)	18,451	7,571
Biodiversity & habitat index (from 0 to 100)	42.8	47.2
$PM_{2.5}$ % of population exposed above WHO (15µg/m^3)	98.6	55.5
Mortality rate attributable to air pollution (per 100,000)	62.5	23.8
Solid waste generation (tons) per capita	0.33	0.47
Landfill disposal % share of total waste generation	95	33
Renewable energy consumption (% of total energy consumption)	19.9	21.3
Share of coal in electricity generation (% of electricity generated)	68.2	13.2
GHG emissions per capita (metric tons per capita)	9.2	8.5
Change in GHG emissions per capita (% change 2008-2017)	-0.6	-15.6
Efficiency Indicators		
Productivity of water use ($ per m^3 water withdrawals)	5.9	131.4
Efficiency of carbon use (GNI per kt of CO_2 eq.)	730,106	4,267,773
Air pollution regulation economic efficiency (from 0 to 100 %)	21.6	40.4

Note: See Annex 1 for definitions of indicators.
Source: World Bank, GRID/RISE.

The public in Serbia has become increasingly concerned and vocal regarding environmental degradation, intensifying the pressure on the government to act. A recent World Bank public opinion survey[6] shows that Serbia's citizens consider a clean and livable environment as an essential factor in decisions related to where they want to live and bring up their children, with more than 75 percent of survey respondents stating that they felt that pollution, particularly air pollution, is worsening[7] and with almost 85 percent stating that they felt that climate change was affecting their immediate environment. A relatively higher proportion of younger people (18–29 years) expressed similar sentiments, with a significant proportion even stating that they had considered immigrating as a result of these factors[8]. This increased environmental awareness, particularly among the young, has resulted in increased green social activism, with intensified pressure on the government to take action.

This report is part of a broader set of analytical work related to the Western Balkans' achievement of greener growth, addressing a subset of focus areas particularly relevant to Serbia's green transition. In particular, the report focuses on issues including environmental taxation, the EU's carbon border adjustment mechanism (CBAM), carbon pricing, institutional analyses, and sectoral priorities covering energy efficiency, air pollution, waste management and circular economy, and water and wastewater. Its scope does not include a number of other issues that would be vital for facilitating Serbia's green transition, such as energy pricing, a transition away from coal, land degradation, the role of carbon sinks, and adaptation priorities. Some of these issues are currently being addressed through parallel initiatives involving the World Bank and other development partners. The findings, interpretations, and conclusions expressed in this report are based on data as of June 30, 2022.

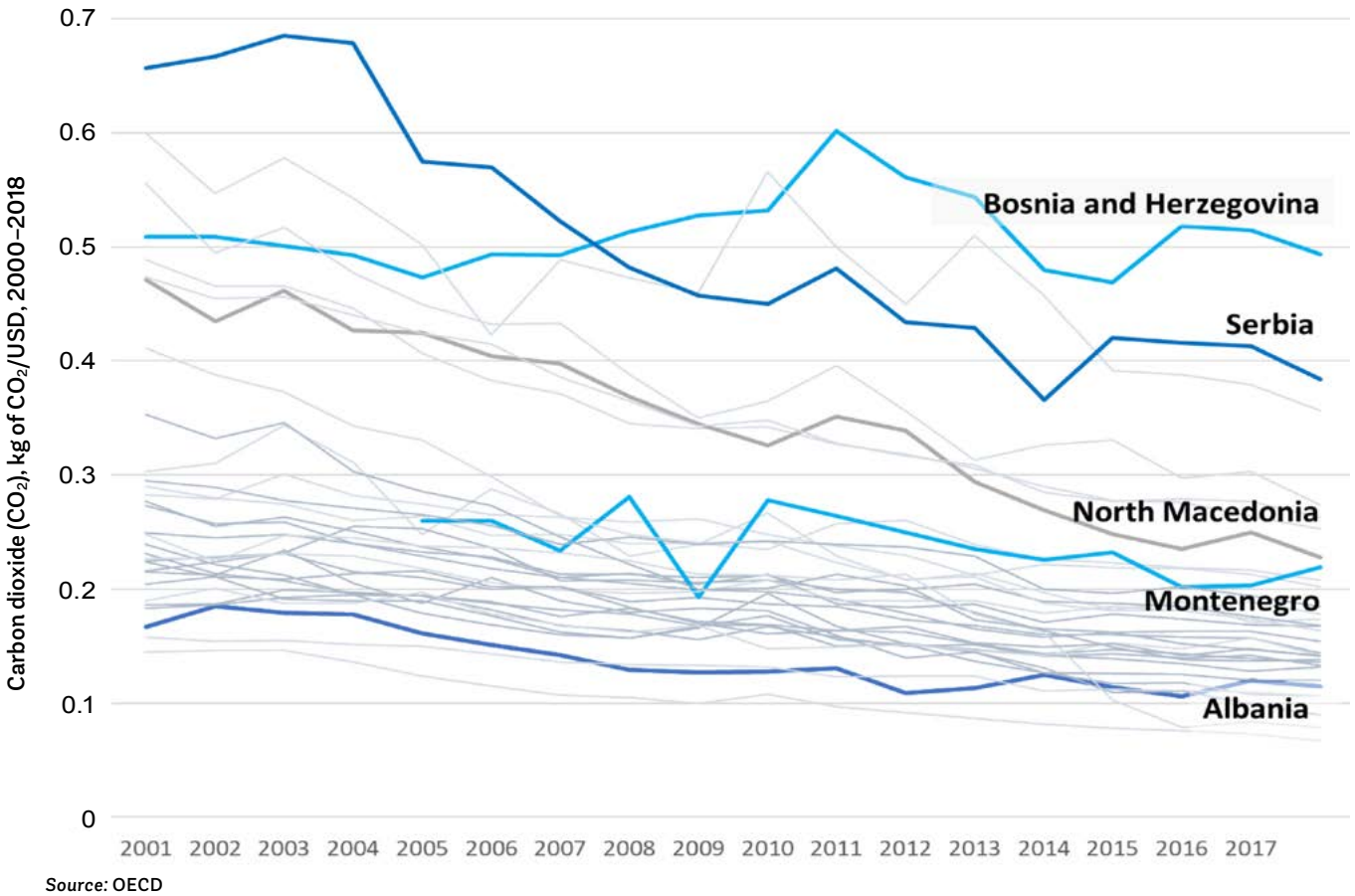
1.2 Challenges of transitioning to greener and more resilient growth for Serbia

The transition to a resilient, low-carbon and green economy is a global megatrend to which Serbia will need to adjust. Due to regulatory and other pressures, emission-intensive businesses, sectors, and countries are facing mounting constraints in accessing finance, investments, and markets in advanced economies (as per IMF classification). In particular, the European Green Deal and the recent "Fit for 55" legislative initiative create strong disincentives for emission-intensive activities, shaping the economic context in which Serbia will interact within the global economy for decades to come. Over the last 20 years, the EU has emerged as a prime mover of the global green transformation, and more recently, the EU is increasingly concerned about unfair competition from countries hosting potential 'pollution heavens' and strives to coordinate shared climate policy and sustainable product standards and impose costs on countries that don't meet them.

While Serbia has ratified most major international environmental agreements, their implementation is lagging behind. Serbia is a signatory to the 2030 Agenda for Sustainable Development and is thus formally committed to the achievement of the Sustainable Development Goals (SDGs). It is also a signatory to the UN Framework Convention on Climate Change and its associated Paris Agreement. At the regional level, it is a signatory to the Sofia Declaration on the Green Agenda for the Western Balkans, which is based on the European Green Deal. As a signatory to these agreements, Serbia has committed to working to achieve the 2050 target of transforming the EU into a carbon-neutral zone. However, currently, its internal economic incentives and policies are not aligned with these commitments. For example, in 2021, the Energy Community Secretariat launched proceedings against Serbia related to its failure to meet the National Emission Reduction Program's targets for sulfur dioxide (SO_2), nitrogen oxide (NO_x), and dust emissions.[9] In addition, a 2020 assessment of Serbia's progress towards the achievement of defined SDGs published by the Statistical Office of Serbia indicated a number of adverse developments in key areas related to food security, water use, clean fuel use, energy intensity, and waste management.[10]

The most significant factors contributing to Serbia's poor environmental performance relate to the high energy and carbon intensity of its economy and a strong dependence on domestic lignite to produce energy. Despite significant improvements over the past two decades, Serbia's GHG level of emissions intensity is still more than 2.5 times higher than the EU average (see Figure 5).[11] The energy sector is by far the largest contributor to Serbia's GHG emissions, contributing to 76.1 percent of the total in 2018.[12] Within the sector, the largest shares of GHG emissions originate from the production of electricity and heat, with almost 70 percent of electricity being produced from coal, particularly domestic lignite.[13] Serbia's coal power plants are old and inefficient, with the average age of thermal power plants in Elektroprivreda Srbije (EPS) around 40 years and with the newest plant in operation being 30 years old. The collapse of a number of coal power plants and resulting power outages in late 2021 resulted in a new sense of political urgency related to the need for the diversification of their energy systems and associated investments. However, there has been a lack of clarity and mixed signals from the government regarding whether or not these coal-driven facilities will be decommissioned and replaced with greener infrastructure, increasing the risk for potential investors.

Figure 5. **Carbon intensity of GDP in select countries**



Source: OECD

The recent surge in global fuel prices has resulted in the authorities considering delaying the phasing out of coal-driven facilities from Serbia's energy system, increasing the risk of locking the country into a carbon-intensive growth model.[14] With the current high prices of fossil fuels, Serbia's use of domestic lignite to produce power and heat may appear to serve as an effective hedge against the energy market shock. However, the global energy crisis of 2021/2022 is likely to be a time-limited event, resulting from global fuel demand rapidly rebounding during the post-COVID-19 recovery and temporarily outstripping supply, with the price spikes exacerbated by a number of factors, including the prior period of global underinvestment in extractive industries, supply chain hurdles, and the war in Ukraine. In the long term, the reliance on coal-driven power generation facilities is likely to be more a *source* of systemic risk than a hedge against it. If Serbia becomes a member state of the EU, it will be directly subject to the EU's carbon pricing regime. However, if the country remains outside the EU, it will be affected indirectly through the carbon border adjustment mechanism (CBAM) that would limit its access to EU markets by imposing a tariff on carbon-intensive products.

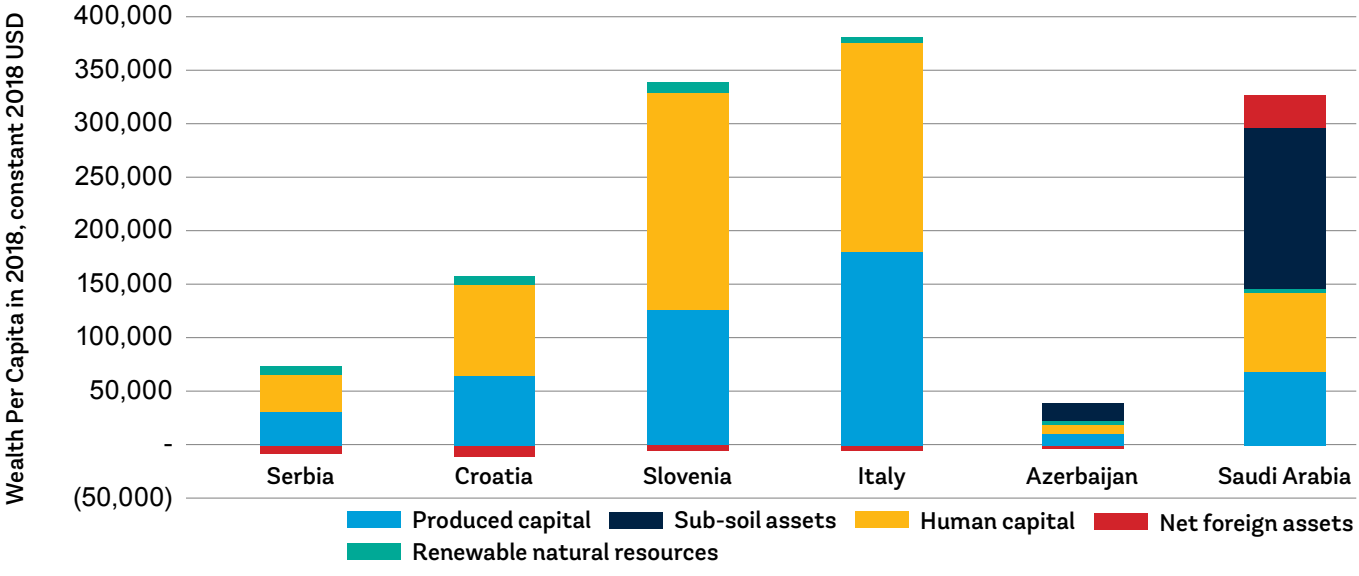
If Serbia continues its current low-productivity, brown growth model path, it will face significant risks as the world in general and the EU in particular transition to a greener, knowledge-based economic growth model. If Serbia continues its current trajectory, its future growth will become increasingly uncertain and unsustainable, particularly given that the EU, its largest trading partner, is increasingly adopting a greener growth model. If Serbia commits itself to transitioning towards a similar model, it could increase its resilience to external climate policy shifts, such as the EU's proposed CBAM. Serbia's path to integration with the EU is highly dependent on the extent to which the country implements a green transition (see Figure 6). This would enable it to adopt a growth model that facilitates the achievement of higher productivity (and wages), better living conditions through improved environmental quality and higher levels of innovation, enabling it to participate in new markets and value networks.

Figure 6. **Going green – the preferred alternative growth path for Serbia**[15]

However, for Serbia to adopt an EU-oriented, greener growth strategy, it would need to undergo a comprehensive process of modernization and structural transformation of its economy, similar to that of other new EU member states. This process would require 'brown' enterprises that do not consider the negative side effects of production on the environment to conform to the EU requirements and standards, which increasingly are requiring polluters to pay for the damage they inflict upon society. In the EU, these enterprises could benefit from access to state aid and EU funds to modernize away from obsolete, dirty technologies and to facilitate a 'just transition' for workers and communities dependent on brown industries, especially coal-mining communities and municipalities dependent on coal-fired heating as well as those with large coal power, steel, and cement plants. At the same time, startups and disruptive innovators could gain greater access to EU funding and technology transfers, facilitating the creation of new green jobs and enabling them to leverage new sources of comparative advantage. In the past, all Central and Eastern EU member states underwent similar transformations, with significant assistance from the EU.

The green transition should be structurally easier for Serbia than for fossil fuel exporting countries. While Serbia's power sector is heavily dependent on coal, its economy does not depend on revenues derived from the extraction and export of fossil fuels. The structure of the assets on which Serbia depends for future economic growth and revenues is more typical of diversified EU member states as compared to heavily hydrocarbon-dependent countries such as Azerbaijan and Saudi Arabia (see Figure 7). As in all advanced economies, human capital rather than fossil fuels dominates total wealth per capita in Serbia (55 percent), with the value of subsoil assets (fossil fuels and minerals) accounting for a mere one percent of total wealth per capita, a similar level to that found in most European countries. Produced assets (buildings, infrastructure, machines, intellectual property, and so forth), which account for 44 percent of Serbia's total wealth, are more energy and carbon-intensive than is typical for the EU, as discussed earlier. Thus, Serbia's integration with the EU economy could lead to the premature retirement of some of these assets. However, it is expected that with such an integration, new, more productive fixed assets will be introduced, while the risk of stranded assets is low.

Figure 7. **Level and composition of total national wealth per capita in Serbia compared to other European countries and fossil fuel exporters**



Source: World Bank. 2021. The Changing Wealth of Nations. https://openknowledge.worldbank.org/handle/10986/36400.

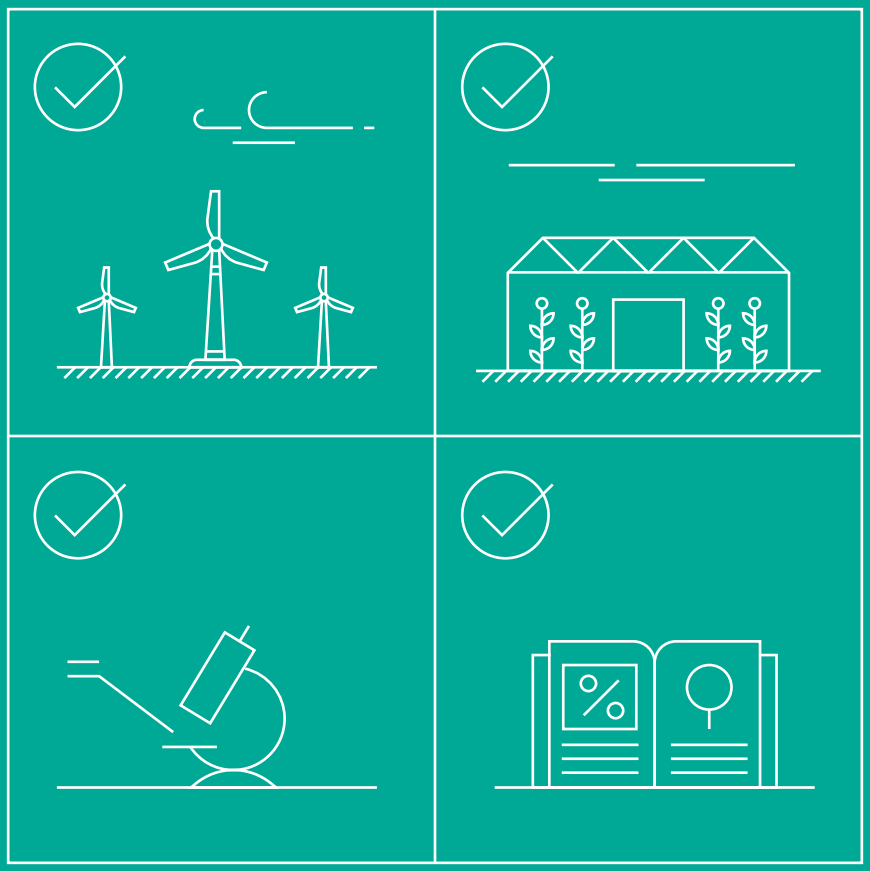
While the Serbian authorities have recognized the changes to the external context and embarked on legislative changes to support its green transition, progress has been slow. With the adoption of the Law on Climate Change in March 2021 and the Law on Use of Renewable Energy Sources (RES) in April 2021, Serbia has made a major step towards aligning with the EU climate and environment acquis. The first of these new laws mandates the adoption of the Low-Carbon Development Strategy (LCDS) and the National Adaptation Program (NAP) in 2022. The Government is currently drafting a new energy sector strategy, the National Energy and Climate Plan (NECP), which is intended to provide further definition of the government's aspirations for the energy sector, especially related to coal mining and power generation. As an additional measure, Serbia's authorities are also working to formulate a NAP. However, Serbia is one of the very few countries that have not yet submitted their second Nationally Determined Contribution (NDC), as mandated by the Paris Agreement. Also, while Serbia formally promulgated its National Emission Reduction Plans (NERPs) in 2020, the implementation of these plans remains problematic.[16]

While work on key strategic documents is still ongoing, there are indications that the Serbian government is aiming to be ambitious on the green agenda. The draft LCDS indicates a potentially ambitious target to reduce GHG emissions by 33.3 percent in 2030 compared to the 1990 level (or 13.2 percent compared to the 2010 level). In the long term, GHG emissions will need to be aligned with the 2050 carbon-neutrality target of the EU, to which Serbia is committed to through the Sofia Declaration. The draft National Air Protection Plan (NAPP) will require significant emissions reductions if the proposed objective of reducing by half the health damage due to poor air quality until 2030 (compared to 2015) is to be met. The recently adopted Waste Management Program 2022-2031 aims to reduce the share of municipal waste disposed in unsanitary landfills from 81 percent in 2020 to 17.8 percent in 2031, while the Industrial Policy Strategy 2021-2030 calls for an increase in the circularity rate in industry to 10 percent by 2030.

International commitments also play an important role in the country's green transition. Serbia is a contracting party to the Energy Community, which aims to extend the rules and principles governing the EU energy market throughout Southeast Europe, including through issues such as the preparation of decarbonization roadmaps for the energy sector and for Just Transition efforts for coal-producing regions. In November 2020, Serbia and a number of other countries in the Western Balkan region formally adopted the Sofia Declaration on the Green Agenda, which is intended to facilitate alignment with the EU's climate laws, including those related to carbon pricing mechanisms, among other climate objectives.[17] The most important external commitment of green policy making are the negotiations over Chapter 27 of the EU Acquis, which formally opened in December 2021 and which influences policy making through the specific transposition of EU directives into national laws, having already shaped policy-making efforts during its preparatory stage.

The government is aware that a deep commitment to green transition could enable it to gain increased access to significant financing opportunities from external sources, including the private sector. Under its economic and investment plan for the Western Balkans, the EU has allocated 9 billion euros for the development of the region, with a significant proportion of these funds earmarked for the implementation of the Green Agenda for the Western Balkans (GAWB).[18] This could play a positive role in crowding in additional international donor initiatives and seeding important policy reforms. Furthermore, there are a number of new and innovative forms of financing available for private investments in renewables, energy efficiency, and adaptation. For example, the global green bond market has grown at an average annual rate of 49 percent in the five-year period to 2021. In August 2021, Serbia adopted a Green Bond Framework and issued its first Green Bond in September 2021, which was oversubscribed by a factor of three and raised EUR 1 billion.

While Serbia's political leadership recognizes the risks associated with continuing with a business-as-usual growth model, more action is vitally necessary. The current government has ambitions of achieving accession to the EU and has expressed its commitment to implementing a Green Growth agenda.[19] It is also aware of the need to respond to increasingly intense public pressure to address environmental degradation, with a number of large environmental protests having taken place over the past couple of years. However, at the same time, it has sometimes appeared to be hesitant to move towards the full implementation of the required measures, as can be seen by delays in the adoption of a number of strategic documents, as mentioned previously, that would indicate a sense of urgency regarding the measures to shift to greener growth. Furthermore, the energy crisis of winter 2021–2022 and the energy price shock due to the war in Ukraine have prompted a rethinking of commitment to coal phase-out. The topic of transitioning out of coal has understandably ignited a debate on alternative growth sectors that would need to be the focus of future development. These important decisions will need to be made based on robust analytics, considerations of political economy, and potential distributional impacts.■



2. What does Serbia need to do to turn greener and more resilient and how can this be achieved?

2.1 The role of pricing signals

To prepare for a transition away from a brown economic model towards a more modern, greener and more resilient model, it is essential to structure pricing signals to better reflect the costs of pollution and the wasteful use of resources. Well-structured environmental tax reforms and carbon pricing policies act to shift price signals to incentivize the use of less polluting and low-carbon production models. These instruments could encourage innovation and generate additional revenue for the government, which it could use to manage the challenges related to facilitating economic transformation. They could also stimulate the creation of greener jobs and contribute to other benefits, such as improved air quality and energy security. This section examines the integrated environmental fiscal policy reform options, including changes to existing energy and environmental taxes and fees, the abolition of some environmentally harmful subsidies, and carbon pricing. However, an examination of a number of other important price signals for greening growth is beyond the scope of the current report.

2.1.1 Environmental fiscal reform

As discussed above, Serbia's distorted price signals and policies related to energy and other environmentally harmful activities are the key drivers of its excessive environmental footprint. Prices that do not factor in environmental costs to society encourage businesses and households to waste energy, water, and other resources and to decrease their own financial costs by increasing environmental costs, which are borne by all members of society. Fiscal reforms could transform these perverse price signals by shifting the fundamental pricing incentives in the economy away from wasteful and polluting technologies and activities to more efficient and greener ones, in line with the internationally acknowledged economic principle that polluters should pay for the damage they cause.[20] Environmental fiscal reforms (EFR) could include the repurposing of subsidies and the alignment of taxes and parafiscal fees with environmental sustainability. They could also be leveraged to incentivize greener innovation and investments and to reduce other distortionary impacts of fiscal policy on the economy. Where fiscal revenues are increased as an outcome of EFR, they can be 'recycled' within the economy.

Environmental fiscal policies work through the incentive effect of taxes, fees, and subsidies,[21] with the incentive effect determined by the choice of the tax base, rate, and subsidy amount. The environmental incentive is stronger if taxes and subsidies target the products or activities that are most harmful/beneficial to the environment. The use of government fiscal revenues collected via taxes, fees, and the elimination of harmful subsidies, to subsidize activities with an environmental benefit can have a second incentive effect in countries. These countries could choose to earmark environmental tax revenue or recovered funds from discontinued environmentally harmful subsidies.

