EUROPE AND
CENTRAL ASIA

WESTERN BALKANS 6

Albania
Country Compendium

World Bank Group

COUNTRY CLIMATE AND DEVELOPMENT REPORT

October 2024

1818 H Street NW, Washington, DC 20433
Telephone: 202-473-1000;
Internet: www.worldbank.org

Table of Contents

LIST OF FIGURES

LIST OF TABLES

LIST OF BOXES

Acknowledgments

This Country Climate and Development Report (CCDR) is a collaborative effort of the World Bank, the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency (MIGA), produced by a core team led by Katharina Gassner, Megha Mukim, and Christos Kostopoulos. Pablo Andres Salas Bravo led the IFC work and Gabisile Ndlovu and Seonyeong Son led the MIGA inputs. The climate adaptation work was coordinated by Solene Dengler, Luc Marius Jacques Bonnafous, Danielle Monsef Abbound and Giuseppe Rossitti. The mitigation work was coordinated by Claudio Protano, Elena Merle-Beral, Luiz Gabriel Sucrmont Rodrigues Simoes and Talis Mabito Tebecis. The macroeconomic aspects of the report were coordinated by Priscilla Kandoole with significant input from the macro modeling team and the country economists mentioned below. The core team also included Celestinah Temilade Odebunmi, Enock Seth Nyamador, Joni Baboci, Mustafa Copelj, Nerali Patel, Pavlina Zdraveva, Tianyu Zhang, and Varnitha Kurli.

This CCDR is underpinned by substantial modeling work that involved coordination among multiple teams. Energy modeling was conducted by Amit Kanudia, George Giannakidis and Rocco De Miglio from MRC Consultants, with support from Szilvia Doczi. Claire Nicolas, Maelle Baronnet and Thomas Nikolakakis conducted power sector modeling. Important contributions were received from Luis Blancas, Eduardo Espitia Echeverria and Raimund Mair on transport. New data and modeling was commissioned to gain insights on climate-related hazards, including from JBA Risk Management for floods, the Global Earthquake Model (GEM) Foundation for earthquakes, the International Center for Environmental Monitoring (CIMA) Research Foundation for wildfires, VITO NV for extreme heat, and the International Institute for Applied Systems Analysis (IIASA) for droughts. Macroeconomic modeling work was led by Charl Jooste and Thi Thanh Thanh Bui; they used the results from the energy and transport modeling and the modeling on climate-related hazards as an input into the macroeconomic structural models. The Western Balkan countries' economists Besart Myderrizi, Hilda Shijaku, Isolina Rossi, Joana Madjoska, Lazar Sestovic, Milan Lakicevic, Natasha Rovo, Sandra Hlivnjak, Sanja Madzarevic-Sujster, and Tihomir Stucka contributed to long term growth modeling and other macroeconomic aspects of the study. Distributional impact of the decarbonization was led by Victor Mylonas using the Climate Policy Assessment Tool (CPAT). Assessment of the co-benefits of the decarbonization was undertaken by Paulina Estela Schulz Antipa, Faustyna Gawryluk, Ira Dorband with support from Weronika Celniak also using the CPAT. Penelope Ann Mealy and Esther G. Naikal led the work using the Green Transition Navigator; Euijin Jung, Aleksandar Stojanov and Pranidhi Sawhney prepared a background note on trade and climate.

In addition, essential analytical work was conducted by the following sectoral teams. Important contributions were received from Raimund Mair, Natalia Limones Rodriguez, Regassa Ensermu Namara, Fan Zhang, Vera Kehayova and Lindita Troka for water; from Augusto Garcia, Irina I. Klytchnikova, Sergiy Zorya, Teklu Tesfaye, Fang Zhang and Xueling Li for agriculture; Neeta Hooda, Sameer Akbar, and Sasa Eichberger for environment, biodiversity, and forestry; Valerie Morrica, Sangeeta Kumari, Dianna Pizzaro, and Luiza Nora for social sustainability and inclusion; Henrike Brecht, Guillermo Siercke, Axel Baumler, Yondela Silimela, Paul Scott Prettitore, and Caleb Travis Johnson for urban, resilience and land. Private and financial sector assessments were contributed by Alper Ahmet Oguz, Milica Nikolic, Marc Schiffbauer, Ana Goicoechea, Stefka Slavova, Charis Lypiridis, Magdalena Soljakova, Gianfilippo Carboni, Bodin Bulatovic, Levent Karadayi, Gabisile Ndlovu, Susan Josefina Vasquez Plasencia, Bexi Francina Jimenez Mota, Seonyeong Son, Tatiana Skalon, Ehab Adel Samir Tawfik, Maja Andjelkovic, Vladimir Hrle, Milos Milivojevic, Thea Louise Jung and Vahe Vardanyan. On poverty, the report was supported by Zurab Sajaia, Leonardo Lucchetti, Alexandru Cojocaru, and Anna Fruttero. Stefan Apfalter, supported by Francis Ralambotsiferana Ratsimbazafy, Dusko Vasiljevic, Mariem Malouche, and Antoine Coste, provided input on state-owned enterprises using the Businesses of State database. The report benefitted from six rapid Climate Change Institutional Assessments led by Kai Kaiser and contributed by Zoran Kapor.