Serbia's current taxation system provides only limited incentives to encourage businesses to shift towards more environmentally friendly technologies and behavior. First, excise duties on fossil fuels are established without reference to their relative carbon content. In addition, natural gas, coke, heavy fuel oil, and coal are not covered by excises. These exemptions encourage the use of polluting fuels such as coal and fuelwood, both of which are major sources of air pollution in Serbia. Second, while a number of Serbia's parafiscal fees are formally constituted as environmental taxes, they do not incentivize environmentally friendly behavior on the part of enterprises. For example, the fee for the protection and improvement of the environment applies to economic entities regardless of the environmental impact of their activities, with the fee set with reference to the size of a company rather than to its environmental footprint. Finally, while the fees for emissions of SO_2, NO_2, and particulate matter (PM) are well-targeted, their incentive effect is weak since rates are well below the costs of applying pollution reduction and mitigation measures, with their impact further undermined by partial exemptions for some major polluting activities.

To address these issues, the authorities should prioritize reforms to gradually align excise duties on energy products with the EU rules in this field. Computable General Equilibrium (CGE) modeling suggests that the output and employment effects of aligning Serbia's excise duties with the revised EU

Energy Taxation Directive (ETD)[22] would not negatively impact GDP, provided that revenue is 'recycled' in terms of reducing the tax burden on labor or other GDP-improving policy priorities like investments in human capital or technology uptake. It is estimated that these reforms would result in additional revenues of around 0.2–0.5 percent of GDP annually in 2025 (see Annex 2 for detail on modeling approach and revenue estimation).

A restructuring and reform of fees imposed on entities that emit air pollutants could create strong incentives to reduce air polluting activities, while at the same time correcting the distortionary tax burden on businesses. This reform could include the abolition of the ill-targeted fee for the protection and improvement of the environment, which would reduce the tax burden on the economy without any harm to the environment as it lacks an incentive effect. The authorities could also consider increasing the much better-targeted fees for emissions of SO_2, NO_2, and PM, which would have the potential to strengthen incentives to reduce air pollution in terms of these indicators while replacing foregone revenues of other reform elements. Reforms of this sort have been proposed by business associations, such as National Alliance for Local Economic Development (NALED), and are supported by the Serbian business community. Box 1 below summarizes the initial impact assessment of these reforms, with full details of the analysis provided in Annex 2.

Box 1. Impact assessment of selected opportunities for environmental tax reform in Serbia

	Option 1: Alignment of fossil fuel taxation with revised EU ETD, including phase out of direct coal subsidies	Option 2: Revise the fee for emissions of SO_2, NO_2, particulate matter (PM) from fuel combustion	Option 3: Abolish the fee for the protection and improvement of the environment
Name of the relevant fee	Law on Excise Duties	Fee for the emission of SO_2, NO_2, particulate matter and produced or landfilled waste	Fee for the protection and improvement of the environment
Current coverage and applicability in Serbia	Fuels for vehicles and electricity. Exemptions apply by user type. No coverage of coal, coke, heavy fuel oil and natural gas.	Operators emitting SO_2, NO_2 or PM above annual thresholds (100kg, 30kg and 10kg respectively) are covered (production of electricity, heat, agriculture, industry, among others). Fee level is calculated based on measured emissions. Correction factors apply.	All legal entities and entrepreneurs in Serbia are covered. Fee level is loosely based on type of activities conducted (three impact categories) and size of the economic subject (4 categories).
Reform proposal and rationale	Alignment of fossil fuel taxation with revised EU ETD, including phase-out of direct coal subsidies, in order to: • reduce emissions by expanding fuel coverage • reduce emissions by more realistic costing of different fuels • align with EU standards.	Expand coverage and abolish distorting correction factors, introduce transparency on planned increases in fee levels in order to: • improve coverage of emitters to reduce pollution • reduce pollution by aligning fee levels with actual polluting behavior • enable forward-looking decision-making	Reform proposal is to abolish this fee given that. The fee is not directly related to the level of emissions (polluter pays principle is not respected), therefore does not provide incentives to reduce polluting behavior. Abolition of this fee furthermore leads to a reduction of administrative costs for local authorities and reduced tax burden on covered subjects.

Box 1. Impact assessment of selected opportunities for environmental tax reform in Serbia (continued)

	Option 1: Alignment of fossil fuel taxation with revised EU ETD, including phase out of direct coal subsidies	Option 2: Revise the fee for emissions of SO_2, NO_2, particulate matter (PM) from fuel combustion	Option 3: Abolish the fee for the protection and improvement of the environment
Name of the relevant fee	Law on Excise Duties	Fee for the emission of SO_2, NO_2, particulate matter and produced or landfilled waste	Fee for the protection and improvement of the environment
Expected environmental / social impact	Electricity prices for households could increase by 16% (compared to 2020 average guaranteed supply price), 14% compared to current price cap for industry. Prices for natural gas could increase by up to 22%. Vulnerable consumers will need income support, including to finance energy efficiency improvements and fuel switch. GHG emissions could decrease by 1% compared to the baseline of no revision by 2030, process emissions by 4%.	Environmental impact could remain small despite increase of the tax base and fee levels, due to high abatement cost for most activities. Nevertheless, the incentive effect will improve pollution efficiency and sector preparedness for increased policy ambition in the long run.	No impacts on incentives for and behavior of businesses and other economic agents are expected from this reform proposal; therefore, no environmental impacts from this reform option are expected. A small increase in pollution may occur from increased output due to improved profitability but is unlikely to be significant given the current scale of the fee.
Expected fiscal impact	Estimated additional fiscal revenues 0.2–0.5% of GDP in 2030.	Increase of revenues from this fee of between 31 and 47% over time (assuming fee level increases 10% per year for three years) Fiscal revenues in year 3 would then be equivalent to approx. 0.1% of GDP.	Reduction of local-self-government revenues (19 million EUR in 2020, approx. 1.1% of local government tax revenues) and reduction of administrative cost for local authorities. Local self- governments currently receive 100% of revenues from this fee.
Further considerations for implementation	Firewood, an essential heating source for many Serbian households, could also see price increase. Lower firewood consumption would reduce exposure to air pollution, but income support for poor households would be required to finance alternative fuel use. However, firewood is largely traded outside the formal economy and requires other regulatory tools than taxation.	Consider introducing a feebate component to enable higher fee levels without harming affected sectors' competitiveness. Revising the distribution between national and local government will support reform option 3.	This reform proposal should be implemented jointly with Option 2 or another tax reform with a partial allocation of tax revenues to local self-governments in order to compensate for the loss in revenues.

Note: **Reform options under assessment were selected based on their relevance with respect to current policy priorities in the country, as well as based on relevance in the context of recent EU policy developments and the opportunity for Serbia to align with updated EU guidance.**

For policy reforms to be effective, gain widespread stakeholder support, and be implemented smoothly, it is vital to ensure policy coherence. All three reform options discussed above are complementary in that they could be applied in parallel in a mutually supportive manner with existing policies intended to facilitate energy efficiency and renewable energy deployment. Option 1, Alignment with the Revised EU Energy Taxation Directive (ETD), is also complementary to policies for the provision of subsidies for the purchase of hybrid and electric vehicles. On the other hand, current policies that undermine the impact of the reform options discussed above include the provision of subsidies for inputs for agricultural production (particularly fertilizer and diesel subsidies) and low emission standards for imported vehicles.[23] These and other similar measures should be eliminated to increase the effectiveness of the pro-environment reforms.

In addition, environmental fiscal policy reform needs to consider impacts at the sectoral and sub-sectoral levels in order to gather strong stakeholder support. For example, an increase in the prices of natural gas, coal and electricity that could result from an alignment of excise duties with the revised ETD would increase production costs in related industries. This especially applies to industries that cannot pass the cost on to consumers (such as those exposed to stronger foreign competition) and those with a relatively high energy intensity of production.[24] Unlike elsewhere in Europe, in Serbia, state-owned enterprises (SOEs) account for a very large share of pollution in relevant sectors. This needs to be accounted for through the environmental reform efforts. EPS, which is the biggest polluter in Serbia, is also both the biggest contributor to pollution taxes and the recipient of the greatest proportion of government subsidies.

The revision of Serbian excise duties to achieve alignment with the EU ETD is likely to increase the cost of heating and transportation, which—unless adequately mitigated—will have a disproportionate impact on low-income households. The 2019 Serbian Household Budget Survey data indicates that households in the lowest income decile spend 8 percent of their total household budget on electricity and heating, compared to only 2 percent in the case of the richest decile. A similar tendency also holds true in the case of expenditure on passenger transport. By contrast, the share of gas and other residential fuels to total expenditure is roughly similar across the various income groups. Middle-income households spend a higher proportion of their budget on motor fuels (petrol and diesel) than do the poorest and richest households. Other factors being equal, a five-percent increase in the cost of heating is associated with a four-percent increase in the heating expenditure share for low-income households compared to a one-percent increase for the richest households. This suggests that the poorest households will bear a higher burden. However, this negative impact can be mitigated through the use of the generated tax revenues to fund poverty reduction programs.

2.1.2 Carbon Border Adjustment Mechanism (CBAM) and Carbon Pricing[25]

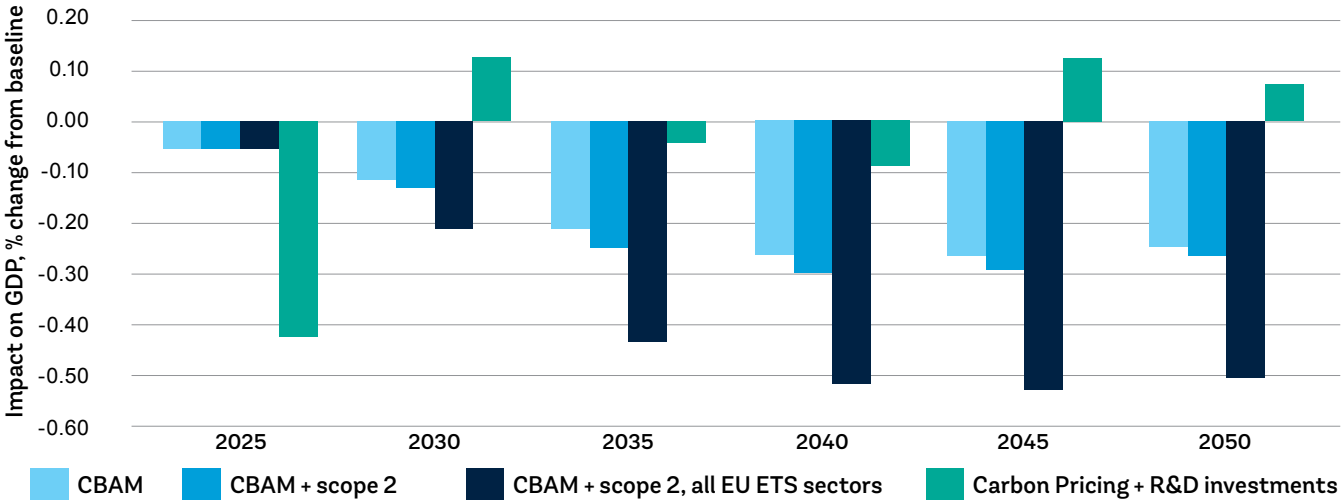
The EU has proposed a CBAM on selected imported goods to commence in 2026 (see Box 2). As the EU is Serbia's main trading partner and given the emissions intensity of Serbia's production processes is 2.5 times higher than the EU average, the CBAM could have major implications for the country's export competitiveness and market access. Based on Serbia's 2021 exports structure, 5 percent of its exports would be covered by CBAM, with this proportion possibly increasing if the CBAM is extended to indirect emissions and/or other sectors, both options currently being debated by the EU.

Box 2. **The EU CBAM**

To protect domestic industries against risks of unfair competition by businesses in jurisdictions with lower or no carbon pricing, the EU has proposed to levy a cost on selected imported goods through a CBAM. The mechanism is narrowly targeted at a relatively small number of products in certain emission-intensive sectors covered by the EU emissions trading system (ETS), most notably cement, iron and steel, fertilizers, aluminum, and electricity. Importers of these goods within the EU will need to present CBAM certificates to cover their embedded emissions multiplied by a price equivalent to the EU ETS auction price. Starting in 2026, the CBAM cost will be slowly phased in at an annual rate of 10 percent, in line with the gradual phase-out of free emission allowances to EU industries, reaching EU ETS price levels by 2035. CBAM will initially cover Scope 1 emissions (direct emissions from controlled sources). Scope 2 emissions (indirect emissions from electricity, heat and steam used in production) and other sectors may be covered in the future. Also, other countries could join the 'climate club' in the future and apply similar climate and trade measures. EU CBAM is not designed to harm the economies of trading partners but to send a signal that a high carbon pricing is an integral component of the economic system within the EU and that the bloc aims to prevent 'carbon leakage' and to incentivize other countries to join global efforts to mitigate climate change. More details are provided in Annex 3.

Macroeconomic modeling[26] suggests that CBAM is likely to have a minimal negative impact on Serbia's economy, while carbon pricing (reinvested in innovation) has the potential to increase GDP above business as usual (BAU). By 2035, Serbia's real GDP would decline by 0.21 percent annually with CBAM in the version proposed by the EC (see Figure 8, light blue bars) compared to the baseline. This would be driven by a decrease in total exports to the EU by 0.62 percent, partly offset by an increase in exports to non-EU countries. Imports of intermediate goods and, to a lesser extent, final goods could decline by 0.59 percent annually by 2035, acting as a counterbalancing driver that limits the deterioration to the balance of trade. Total employment also remains nearly unchanged (a 0.1-percent drop annually) by 2035. These impacts would increase if CBAM extends to Scope 2 emissions (see Figure 8, blue bars) and to other EU ETS sectors (navy bars).

Figure 8. **CBAM and carbon pricing scenarios for Serbia**



Source: Original calculation for this publication.

In the unlikely event that neither the Serbian government nor the country's private sector makes domestic adjustments, the CBAM would affect the net real exports, output, and employment in a few targeted, highly emissions-intensive sectors. For instance, if the EU CBAM is implemented as proposed by the EC, Serbian electricity exports in 2035 would decline by 27.01 percent annually, although with output declining only by 3.96 percent. The export of ferrous metals would decline by 30.55 percent and output by 28.95 percent, as most of the production is exported to the EU. The export of chemical products would decline by 6.53 percent, while the output would drop by 5.63 percent, with both the export and output of non-ferrous metals falling by 3.47 and 3.44 percent, respectively. Negative sectoral employment impacts simulated by the model account for employees who move between sectors in response to policy change. The labor force employed by CBAM-covered sectors would gradually move to other sectors, although active labor market and social policies would be needed to facilitate reskilling, retooling, and relocation of workers and to support those who are unable to make the transition. The greatest losses of employment would occur in the power generation (-3.97 percent), ferrous metals (-28.92 percent), non-ferrous metals (-3.53 percent), chemical products (-5.35 percent), and non-metallic minerals (-1.18 percent) sectors. However, these losses would not have a significant macroeconomic impact because cleaner sectors would record increased output due to the labor and capital shifts. The negative impact on carbon-intensive exports would be greater if the EU extended the scope of the CBAM and/or emissions coverage and if Serbia's non-EU trading partners also applied the CBAM. On the other hand, the EU CBAM proposal allows plenty of time for Serbian businesses to adjust their use of technologies and fuel to mitigate the impact.

While emissions in Serbia can be expected to decline slightly due to the imposition of the CBAM, additional domestic policies are needed to drive investments in technological innovation and efficiency improvements. As CBAM only imposes a cost on the share of products exported to the EU, GHG emissions will decline slightly due to a decline in the output of those exported products (between 2.81 and 5.29 percent annually by 2035 compared to BAU, depending on the scope of the CBAM). More transformative domestic policies are needed to drive investments in disruptive technological innovation and efficiency improvements, particularly if Serbia's other trading partners also choose to apply the CBAM. Policies involving the imposition of energy taxes aligned with the environmental cost of fuels and a domestic carbon price could play a positive role in driving these transformative changes. In addition, the Serbian government could reinvest the revenues it collects in research and development and measures to promote the adoption of the new skills required to facilitate the emergence of a more productive and competitive economy (see Box 3).

Box 3. **Carbon pricing revenue use**

Establishment of a carbon pricing system would generate domestic fiscal revenues for the government, which it could reinvest to amplify the benefits of the system for Serbia's labor force and economy. Modeling suggests that the value of revenues from carbon pricing could amount to between 0.59 to 1.41 percent of baseline GDP annually over the 2025-2050 period.[27] How the revenue is used will affect the macroeconomic and distributional impacts for Serbia, and so it is important to factor this in when assessing these impacts. Measures to recycle these revenues back into the economy are vital for the macroeconomic performance of climate policies, with potential double-dividend effects that may even have positive effects on domestic output and employment. A proportion of the revenue could also be directed to assist individuals, households, or businesses in dealing with any negative impacts of carbon pricing through direct transfers or other policies and programs.

Depending on the economy and energy system structure of a particular country, revenues can be used in different ways to lower the cost of mitigation. Modeling conducted for this report assessed three options: i) reducing payroll taxes; ii) investments in low-carbon research and development; and iii) labor force training. Lowering payroll taxes could have a positive impact on employment and even on GDP in the short term. This is because the cost of labor goes down and Serbian production becomes more competitive. In turn, the increased demand for labor could result in increases in household income. Investments in research and development could increase the total factor productivity of Serbia's production processes, counterbalancing the cost associated with the imposition of climate policies, but knowledge spillovers from and to international markets lower the near-term GDP effect of domestic R&D investment. Similarly, education and labor force training can improve overall labor productivity and thus Serbia's overall competitiveness.[28] This work did not aim to determine the best use of revenue for Serbia, and follow-up work will be required for that.

The carbon pricing scenario presented in this report channels revenue toward a mix of R&D investments and training of the labor force, which can have positive macroeconomic effects, depending on the availability of human capital. Out of the three options described above, R&D and labor training had the highest positive macroeconomic impact. Other uses not assessed in this modeling exercise that could be considered in further analysis include redirecting carbon revenues to low-carbon investments that directly limit the pressure that additional investment requirements impose on the domestic capital markets. This is similar to how part of the revenue is used in the EU, where the ETS Directive requires that at least 50 percent of the auctioning revenue (or equivalent in financial value) is spent by Member States for climate- and energy-related purposes. Revenues could also be partly redirected as lump sum payments to households, which could help manage the potentially negative effects of the carbon price on low-income households. However, further analytical work would be required to assess the impact on different income groups and potential options for compensation measures. Overall, a combination of revenue recycling schemes could provide an optimal double dividend, both in terms of macroeconomic and distributional policy performance.

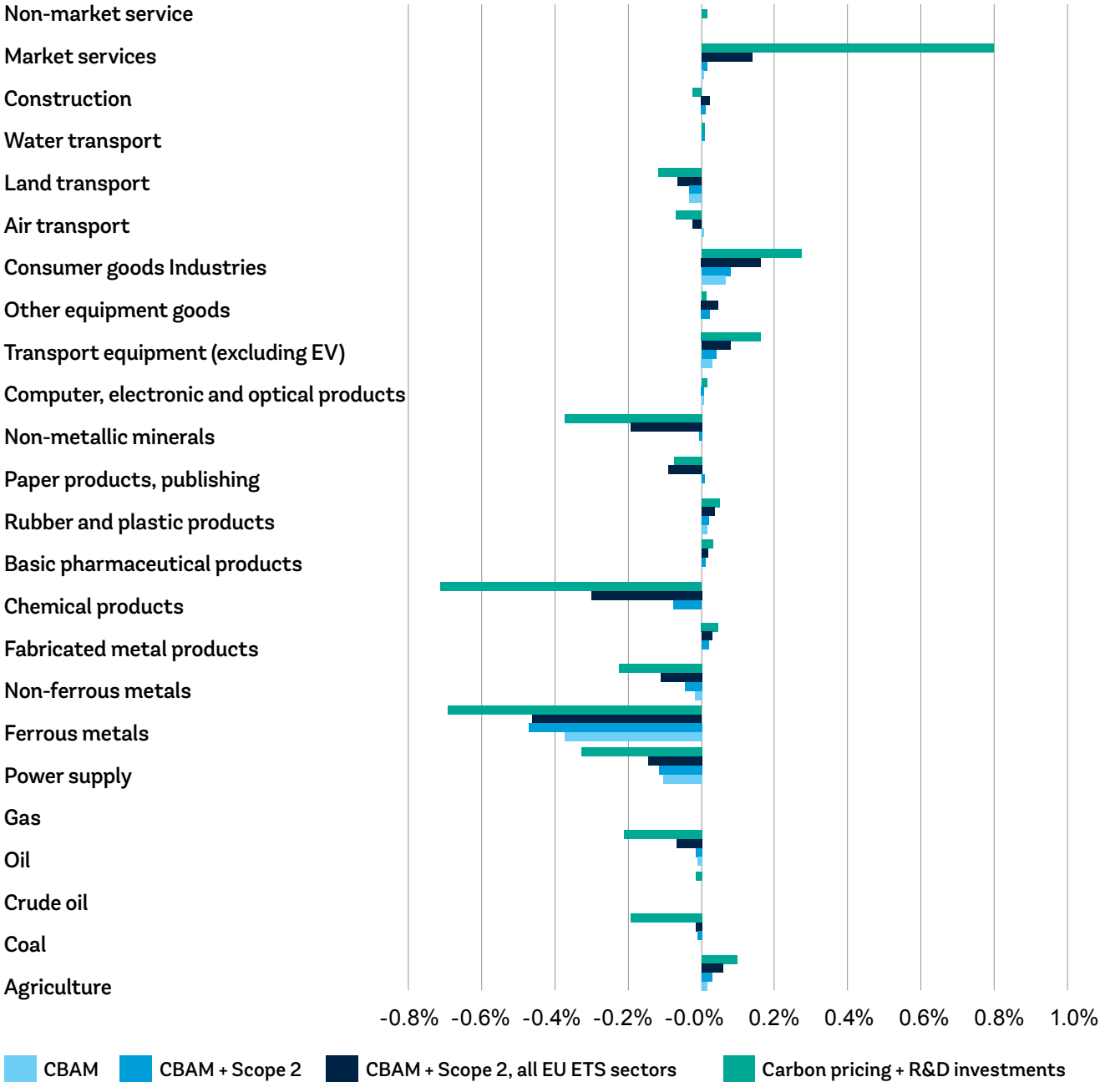
Adopting an explicit domestic carbon price would have only a minor negative impact on growth and could even trigger longer-term productivity improvements that would increase GDP above the BAU scenario. The CGE modeling exercise assumed the introduction of an EU-compatible domestic carbon price (carbon price on EU ETS sectors and an excise tax in line with the EU ETD) and the investment of the revenue in innovation and education.[29] Initial results show that while investments in innovation would result in a very minor, short-term cost to GDP (0.04 percent loss annually by 2035), over time, they would result in increases to productivity boosts that would increase GDP above the 'brown' BAU baseline (see Figure 9, green bars). The imposition of a comprehensive carbon price system would also result in a minor negative impact on overall employment (-0.10 percent annually by 2035) relative to CBAM exposure.

A broad-based, ambitious energy and carbon pricing reform initiative that involves the investment of the resulting revenues in innovation and education would deliver significant climate benefits, reducing emissions by 40 percent annually by 2035 (compared to BAU). At the same time, it would facilitate increased access for Serbian businesses to technologies, know-how, and markets and increased output and employment, compensating for any loss of output from the carbon-intensive industries. The initial costs of investment in innovation initiatives could be partly funded through the use of EU assistance, such as the €3.2 billion first investment package under the EU's Economic and Investment Plan for the Western Balkans, €9 billion Green Agenda Action Plan for Western Balkans, and future structural and innovation funds (if Serbia does become an EU Member State) or through international climate financing initiatives, which would generate further improvements above and beyond the conservative results achieved with the CGE model.

While the impacts of the imposition of a domestic carbon pricing system on emission-intensive sectors may be significant, these sectors account for only a small share of GDP and employment, with this impact offset by the positive impact on larger knowledge-intensive sectors. The most affected sectors will include ferrous metals, chemicals, non-metallic minerals, power supply and coal mining, which taken together accounted for 7 percent of Serbia's total production, 10 percent of exports, and only 3 percent of total employment overall in 2015. This confirms the point made earlier in this report that Serbia's economy does not systemically depend on carbon-intensive industries. Figure 9 and Figure 10 illustrate the structural shift that can be expected in Serbia's economy under alternative policy scenarios. The figures show the percentage change in a given sector's output (Figure 9) and employment (Figure 10) against BAU weighted by the share of this sector in GDP. The results should be interpreted in terms of the contribution of changes in output/employment of individual sectors to percentage changes in country GDP/total employment relative to the BAU (reported here just for 2035). The most disruptive structural transformation would occur under the scenario involving energy tax and carbon price reforms with the reinvestment of additional revenue in research and development (green bars). Under this scenario, the contraction of the ferrous metals sector would result in a decline in GDP of 0.69 percent in 2035 and to a decline in employment of 0.12 percent relative to the BAU. The contraction in the chemical sector would result in a decline in GDP of 0.71 percent and in employment of 0.07 percent, with the figures for power supply at 0.33 percent and 0.11 percent, respectively and for coal at 0.20 percent and 0.25 percent. However, this scenario would increase output and employment through contributions from less emissions-intensive sectors such as market services, lifting national GDP by 0.79 percent and employment by 0.46 percent, through increases to consumer goods (a 0.27 percent increase in GDP and 0.15 percent of total jobs), transport equipment (0.16 percent and 0.09 percent, respectively) and agriculture (0.10 percent and 0.25 percent, respectively). In 2015, these sectors contributed to 56 percent of total GDP and 59 percent of overall employment. These structural shifts away from carbon-intensive sectors and towards knowledge-intensive sectors help to explain why the net macroeconomic impact of carbon prices, energy taxes, and innovation is small and indeed positive in the longer term. Furthermore, the growth and jobs resulting from this transformation are also of higher quality because they are driven by productivity improvement.

Going forward, with Serbia's emissions-intensive sectors facing increasingly severe policy and market risks, separate strategies will be needed to facilitate the structural adjustment and transformation of the economy. Modeling suggests that emissions-intensive sectors such as the coal and ferrous metals sectors are the ones that are likely to record the most severe drop in domestic production by 2035 as a result of the imposition of carbon pricing, due to their highly carbon-intensive content or production process.[30] While the chemical products industry is distributed across the country, coal and ferrous metals industries are more tightly clustered within specific regions, with this creating issues that will require additional attention by policy makers.[31]

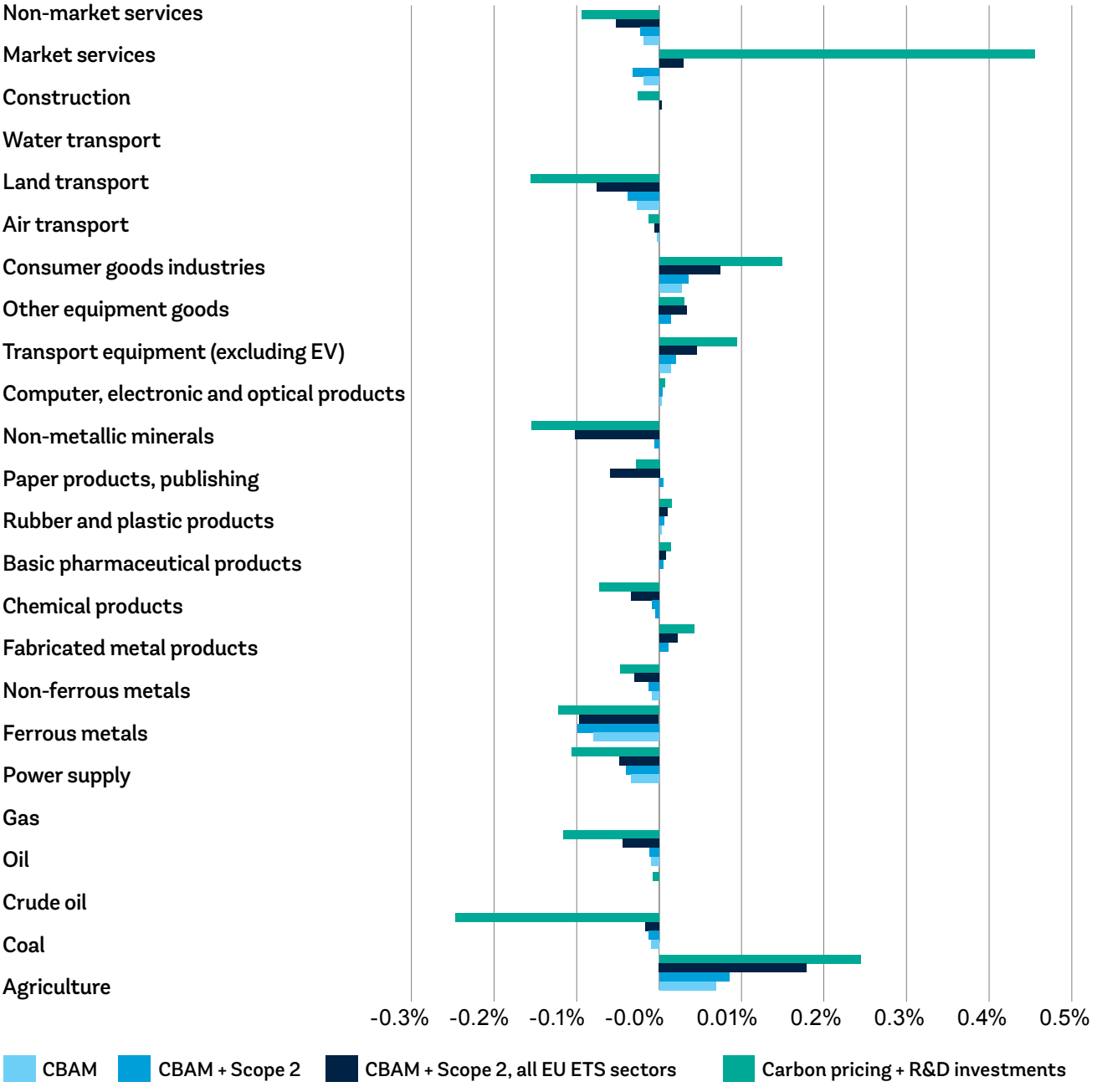
Figure 9. **CBAM and carbon pricing scenarios: sectors contribution to percentage change in country GDP compared to BAU (in 2035)**



Note. For example, a 0.8 percent increase in contribution of market services to Serbia's GDP in the scenario with carbon pricing and R&D investments means that as a result of this policy, the increase of output of this sector would increase Serbia's GDP by 0.8 percent above BAU in 2035. At the same time, the drop in output of chemical products would contribute to the reduction of Serbia's GDP by 0.7 percent below BAU in the same year.

Source: Original calculation for this publication based on GEM-E3 simulations.

Figure 10. **CBAM and carbon pricing scenarios – sectors' contribution to percentage change in total employment compared to BAU (in 2035).**



Source: Original calculation for this publication based on GEM-E3 simulations.

Initial results of the modeling exercise indicate that there is a low risk of carbon leakage in Serbia, which is logical as the main trading partner (EU) introduces carbon pricing.[32] The modeling results indicate a decline in fossil fuel imports due to the impact of carbon pricing on energy consumption and due to a shift towards increased demand for cleaner fuels. It is also expected that there will be an increase in imports of low-carbon technology. There is also a moderate increase in the import of emissions-intensive goods, with imports of power increasing by 3.78 percent, of non-metallic minerals by 2.73 percent, and of rubber and plastic products by 1.6 percent (all figures compared to BAU baseline for 2035, annually). However, overall, the results suggest a low risk of carbon leakage for Serbia. Experiences with carbon pricing in other jurisdictions also provide little evidence to suggest leakage. To the extent that such leakages occur, they could also be addressed through adjustments to the allocation and/or use of revenues derived from carbon pricing.

These initial modeling results may provide significant inputs to enable the authorities to prepare Serbia for the implementation of carbon pricing in line with the EU model. While the EU carbon pricing model may serve as a template for the region, the authorities may need assistance to align Serbia's policies with those of the EU, particularly for interim measures, perhaps involving a transitional period of carbon and energy taxes. Furthermore, the Government may also want to conduct more disaggregated analysis to gain a better understanding of how carbon pricing could affect different stakeholders or different regions and what additional policies may be needed to support those geographic areas, households, and sectors. Also, the authorities will need to intensify their efforts to develop a robust monitoring, reporting, and verification (MRV) framework to manage emissions.

2.1.3 Distributional impacts of the proposed environmental fiscal reform (EFR) and carbon pricing on households and firms

Energy tariffs are the main channel through which households' disposable incomes could be impacted by the proposed environmental fiscal reforms. In general, polluting companies are likely to attempt to pass their increased costs due to environmental fees and carbon prices on to consumers by increasing energy tariffs. In cases where the residential customer tariffs cover the full utility costs, any increase to their costs due to the imposition of carbon prices or energy taxes would have been passed through to consumers, depending on the price elasticity and substitutability of the goods and services. In Serbia, residential customers are largely protected from external market shocks due to the regulation of electricity, heat, and gas tariffs, especially as these tariffs apply to guaranteed supply to residential and other small customers. It is intended that the energy component of residential electricity tariffs (as opposed to the fixed capital cost component) will reach the full economic cost estimated by EPS by 2025. However, planned tariff increases were put on hold in November 2021 due to the steep price hikes during the 2021–2022 energy crisis and the associated disruptions to the global energy market. At the time of the writing of this report, the electricity and gas tariff increase has remained on hold. However, in the mid-to-long term, protected residential consumers may be subject to an increase in the cost of guaranteed supply, with the wholesale price for guaranteed supply gradually catching up with the generation costs and wholesale market prices. If the environmental fiscal reforms discussed in this report are implemented, thermal power and heating plant operators would be required to start paying for the cost of the pollution they create, with this cost currently falling on Serbian society as a whole, and particularly on its poorest members, who are disproportionately impacted by environmental degradation and associated issues. This study did not attempt to quantify the tariff increases that would result from the imposition of the reform measures, as

sufficient details related to planned changes to tariff policy[33] and the specific options of environmental fiscal reforms were not available.

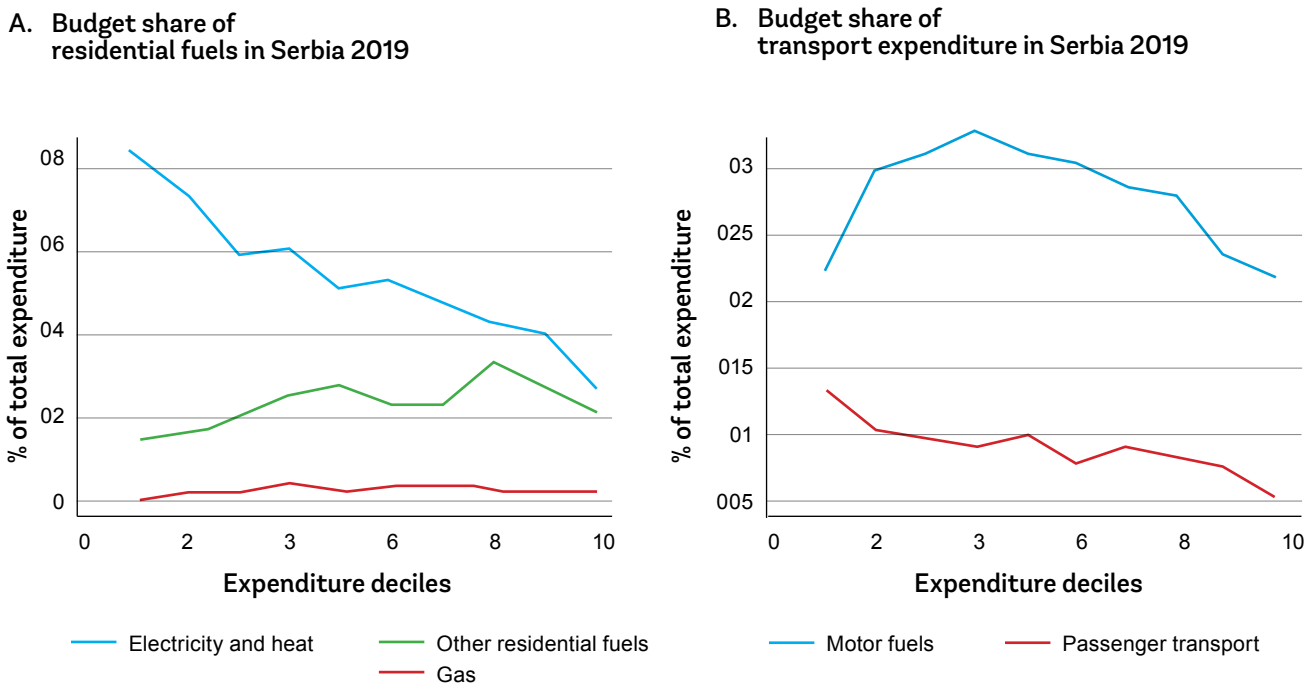
The impact of the reforms on large commercial customers of thermal power and heating plant operators would be different from that on protected residential consumers. These larger commercial customers already buy electricity from EPS under market conditions, with the wholesale market price of electricity pegged to the Hungarian spot market and Austrian Power Future Year-ahead prices until 2027. For EPS, while environmental fees, energy excises, and carbon taxes would increase generation costs and reduce the company's profit margin if the wholesale price (which has significantly increased in Hungary and Austria since 2021) remains above production costs, EPS would remain competitive, and the commercial consumers would not experience any impact of EFR on their offtake prices. Furthermore, the proposed design of the EFR mitigates the risk of a significant impact on profit margins, even if energy prices were to increase (see discussion in the last paragraph of this section).

If EFR or equivalent environmental policies were not implemented, household incomes and welfare would be affected through different channels. At present, the cost of environmental degradation is borne by the victims of the pollution, not by the polluting entities. This environmental degradation exerts upward pressure on expenditure on health care and protection from pollution, with household incomes declining due to the impact of pollution on human capital through diseases and premature deaths. The available evidence indicates that poor households generally experience lower environmental quality than rich households. Hence, these poorer households are more likely to benefit to a relatively greater extent than rich ones as a result of the improvements to environmental quality resulting from the EFR.

The potential distributional impact of the EFR depends on the relative differences between the expenditure of rich and poor households on different energy and transport services. The persistently high electricity prices on wholesale markets and the additional uncertainty resulting from the war in Ukraine are resulting in increased pressure on regulators in the regions to allow operators to make adjustments to tariffs to pass on at least a proportion of the higher costs to residential consumers.[34] If and when that happens, households in the Western Balkans will experience a significant impact as a result of the decreased energy affordability, given that they already spend a relatively high proportion of their household budgets on energy (see Figure 11). While households in the lowest income decile spend on average 8 percent of their total household budget on electricity and heating, the richest decile spends only about 2 percent. Poor households also spend a higher share of their income on passenger transport. The impact of the increases to the emission fees for air pollutants (PM, SO_2 and NO_x) is therefore potentially regressive for households, while also having the potential to increase the thermal energy costs of businesses. In contrast, the share of total expenditure on gas and other residential fuels (including liquefied hydrocarbons, e.g., butane, propane; liquid fuels, coal; and other solid fuels) is roughly similar across the various income groups. Middle-income households spend a higher proportion of their budgets on motor fuels (petrol and diesel) than do the poorest and richest households. Without any compensatory measures, the poor may suffer disproportionately, given their limited room to immediately adjust consumption and fuel sources. For example, a previous simulation analysis for Serbia suggests that an electricity tariff increase by 16.3 percent can lead to an increase in the household budget share for electricity by 0.5 percent and an increase in the overall poverty rate by 1 percent.[35]

The design of EFRs proposed in the report is intended to mitigate the negative impact both on households (especially the poorest and most vulnerable) and on businesses. First, while the proposed reforms recommend pollution fee increases, they also propose the abolition of the so-called fee "for the protection of the environment," since, despite its name, it does not provide any incentives to reduce emissions. Second, if the NO_x pollution is increased to a level close to the marginal abatement cost, the generated revenues could be returned to the same firms

Figure 11. **Budget share of residential fuels and transport by expenditure deciles in Serbia**



Source: Serbian Household Budget Survey 2019.

in proportion to their output (as is the case in Sweden) for modernization expenditures. Third, a portion of net revenues generated as a result of the implementation of the EFR could be utilized to fund social programs to benefit the poorest households, compensating for any decreases in disposable income resulting from energy tariff increases. Revenues generated as a result of the EFR could also be used to reduce households' payroll taxes or to invest in innovation and education to boost firms' productivity and competitiveness (human capital development). The manner in which these additional revenues are recycled should be determined on the basis of comprehensive discussions with all stakeholder groups through the political process, although it will almost inevitably require strengthening and expanding targeted social protection for vulnerable consumers.

While it is vitally important to provide effective protection to poor and vulnerable customers, it is also important that all users are gradually exposed to the full social cost of energy. Maintaining energy prices at artificially low levels constrains the government's already tight fiscal space, without providing protection to those most in need of it, given that untargeted energy consumer subsidies disproportionately benefit richer households and encourage both households and businesses to use energy wastefully and without reference to environmental considerations.[36] The continuation of these subsidies would exacerbate the vulnerability of Serbia's economy to future policy and price shocks related to the green transition and disincentivize Serbian businesses from preparing to compete in the EU market under the emerging Green Deal policies. While a detailed distributional analysis of environmental fiscal reform of the design of social transfer mechanisms was beyond the scope of this current study, it is suggested that follow-up studies should conduct such analysis to enable the authorities to better prepare for the distributional impacts of the reforms.

2.2 Broad and deep sectoral reforms will ensure a fast transition

While the pricing reforms discussed in the previous section are vital to Serbia's green transition, their design will involve careful and lengthy consideration. On the other hand, a number of sectoral reforms could be initiated in the shorter term to support the government's priorities and ongoing work. As noted earlier in Section 1.3, the government has drafted a number of key policies and regulations to address climate challenges and local environmental issues, thus facilitating the transition. This section focuses on four sectoral interventions for which there is strong public demand, government momentum, and potential support from development partners. Annex 4 provides a broad overview of the strengths, weaknesses, opportunities, and threats (SWOT) related to reforms in these sectors as well as climate action, which is a crosscutting agenda.

2.2.1 Energy efficiency

Serbian authorities have implemented a number of initiatives to improve energy efficiency and thus reduce both the demand for energy and carbon emissions, yet these efforts need to be intensified. In the current context of energy insecurity resulting from the war in Ukraine, measures to improve energy efficiency are perhaps the most viable intervention to reduce both energy demand and emissions in the short term.

The residential sector remains the largest consumer of energy in Serbia, largely due to the poor energy efficiency of the country's building stock. The residential sector accounted for 31 percent of Serbia's final energy consumption in 2019, followed by industry (24 percent), transport (25 percent), commercial and public services (9.5 percent), and agriculture and forestry (2 percent).[37] The average specific heat consumption (per m^2) of residential buildings is 37 percent higher in Serbia than the average level for the EU27. About 75 percent of the final energy consumed by Serbian households is used for space and water heating, largely through the use of firewood and coal (36 percent and 12 percent, respectively, in 2018),[38] with these sources of energy used almost exclusively in rural areas.[39] Firewood and coal are often burnt in old, inefficient boilers, leading to negative environmental and health impacts as a result of air pollution, with the use of these fuels raising concerns related to the sustainability of wood harvesting.

The implementation of the EU acquis in the Serbian energy efficiency sector is well advanced, with the largest remaining gaps found in the building sector and in heating and cooling. Serbia has achieved significant progress towards the EU's Energy Efficiency Directive by promulgating the new Law on Energy Efficiency and Rational Use of Energy in April 2021. Amongst other measures, this law established an administrative entity — the Administration for Energy Efficiency Financing and Promotion (EEA) — and strengthened the energy management system and framework for energy audits. The implementation of the EU acquis lags in the building sector and in heating and cooling. For example, in the area of district heating, Serbia has not yet assessed its potential for high-efficiency cogeneration and efficient district heating and cooling, as required by the Energy Efficiency Directive.

Many factors continue to constrain Serbia's initiatives to increase energy efficiency, including the inadequate implementation of legislation, low energy prices, affordability concerns, and limited access to financing. The slow roll-out of consumption-based billing in district heating (which could stimulate energy savings) is just one example of the inadequate implementation and enforcement of the new legislation. Relatively low energy prices reduce incentives to invest in energy efficiency measures. Yet, even at current prices, energy poverty is a growing concern, with households spending about 9 percent of their total budget on space and water heating on average. Low-income households have fewer resources available to finance investments in energy efficiency measures and find it more difficult to access financing. Available funds from public sources (national and municipal budgets) are very limited, with donor-funded programs insufficient to cover all investment needs and with a lack of sustainable (revolving) financial mechanisms.

In the near term, implementing the proposed policy

reforms will require secondary legislation to support the 2021 Law on Energy Efficiency and Rational Use of Energy, together with energy price reforms and the establishment of sustainable financing mechanisms. For effective implementation of the 2021 Law on Energy Efficiency and Rational Use of Energy, many supporting regulations and by-laws will need to be formulated and enforced, particularly to support the establishment of a new energy audit system to assess the energy performance of buildings. In addition, four remaining regulations related to labeling appliances need to be fully implemented.[40] While energy prices are close to or at the cost recovery level, energy taxation is relatively low, leading to relatively low prices compared to elsewhere in the region and to limited incentives to invest in energy efficiency measures and distributed renewable generation. Therefore, the authorities may consider removing price caps and gradually increasing energy taxation (e.g., to account for externalities). At the same time, the government should consider gradually phasing out subsidies for electricity generation from coal and lignite, together with measures to protect vulnerable households against energy price increases. The government could also aim at transforming the EEA to make it financially sustainable and autonomous in matters related to governance, procurement, budget control, and staffing. In addition, the authorities should prioritize the introduction of consumption-based billing in all district heating systems to avoid deterioration of financial sustainability and quality of district heating services.

2.2.2 Air pollution

In Serbia, air pollution is a major health concern, causing thousands of premature deaths and enormous costs to the economy. More than one-third of Serbia's population lives in regions where the air contains at least one pollutant at levels deemed hazardous for human health.[41] The energy sector, residential combustion, and agriculture are the most significant contributors to $PM_{2.5}$ concentrations, at 22.8 percent, 19.3 percent and 12.9 percent, respectively. The emissions from the energy sector result mainly from lignite coal power plants, while in the residential sector, they come mainly from residential solid biofuel burning, particularly heating through burning wood.[42]With the significant negative impacts of air pollution in Serbia, the country's strategic policy framework remains incomplete, with a need to update key legislation to address these impacts. The most recent revisions to the Law on Air Protection were introduced in 2013, and NAPP, which was supposed to be adopted within two years following the adoption of the Law, still remains in the process of being adopted. While the need for a new Law on Air Protection by 2023/24 has been recognized, the draft NAPP outlines interventions aimed at reducing by half the health impact resulting from poor air quality by 2030. It is intended that the forthcoming NAPP will complement the National Plan for the Reduction of the Main Pollutant Emissions from Old Large Combustion Plants (NERP). While this plan was formally adopted in 2020, its implementation has been delayed. The NERP aims to reduce the total annual emissions of SO_2, NO_x, and particulate matter from 12 old, large combustion plants in order to reach limit values of emissions by the beginning of 2028. Since the energy sector contributes to almost half of Serbia's overall $PM_{2.5}$ pollution, most of which derives from coal combustion, it can be expected that the NERP will facilitate significant improvements in air quality.

While Serbia has a good level of alignment with the EU acquis on air quality, it needs to accelerate the implementation of mandated measures. According to the European Commission, Serbia needs to prioritize improving its air quality plans and air quality monitoring system. In particular, the Serbia 2021 Progress Report's key recommendations include the adoption of the EU air quality index and ensuring adequate staffing of the Serbian Environmental Protection Agency (SEPA). However, improved air quality management generally needs more effective support by the government, including through measures to update the Law on Air Protection, implement the NAPP, and strengthen the institutional framework as presented in Section 2.3. Furthermore, as mentioned in Section 2.1.1, there is a need to reform some of the existing fiscal instruments since they do not penalize polluters.

Policy reforms in the near-term need to focus on strengthening the legislative framework for air quality issues and on providing support for the achievement of specific emissions reduction targets in the energy, industrial, and agricultural sectors. Among other measures, these reforms could be conducted through amendments to the Law on Industrial Pollution Prevention and Control (IPPC), the formal adoption of the new Law on Air Protection, and the implementation of the NAPP, including the specific interventions outlined therein. Specific air quality targets aimed at containing SO_2 and $PM_{2.5}$ emissions from the energy sector, achieving compliance with BAT-associated emissions levels in industrial processes and product use, and reducing ammonia emissions from agriculture will require numerous policy reforms to achieve greater alignment with EU legislation. In addition to the actions outlined in the NAPP, an integrated climate change mitigation and air quality management program needs to be implemented to manage potential synergies and trade-offs.

2.2.3 Waste management and Circular Economy

Serbia's economy is characterized by low levels of resource productivity and ineffective waste management. Serbia's economy is only 1.4 percent circular,[43] meaning that almost 99 percent of all materials consumed each year are not recycled for use as secondary raw materials. The low levels of resource productivity can be explained by its relatively high degree of reliance on extracting material resources (e.g., mining and quarrying), and by its ageing and inefficient industrial legacy infrastructure. In 2020, 91 percent of the total waste generated across the economy was landfilled.[44] The separate collection of different forms of municipal waste is rarely conducted, confined mostly to pilot projects by a few municipalities. Recycling rates are low, with eight out of every 10 tons of municipal waste[45] dumped in unsanitary landfills, including an estimated 2,305 illegal landfills (2019).[46] The large number of non-compliant landfills poses a serious threat to the health of the population, environmental safety and biodiversity conservation.