The human development (HD) work was coordinated by Indhira Santos and led by Tigran Shmis (Education), Predrag Djukic (Health), and Sarah Coll-Black, Alicia Marguerie, and Daniel Garrote Sanchez (Social Protection and Jobs). The HD team benefitted from input provided by Catherine Fitzgibbon, Renata Gukovas (Social Protection and Jobs), Domagoj Racic (Education), Muloongo Simuzingili and Lorena Kostallari (Health). The CCDR team also benefitted greatly from strategic inputs provided by Ede Ijjasz-Vasquez.

Detailed feedback and suggestions were received from peer reviewers Ani Balabanyan, Daniel Navia Simon, Ivana Fernandez Duarte, Jas Singh (with contributions from Raimund Malischek), Nancy Lozano Garcia, Wolfhart Pohl and Yue Man Lee. Helpful comments at various stages were also received from teams represented by Ahmadou Moustapha Ndiaye, Alberto Rodriguez, Carolina Monsalve, Craig Meisner, Damian Brett, Dena Ringold, Elizabeth Ruppert Bulmer, Fan Zhang, Kevin Carey, Luiza Nora, Michael Stanley, Pablo Fajnzylber, Paulo De Sa, Rhedon Begolli, Sebastian Molineus, Stephane Hallegatte, Tamara Babayan, Ulrike Lehr, Yuriy Myroshnychenko, Armin Ridzalovic, Laureta Qorlazja, Visar Perani, and many others.

The CCDR benefitted from the feedback received from the governments, private sector stakeholders, academia, and civil society organizations during the consultation events organized in each of the six countries in January-May 2024. Filip Kochan and communication teams in WB6 country offices coordinated consultation, communication, and dissemination activities.

The CCDR was prepared under the leadership of Antonella Bassani, Xiaoqing Yu, Sameh Naguib Wahba, Charles Cormier, Asad Alam, Fadia Saadah, Lalita M. Moorty, Ary Naim, Nicolas Marquier and Rana Karadsheh. Managerial guidance was provided by Christopher Sheldon, Emanuel Salina, Massimiliano Paolucci, Nicola Pontara, Jasmin Chakeri, Sudeshna Ghosh Banerjee, Stephanie Gil, Christoph Pusch, with inputs from Ramon Munoz-Raskin, Simon Ellis, Richard Record, Indhira Santos and Nathalie Lahire. The team is particularly grateful to Thomas Farole who provided outstanding guidance and support throughout the CCDR process.

The team is grateful for excellent research support from Daniel Mayer, Eda Belgin Abedin and Senjuty Bhowmik, as well as administrative support received from Bisera Nurkovic, Dragana Varezic, Luan Aliu, Nejme Kotere, Mjellma Rrecaj, Odeta Bulo, Paula Blanco, Sanja Tanic and Valentina Aleksic. Mary Fisk and the GCSTI English Team edited the report, and Vladimir Mirzoyev provided the graphic design.