Serbia is committed to the development of Circular Economy strategies and to the construction and maintenance of waste management infrastructure. In January 2022, the government adopted a new National Waste Management Program 2022–2031, which creates a strategic basis for the implementation of investment measures over the next 10 years, with the program mandating the establishment of modern regional waste management centers across the country and the introduction of various economic and other instruments to incentivize a shift towards a circular economy. The latter will also be facilitated by the forthcoming Action Plan (2022-2024) and the Circular Economy Development Program (2022-2024). In addition, the authorities have established various waste management and circularity targets, including targets related to the reduction of municipal waste disposed in unsanitary landfills from 81 percent in 2020 to 17.8 percent by 2031.

Despite Serbia's growing body of waste legislation and a high level of alignment with the EU acquis on waste, numerous barriers to improving waste management remain. Serbia faces major institutional challenges to its initiative to improve waste management, resulting not only from sluggish adoption of policy documents affecting the waste sector but also in significant gaps in monitoring and enforcement of existing legislation. A major weakness of the existing legislative framework is that it provides few economic incentives for environmentally sound behavior and inadequate penalties for illegal practices. For example, waste management fees are calculated per square meter of residential or commercial space and in some municipalities, based on the number of household members.[47] Given that many economic actors in Serbia lack awareness regarding waste management and circular business models, institutional weaknesses and the lack of incentives encourages the widespread practice of illegal landfilling.

Serbia's policy priorities for waste management and for facilitating the emergence of a circular economy are defined by the Waste Management Program and its Action Plan, the forthcoming

Circular Economy Development Program, and by measures to achieve alignment with the EU acquis. There is a particular need to establish effective Extended Producer Responsibility (EPR) systems, tariff models based on the amount of waste disposed, and a landfill tax. However, these measures need to be designed in a way that avoids littering and illegal dumping, which are likely in the absence of adequate monitoring and enforcement. There is a need to strengthen incentives for the private sector through the possible introduction of circular economy vouchers and circularity-related criteria to establish eligibility for state support. There is also an urgency to revise regulations related to by-products and the end-of-waste status to facilitate greater reuse of certain types of waste. To achieve better alignment with the EU acquis, the authorities should facilitate further implementation of the Waste Framework Directive through amendments to the Law on Waste Management.

2.2.4 Water and wastewater

Serbia is affected by a large number of issues related to water and its management, with wastewater management identified as a key local environmental challenge. Other critical challenges include significant gaps in wastewater management and sanitation, freshwater pollution, poor drinking water quality, and excessive water losses, together with water-related risks such as floods and droughts, whose frequency is increasing due to climate change, as stated earlier. A particularly pressing concern is the low percentage of wastewater that is treated (18 percent in 2020; of which 1.3 percent was purified through primary treatment, 11.8 percent through secondary treatment, and 4.9 percent through tertiary treatment). This results in significant environmental and public health hazards, including pollution of surface water bodies. Inadequate connections to sewer systems and the lack of wastewater treatment facilities have resulted in a low rate of safely managed sanitation services. In fact, less than 20 percent of Serbia's population has access to safely managed sanitation services.

Serbia's water supply network experiences losses of 41 percent of supplied water,[48] significantly higher than the average level for the EU. There have been no significant improvements in this area over the past decade, indicating a lack of investment in the maintenance and upgrading of aging infrastructure. With increasing energy prices having a particularly severe impact on less efficient utilities and with the expected impacts of climate change, high levels of water losses are becoming an increasing cause for concern.

Sector financing is inadequate and constitutes a major constraint on network maintenance and on the renewal and expansion of infrastructure, both of which will require huge investments to address adequately. At present, tariffs barely cover operational and maintenance costs, with average[49] residential tariffs being significantly lower than the regional average. The price of drinking water and wastewater treatment is relatively low at 0.61 EUR/m^3 (or 1.2 percent of the average household budget) compared to the average for EU countries.[50] As a result, subsidies from local budgets are sometimes required to cover the operational costs of water utilities and, to an even greater extent, investments in infrastructure. In most cases, water utilities largely rely on external sources to finance capital expenditure. The cost of achieving compliance with EU standards is estimated to stand at around five billion euros (40 percent for drinking water supply and 60 percent for sanitation), or an average of 32 euros per inhabitant per year for the next 20 years, around twice the current annual investment rate.

While Serbia's water sector legislation is comprehensive, the division of mandates is unclear, resulting in a lack of a sense of ownership by the responsible entities. Responsibilities for the water sector remain divided among many different ministries and agencies. There is also no regulatory agency charged with the overall responsibility for establishing rules and regulating service provisions related to the water supply and sanitation sectors. The primary legislative instrument to establish a legal basis for water management and water protection is the Water Law[51], with an associated set of bylaws and regulations. The authorities have also formulated the Water Management Strategy as a planning document to guide the long-term direction of the country's water

management until 2034.[52] To implement the Water Management Strategy, the authorities have developed an initial Action Plan for 2021-2023.[53]

To address Serbia's water challenges in the near-term, the authorities' current policy priorities include strengthening governance, adopting the new water law, setting effective tariffs, finalizing new planning instruments, and further alignment with the EU acquis. At the national level, clarification and definition of the roles and duties are needed to improve the efficiency and effectiveness of water policy. To achieve this, the authorities need to adopt the newly drafted Water Law and formulate and implement associated regulations. With low water tariffs in Serbia, the authorities should set the tariffs in accordance with the cost recovery principle. Furthermore, the River Basin Management Plan and the first Flood Risk Management Plan need to be finalized to guide the planning of investments in Serbia's water sector. Finally, measures to further align Serbia's water-related legislation with EU standards will be necessary, particularly regarding the institutional framework for enforcement, monitoring, and coordination.[54]

2.3 Strong institutions are needed to sustain the transition to greener and more resilient growth

Given that strong institutions form the foundation for effective reforms, Serbia has the means to address many key institutional weaknesses that constrain the effective implementation of needed interventions across sectors. Generally, the effectiveness of Serbia's government institutions has been assessed as only slightly lower than that of Bulgaria and Romania at the point prior to their EU accession, suggesting that Serbia is capable of scaling up its capabilities to the necessary levels.[55] As an upper middle-income country, Serbia has a high proportion of workers with tertiary education, providing a pool of talent upon which to draw. Hence institutional strengthening has the potential to support the transition to greener and more resilient growth, as further outlined in Annex 5 with examples for addressing air pollution and climate mitigation.

While the government needs effective policies and regulations to address the challenges related to the transition to greener and more resilient growth, their implementation is predicated on institutional capacity. As noted in the Action Plan for Administrative Capacity Development submitted to the EU as part of Chapter 27, there remains a significant gap in Serbian institutions' staffing needs. Furthermore, there is a lack of effective local institutions to support the implementation of regulations.[56] In particular, three main institutional issues need to be addressed: i) a gap in human resources (quality and quantity) available to the public sector; ii) a lack of cooperation and coordination across institutions and levels of government; and iii) inadequate accountability.

Given the cross-cutting nature of policies to achieve a green transition, multi-sectoral coordination is particularly relevant to achieve progress. The authorities have made efforts to improve multisectoral coordination through the establishment of the National Climate Change Council (NCCC) under the 2021 Law on Climate Change. This newly established entity needs a high level of government oversight (e.g., under the Prime Minister's Office). This would also enable the more explicit mainstreaming of the green agenda across sectoral strategies and plans, with leadership provided by core institutions. In addition, with the right incentives and support, local governments could also act as catalysts for greener growth solutions. For example, the Law on Air Quality assigns the mandate for the preparation of air quality plans and the operation of the local network for air quality monitoring to local governments. However, a number of institutional challenges constrain implementation, including limited capacities at the local level and a lack of communication and coordination between local agencies and those at the national level.

Ensuring the effective and systematic enforcement of policies and regulations requires adequate staffing and capacity within the responsible

institutions. Inadequate enforcement is the result of weak regulations and inadequate institutional capacities (e.g., in the drafting and implementation of environmental regulations). For example, in the case of local self-governments (LSGs), the penalties defined under the Law on Renewable Energy Sources (RES) are either not authorized by the regulation or are so low that they do not encourage the heat distribution company to provide access to the grid for heat energy from RES. Likewise, the capacities required to conduct effective inspections are also insufficient. It is estimated that measures to improve staffing to adequate levels through approving new positions, agreeing on allocations, developing job descriptions, and recruiting, could take at least two years.

Work force planning and related budgetary allocations need to be strengthened to support institutional needs and ensure that necessary capacities are in place. Even though Serbia prepared Action Plan for Administrative Capacity Development (APACD), which it submitted to the EU as part of Chapter 27 negotiations, there is a significant gap in the staffing needs. For instance, based on APACD, the reinforcement of administrative capacity for air quality is necessary on all three levels of government (national, provincial and local). This is especially relevant in the case of SEPA and LSGs, which lack capacities in terms of staff, budget for accreditation and maintenance of monitoring systems, development and implementation of air quality plans, etc. Moreover, the APACD does not consider the institutional needs and capacities needed for the introduction of new policy reforms and measures, as illustrated in the examples below. These additional capacities and related positions haven't been included in the workforce planning, nor have they been budgeted yet.

The introduction of policy reforms and measures will have an impact on the institutional frameworks needed for their implementation. While the draft NAPP and the draft Low Carbon Development Strategy (LCDS) and Action Plan provide several such measures, they require policy/regulatory and institutional support for their effective implementation (see Box 4). In particular, it will be necessary either to enhance SEPA's capacity in terms of quantity and quality or to develop some form of collaboration with technical institutes and academic institutions. To effectively implement the environmental fiscal reform options discussed in this study, the authorities will need to introduce many major changes to the institutional framework. The necessary changes include measures to increase the capacities of policy makers to design targeted measures and financial support mechanisms, manage the reporting and calculation of fee levels (e.g., through improved IT systems and coordination with local registries), and improve local enforcement of reporting requirements on emissions, among others.

To improve institutional efficiency, potential gains could be realized through ongoing digitalization, which could ease the cost and burden associated with establishing effective systems for environmental and emissions-related permits and reporting. The authorities' ongoing efforts to establish an IT system to monitor, report, and verify (MRV) progress towards the fulfillment of international climate commitments is a step in that direction. It is expected that this initiative will be expanded to cover GHG emissions from specific installations, which will ease integration with the EU Emission Trading System. With the possible introduction of CBAM and carbon pricing, it could be challenging and resource-intensive to track the emissions resulting from the production of complex products. To address this, further use of IT solutions could be explored to facilitate implementation without compromising the security and integrity of the system. ■

Box 4. **Institutional resources required for the effective implementation of measures associated with Serbia's transition to greener and more resilient growth**

Draft National Air Protection Program and Action Plan Measure 1.1.2: Enforcement of the EU Directive 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants

This regulatory measure is aimed at supporting alignment with EU Directive 2015/20193 on Medium Combustion Plants (MCPDs). It includes four activities: i) finalizing a work program for full alignment of the national legislation with MCPs; ii) establishing a reporting system and database for medium combustion plants (MCPs); iii) implementing measures to improve and increase human resources in Serbian institutions to enable them to effectively manage MCPDs (and also other installations, such as small combustion plants (SCP) and domestic appliances); and iv) implementing measures to ensure compliance of MCPs with BAT Achievable Emission Levels (AELs).

For the effective implementation of this regulatory measure, the Law on Air Quality must be amended and a regulation promulgated on emission limit values of pollutants in the air from MCPs. In terms of technical capacities, efforts to improve monitoring and reporting by SEPA are necessary. While an inventory of MCPs is available, an effective reporting system has not yet been established. Currently, SEPA is extending its IT system to cover the reporting of emissions from pollution sources to the local level. This system is intended to enable the monitoring and reporting of MCPs´ emissions through these local pollution registries. However, improvements to IT systems at both local and national levels will be required to ensure an effective and fully functioning system.

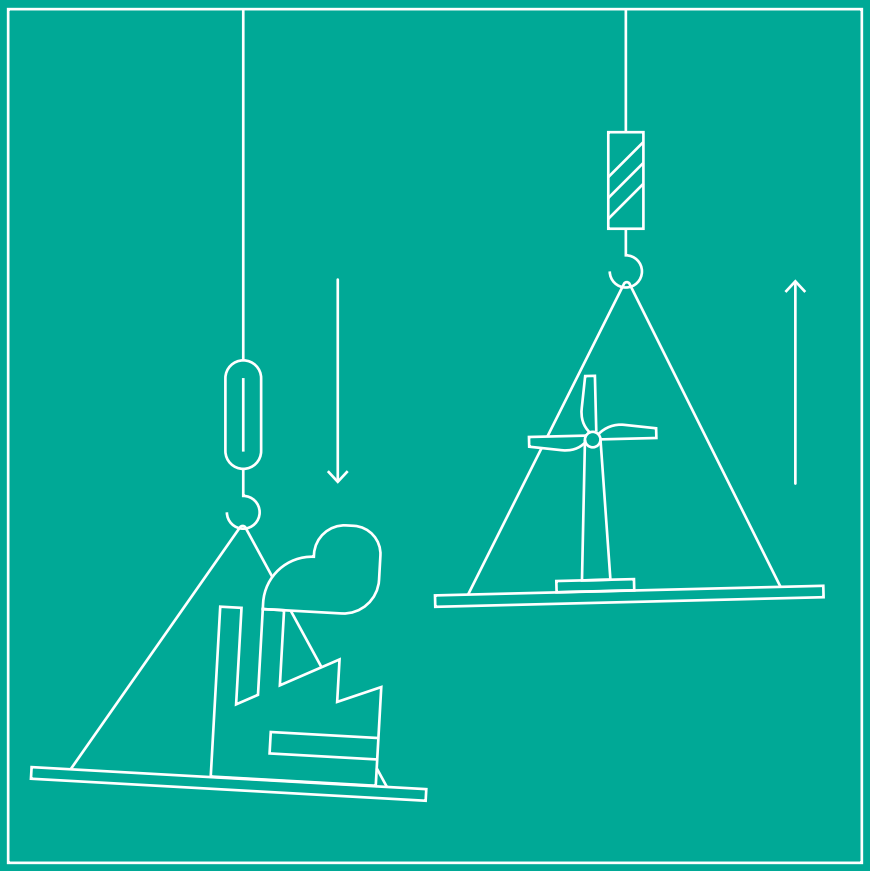
Furthermore, improvements to institutional capacities are necessary to enable effective enforcement and compliance. In particular, measures to improve capacities within the MEP, the Autonomous Province of Vojvodina (Provincial Secretariat for Urban Planning and Environmental Protection) and SEPA are required, with these institutions needing dedicated staff with expertise in MCPD, SCP, and domestic appliances.

Draft Low Carbon Development Strategy and Action Plan Measure 8: Energy efficiency, improvement of heating and cooling infrastructure and promotion of the use of renewable energy sources (RES) in households

This measure involves a combination of regulatory and financial tools to replace inefficient equipment with Eco Design compliant boilers and heaters and to facilitate extending District Heating (DH) to more consumers and greater use of RES in buildings. The regulatory framework changes required under this measure have been partially completed, with the Ecodesign Framework Directive transposed in December 2021, although implementing regulations has yet to be enacted. Minimum requirements for the use of RES for heating in new and renovated buildings will need to be defined, although such measures have not yet been included in the legislation on energy efficiency in buildings.

In terms of the overall institutional framework, the lead agency, the Ministry of Mining and Energy (MoME), is well positioned to take on the implementation of these measures, as it has benefited from the most recent workforce planning in October 2021. To facilitate the replacement of obsolete, inefficient solid fuel boilers with Eco Design boilers or heat pumps, this measure foresees the provision of financial incentives. Although mechanisms for the disbursement of incentives from MoME to local self-governments (LSGs) with households as final beneficiaries were tested in 2021, the disbursement of these financial support measures to a large share of households will require additional resources. At the national level, the Directorate on Energy Efficiency will play a key role, requiring the building and development of additional capacities. The same is true for the LSGs, which would also require dedicated staff, with a number of such staff depending on the size and number of households not connected to the district heating or gas supply.

Similarly, in addition to the improvements in its capacity to manage funds, the Directorate needs to strengthen its capacities to conduct communication and awareness campaigns on the importance of replacing inefficient equipment. The LSGs will need to play a multiplier role to ensure the effective dissemination of awareness raising activities, with most LSGs currently not having adequate capacities for this purpose.



3. Managing transition risks and charting a course to greener and more resilient growth

With the EU moving towards an innovation and knowledge-based green growth model, Serbia will need to proactively prepare for the transition and adapt not only to increasing demands from its own citizens for improved environmental management but also to external drivers. This report makes the case that by acting in anticipation of emerging megatrends, Serbia can successfully navigate the transition risks by capitalizing on the opportunities presented by the emergence of the new greener economy, especially on the pathway to EU accession. Serbia needs a set of well-formulated, transparent policies, particularly fiscal policies, accompanied by the appropriate implementing regulations and strong institutions to facilitate a transition that will enable it to be more resilient to external shocks and competitiveness and achieve higher levels of sustainable, inclusive growth, and greater job creation. Businesses, investors, and financial institutions expect more clarity on the long-term strategic direction of Serbia's development as well as policy consistency while maintaining flexibility and adaptability to change.

While inconsistent price signals are still one of the most significant constraints to Serbia's transition to greener and more resilient growth, transformation in this area is being driven by internal and external drivers of change. As this report makes clear, the lack of adequate pricing of resources and environmental externalities, like air pollution, distorts investment decisions and contributes to low productivity in energy, water, waste, and industrial sectors in particular. The environmental fiscal reforms suggested in this report could incentivize the greening of Serbia's enterprises, including through measures to link energy and resource prices to environmental taxes and to phase out environmentally harmful subsidies to polluting industries. For example, the reform of air pollution fees could create much needed incentives to encourage enterprises to adopt air pollution abatement and mitigation measures while correcting the distortionary tax burden on businesses and improving the tight fiscal position of the government. The reforms could include the abolition of the ill-targeted fee for the protection and improvement of the environment, which would reduce the tax burden on the economy without detrimental impacts on the environment and fiscal space. With the forthcoming introduction of CBAM, Serbia's adoption of carbon pricing and implementation of a few other environmental policy reforms, including alignment with the EU ETS, create a greener and more resilient pathway to EU integration.

The proactive alignment of energy taxation with the evolving ETD and adoption of carbon pricing could enable Serbia to mitigate risks associated with the CBAM, creating stronger incentives for firms and households to innovate and change their profile of investment and consumption choices. While CBAM would not bring fiscal revenues to the government (as the payment goes to the EU), energy excises and carbon pricing could generate revenues that the government could reinvest in social protection of vulnerable energy consumers and in building the country's research and development capacities and fostering the new skills required for participation in a more productive and competitive economy. The base for carbon pricing revenues could be broader than the exports targeted by CBAM, which is focused on a limited group of sectors. However, over time, the scope of the CBAM is likely to expand to other sectors, with its gradual phasing in providing plenty of room for Serbian exporters to modernize and avoid the negative impacts of CBAM. However, given its narrower sectoral focus, CBAM is expected to have a relatively small overall impact on emissions (only 2–5 percent) as compared to 38 percent with the imposition of carbon pricing. The impact of an energy tax increase and carbon price on different economic sectors could also be better targeted to facilitate structural transformation, with a shift away from energy-intensive sectors and towards more knowledge-intensive ones, especially if associated with revenue recycling to pro-employment and productivity-enhancing innovation.

In its efforts to facilitate the transition to greener and more resilient growth, Serbia is constrained by a number of major institutional deficiencies that impact its ability to improve environmental management, and these deficiencies must be addressed as a matter of urgency. Serbia's lack of institutional capacities in the areas of environmental

and climate management is a frequently cited issue in the European Commission's annual EU accession progress reports. To address these, the authorities should focus on measures to improve inter-institutional cooperation, strategic investment planning to raise environmental investments, and overall management, including measures to increase the transparency of governmental procedures. As part of Chapter 27 negotiations on the environment, Serbia has made bold commitments to enhance capacity, as described in the Action Plan for Administrative Capacity Development submitted to the EU. This Action Plan recognizes the need to strengthen capacities not only through the deployment of additional personnel and the provision of enhanced training but also through organizational and structural improvements, including the development of improved coordination mechanisms between relevant ministries and across levels of government; greater accountability from the central to the local government level; strengthened financial management and control in administrative units, including better capacities to manage funds; and more clearly defined career paths to attract qualified professionals able to facilitate the shift towards a new knowledge-based, green economy.

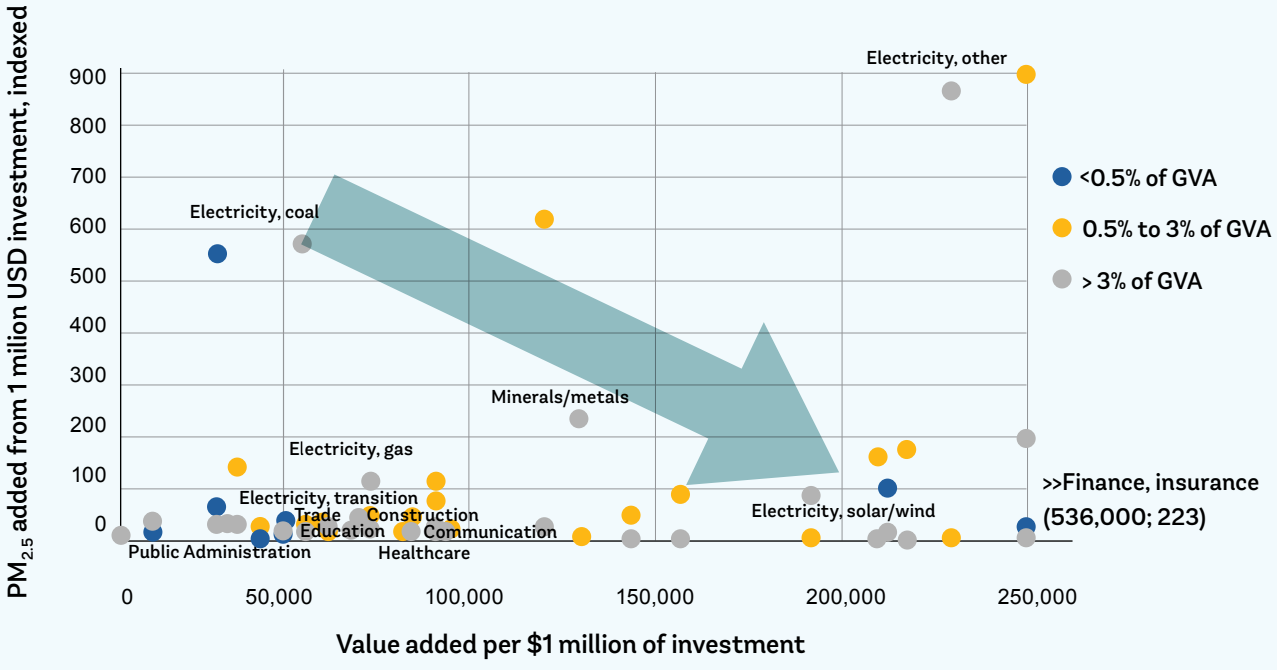
The government has not yet adopted the strategic documents necessary to provide a roadmap for its transition to greener and more resilient growth, thus constraining its ability to attract investments and finance innovation to facilitate this transition. As noted throughout this report, there have been significant delays in the adoption of key strategic policy documents, which are essential to guide national and sectoral action and investments to support greener and more resilient growth. These include the Integrated National Energy and Climate Plan, the Energy Sector Strategy, the second Nationally Determined Contribution, the National Air Protection Program, the Flood Risk Management Plan, and the Circular Economy Development Plan. All these documents provide a potential menu of reform options that the government intends to pursue. However, even where strategic documents are in place, implementation is often at an early stage, with monitoring and enforcement measures remaining insufficient. For example, the new Waste Management Program 2022–2031 explicitly acknowledges that the previous program was not fully implemented.

Serbia's transition to greener and more resilient growth will require a coordinated 'whole of government' effort to create the conditions necessary for increased growth driven by environmentally friendly sectors that are characterized by high returns on investment. Policy reforms should aim to establish an environment that is conducive to increased investment in sectors that can promote more rapid growth and that have a less detrimental impact on the environment and climate. Multiplier analysis could provide insights on expected increases in emissions and value-added in response to additional investment and demand (see Box 5).[57]

Box 5. **Supply-side multiplier analysis**

GTAP-based multiplier analysis shows that in Serbia, sectors with the highest investment-side value-added multipliers and the lowest $PM_{2.5}$ and GHG multipliers are the services sectors (finance/insurance in particular) and renewable electricity, with the converse holding true for the conventional electricity sector, which is heavily dependent on coal and which provides small returns on investment and is a big polluter. Many other sectors have medium value-added multipliers and also show low $PM_{2.5}$ and GHG multipliers.[58] A successful transition to greener and more resilient growth would require an increased reliance on sectors that have higher value-added multipliers and lower emissions (shown by the green arrow on the graph) while also supporting sectors with both low and high value-added and high levels of emissions to improve both their economic and environmental performance.

Figure 12. **Value added multiplier and $PM_{2.5}$ multiplier (supply side)**



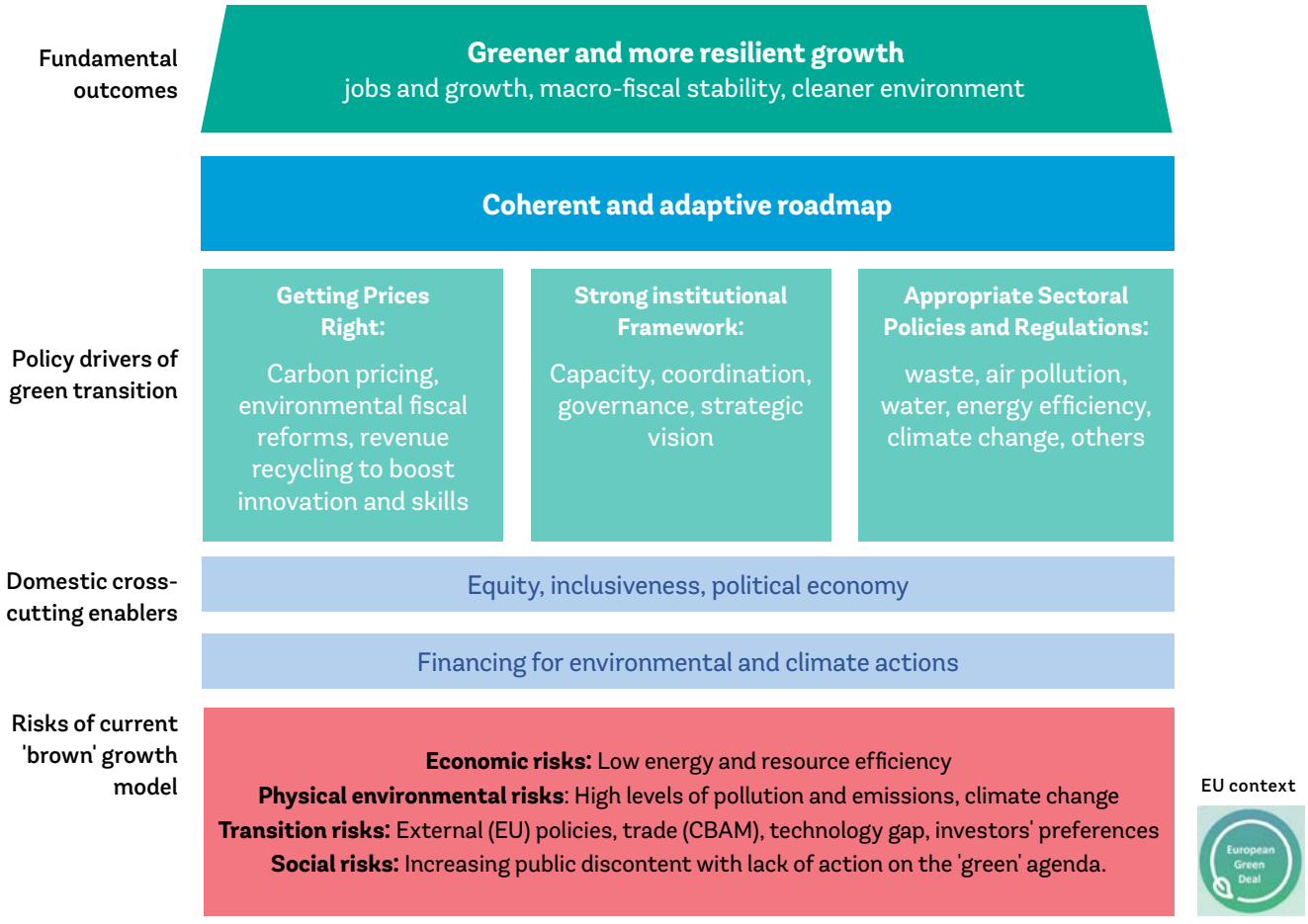
Note: Data labels provided only for sectors >3% of GVA in 2020. Not all sources of $PM_{2.5}$ covered.
Source: Original calculation for this publication based on Taheripour et al. 2021, GTAP, and SORS 2021.

The implementation of green policies is negatively impacted by Serbia's overall regulatory environment, which is often characterized by a lack of secondary regulations to ensure the effective implementation of legislation. This also has an impact on the institutional mechanisms required for implementation. For example, there is a need to adopt secondary legislation to support the implementation of key policies and laws, including the Law on Climate Change, Law on Renewable Energy Sources, Law on Energy Efficiency and Rational Use of Energy, to name only a few. The long delays in the formulation and adoption of secondary legislation not only delays implementation, but also sometimes results in the need for the adoption of completely new laws, given the sheer number of amendments that must be made.

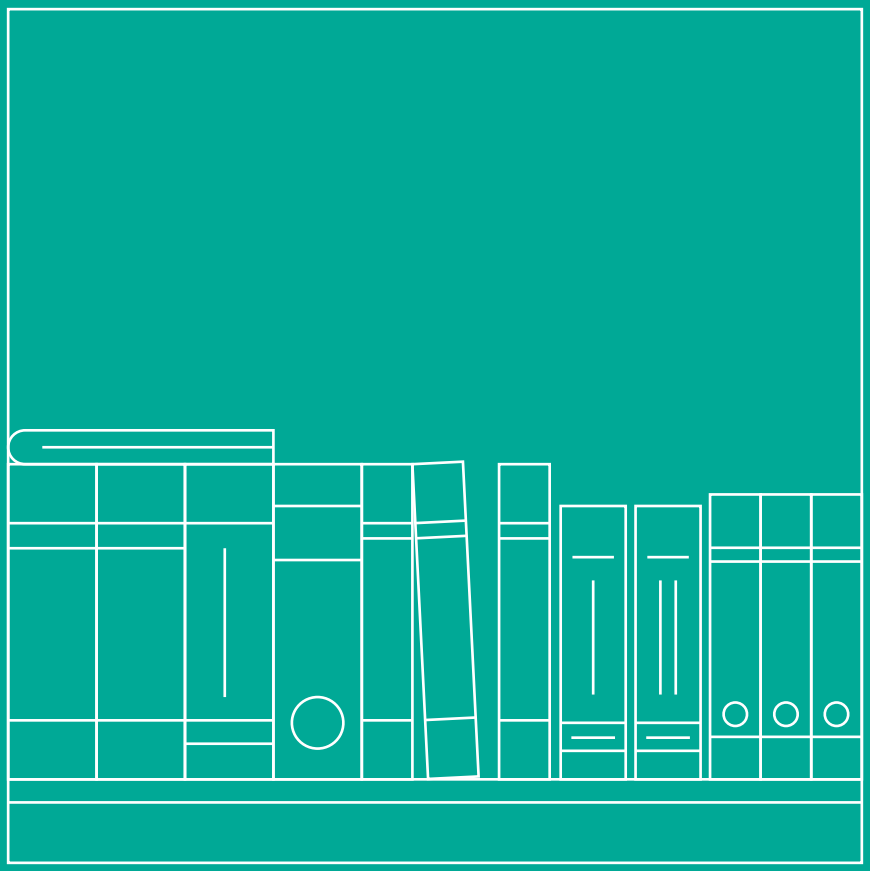
Economic shocks related to the COVID-19 pandemic, the war in Ukraine, and the ensuing energy crisis may make the transition to greener and more resilient growth appear more challenging, but they also have unveiled its urgency and systemic importance. Recent energy price spikes have given new life to old concepts of energy security, with some renewed calls for the achievement of energy autarky through reliance on domestic coal (especially non-tradable, low-quality lignite) rather than the adoption of a more sustainable approach through diversification of sources, fuels, technologies, and routes, which underpins the EU energy security strategy. However, in the coming years, as global supply and demand for oil and gas rebalance again and the EU accelerates green energy transition diversification and greening of energy sources and supply routes, combined with energy efficiency, system flexibility, and integration with regional and European energy networks will be the most robust strategy to energy security and resilience to external shocks. Further, reductions to the use of coal/lignite will not be without challenges, given structural dependencies and the socio-economic implications for certain regions and income groups. However, this transition can be manageable given Serbia's geographical position, endowments, regional integration and access to pre-accession and future EU funds.

Serbia would benefit from developing a coherent and adaptive roadmap to support the transition to greener and more resilient growth. This could lead to numerous benefits for the Serbian economy and its citizens, including jobs and economic growth, macro-fiscal stability, and a cleaner environment. However, to get there, the government will need to address key policy drivers in terms of appropriate economic incentives, strengthen institutions, and put in place the right sectoral policies. The price increases related to the green transition need to be well informed by the local political economy and complemented with distributive welfare measures to ensure that they are inclusive and equitable. Financing for some of the measures could be through carbon pricing and energy taxation, and the revenues could be further reinvested in innovation and education to facilitate economic and structural transformation. Carbon pricing has the additional benefit of reducing the impacts of EU CBAM on Serbia's economy. The roadmap could help mitigate the risks of the current 'brown' growth model, as shown in Figure 13, which also provides an organizing framework to support the transition to greener and more resilient growth in Serbia. ■

Figure 13. **Organizing framework for the transition to greener and more resilient growth in Serbia**



Source: Original elaboration for this publication.



[1] Global Alliance on Health and Pollution (GAHP) and The Lancet Commission on Pollution and Health. 2019. Pollution and Health Metrics. Global, Regional, and Country Analysis. Geneva: GAHP. https://gahp.net/wp-content/uploads/2019/12/PollutionandHealthMetrics-final-12_18_2019.pdf.

[2] World Bank. 2019. New Growth Agenda: Boosting Productivity for Faster Growth, World Bank.

[3] Data refer to 2014-2017, based on the 2019 World Bank Country Economic Memorandum.

[4] Perović, V., Kadović, R., Đurđević, V., Pavlović, D., Pavlović, M., Čakmak, D., Mitrović M. Pavlović, P. 2021. Major drivers of land degradation risk in Western Serbia: Current trends and future scenarios. Ecological Indicators, 123, 107377.

[5] https://www.srbija.gov.rs/vest/en/164639/environmental-protection-one-of-the-priorities-for-government.php.

[6] Public opinion surveys were completed in November 2021 and March 2022.

[7] According to a recent World Bank report, $PM_{2.5}$ caused an estimated 12,578 premature deaths in Serbia in 2019 or some 144 deaths per 100,000 population. The annual costs of health damages from $PM_{2.5}$ amounted to the equivalent of 18.9 percent of Serbia's GDP, the highest share worldwide.

[8] On average each year, about 45 thousand people emigrate from Serbia to OECD countries.

[9] https://www.energy-community.org/legal/cases/2021/case1021RS.html

[10] Statistical O wffice of the Republic of Serbia. 2020.
Progress Report on the Implementation of Sustainable Development Goals by 2030 in the Republic of Serbia.

[11] https://www.iea.org/countries/serbia.

[12] https://www.iea.org/countries/serbia.

[13] https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx.

[14] https://www.serbianmonitor.com/en/serbia-will-continue-to-use-coal-despite-environmental-threats/.

[15] Source: Original elaboration for this publication.

[16] https://energy-community.org/news/Energy-Community-News/2020/01/15.html.

[17] https://www.rcc.int/docs/596/action-plan-for-the-implementation-of-the-sofia-declaration-on-the-green-agenda-for-the-western-balkans-2021-2030.

[18] https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1811.

[19] Prime Minister's meeting with Chancellor Angela Merkel in September 2021.

[20] Application of the polluter-pays principle means that polluters, rather than victims, bear the cost of pollution, including the cost of public measures taken to prevent, control, and remedy pollution. When the principle is applied, polluters are incentivized to limit pollution to efficient levels, and sufficient revenues are generated to remedy all caused pollution. Full application of the principle requires availability of low-cost tax collection mechanisms. Limitations therefore apply where tax collection effort is high due to high informality or structure of the tax base.

[21] Subsidies are understood here broadly in line with the EU state aid, WTO and OECD definitions as direct fiscal transfers as well as and subsidies implicit in tax exemptions and many other forms of government support that gives the recipient an advantage on a selective basis.

[22] The EU's ETD entered into force in 2003 and lays down structural rules and minimum excise duty rates for the taxation of energy products used as motor fuel and heating fuel, and electricity. The revision as proposed in 2021 brings two main areas of reform: (1) a new structure of tax rates based on the energy content and environmental performance of the fuels and electricity and (2) a broader taxable base by including more products in the scope and by removing some of the current exemptions and reductions.

[23] Note that regulatory measures for reducing pollution from vehicles are foreseen in the draft NAPP.

[24] In the extreme case of the fertilizer industry, the price of natural gas determines 60–80 percent of total production cost.

[25] This analysis was undertaken before the war in Ukraine and related price increases.

[26] Simulations of multiple scenarios were conducted with GEM-E3 computable general equilibrium (CGE) model—the same that was used for Serbia's Low Carbon Development Strategy.

[27] See annex for assumptions on the baseline scenario.

[28] However the effectiveness of labor force training and R&D investments is contingent on the availability of human capital.

[29] This is the most likely scenario since it is aligned with the EU accession process and commitments like the Sofia Declaration on the Green Agenda for the Western Balkans.

[30] Domestic carbon price at EU ETS Allowance levels and excise tax revision.

[31] Once part of the EU, support to develop targeted industrial, labor and social policies for affected regions and industries in Serbia would be available through mechanisms like the Modernization and Just Transition Fund. Nevertheless, challenges from the broad, structural economic adjustments partly triggered by a carbon price will create new winners and losers and the issues in navigating these changes should not be underestimated.

[32] The risk that firms may lose business, profits, or market share to competitors operating in jurisdictions with a lower or no carbon price.

[33] https://www.prosperoevents.com/serbia-to-join-europe-in-instituting-electricity-price-increase/.

[34] World Bank. 2022. Steering Through Crises. Western Balkans Regular Economic Report; 21. Washington, D.C.: World Bank.

[35] World Bank. 2016. Serbia First Public Expenditure and Public Utilities Development Policy Loan.

[36] World Bank. 2022. Steering Through Crises. Western Balkans Regular Economic Report; 21. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/37368 License: CC BY 3.0 IGO.

[37] https://www.iea.org/countries/serbia.

[38] Eurostat. https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do.

[39] Statistical Office of the Republic of Serbia, 2011 Census.

[40] To implement the energy efficiency law and fully implement the Framework Labelling Regulation (EU) 2017/1369.

[41] World Health Organization. 2009. Environment and Health Performance Review Serbia, https://www.euro.who.int/__data/assets/pdf_file/0008/95345/E93534.pdf

[42] McDuffie, E.E., Martin, R.V., Spadaro, J.V. et al. 2021. Source sector and fuel contributions to ambient $PM_{2.5}$ and attributable mortality across multiple spatial scales. Nat Comm 12, 3594. https://doi.org/10.1038/s41467-021-23853-y

[43] Statistical Office of the Republic of Serbia, Eco-Bulletin 2020.

[44] Statistical Office of the Republic of Serbia, Eco-Bulletin 2020; although the GRID diagnostic estimate is 95 percent.

[45] Waste Management Program 2022-2031.

[46] Circular Economy Development Program in the Republic of Serbia for the Period 2022-2024

[47] EEA. 2021. Municipal waste management in Western Balkan countries – country profiles, European Environment Agency: Copenhagen..

[48] Serbian Association for Water Technology and Sanitary Engineering (UTVSI). Serbia water utility benchmarking report for 2020.

[49] World Bank. 2015. State of the Sector Report – 2018 Update. https://sos.danubis.org/files/File/country_notes_pdf/SoS_Serbia.pdf.

[50] The European Federation of National Association of Water Services. 2021. Europe's water in figures – an overview of the European drinking water and wastewater sectors. https://www.eureau.org/resources/publications/eureau-publications/5824-europe-s-water-in-figures-2021/file

[51] Water Law. Official Gazette of the Republic of Serbia. No. 30/2010, 93/2012, 101/2016, 95/2018 and 95/2018.

[52] Water Management Strategy of the Territory of the Republic of Serbia until 2034. Official Gazette of Republic of Serbia, No. 03/2017.

[53] Action Plan for the Implementation of the Water Management Strategy of the Republic of Serbia for the period from 2021 to 2023. Official Gazette of Republic of Serbia, No. 79/2021.

[54] More details on the strengths, weaknesses, opportunities, and threats (SWOT) related to water and wastewater management are provided in Annex 4.

[55] World Governance Indicators. http://info.worldbank.org/governance/wgi/.

[56] For instance, in case of City of Valjevo, the legal obligation of having a local air quality plan is fulfilled as part of the third 5-year action plan currently under preparation. However, the previous two local air quality action plans were not implemented partly due to the lack of institutional capacities.

[57] Multiplier analysis presented in this report is a result of the Taheripour et al. 2021 I-O model based on the Global Trade Analysis Project (GTAP) database. The model captures increases in economy-wide indicators in response to hypothetical increases in sectoral investments as well as sectoral demand, respectively. The model represents the structure of the economy at a fixed point in time and thus does not take into account resource constraints as well as the possibility of factor substitution. However, this approach provides useful insight regarding optimal resource allocation within the current economic structure.Taheripour et al. show in their research, covering over 140 economies, that investments in service sectors such as health, education, and communication, and in a few non-service sectors such as forestry and construction are associated with relatively high job multipliers and lower GHG emissions. In some countries, agriculture also falls into this category, with crops and non-ruminant livestock, being associated with lower emissions and high employment multipliers. Conversely there are more severe trade-offs in other sectors where relatively high job/VA growth is associated with large emission multipliers. The direct employment multipliers of some sectors could be small, but with large spillovers of jobs to the rest of the economy. For more detail, see World Bank Policy Research Working Paper, "Putting the Green Back in Greenbacks: Opportunities for a Truly Green Stimulus," Taheripour et al, 2021.

[58] The analysis finds a high correlation between industries that generate GHG emissions, which cause long-term climate impacts, and those that generate air pollution, which have immediate harmful impacts on human health, suggesting that in many cases policies could be designed to address both simultaneously, based on Taheripour et al. 2021. The model also provides for the analysis of the relation of value-added multipliers and CO_2 emissions, as well as jobs multipliers and different emissions

[59] *Calculated with the exchange rate from 31.12.2018 1 EUR = 118.1946 RSD..*

[60] *The Law on Fees for the Use of Public Goods imposes the Environment protection fee also on individuals, but the implementing government Decree did not set the fee schedule for individuals thus making this provision unimplementable.*

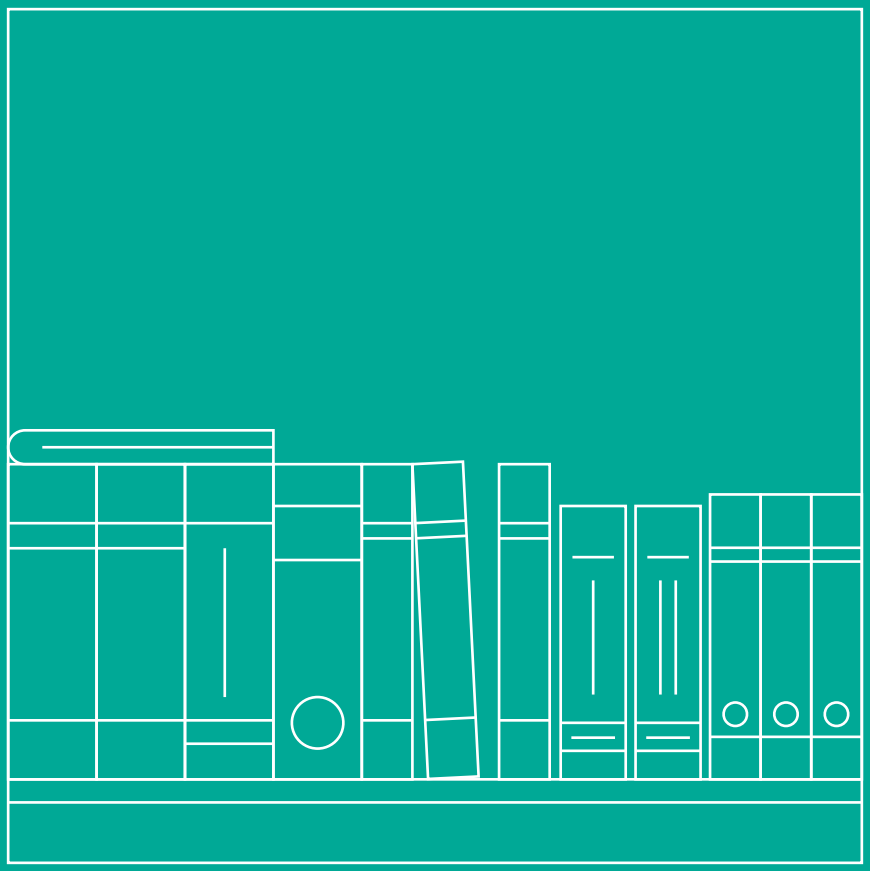
[61] *This does not mean that LSGs spend less for environmental protection. On the contrary, the representative of the Standing Conference of Towns and Municipalities stated that municipalities spend more money on environmental protection than revenues collected through the fee for protection and improvement of the environment.*

[62] *https://e3modelling.com/modelling-tools/gem-e3/.*

[63] *https://ec.europa.eu/commission/presscorner/detail/en/IP_21_3541.*

[64] *EUR 35 (2025), EUR 48 (2030), EUR 222 (2040) and EUR 395 (2050).*

[65] World Bank own estimations. This narrow focus of the analysis is due to the importance of both areas for Serbia's effort to transition to greener growth. Poor air quality is a decade long problem in Serbia and recently the Government of Serbia (GoS) recognized this as one of its priorities, following an increasing demand for action from the public. At the same time climate mitigation, especially in the energy sector, is crucial for Serbia's transition to greener growth and for fulfilling commitments in the context of the Paris Agreement and the European Union (EU) accession process. Moreover, with the current energy crisis and rise of fossil fuel prices, the need for reducing energy consumption and deployment of renewable energies is more pressing than ever.



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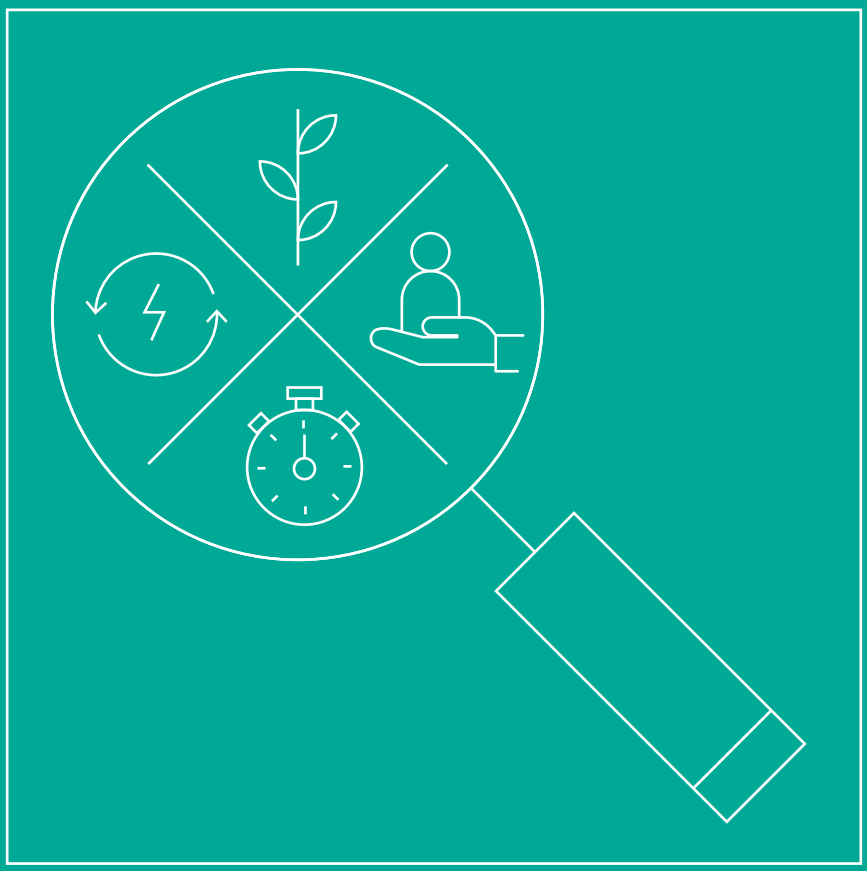


Annex 1: GRID Diagnostics Serbia – Indicators

The GRID diagnostics analysis indicators for green and inclusive development consider not only produced but also natural and human capital. The diagnostics consists of four pillars: Resilience, Inclusion, Sustainability and Efficiency (RISE). The diagnostics can identify key problems along those pillars. Here, only selected indicators covered by the report are included. The results for Serbia compared to the upper middle-income countries (UMI) and EU mean are shown in Table A1.1.