Abbreviations

A&R	Adaptation & Resilience
ASAI	Albanian Supreme Audit Institution
BAU	Business-As-Usual
BCR	Benefit–Cost Ratio
CAP	Common Agricultural Policy
CAPEX	Capital Expenditure
CBAM	Carbon Border Adjustment Mechanism
CCA	Climate Change Adaptation
CCDR	Country Climate and Development Report
CCIA	Climate Change Institutional Assessment
CCS	Carbon Capture and Storage
CEP	Clean Energy Package
CC-MFMod	Macro-Structural Model with Climate Change Module
CPAT	Carbon Price Assessment Tool
CPS	Carbon Pricing Scenario
CSA	Community-Supported Agriculture
DRF	Disaster Risk Finance
DRM	Disaster Risk Management
EC	European Commission
ECA	Europe and Central Asia
EE	Energy Efficiency
ETS	Emissions Trading System
EU	European Union
EU-27	The 27 EU Countries
EUR	Euros
EV	Electric Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft Für Internationale Zusammenarbeit (German Society for International Cooperation)
GPP	Green Public Procurement
GTAP	Global Trade Analytics Project
GW	Gigawatt
HPP	Hydroelectric Power Plant
IEA	International Energy Agency
IMWGCC	Inter-Ministerial Working Group on Climate Change
INSTAT	Institute of Geography and Statistics, Albania
IPPU	Industrial Processes and Product Use
KESH	State-Owned Electro Energy Corporation
KINESYS-WB6	Knowledge-Based Investigation of Energy System Scenarios for the WB6
LCU	Local Currency Units
LSG	Local Self-Government
LT-LEDS	Long-Term, Low-Emission Development Pathways
LULUCF	Land Use, Land-Use Change and Forestry
MFH	Micro Food Hub
MRV	Monitoring, Reporting and Verification (Of GHG Emissions)
$MtCO_2eq$	Million Tons of CO_2 Equivalent
MTE	Ministry of Tourism and Environment
MW	Megawatts
MW	Moment Magnitude Scale (of Earthquake Size)
NBS	Nature-Based Solutions
NCASPD	National Climate Actions Strategies and Policies Database
NDC	Nationally Determined Contribution
NE	Ndihma Ekonomike
NEA	National Environment Agency
NECP	National Energy and Climate Plan
NEET	Not In Employment, Education or Training
NPV	Net Present Value
NSDI	National Strategy for Development and Integration
NZE	Net Zero Emissions Scenario
NZE-HG	Net Zero Emissions Scenario with Higher Growth

OECD	Organization for Economic Co-Operation and Development
OPEX	Operational Expenditure
PPP	Public–Private Partnership
PPP	Purchasing Power Parity
PV	Photovoltaic
RCP	Representative Concentration Pathway
RDF	Refuse Derived Fuel
RE	Renewable Energy
RES	Renewable Energy Sources
RS	Reference Scenario
SARDF	Strategy for Agriculture Rural Development And Fisheries
SMEs	Small and Medium-Sized Enterprises
SNG	Subnational Government
SOE	State-Owned Enterprise
SRF	Solid Recovered Fuel
STEM	Science Technology Engineering Mathematics
TEN-T	Trans-European Transport Network
TIMES	The Integrated Markal-Efom System
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
WAM	With Additional Measures
WB6	Western Balkans 6 (The Six Countries of Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia)
WBG	World Bank Group
WEM	With Existing Measures

Executive summary

Albania, a small upper-middle-income country aspiring to join the European Union, has made significant strides in reducing poverty and in narrowing its income gap with the EU. However, energy poverty remains a concern, and a significant portion of the population struggles to meet their energy expenses. Despite this, Albania boasts the lowest carbon and energy intensities in the Western Balkans, largely because of its reliance on renewable energy sources, particularly hydropower. However, the country faces challenges in managing its water resources, crucial for both agriculture and energy production, especially in light of climate change-induced events like floods and droughts. To reduce its power sector's reliance on hydro resources, Albania is pursuing enhanced regional trade in electricity to improve its energy security and to integrate more renewable energy sources. Cooperation with neighboring countries, particularly Kosovo, is seen as crucial to achieve these goals and integrate into the broader European energy market.

Albania has shown increased attention to climate change adaptation and mitigation through legislative efforts such as the revision and submission of its Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC), and the passing of the Law on Climate Change in 2020. The country has outlined sector-specific targets and action plans for both mitigation and adaptation, with a focus on areas like energy, transport, agriculture, and coastal ecosystems. Despite these efforts, the implementation of climate adaptation measures, as outlined in Albania's National Strategy on Climate Change and its Plan for adaptation, is lagging. Additionally, while Albania aims to integrate climate change considerations into various sectors, the road ahead has challenges in the form of inadequate financial resources, a lack of institutional capacity, and potential opposition to certain measures, such as the development of new hydro plants. The country is also preparing a long-term Building Renovation Strategy and establishing a Monitoring, Reporting, and Verification (MRV) system, although institutional capacity will need to be strengthened if these are to be implemented effectively.