Regarding resilience to natural disasters, although population exposure to disasters is low, Serbia is prone to a wide variety of natural hazards, including floods, landslides, droughts, and earthquakes due to extreme weather and climate change. In comparison to the EU27, Serbia ranks in all indicators below the EU mean, except for population exposure from disasters. This indicates high risks to assets and wellbeing from natural disasters. Additionally, exposure to dry precipitation shocks is above UMI average. For Resilience, Serbia is only ranked ahead of Western Balkan countries and LICs.

In the field of inclusion, access to electricity and education are nearly universal. However, access to health services and safely managed drinking water are still inadequate. Safe sanitation access is extremely low (18.4 percent of the population). For Inclusion, Serbia performs better than UMI average and is similar to ECA average level, but it is ranked behind Western Balkan countries and the EU mean.

Regarding sustainability, Serbia's performance varies widely. Air pollution is a serious concern affecting large amounts of the population. Although Serbia performs relatively well when it comes to mortality rate from air pollution using the WHO figure, other sources show a much more severe impact with a mortality rate of 62.5 per 100,000 – almost three times higher than the EU mean. Serbia faces the threat of water quality degradation and water pollution, which is primarily caused by inadequate treatment of wastewater and industrialization. Solid waste production per capita is lower than the EU mean, but is almost exclusively deposited in landfills. Energy consumption in Serbia highly relies on fossil fuels, with nearly 70 percent of electricity being generated using domestic lignite coal. Although total GHG emissions and CO_2 emissions from agriculture and land use change are far below UMI average, CO_2 emissions per capita from production is above UMI average. Serbia falls behind all the income groups as well as Western Balkan countries in the rankings regarding the sustainability indicators.

Regarding the efficiency of resource use, Serbia performs inadequately. Although energy intensity has declined by 14 percent from 2005 to 2015, the energy intensity level of Serbia is still above the UMI average as of 2017. The efficiency of carbon use is very low compared to the EU mean, and economic efficiency in air pollution abatement is inadequate. Compared to other countries' efficiency indicators, Serbia is the best performer next to high-income countries but performs below the Western Balkan average. In summary, Serbia performs throughout the different GRID indicators much worse than the EU countries. ■

Table A1.1: **GRID indicators for Serbia**

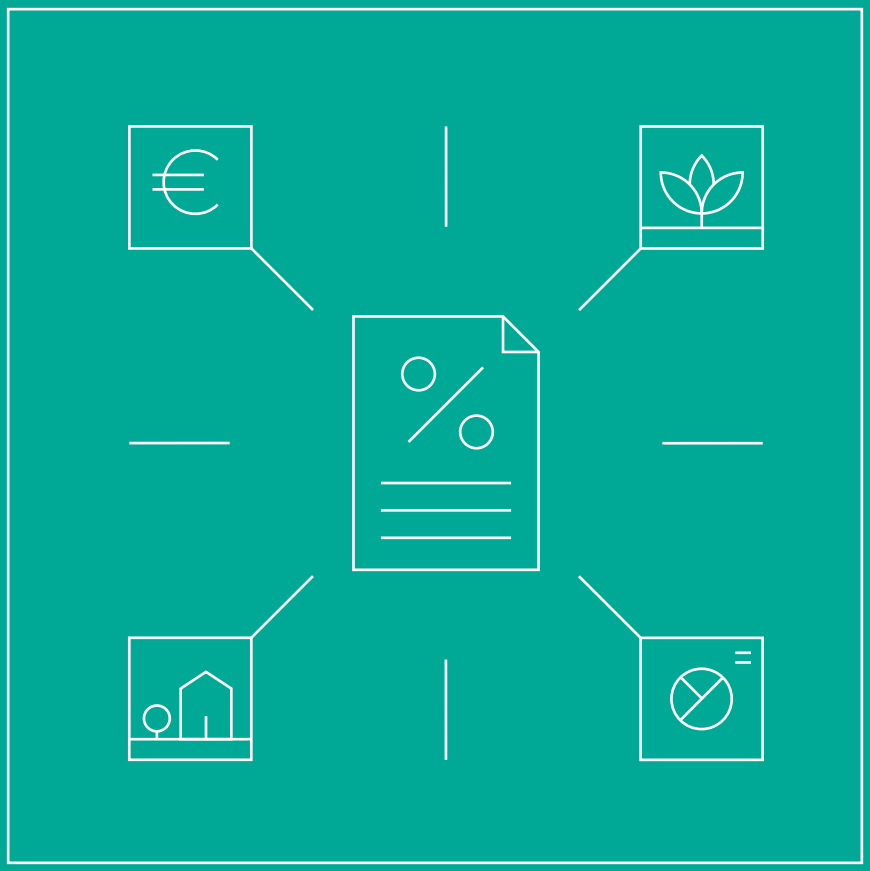
Indicator Name	Indicator Description	Serbia	UMI mean	EU mean
Resilience Indicators				
Natural disaster risk to assets (% of GDP)	The average value of the damages disasters cause to assets (expressed in repair or replacement value).	1.4	0.6	0.3
Natural disaster risk to well-being (% of GDP)	The decrease in GDP that would have the same impact on people's well-being as the disasters that occur in the country (i.e. people's willingness to pay to prevent all disasters.	1.7	0.9	0.4
Population exposure from disasters (% of total pop exposed)	The average share of the population affected by geophysical, meteorological, hydrological, or climatological natural disasters over a 20-year period (2000–2019).	0.3	1.8	3.5
Population exposure from dry rainfall shocks (% of total pop exposed)	The average share of the population exposure to a dry rainfall shock (rainfall <1 st. dev. below average) over a five-year period (2009–2013).	20.1	16.8	13.0
Inclusion Indicators				
People Using Safely managed sanitation (% of total pop)	The percentage of people using improved sanitation facilities that are not shared with other households and where excreta are safely disposed of in situ or transported and treated offsite. Improved sanitation facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines: ventilated improved pit latrines, compositing toilets or pit latrines with slabs.	18.4	46.0	87.4
People Using Safely managed drinking water (% of total pop)	The percentage of people using drinking water from an improved source that is accessible on premises, available when needed and free from fecal and priority chemical contamination. Improved water sources include piped water, boreholes or tubewells, protected dug wells, protected springs, and packaged or delivered water.	75.0	76.6	97.5
Belief that "Most people can be trusted" (% agreeing)	Survey question from the World Value Survey, which conducts nationally representative surveys in 77 countries and societies. Respondents are asked if most people can be trusted, and the indicator is the share of those that respond "Most people can be trusted," with the other option being "Need to be very careful."	16.3	17.1	33
Human capital index	The index measures the amount of human capital that a child born today can expect to attain by age 18, given the risks of poor health and poor education that prevail in the country where she lives. It is designed to highlight how improvements in current health and education outcomes shape the productivity of the next generation of workers, assuming that children born today experience over the next 18 years the educational opportunities and health risks that children in this age range currently face.	0.68	0.60	0.70

Table A1.1: **GRID indicators for Serbia**

Indicator Name	Indicator Description	Serbia	UMI mean	EU mean
	Sustainability Indicators			
Total renewable water resources per capita	**Total renewable freshwater resources per capita (cubic meters):** Renewable resources (internal and external river flows and groundwater from rainfall) in the country. Total renewable freshwater resources per capita are calculated using the World Bank's population estimates.	18,451	10,246	7,571
Biodiversity & habitat index	The index is calculated from remote sensing data and other studies of ecological diversity. A score of 100 indicates that a country has experienced no habitat loss or degradation, and a score of 0 indicates complete habitat loss.	42.8	56.3	47.2
$PM_{2.5}$ %pop exposed above WHO (15ug/m)	Percent of the population exposed to ambient concentrations of $PM_{2.5}$ that exceed the World Health Organization (WHO) Interim Target 3 (IT-3) is defined as the portion of a country's population living in places where mean annual concentrations of $PM_{2.5}$ are greater than 15 micrograms per cubic meter.	98.6	91.4	55.5
Mortality rate attributable to air pollution (per 100,000)	Number of deaths attributable to the joint effects of household and ambient air pollution in a year per 100,000 population. The rates are age standardized. Following diseases are taken into account: acute respiratory infections (estimated for all ages); cerebrovascular diseases in adults (estimated above 25 years); ischemic heart diseases in adults (estimated above 25 years); chronic obstructive pulmonary disease in adults (estimated above 25 years); and lung cancer in adults (estimated above 25 years).	62.5	67.9	23.8
Water quality, nutrients, salts, chemicals (SDG 6.3.2)	A water quality index which covers the pollutants tracked by SDG 6.3.2, namely nutrients, salts, and chemical pollutants. It is an index of 3 water quality parameters, nitrates, electrical conductivity, and biological oxygen demand. The dataset was generated for the report *Quality Unknown: The Invisible Water Crisis,* using a machine learning model using data from 2000-2013. The resolution is the 0.5 x 0.5 degree gridcell. The country value here is calculated by taking a population weighted average of all gridcells where the centroid falls within the country.	-4.6	-2.8	
Solid waste generation (tonnes) per capita	Annual municipal solid waste generation in tonnes/ population size	0.33	0.31	0.47
Landfill disposal % share of total waste generation		95		33

Table A1.1: **GRID indicators for Serbia**

Indicator Name	Indicator Description	Serbia	UMI mean	EU mean
Sustainability Indicators				
Renewable energy consumption (% of total energy consumption)	Renewable energy consumption is the share of renewable energy in total final energy consumption.	19.9	20.5	21.3
Share of coal in electricity generation (% of electricity generated)		68.2	23.2	13.2
GHG emissions per capita		9.2	7.5	8.5
Change in GHG emissions per capita (% change 2008-2017)	Percentage change of GHG emissions per capita from 2008 to 2017.	-0.6	2.1	-15.6
Efficiency Indicators				
Productivity of water use ($ per m3 water withdrawals)	The value added in US dollars per volume of water withdrawn in cubic meters by a given economic activity over time. It considers water use by all economic activities, with a focus on agriculture, industry and the service sector.	5.9	19.2	131.4
Efficiency of carbon use (GNI per kt of CO_2 eq.)	The ratio of GNI (constant 2010 US$) to total greenhouse gas emission (kt of CO_2 equivalent). Total greenhouse gas emissions in kt of CO_2 equivalent are composed of CO_2 totals excluding short-cycle biomass burning (such as agricultural waste burning and Savannah burning) but including other biomass burning (such as forest fires, post-burn decay, peat fires and decay of drained peatlands), all anthropogenic CH_4 sources, N_2O sources and F-gases (HFCs, PFCs and SF6).	730,106	1,277,034	4,267,773
***Energy intensity (mj per constant 2011 purchasing power parity GDP)**		609	494	387
Air pollution regulation economic efficiency	Measures the share of the budget spent on reducing air pollution that is spent efficiently, i.e. the share of the actual budget that could have been spent to achieve the same air pollution related morbidity. A value of 100% means it would not be possible to spend less and achieve the same level of efficiency. 90% means a country could have spent 10% less to mitigate air pollution and achieved the same morbidity outcomes if it had spent those funds more efficiently.	21.6	23.1	40.4



Annex 2: Impact Assessment of Selected Opportunities for Environmental Tax Reform in Serbia

This annex provides more information on the methodology behind the impact assessment of selected opportunities for environmental tax reform in Serbia. The first and second sections provide context and background information. The third section details the methodologies applied. The final section provides additional detail on findings on each of the assessed reform options.

A2.1 Context

An initial impact assessment was conducted of three opportunities for environmental fiscal reform in Serbia. For the three reform options under assessment, environmental and fiscal impacts were analyzed, and a rapid overview of relevant institutional aspects in the context of environmental taxes and charges in Serbia is provided. The assessment furthermore covered legal basis, collected amounts, subjects and recipients of existing environmental taxes and charges, including excise duties in Serbia and policy interactions. Reform options under assessment were selected based on their relevance with respect to current policy priorities in the country, as well as based on relevance in the context of recent EU policy developments and the opportunity for Serbia to align with updated EU guidance.

Background on environmental taxation in Serbia

Despite the share of environmental taxes in Serbian GDP being high, incentives for avoiding environmental damage remain low. The overall amount of environmental taxes collected in Serbia in 2019 was slightly over 223 billion RSD (ca. 1.9 bill. EUR[59]). The share of environmental taxes in Serbian GDP increased in the last 10 years from 3.3 percent to 4.2 percent, while the share of environmental tax revenues in total tax revenues over the last eleven years (2009-2019) was between 8.3 and 11.4 percent. Environmental taxes in Serbia are dominated by energy taxes (more than 85 percent), followed by transport taxes and pollution fees and, finally, fees for the use of natural resources. Within all mentioned categories, a majority of applicable taxes are not at all or not directly linked to polluting behavior, therefore providing imperfect or non-existent incentive effects.

Method

The environmental impact assessment is conducted based on a review of the policy documents, stakeholder and institutional landscape, national and municipality level tax budget statements, as well as exemplary firm balance sheets and cost structures of production and abatement technologies. A sample of local self-governments has been screened to determine the relevance of the environmental fees for the income, level of execution and compare the level of income with spending. Similarly, selected installations have been assessed for their cost structure and estimated tax payments under current policy design and assessed reform options.

The impact assessment was furthermore informed by economic modeling to identify whole-of-economy effects of energy tax reform, including coal subsidy phase-out. A dynamic CGE (GEM-E3-SRB) was employed to estimate impacts to sectoral GDP and employment as well as production cost of the proposed reform of excise duties in line with the revised EU ETD. Similar assessment was not conducted for the other two reforms under assessment, as no whole-of-economy effects are expected from these reforms due to their small fiscal impacts. For details on the model as well as baseline assumptions, see the technical annex on CBAM and Carbon Pricing. All analysis on CBAM, carbon pricing, and EU ETD alignment was conducted in the same model with identical baseline calibration.

A2.2 Findings of the initial impact assessment

A2.2.1 Revision of excise energy taxes

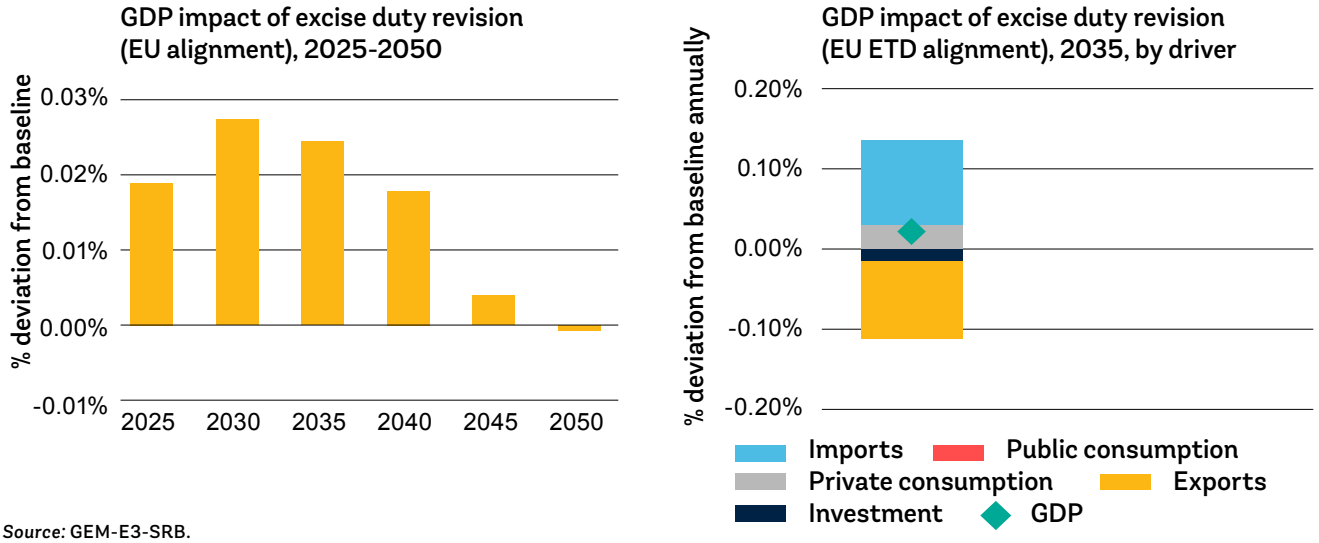
The policy reform proposal is to align excise duties in Serbia with minimum levels of taxation applicable under the revised ETD. With the Law on Excise Duties in place, Serbia's minimum thresholds for taxation of transport fuels largely comply with the existing 2003 Energy Taxation Directive (ETD, 2003/96/EC). The greatest deviation is in terms of coverage since the Serbian Law does not cover coal, coke, heavy fuel oil and natural gas. Existing thresholds are not promoting

energy efficiency and use of renewable energy due to energy or CO_2 content not being considered. The EU has proposed a revision of the ETD in the context of the Fit-for-55 package, with the aim to reflect relative GHG intensities of fuels in minimum tax levels, which is not the case under the existing 2003 Energy Taxation Directive, and to reduce distorting exemptions.

Given current tax rates, significant increases in fee levels are required for natural gas, non-sustainable biogas, non-renewable fuels of non-biological origin and others for Serbia under this proposal. Alignment with the EU ETD will furthermore require a more detailed differentiation between different types of biofuels and a phase-out of direct fossil fuel subsidies. The rationale for this proposal is to compensate for the eroding tax base due to the decarbonization effort, increase environmental effectiveness and increase alignment with the EU Acquis.

Focusing the analysis on the most relevant discrepancy between the revised ETD and the Serbian Law on Excise Duties (introduction of excise tax for coal and natural gas and firewood), fiscal impacts of alignment would be significant. The revenues collected could increase by 470 million euros from coal and natural gas alone. This amount is more than the combined revenues from the pollution, natural resources and transport fees and would increase the energy taxes by almost 29 percent. The impact on the electricity price is still estimated as negligible and will depend on tariff regulation, while the impact on natural gas price is estimated to be 7.7 RSD/m³ equaling an increase of nearly 22 percent. Assuming revenues are redirected towards the reduction of payroll taxes, this reform can have positive employment impacts leading to small increases in GDP in the mid-term, with the impact fading in the long-term.Final impact of the policy reform on household groups will also depend on revenue use. Next to increasing taxes on natural gas and coal, the revised ETD introduces taxation for different categories of biofuels, depending on sustainability, including firewood. A great share of households in Serbia is heating with firewood (46.8 percent). For an average household consuming 8.1 stacked m³ of firewood per year, the increase in costs is around 65 euros per year. Including the additional costs for taxes for coal and natural gas, the additional costs

Table A2.1: **Impact of alignment of excise duties in Serbia with the revised EU ETD proposal on GDP, over time (left) and decomposition of impact (right)**



Source: GEM-E3-SRB.

are estimated to amount to more than 110 euros per year per household (note that a considerable portion of used firewood is traded outside of the formal economy, which would make tax compliance less effective). The increase in costs for the households should be mitigated by channeling the collected revenues for grants and incentives for energy efficiency measures or deployment of RES, to not only prevent an increase in energy poverty but also to promote the development of clean technology and market uptake.

An increase in the prices of natural gas and coal that could result from the alignment with the revised ETD would lead to increased costs and reduced profits for businesses, but the overall impact on GDP and employment is expected to remain insignificant due to counteracting effects from revenue use. Industries that are the largest consumers of coal are in the production of electricity and steel, cement and chemical industries. In this context, an interesting example is the fertilizer industry, where the price of natural gas can account for 60-80 percent of the cost structure, but strong market power suggests price-pass-through to consumers is likely.

Coal subsidy removal is also required under the revised ETD and could be implemented jointly with the revision of excise taxes in Serbia. Coal subsidies provided through fiscal support, public finance support and SOE investment support are estimated at more than 40 million EUR per year (2019).

A2.2.2 Abolishment of the fee for protection and improvement of the environment

The fee for the protection and improvement of the environment (known as eco-tax in Serbia) applies to legal entities and entrepreneurs in Serbia and is loosely based on the level of impact and size of the economic subject.[60] The fee applies to legal entities and entrepreneurs depending on the level of impact of activities conducted (three categories) and the size of the economic subject (4 categories). The revenues from this fee amounted to 2.3 billion RSD (19 million EUR) in 2020, which is 100 percent received by local self-governments.

The policy reform proposal is to abolish the fee for protection and improvement of the environment due to the lack of incentive effect. Subjects are bound to full payment of the fee even if they do not create any pollution or create less pollution than their peers. Thus, the fee does not incentivize the reduction of pollution as the level of payment is set by the assumed impact to the environment of payers' economic activity and its size, regardless of the amounts of pollutants emitted.

The direct impact of this policy reform proposal is the reduction of local-self-government revenues and reduction of costs on economic subjects. While the fiscal impact will be small at about 19 million euros annually (0.16 percent of government tax revenues in 2020), the fee is more significant from the perspective of local self-governments who are recipients of the fee (1.05 percent of local government tax revenues on average). It is recommended that the abolishment of the fee is introduced jointly with other policy reform options filling the gap in revenues for local self-governments.

No impacts on incentives for and behavior of businesses and other economic agents are expected from this reform proposal in the short and long term; therefore, environmental impacts from this reform option are found to be nonexistent. A small increase in pollution may occur from increased output due to improved profitability, but this is unlikely given the current scale of the fee: For an exemplary medium-sized company producing fertilizers and nitrogen compounds, the annual fee is 500,000 RSD (about 4,200 euros), presenting less than 0.05 percent of annual revenues.

A2.2.3 Revision of the fee for pollution of the environment: fee for the emission of SO_2, NO_2, particulate matter and produced or landfilled waste

The fee for the emission of SO_2, NO_2, particulate matter and produced or landfilled waste is one

of the two highest revenue environmental fees (excluding energy taxes). The subjects of this fee are integrated pollution prevention and control (IPPC) operators, producers or operators of hazardous waste obliged to have IPPC permits, and public utility companies, as well as legal entities and entrepreneurs managing municipal waste emitting SO_2, NO_2 or PM above selected annual thresholds. The fee is calculated based on actual quantities of emissions and disposed waste. The fee is subject to three correction factors which reduce the applicable fee level, depending on the amounts emitted, the existence of continuous measurements and breach of limit values of emissions and source of emissions. Historically, revenues from the fee on NO_2, SO_2 and particulate matter amounted for up to 0.2 percent of GDP. In 2020, revenues were proportionally smaller and only amounted to 0.06 percent of GDP.

The policy reform proposal is to revise the coverage by expanding to all polluters in the registry of sources of pollution, removing the thresholds, abolishing the correction factors and increasing the level of the fee by 10 percent annually over three years. The rationale for extending the coverage is to cover a larger share of emissions by the instrument, which is especially relevant for NO_2 and PMs. The rationale for abolishing the correction factors is to provide a fully proportional abatement incentive independent of the emitted amounts. Increasing the fee level following a pre-announced path increases the incentive to abate and informs forward-looking investment decisions.

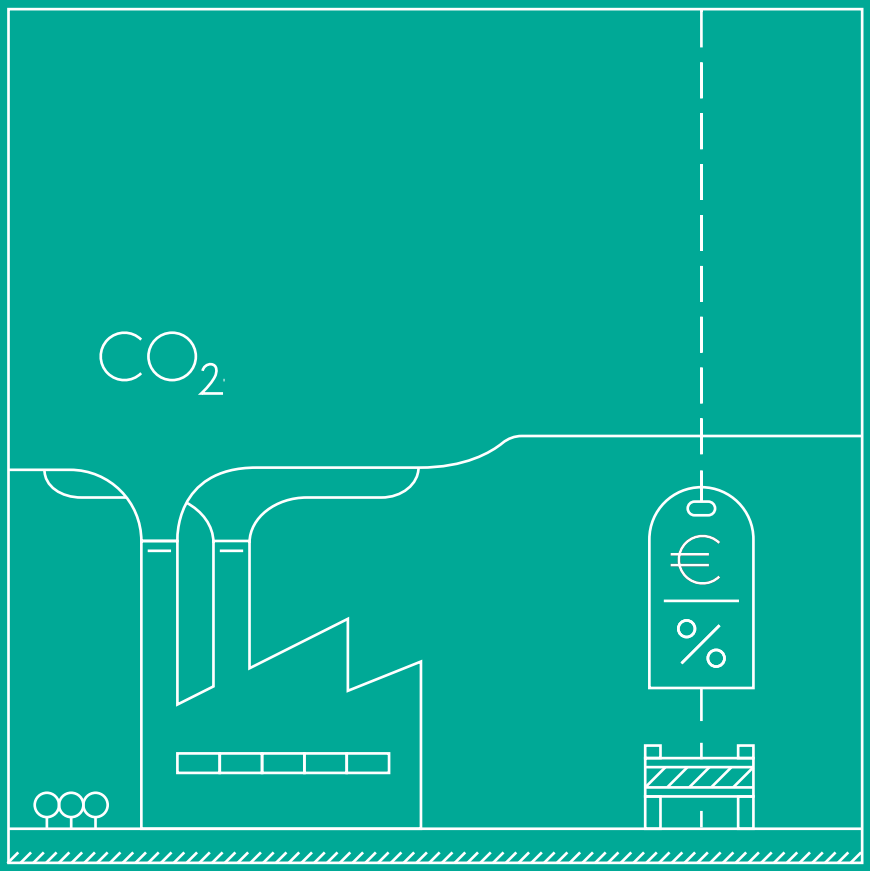
For fiscal impacts of the proposed reforms of the air pollution fee, the estimated upper bound for increase in expected tax revenues from the proposed reform is 50 percent, while impacts on businesses will vary significantly by industry and also size of the entity. Effective collections will depend on the pace of changes in polluting behaviors in response to increased fee levels. Emissions-intensive industries will see a higher increase in cost proportional to revenues. Entities that were covered by one or both of the applicable correction factors see the highest increase in cost from the removal of correction factors. In the long run, the fee's share of revenue is expected to decrease significantly due to investments in abatement action driven by the regulatory instruments, such as NERP and measures foreseen under the draft National Air Protection Program.

Opposition to the reform is expected to be low given the low impact on net revenues and a low increase in average burden per taxpayer; however single actors could feel disproportionally disadvantaged. Given that EPS contribute more than 25 percent of the total revenue from environmental taxes, a special stakeholder plan needs to accompany any reform, even where expected changes are small.

A2.3 Institutional aspects

It is important to assess the impact on the budget of local self-governments, where applicable, and consider rebalancing measures. It is clear that in local self-government units, the revenues collected from the fees are not earmarked but are partly used for covering operational expenses.[61] Where a fee is abolished that served as a source of revenues for LSGs, it is recommended to accompany the reform with a revision of the local/national distribution of another fee.

It is furthermore necessary to strengthen the capacities and position of the Ministry of Environmental Protection (MoEP) in the context of proposed reforms. Taxation policy is the responsibility of the Ministry of Finance, with little or no influence from the Ministry of Environmental Protection. The polluters´ registry is under the responsibility of SEPA and based on interviews with stakeholders, SEPA needs more capacities in maintenance of the registry and for taking over a greater role in monitoring and verification of collected fees and taxes. When considering expanding the base of potential fee payers as proposed in this analysis, consideration should be given to improving the capacity to adequately manage compliance risk, with a special focus on organizing audit processes and assisting in voluntary compliance. ■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Annex 3. Carbon Border Adjustment Mechanism and Carbon Pricing

This annex provides more information on the modeling results undertaken for CBAM and carbon pricing scenarios in Serbia. The first section provides details on the model used, as well as assumptions behind and design of the baseline, CBAM and carbon pricing scenarios. The second section breaks down the key drivers of GDP impacts under the scenarios modeled. The final section explores alternative revenue uses from domestic carbon pricing policies and how that could alter the impact on Serbia.

A3.1 Background on model and scenarios

This analysis builds on the dynamic general equilibrium model GEM-E3-SRB, also used by the Serbian government to inform its long-term development strategy. GEM-E3-SRB is a tailored version of the GEM-E3[62] model co-developed and frequently operated by the European Commission's Joint Research Council. The model represents the structure of the economy and energy system, including the carbon intensity (Scope 1, 2 and 3) of production processes of goods and services, including process emissions which are highly relevant for most CBAM sectors. The model is dynamic and produces projections of the economy and energy systems until 2050 in five-year time steps. It serves to assess the direct, indirect and induced effects of EU and Serbian climate policies. The model accounts for changes in the competitiveness of the Serbian industries and how the changes in production and exports of industries affect employment, household income and domestic consumption. Represented regions are Serbia, other Energy Community countries, the EU, and the rest of the world.

Results are dependent on scenario design as well as baseline assumptions. Baseline assumptions include strong export-led growth in the medium to long term, shaped by growth in exports of services, while the existing trend of a declining population continues (Table A3.1). With respect to climate policies, continuation of currently legislated climate and energy policies is assumed for Serbia under the baseline (2015 NDC is met and surpassed). For the EU, the baseline scenario assumes implementation of the Fit for 55[63] policy package, leading to carbon neutrality by 2050. The model is furthermore sensitive to the EU carbon price, which is calibrated assuming that the Fit-for-55 targets are achieved with a mix of carbon pricing and supporting regulation.[64] The model furthermore assumes high labor and capital mobility across sectors.

Table A3.1: **Exogenous assumptions for Serbian GDP and exports annual growth rates in the GEM-E3-SRB Baseline scenario**

Real annual growth rates, %	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70
GDP growth	2.64	4.82	4.00	4.10	4.25	4.35	4.50	4.50	4.50	4.50	4.50
Exports (goods and services)	9.14	7.20	7.50	7.50	7.50	7.25	7.00	7.00	6.50	6.50	6.00
Population, %	-0.53	-0.54	-0.61	-0.68	-0.75	-0.79	-0.82	-0.53	-0.54	-0.61	-0.68

Source: World Bank own estimations.

The CBAM scenarios assume the mechanism is gradually phased in consistent with the most recent ETS proposal. As the EU CBAM is designed to gradually replace free allowance allocation, in 2026 the mechanism is only applied to the power sector (as it is the only sector under full auctioning in the EU ETS to date). From 2026, CBAM coverage gradually increases by 10 percentage points each year until 2035, in line with the phaseout of free allowance allocation in the respective sectors.

The carbon pricing scenario assumes Serbia introduces an ETS with similar scope, coverage, permit allocation method and carbon price levels as the EU. It also assumes a gradual phase-out of direct coal subsidies and revision of fuel excise taxes aligned with the revised EU Energy Taxation Directive.

All results should be understood as an upper boundary of expected outcomes, as CGE models tend to overestimate mitigation costs and underestimate the adaptive capacity of the market. Models tend to overestimate the cost of mitigation as they underestimate the impact of low-carbon innovation, which reduces costs. Supporting regulation, as well as early announcements of policy changes, may furthermore allow adaptive adjustments within sectors before assessed policies take place.

Table A3.2: **Overview of scenarios**

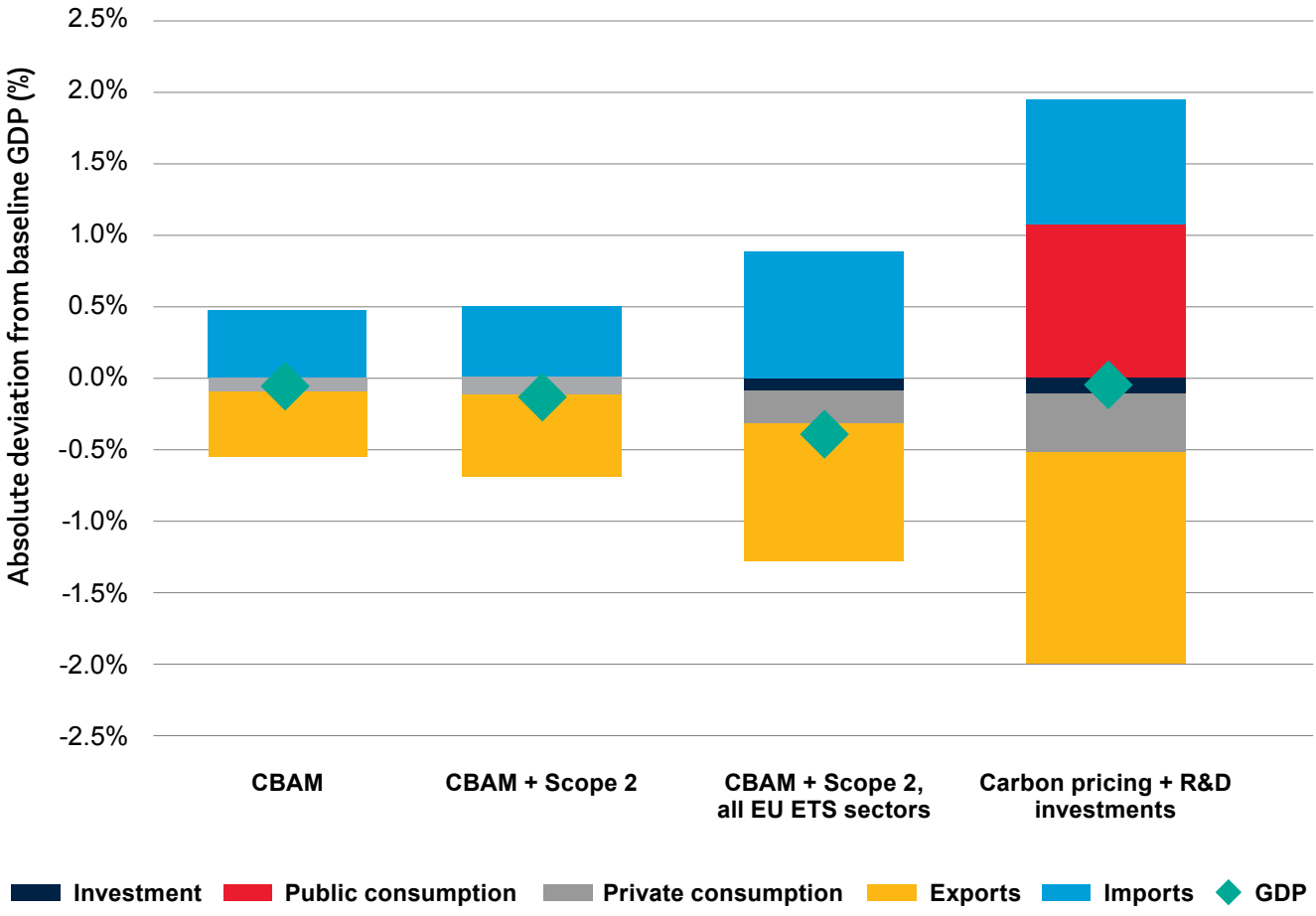
	Baseline	CBAM	CBAM + Scope 2	CBAM + Scope 2, all EU ETS sectors	Carbon Pricing + R&D investments	Carbon Pricing + reduced payroll tax
CBAM Scope	n/a	Cement, iron and steel, aluminum, fertilizers, electricity		All EU ETS sectors		
CBAM Emissions Scope	n/a	Scope 1	Scope 1 and 2			
Domestic carbon pricing	no	no	no	no	yes (EU allowance price level on EU ETS sectors)	
Carbon pricing revenue use	n/a	n/a	n/a	n/a	Investment in R&D and training	Reduce payroll taxes
CBAM exemption for Serbia	n/a	no	no	no	yes	
Excise Taxes	BAU	BAU	BAU	BAU	Excise tax on fossil fuels aligned with revised ETD	
Fossil fuel subsidies	BAU	BAU	BAU	BAU	Gradual phase-out of direct coal subsidies	

A3.2 Drivers of macroeconomic impacts of CBAM and carbon pricing in Serbia

The introduction of CBAM is projected to have limited macroeconomic implications for Serbia, though costs increase with broader CBAM coverage. Under the current EU proposal, GDP costs range from -0.06 percent in 2025 to -0.24 percent by 2050 in the main CBAM scenario (current EU proposal). Costs increase marginally if scope 2 emissions (i.e., electricity consumption) are covered by CBAM, as the emission intensity of such consumption is only a share of the overall emissions intensity for those sectors. Expanding CBAM to all EU ETS sectors almost doubles costs for Serbia, with a loss of 0.52 percent of GDP in 2035 (all costs expressed as the difference in GDP in a given year under baseline and selected policy scenario respectively.

The key driver of GDP losses from CBAM is a reduction in total exports, with a loss of 0.62 percent of total exports by 2035. However, a drop in imports for intermediate goods and to a less extent, final goods drop by -0.59 percent and act as a counterbalancing driver to the deterioration of the balance of trade (see Figure A3.1).

Figure A3.1: **Decomposition of GDP impacts in 2035**

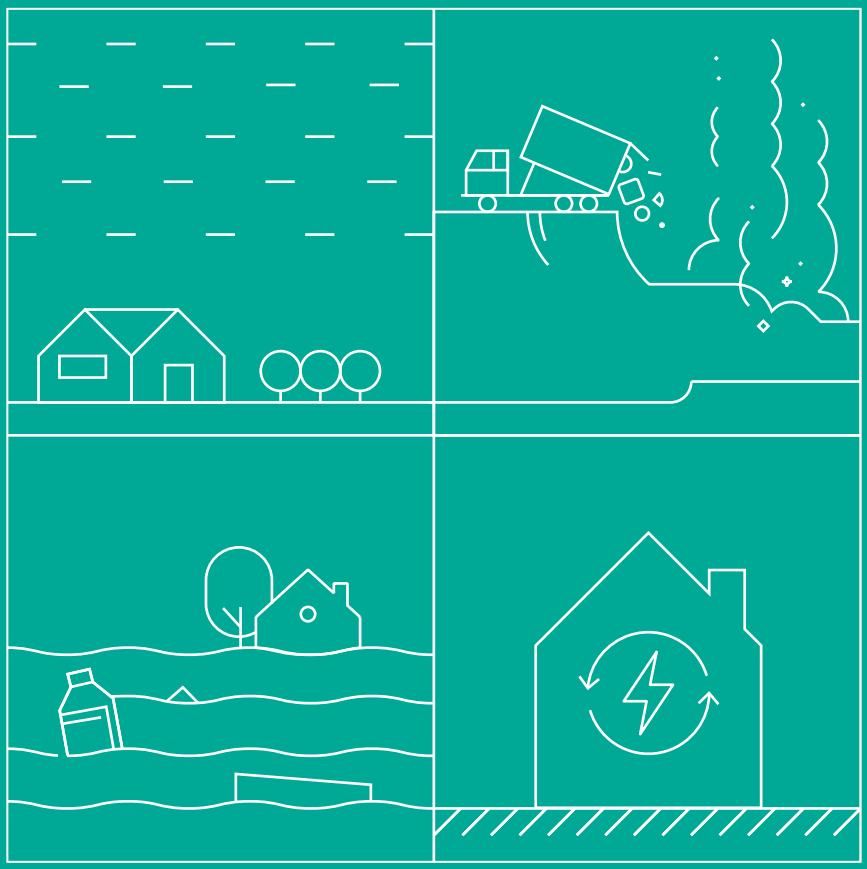


If Serbia imposes a carbon price in line with the EU model, this will have limited macroeconomic impacts on economic growth while driving significant emissions reductions. Compared to CBAM (3-5 percent emissions reduction), a domestic carbon price would result in 40 percent emissions reductions by 2035 as it sends a more ambitious signal across the economy to increase efficiency and shift from carbon-intensive production. Carbon pricing is found to have a limited impact on the economic growth of Serbia, reducing annual growth rates by less than 0.1 percentage points in the entire 2025-2050 period and even bringing positive effects in the short or long-term depending on the revenue recycling approach (see next section). By 2035, GDP impacts from a carbon price are a result of declines in exports, investments, and private consumption from the higher cost of carbon-intensive products and production processes.

A3.3 Alternative revenue use: R&D investments and payroll tax reduction

The macroeconomic cost of domestic carbon pricing will depend on the use of revenues; impacts could be more adverse than presented above in the absence of productivity boosting revenue investment. Fiscal revenues from carbon pricing and excise duties range between 0.6 and 1.4 percent of Baseline GDP in the 2025-2050 period. Redirecting revenues to investment in R&D and training can increase the total factor productivity of the Serbian production processes, depending on the availability of human capital, leading to a small but positive impact on GDP (up to 0.12 percent by 2045). These investments increase demand for services that are almost exclusively delivered by the domestic market while enhancing knowledge growth.

Using revenue to reduce distorting payroll taxes was also modeled, leading to slightly adverse impacts on GDP in the long run. Reducing payroll taxes can have positive employment and GDP implications (+0.28 percent compared to baseline by 2030) in the short term. This reduces the cost of labor and Serbian products become more competitive while the increasing demand for labor increases household income. In 2035 and beyond, GDP impacts of carbon pricing could become slightly negative under this revenue use option (-0.28 percent), driven by the loss in competitiveness as the model assumes Serbia is the only country in the region increasing its climate policy ambition. However, given the need for countries to increase the ambition of their NDCs every five years – and the pressure of CBAM and external green transition drivers – this will likely not be the case. ■



Annex 4. SWOT Analyses of Key Reform Areas for Greener and More Resilient Growth

This annex provides an overview of the strengths, weaknesses, opportunities, and threats (SWOT) related to the transition to greener and more resilient growth in key reform areas of the Serbian economy. The reform areas that have been analyzed include waste and circular economy, air pollution, water, and energy efficiency. Climate action is also included as a cross-cutting reform area that influences the other four areas. All areas are considered priority areas for the Serbian government and are likely to have reform actions ready in the next year or so. Detailed narratives have been developed for each area from which the SWOT analyses have been extracted for this report. These SWOT analyses are intended to give a broad overview of each reform area and to give background information regarding the basis for the policy conclusions included in the main part of the document. The SWOT analyses are based on a review of policy and analytical documents, complemented by inputs from experts from relevant World Bank Global Practices and from external sources, including other IFIs active in Serbia. They do not provide an in-depth analysis but are meant to give an overview of the key challenges and opportunities in the respective sectors.

A4.1 Waste and Circular Economy

The Serbian government has identified municipal solid waste as one of the critical local environmental challenges in Serbia. The lack of waste treatment and disposal infrastructure generates serious environmental problems in terms of pollution of air, soil and rivers, with impacts throughout the region. The transition to a green economy in Serbia will thus require significant improvements in waste management as well as intensified efforts towards the circular use of products and materials. Serbia is committed to this path through the Sofia Declaration, which, among others, calls for the development of circular economy strategies and further progress in the construction and maintenance of waste management infrastructure.

Table A4.1: **SWOT analysis for the Serbian waste sector and circular economy**

Strengths	Weaknesses
Solid waste is identified as one of the three critical challenges to environmental sustainability	Implementation of existing laws remains poor
Primary legislation is largely in place and policy is under development	Insufficient monitoring and enforcement
Good level of alignment with the EU acquis	Economic instruments not yet implemented
New Waste Management Program 2022–2031 adopted	Low levels of penalties
Waste Management Law in place	Low tariffs for waste collection and lack of interest from local decision makers to increase them jeopardizing the financial viability of sanitary landfills
First CE Roadmap in the region	No earmarking or transparency on the use of waste collection fees
New CE Development Program 2022–2024 forthcoming	Previous Waste Management Strategy 2010–2019 not fully implemented
Recognition of environmental protection and circular economy in Serbia's Industrial Policy Strategy as a source of new industrial growth	Low institutional/administrative capacity both at the central and local level
PPP framework operational	Limited capacities of the waste management department at MoEP
	Limited capacity of Serbian Environmental Protection Agency and environmental inspectorates
	Lack of capacities for planning, tendering and implementation of complex investments
	Low investment in waste reduction, separation and recycling
	Insufficient cooperation between national and local level
	Difficulties in cooperation between local self-governments
	Low level of implementation of regional landfill agreements and inter-municipal cooperation
	Data reporting and management
Opportunities	**Threats**
EU accession perspective	Weak overall agenda for environmental reform
Opening of Chapter 27 negotiations in December 2021	Delays in the adoption of regulations and policy documents
CE is a key pillar of the EGD and the Green Agenda for the Western Balkans	Slow and inconsistent procedures
Action Plan for Administrative Capacity Development submitted to EU	Illegal practices, e.g., landfilling
EU funding	Lack of MSW treatment and disposal infrastructure
Funding support from donors	Limited alternative sources of funding and underdeveloped financial markets
High economy-wide investment activity and FDI inflow	Lack of awareness, particularly regarding waste management and opportunities to use waste as a raw material in industrial processes
Competitiveness of Serbian industry through the application of new business models	Industrial production is predominantly based on outdated technologies, characterized by a high generation of waste per unit of output
Downward trend in the total amount of waste and a slightly upward trend in recycling in urban settlements	
Construction of regional landfills pursuant to the Waste Management Strategy	
Signed financing agreements for loans from CEB and China	

A key strength of the Serbian waste sector is the rich and expanding body of (primary) legislation. In January 2022, the Serbian government adopted a new Waste Management Program 2022-2031, which creates a strategic basis for the implementation of investment measures over the next 10 years – such as the setting up of modern regional waste management centers across the country – as well as the introduction of various economic and other instruments that will incentivize the separation of different waste streams, recycling and a general shift towards the circular economy. The legal basis of the new program is the *Law on Waste Management,* passed in 2009. In addition, Serbia was the first country in the Western Balkans to have developed a *Roadmap for Circular Economy in 2020.* This more general strategy is being complemented by a forthcoming *Circular Economy Development Program 2022-2024* together with an associated Action Plan, which will set concrete objectives and identifies measures for the three years covered by the program.

Despite the political will expressed in various strategies, a major weakness is the poor implementation and enforcement of existing strategies and laws. For example, the new waste management program recognizes that the previous strategy (2010-2019) did not fully achieve goals related waste collection, separation and recycling, the construction of infrastructure and the termination of waste disposal to unsanitary landfills, as well as the application of economic instruments and more generally the establishment of a sustainable waste management system. Part of the reason is that Serbia faces major institutional challenges to improve waste management. The lack of capacities for planning, tendering and implementation of complex investment projects is also an obstacle for much needed investments in the waste sector. An additional weakness of the existing legislative framework is the low level of economic incentives for environmentally friendly behavior and inadequate penalties for illegal practices. This is recognized by the new Waste Management Program 2022-2031 but requires urgent action to induce change.

The EU accession perspective and the clear commitment of the Serbian government to the Green Agenda for the Western Balkans provides opportunities for EU and donor finance. Improved waste management and the circular economy are key elements of the Green Agenda for the Western Balkans and are also at the center of EU finance in the programming period 2021-2027. This is an opportunity in terms of funding from the EU, donors and – *inter alia* through leverage effects – from the private sector. Another opportunity is the opening of Chapter 27 on the environment and climate change under the EU accession negotiations. This will provide for further alignment of Serbian waste legislation with the EU acquis.

However, there are many threats to the improvement of waste management in Serbia, including awareness and political momentum. Many economic actors in Serbia, including from industry, still lack awareness and basic knowledge about the benefits of waste management and circular business models. On the larger scale, this translates into the environment agenda playing a subordinate role on the political level. The sluggish adoption of policy documents affecting the waste sector are just one manifestation of this. Perhaps related to the lack of awareness is the widespread practice of illegal landfilling and the general absence in monitoring and enforcement. Without addressing illegal practices in the waste sector, it is unlikely that new waste management strategies will be successful.

A4.2 Air Quality

Air quality is a major health concern in Serbia, causing thousands of premature deaths and enormous costs to the economy. It is a multi-sectoral challenge, with the energy sector as the main contributor. The emissions from the energy sector result mainly from lignite coal power plants and in the residential sector, mainly from residential solid biofuel burning (e.g., heating with wood). Notable, also fuel oil plays a role in the heating sector and can be locally an important source, as in Belgrade where it contributes to 38 percent to $PM_{2.5}$ concentration. Other key sources of air pollution include vehicle exhaust (especially nitrous oxide emissions), industrial emissions, resuspended dust, and agricultural clearing fires. Although air pollution is one of the leading environmental problems in Serbia, more work needs to be done to lay the groundwork for further policy steps.

Table A4.2: **SWOT Analysis for Air Quality Management in Serbia**

Strengths	Weaknesses
Air quality is acknowledged by the government as one of the critical challenges to environmental sustainability.	No up-to-date air quality laws exist
Huge public support for addressing air pollution	Lack of sufficient staffing of Serbia Environmental Agency
Primary legislation is largely in place	Legislation and bylaws do not recognize emissions from individual household heating as a major source
Good level of alignment with the EU acquis	Non-existent or insufficient capacity of LSGs to treat air quality issues
First air quality plans on city level (Belgrade, Nis)	Emission inventories and air quality monitoring
National Plan for the Reduction of the Main Pollutant Emissions from Old Large Combustion Plants (NERP) adopted in 2020	Technical robustness of air quality plans backed by implementation mechanism and financing
	Emissions of air pollutants from operators operating under national jurisdiction
	Insufficient allocation of budget for cleaner air.
Opportunities	**Threats**
National Air Protection Program (NAPP) to be adopted in 2022	Weak overall agenda for environmental reform
Alignment between draft NAPP and the draft low carbon development strategy	Commercial and foreign investment interests are given priority over the environmental agenda
Plans to adopt a new law on air quality in 2023/24	Lack of regional cooperation to address transboundary air pollution
National goal of EU accession	Lack of government support, including financing, for implementing the NAPP
EU grant financing	
Air quality is a key pillar of the EGD and the Green Agenda for the Western Balkans	
Engagement with IFIs keen to support air quality management	

A strength of legislation on air pollution in Serbia is that the primary legislation is largely in place and mostly aligned with the EU acquis. One of the major sources of air pollution – electricity production in old large power plants – is targeted by the National Plan for the Reduction of the Main Pollutant Emissions from Old Large Combustion Plants (NERP). Also, on the city level, first air quality plans exist, like in Belgrade and Nis. Another strength is the huge public support for addressing air pollution. It is also acknowledged as one of the critical challenges to environmental sustainability by the government.