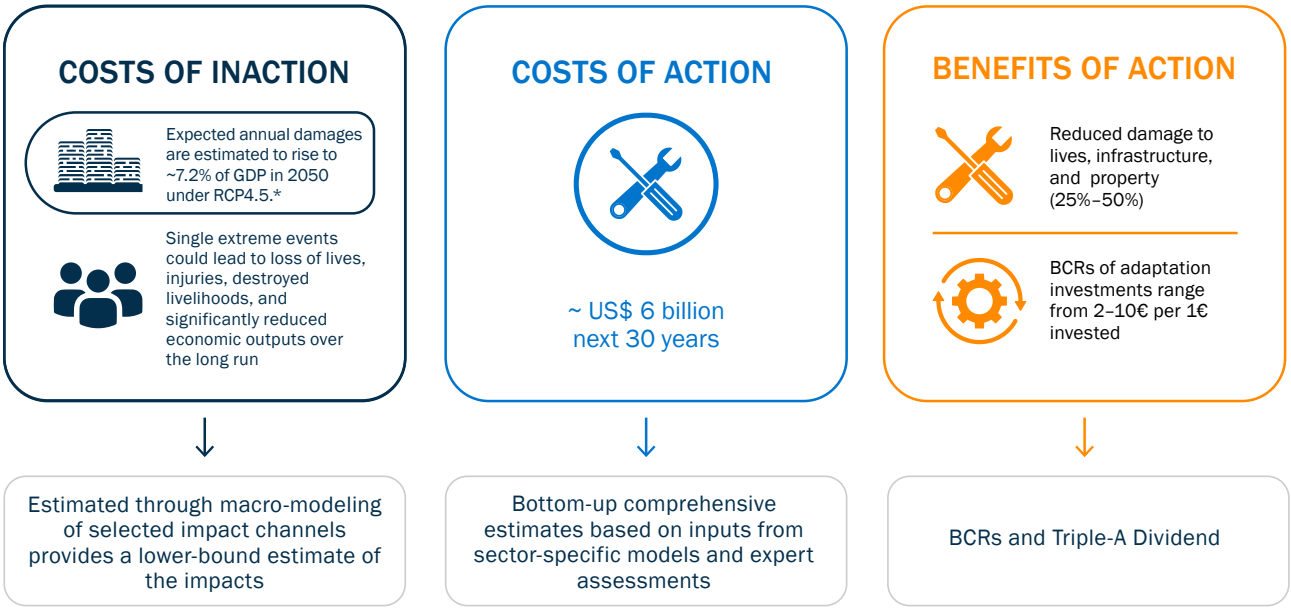
The institutional maturityfor implementing climate action in Albania is still nascent or emerging. While Albania's planning ability is slightly better than the Western Balkans 6 (WB6) average, organizational structures for climate change lack coordination and capacity. The Ministry of Tourism and Environment is formally tasked with leading climate policy, but challenges persist in integrating climate change into sectoral strategies. Disaster risk management responsibilities are defined, but coordination gaps exist. Although efforts are under way to integrate climate priorities into public finance management, implementation remains incomplete. Sustainable climate finance mechanisms and dedicated funds for adaptation are lacking, hindering long-term planning. Local self-governments have a limited role in mitigation and adaptation, with responsibilities changing over time. State-owned enterprises have few obligations to engage in climate preparedness. Accountability mechanisms, including parliamentary oversight and judicial review, are weak. Strengthening coordination, capacity-building, and accountability structures are essential for advancing Albania's climate action agenda.

Among European countries, Albania has one of the highest levels of disaster risk and exposure to earthquakes, flooding, landslides, and wildfires, which have affected 95 percent of Albanian municipalities in the past two decades. Increased variability in the frequency and magnitude of disaster events is making such events increasingly unpredictable. All countries in the Balkans have been dealing with the consequences of informal development and a lack of planning controls in the transition period that characterized the urbanization of the 1990s. Informal growth often happened in flood-prone areas meaning that Albania along with Montenegro, Bosnia and Hercegovina, and Croatia rank high in countries with settlement areas in flood-hazard zones, with a heightened impact on socially vulnerable and disadvantaged communities. The increased variability in the timing, duration, and severity of natural disasters raises the probability that, in some cases, disasters may compound and cascade. For example, the November 2019 earthquake, which was the strongest in more than 30 years, affected 36 health facilities while these facilities were highly critical due to the COVID-19 pandemic. Localized effects heighten the risk in certain critical sectors. For instance, energy and agriculture are two vital sectors of the Albanian economy that are disproportionately impacted by climate risks. Despite a

projected decrease in annual rainfall of 8.5 percent by 2050, it is predicted that seasonal rainfall will become more variable, bringing with it both extreme rainfall events and droughts, with significant impacts on agriculture and critical energy infrastructure. High-intensity rainfall in the Drini River could cause downstream flooding that could ruin crops and kill livestock, while more intense drought could both cut national energy production in half and cause harvest losses in the critical summer months. In 2015, floods in Albania are estimated to have affected 42,000 people, caused one fatality, damaged 2,000 houses, and flooded 17,000 hectares of land, with land erosion aggravating risks.[1] Albania can suffer major economic damage from climate change under all scenarios of the representative greenhouse gases concentration pathways (RCPs). In the absence of any investments to adapt to a changing climate, the potential impact on GDP would be around 7 percent in 2050 under RCPs 2.6, 4.5 and 8.5, which can be considered a lower-bound estimate. It should be emphasized that modeling the effects of natural hazards and climate change on GDP is not straightforward, and expected average impacts can hide how dramatic individual events can be.