Although Serbia's legislation is mostly in line with the EU acquis, there is a great weakness in updating the laws to current EU guidelines, with the Law on Air Protection dating back to 2013 and no corresponding air protection strategy. This is accompanied by a lack of funding in the sector resulting in a lack of staffing of the Serbia Environmental Agency as well as insufficient emission inventories and monitoring. This is also true on the local level — the technical robustness of the existing air quality plans on the city level is backed by implementation mechanisms and financing, as well as a lack of capacity of the local governments to treat air quality issues.

The National Air Protection Program to be adopted in 2022 presents an opportunity to get air quality regulations up to date. While the NERP includes only old, large power plants, the NAPP targets small power plants, industry, transport and agriculture. The strategy is aligned with the (draft) low-carbon development strategy proving a holistic and cross-cutting approach to air quality management and climate mitigation. The NAPP shall be followed by the planned new law on air quality to be adopted in 2023/24. These measures can be supported by EU grant financing and the engagement of IFIs since air quality is a key pillar of the EGD and the Green Agenda of the Western Balkans.

However, there are multiple threats to these opportunities, especially the inadequate political momentum to address air pollution. This is expressed by the lack of funding for the implementation of the NAPP and the priority of commercial and foreign investment interests over the environmental agenda. Additionally, there is a lack of regional cooperation to address transboundary air pollution, which is also not mentioned in the NAPP.

A4.3 Climate Action

Serbia is one of the countries most affected by climate change worldwide, which has massive effects on people, the environment and the economy. Currently, Serbia faces wide-ranging and grave climate change impacts, inter alia, on water availability and quality, biodiversity, human health and health of ecosystems (including forestry). These will continue to pose a significant risk to practically all sectors of the economy, yet, with higher frequency and severity of extreme weather events, some sectors will be more exposed and vulnerable to the effects of climate change than others. According to the first Intended Nationally Determined Contribution of Serbia submitted to the UNFCCC in 2017, the most vulnerable sectors of the country are agriculture, hydrology, forestry, as well as human health and biodiversity.

Table A4.3: **Analysis for Climate Action in Serbia**

Strengths	Weaknesses
Commitment of the government to a green agenda and climate action	Carbon-intense economy and the country´s heavy reliance on coal
National Council on Climate Change (NCCC)	Lack of clear leadership: in case of mitigation, more influence on the side of the Ministry of Mining and Energy than the Ministry of Environmental Protection; in case of adaptation, strong influence on the side of the Ministry of Agriculture, Forestry and Water Management
Member of Energy Community	Insufficient coordination and cooperation between ministries and between national and local level
Some progress in alignment with EU acquis	Delays in the adoption of regulations and policy documents
Adoption of Law on Climate Change in March 2021	Secondary legislation lacking to enable full implementation
Adoption of Law on Use of Renewable Energy Sources in April 2021	Poor enforcement due to lack of capacities
Low Carbon Development Strategy prepared in 2020, setting an ambitious target to reduce GHG emissions by 33.3 percent in 2030 compared to 1990 level	Slow development of key policy documents, including NECP, NDC and Adaptation Strategy
Several other important laws and programs have been approved in recent years:	Limited progress on EU Chapter 27 as indicated in the 2021 EU Progress Report
• Adoption of the National Emission Reduction Plan (NERP) in 2020, in view of complying with the EU Large Combustion Plants Directive	No set coal phase-out date
• Sustainable Urban Development Strategy (June 2019, Action Plan adopted in April 2021),	Pending alignment of legislation on monitoring, reporting and verification of GHG emissions in line with the EU emissions trading system and effort-sharing regulation
• Nature Protection Program 2021-23 (May 2021).	Nature-based solutions (NbS) are not explicitly mentioned in the current draft of the NDC
Opportunities	**Threats**
Funding support from donors	The pace of policy changes in the EU is higher than the transposition process
EU accession perspective, EU funding	Lack of administrative, institutional and technical capacity at central and local levels
Further alignment with EU acquis will enhance climate mitigation and adaptation efforts	Lack of awareness and the level of overall understanding of links between climate change, its impacts, development of sectors and solutions to tackle it among wide population
Action Plan for Administrative Capacity Development submitted to EU	Insufficient information and capacity of different stakeholders
Suspension of activities to build a new thermal power plant (Kolubara B) in May 2021	Insufficient involvement of local governments
Implementation of NbS for climate change can gain further support from international funds	Plans for additional thermal power plans
Work is delayed but ongoing with respect to:	Companies, especially MSMEs face a lack of funding, skills and information on green technologies, as well as complex legal requirements
• Update of the Nationally Determined Contribution (NDC) to the Paris Agreement,	Companies receive insufficient support from commercial banks
• National Energy and Climate Plan (NECP),	Insufficiently developed capital markets
• National Adaptation Plan (NAP),	Migration of skilled labor force
• National Air Protection Plan (NAPP).	Increase in costs of electricity and energy can lead to energy poverty
Increasing demand for green finance	

A key strength of Serbia in addressing climate risks is its repeated commitment to the green agenda and climate action through numerous international and European agreements. On the international level, Serbia is committed to implementing Agenda 2030, including the Sustainable Development Goals (SDGs), and also ratified the Paris Agreement on Climate Change. On the EU level, Serbia is committed to the EU's ambition to become carbon neutral by mid-century through the Green Agenda for the Western Balkans. With the adoption of the Law on Climate Change and the Law on Use of Renewable Energy Sources, the country has progressed alignment with the EU acquis. This shows that the government is aware of the risks associated with climate change and the highly energy and carbon-intensive Serbian economy. However, the success of these policies depends on the speed and quality of their implementation through the necessary by-laws.

Despite some advancement on the strategic level, key weaknesses are Serbia's slow alignment with the EU acquis and repeated delays in the adoption and implementation of key policy documents. Despite the political will expressed in various strategies and public statements, significant delays in the adoption of key regulations and policy documents are a major weakness for tackling climate change and for guiding private investment towards the green transition. In the absence of an ambitious NECP, for example, Serbia's climate policy remains unaligned with the EU's climate neutrality aspirations. However, the slow development and adoption of crucial strategic documents is also evident in other areas, including Serbia's LCDS, its updated NDC and the National Adaptation Plan. Without these key strategic documents and related objectives and targets, Serbia's decarbonization and adaptation path is uncertain, and the country remains a carbon-intensive economy heavily reliant on coal.

The EU accession perspective and the clear commitment of the Serbian government to the Green Agenda for the Western Balkans provides opportunities for EU and donor finance. Climate and energy are key elements of the Green Agenda for the Western Balkans and are also at the center of EU finance in the programming period 2021-2027. This is an opportunity in terms of funding from the EU, donors and – among others, through leverage effects – from the private sector. Another opportunity is the opening of Chapter 27 on the environment and climate change under the EU accession negotiations. This will provide for further alignment of Serbian climate and energy legislation with the EU acquis.

Capacity constraints of public institutions are a key threat to the improvement of environmental management in Serbia. The problem of persisting environmental and climate risks is strongly linked to weak institutions. The institutional problem stems from three major issues – a gap in human resources (quality and quantity), a lack of cooperation and coordination across institutions and levels of government, and poor accountability. The lack of capacities for planning, tendering and implementation of complex investment projects is also an obstacle for much needed climate investments. On a positive note, Serbia has made bold commitments to enhance capacity in the Action Plan for Administrative Capacity Development submitted to the EU as part of Chapter 27 negotiations. This Action Plan recognizes the need to strengthen capacity not only through more personnel and training but also through organizational and structural improvements.

There are also other threats to effective climate action in Serbia, including a lack of public awareness and inadequate green finance. According to the 2021 Balkan Public Barometer, 81 percent of the Serbian population considers climate change to be a very serious or somewhat serious problem. Yet, there remains a persistent lack of awareness among economic actors and the wider population regarding the links between climate change, its impacts, economic development and the solutions aimed at mitigating GHG emissions and adapting to climate impacts. This hinders the integration of effective climate action in public, economic and private life. Another obstacle is the limited access to green finance, particularly among SMEs. One reason for this is the lack of support from commercial banks, for example, by asking for significant collateral on unfavorable terms. Similarly, regarding the regulatory environment, the lack of a functioning fiscal/financial framework does not incentivize the private sector to reduce its environmental footprint.

A4.4 Water

Water-related challenges in Serbia are manifold, but wastewater management is a government priority. Critical challenges include significant gaps in wastewater management and sanitation, related freshwater pollution, remaining issues regarding drinking water quality and excessive water losses, as well as water-related risks like floods and droughts in the context of climate change. The fact that the government has identified wastewater management as one of three critical local environmental challenges in Serbia promises intensified action and improvements in the future.

Table A4.4: **SWOT Analysis for the Water Sector in Serbia**

Strengths	Weaknesses
Water Management Strategy until 2034	Access to safely managed sanitation services is below regional standards
Action Plan for the Implementation of the Water Management Strategy for the period 2021 – 2023	Only around 18 percent of the wastewater is treated in wastewater treatment facilities
Overall sufficient availability of water resources	Degraded quality of water bodies and limited water conservation mechanisms
Relatively high access rate to water supply	Inadequate quality of drinking water in some areas
According to the Water Exploitation Index, Serbia is in a safe zone in terms of water stress	Underdevelopment of the state of utility services
Possibilities for funding from the EU for modernizations of water networks and water treatment facilities	Inadequate investment & rather insufficient maintenance of water infrastructure with a high level of water losses of around 41 percent
Wastewater treatment is an environmental policy priority of the Serbian government	Low water use efficiency in the economy, low water recycling and reuse levels
	Low institutional capacity and complex administrative procedures
	Fragmentation of institutions and their responsibilities and underfunding
	Lack of effective planning instruments for river basin and flood risk management

Opportunities	Threats
A new Water Law is under preparation and is planned to be adopted by the end of 2022	Climate change impacts
Further by-laws to be developed and adopted afterwards	Weak overall agenda for environmental reform
Clear responsibilities of water-sector related institutions have the potential to improve the effectiveness of sector regulation and policy	Water pollution is primarily due to outdated technology, lacking storage and disposal of by-products, lack of pollution abatement installations, untreated wastewater, drainage water from agriculture, leachate from landfills, and pollution linked to river navigation
Water and wastewater services sector can be a driver of the promotion of greener circular economy - tapping into the potential of treated wastewater (e.g. improving the management of sludge)	Discharge of the untreated wastewaters into the water bodies
The implementation of EU environmental standards, through Chapter 27, will provide an opportunity to develop a water and wastewater management framework	The small amount of surface water formed on the national territory that decreases over time
New legislation can be a driver for investments in water quality and ease of access, particularly for commercial and industrial sectors	Reduced amount of water as a result of climate change and higher competition for water resources
EU funding to support the building of the wastewater treatment plants	The impacts of climate change on water quality and availability can affect many sectors
Funding from other multilateral development banks and development partners	High spatial and temporal unevenness of the water regime
Potential to reduce organic pollution of the national surface water bodies by putting in place at least biological treatment technology	Highly flood-prone areas
First River Basin and Flood Risk Management Plans according to EU standards are under preparation, bringing along the opportunity for an integrated approach to water management	Transboundary water cooperation is often a politically sensitive issue

Key strengths of the Serbian water sector are the richness of water resources and generally comprehensive legislation. Serbia is relatively rich in water resources and not considered as water stressed, although with a high dependency on water resources originating from outside its territory. The legal basis for water management and water protection is the Water Law and its bylaws. It determines the legal status of water, water facilities and water land management, as well as the way and sources of financing water activities. In addition, the Water Management Strategy until 2034 is a planning document indicating the long-term direction of water management in Serbia. To put the Water Management Strategy into practice, Serbia developed its first Action Plan for the Implementation of the Water Management Strategy for the period 2021 – 2023.

However, the water sector remains characterized by poor sustainability of service provision, lack of investments, lack of capacities, fragmented sector organization, and the regulation of services. Sector financing is inadequate mainly because water and wastewater tariffs barely cover operation and maintenance costs. Reaching adequate water fees and tariffs is still an unaccomplished objective. As a result, subsidies from the national/local budget are sometimes still necessary to supplement tariffs to cover operation costs of utilities, as well as most of investments, which are mainly funded by international grants and loans. Non-compliance with drinking water quality standards remains a big concern in some areas, such as those where arsenic is present. Untreated sewage and wastewaters are still the main sources of water pollution and a serious issue even for the country's capital. Serbia should address river pollution more rigorously by focusing on the development of wastewater treatment facilities and reduction of nutrient runoffs from agriculture. Work on the river basin management plan for the period 2021-2027 is progressing, although slowly, with gaps which will need to be closed stepwise in upcoming iterations and updates. Similarly, limited progress has been achieved as regards the development of flood risk management plans which will need to be further strengthened in future updates, and an ambitious but realistic program of measures to be implemented to increase the country's resilience.

Importantly, Serbia has fragmented responsibility for the water sector and institutional capacities need to be strengthened. Serbia lacks coordination between institutions and single ministry responsibility for the water sector. Five main ministries constitute the national institutional framework of the water sector, sometimes with overlapping mandates. Unlike most of the countries in the region, Serbia has no independent water regulatory agency. In addition, improving local governance and strengthening capacities, in particular for operating and maintaining water and wastewater facilities, remains a priority. Increased transparency on planning, selecting and managing environmental investments will ensure better adherence to EU laws and standards in this sector and better value for money.

The new Water Law, currently under preparation, should provide a more effective framework for water management, water regulation, protection and control of waters in Serbia, and further alignment with EU water legislation. In order to deal with the above outlined issues, the Government is in the process of the preparation of a new Water Law. A draft for the new law has been prepared and is planned for adoption after the internal negotiation and consultation process by the end of 2022. Further by-laws are planned to be adopted in the following years. In addition, the first River Basin and Flood Risk Management Plans, according to EU standards, are under preparation, bringing along the opportunity for an integrated approach to water management.

Climate change is a major threat to the water sector. Even though Serbia is currently not experiencing water stress, a high spatial and temporal unevenness of the water regime might affect water availability in the future. Coupled with climate change effects, rising demand for water by many segments of the economy and higher competition for water resources might exacerbate the above-mentioned trend. Due to the high dependency of Serbia on water resources originating from outside its territory, transboundary cooperation is gaining further importance in the context of climate change.

A4.5 Energy Efficiency

Energy efficiency is one of the key instruments for fueling Serbia's economic growth while meeting GHG reduction objectives. The International Energy Agency (IEA) considers energy efficiency to be the 'first fuel' as it represents the cleanest and, in most cases, the cheapest way to meet a country's energy needs. It is thus a key element of the green transition. Serbia's total final energy consumption has been declining over the last few years, and the residential sector remains the main consumer. The investments required to improve the energy efficiency of Serbian buildings are significant, but they are estimated to result in sizeable benefits. Potentials are largest in the residential sector, particularly in single-family houses.

Table A4.5: **SWOT Analysis for Energy Efficiency in Serbia**

Strengths	Weaknesses
Implementation of EU legislation in the energy efficiency sector is well advanced	Insufficient human capacity in the line ministry and local authorities; the new EEA is not fully staffed yet
New Law on Energy Efficiency approved, and its 'operationalization' through secondary legislation is ongoing	No concrete targets, as NECP and updated Energy Sector Strategy are not adopted yet
Energy Efficiency Administration was established in the Ministry of Mining and Energy (MoME) with the mandate to support the clean energy transition	Lack of effective monitoring and evaluation system
A new support mechanism for energy efficiency in the residential sector has been piloted (public calls implemented by MoME and Local self-governments).	Serbian enterprises and households lack awareness of possible energy savings and available measures to reduce their consumption
	People perceive higher-quality energy-efficient installations as being expensive.
	Delays in the adoption of regulations, including:
	• regulations for the calculation of energy performance in buildings and certification
	• ecodesign regulations/minimum energy efficiency requirements for key energy consuming products in the residential sector
	• technical documentation for buildings
	Underdeveloped ESCO market
	Industrial production is predominantly based on outdated energy-intensive technologies
Opportunities	**Threats**
Significant energy savings potential in most sectors, especially in buildings	Implementation and enforcement of existing laws remain poor, e.g., roll-out of consumption-based billing in district heating is incomplete
Prospects of improving the competitiveness of Serbian industry through energy and resource efficiency	Low energy prices discourage investment in energy efficiency and mean higher payback periods
Mitigation of energy price increases in the residential sector thanks to energy efficiency investments	Affordability issue: low financial capacity of a significant part of the Serbian population
EU accession perspective	Absence of a sustainable and effective financing system (donor funding is not sufficient to cover all investment needs)
Opening of Chapter 15 negotiations on Energy in December 2021.	Difficult access to commercial financing for lower-income households and homeowners' associations (HOAs)
Funding support from the EU and other donors for both investment and technical assistance	Difficult decision-making in HOAs for the renovation of multi-apartment buildings
High economy-wide investment activity and FDI inflow	Grey economy, which is common for investment in home renovations, reduces tax revenues for the government and results in poorer quality interventions.
Energy Efficiency is integrated into the climate pillar of the EGD and the Green Agenda for the Western Balkans	

Source: World Bank, based on policy documents and literature review.

The key strength of the Serbian energy efficiency sector is related to the recent improvements in the legal, regulatory and institutional framework. The new Law on Energy Efficiency improves the legal basis for energy efficiency improvements in all sectors and establishes a new Energy Efficiency Administration to implement national energy efficiency (EE) programs. A new support mechanism for Energy efficiency in the residential sector, which was piloted in 2021, is being enhanced and scaled up.

Several barriers deter further progress in increasing energy efficiency in Serbia. These include weak institutional capacity (especially at the local level), a lack of specific EE targets and an effective monitoring and evaluation system, missing rules and regulations for some sub-sectors, low awareness of energy efficiency opportunities, and underdeveloped energy services market.

Serbia's EU accession perspective provides an opportunity in terms of potential funding support from the EU and other donors. Supported by donor-funded investments and technical assistance, Serbia is well-equipped to grasp the large energy efficiency potential in all sectors of the economy. Apart from the environmental and climate change benefits, enhanced Energy efficiency would result in improved competitiveness of Serbian industry and would enable mitigation of future energy price increases in the residential sector thanks to reduced energy consumption.

Yet, these opportunities are hindered by several factors, including poor implementation of legislation, low energy prices, affordability concerns, and limited access to financing. The slow roll-out of consumption-based billing in district heating (that can stimulate energy savings) is just one example of poor implementation and enforcement of the adopted legislation. Relatively low energy prices reduce incentives for investing in Energy efficiency. At the same time, even at current prices, energy poverty is a growing concern: even before the war in Ukraine, households spend about 9 percent of their total budget on space and water heating, which makes them vulnerable to changes in the price of the energy products used for heating. Low-income households have fewer resources available to finance Energy efficiency investments and find it more difficult to access financing due to their lower creditworthiness and missing collaterals. Available funds from public sources (national and municipal budgets) are very limited, donor-funded programs are not sufficient to cover all investment needs, and sustainable (revolving) financial mechanisms are missing. ■

Annex 5. Performance Assessment of Public Environmental and Climate Institutions in Serbia: Focus on Addressing Air Pollution and GHG Emissions from the Energy Sector

A strong institutional framework and related capacities are essential complements to credible and effective policies to support the green and just transition. As noted in the Action Plan for Administrative Capacity Development (APACD) submitted to the EU as part of Chapter 27, a significant gap remains in terms of the staffing needs that the government plans to fill. In order to help prepare institutions for the challenges related to the green transition, the analysis of the performance of institutions at both national and subnational levels – limited to selected exemplary municipalities – in the areas of air pollution and climate change mitigation was conducted.[65] A summary of the analysis (which includes the overview of the regulatory framework and its gaps, as well as the institutional framework itself and related capacities that are limiting the investments in the areas of air quality and climate change mitigation) is included in the box below.

The analysis shows that even though Serbia has made significant progress in recent years, it still needs to strengthen the institutional framework to flexibly pursue the policy reform agenda that support a green transition. Meeting multiple development, environmental and climate objectives will require not only coherent policy incentives and measures, but also strong institutional and governance frameworks to enable their implementation. Further recommendations for strengthening institutional framework in Serbia which can actively support public policies, regulations and future market mechanisms and investments that will be critical for fostering sustainability and green growth going forward are as follows.

Serbia has the means to focus more on addressing some of the key institutional weaknesses for undertaking effective green action across sectors. As an upper middle-income country with numerous close links to highly developed countries in its neighborhood, tertiary education levels are relatively high, giving policy makers a potential pool of talent to draw on. As such, human capital is one of the major assets in Serbia that needs to be further utilized. Hence strengthening the institutional framework presents an opportunity to create new job positions for dedicated professionals interested to work in the public sector.

Regulatory Framework: There are significant gaps in strategic orientation with key pieces of draft public policy not enacted yet. Primary legislation development is well advanced with a high level of alignment with the EU acquis. However, development of the secondary legislation is still ongoing and presents a barrier for implementation. In general, the implementation and enforcement of regulations are lagging due to insufficient capacities and weak enforcement mechanisms.

Institutional Framework: The division of responsibilities in the institutional framework is clear. However, the involvement of several ministries leads to fragmentation of scarce capacities and requires additional coordination efforts. In the case of the energy and agriculture sectors, the need for integration of climate change in sector policies was recognized and structures dealing with the topic of climate change were included in their institutional set-up. In terms of capacities, there are significant gaps at MoEP, operating with barely 50% occupied positions compared to the work force plan. The efficiency of the system is further limited by the centralized decision making and the lack of managerial accountability on lower administration levels. Likewise, even though the roles and responsibilities of the LSGs are critical in case of air quality, as well as in the implementation of climate change mitigation measures in the energy sector, their effectiveness is hampered by insufficient capacities, estimated at less than one third of what is recommended in APACD.

Investments: The regulatory framework is aimed at enabling, but not driving investments. Overall positive trend in increasing investments is driven mainly by the financial support in the form of grants. National financing is insufficient and there is significant dependency on international donors and financing institutions. The level of investments is also limited by insufficient institutional capacities in the public sector institutions. Furthermore, there are no sustainable financing mechanisms for air pollution or GHG emission reduction. The mechanism of PPP for attracting private sector financing is equally underused.

The mechanisms for monitoring and enforcement also need to be reinforced as a prerequisite for effective and systematic implementation of policies and regulations. Poor enforcement is often the result of weak regulations (that set the system of penalties and controls), but also of an inadequate institutional capacity. In most cases, the penalty levels are quite low, while the capacities for the inspection are equally insufficient both at the national and local levels. Based on APACD, the inspection capacities need to be increased by 28 positions in MoEP, 17 positions in the Ministry of Agriculture, Forestry and Water Management (MoAFWM), 12 positions in the Ministry of Health, more than 60 positions in the Ministry of Interior, and 24 positions at the Provincial level. The capacities of inspection on the local level are also insufficient. Based on the annual report of environmental protection inspection for 2017, in 11 out of 145 local self-governments, there are no inspectors.

Given the nature of climate change and air quality, there is room to strengthen multi-sectoral coordination, which is necessary for the implementation of sector policies and programs. An effort in this direction has been made through the establishment of the National Climate Change Council (NCCC) under the 2021 Law on Climate Change. NCCC needs to have a clear policy coordination mandate and be placed under adequately high level of government oversight (e.g. the Prime Minister's Office). This would also allow to embed the green agenda across sectoral strategies and plans, help scale-up policy making and implementation, and provide opportunities for engagement with businesses and citizens.

The implementation of air pollution and climate change mitigation policies and regulations requires coordination not only on the national level but also between the ministries and the local level. Although the regulatory setting is not putting the local level as the key agents of change, with the right incentives and support, local governments too can be catalysts for green growth solutions. Based on the Law on Air Quality, local governments have several responsibilities, including preparation of the Air Quality Plan, establishment and operation of the local network for air quality monitoring, regular reporting on collected data to SEPA, and enactment of short-term action plans, amongst others. However, even with a decentralized and prescriptive regulatory framework, there are several institutional challenges that hinder its implementation, including the weak or insufficient capacities at the local level and the lack of communication and coordination with the national level.

Serbia also needs to consider the introduction of new policy reforms and measures, which will have an impact on the institutional frameworks needed for their implementation. For example, the introduction of the CBAM will require an increase in SEPA's capacity, both in terms of quantity and quality, or some other collaborative arrangements will have to be pursued with technical institutions. Likewise, should Serbia pursue environmental fiscal reforms, the institutional framework would have to be adapted, such as in the area of administering financial support schemes, calculation of fee levels to be paid (including through improved IT systems), and ensuring polluters' reporting on their emissions, amongst others.

Serbian institutions need to be made more effective in facilitating investments in measures that are already identified in government strategies and plans. While many measures requiring investments in pollution reduction technology are not yet in place yet, the draft NAPP and the draft LCDS and Action Plan foresee several such measures that need to be put in place and will need institutional support. Going forward, it will be important to ensure that policies which enable investments and strengthen market incentives for green investments are complemented with appropriate institutional and capacity strengthening efforts. ■