The costs of investing in adaptation are high, but the costs of inaction are even higher, as are the benefits of taking action. Albania would need to invest in US$6 billion (in 2020 dollars, undiscounted) over the next decade to protect people and property from the damaging and escalating impacts of climate change (Figure ES.1). This initial comprehensive adaptation investment package would cost equivalent to around 0.6–1 percent of GDP per year until 2050. Yet such adaptation-focused investments would yield what has been called a Triple-A Dividend: (i) avoided losses, (ii) accelerated economic potential, and (iii) amplified social and environmental co-benefits. Implementing adaptation climate actions at the national level greatly reduces human and economic losses from disasters and climate events and facilitates human capital development.

FIGURE ES.1: Summary of adaptation investment narrative



Source: World Bank analysis

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

* The macroeconomic model yields annual estimates for damages based on the expected annual loss from each climate hazard. The expected damages are projected to grow over time, reflecting increasingly unpredictable and volatile climate conditions. Combined damages from the drought impact on maize and wheat, heat stress on labor productivity, and riverine floods, are estimated to be 7.2 percent of GDP under RCP 4.5 in 2050 for Albania.

[1] IFRC (International Federation of Red Cross and Red Crescent Societies). Albania: Floods - Emergency Plan of Action (EPoA) DREF n° MDRAL005. (2015). https://reliefweb.int/report/albania/albania-floods-emergency-plan-action-epoa-dref-n-mdral005

Adaptation investments can be a precursor to employment growth and the improvement of workforce skills. Increased trade opportunities often follow in the wake of these adaptation projects, further bolstering the case for a proactive approach to achieving climate resilience. Enhancing climate resilience through a dovetailed, synergetic approach in the agriculture and tourism sectors could unlock economic opportunities and support employment. With the two sectors accounting for 40 percent of GDP and 56.4 percent of Albania's workforce, an innovative approach in these two sectors would have direct impacts on employment and economic development. Enhancing climate resilience in the urban and transport sectors would unlock economic and trading opportunities and support employment. The integration of risk information into the planning, design, and maintenance stages of all infrastructure investments should therefore be encouraged. Moreover, investing in nature-based solutions (NBS) promotes adaptation while yielding substantial cobenefits for the ecosystem and local communities, especially the vulnerable and those in mountainous and downstream areas. NBS for flood prevention can yield high net benefits, with benefit–cost ratios that are generally greater than 2, often as high as 12 for peatland restoration, and up to 18 for floodplain restoration. Albania's Urban Renewal program has undertaken more than 581 projects across the country. Lastly, investing in human capital helps to adapt systems through improved education and productive skills, to identify health issues early, and to protect vulnerable populations from falling into poverty.

Accelerating the energy transition to achieve economy-wide net-zero emissions in Albania by 2050 is feasible, but it will require radical transformation and decisive action. An energy system modeling analysis was carried out as part of the WB6 Country Climate and Development Report (CCDR) to assess sectoral decarbonization pathways for the WB6 countries. In the reference scenario (RS)[2] without a net-zero ambition, emissions would increase by 2050, with more reliance on natural gas, solar, and wind energy because of their cost-competitiveness. With a net-zero ambition for Albania, hydropower, wind, solar, and biomass, equipped with carbon capture and storage (CCS), would be the main electricity sources in the country, and there would be no role for natural gas in the longer term. Wind would overtake hydropower as the main source of electricity thanks to its attractive onshore wind potential, while hydropower would be used to balance the intermittency of solar and wind resources. This diversification of electricity generation, which is currently highly reliant on hydropower, would improve the flexibility and resilience of the current system. The Vlora thermal power plant would remain productive in the medium term, but it would become uneconomical to operate it after 2030. Achieving net zero by 2050 would also require significant energy efficiency improvements and electrification across the economy, especially in the transport and heating sectors.

The target of net zero by 2050 can be achieved with negligible macroeconomic fiscal impacts on the economy's current potential growth. Overall, compared to RS, Albania would need to invest an additional US$200 million until 2030 and US$5.3 billion until 2050 (in 2020 dollars, in present values) in the energy system to achieve economy-wide net zero, equivalent to about 2.5 percent of GDP per year on average until 2050. Most of this investment would go toward the transport sector (namely the electrification of passenger cars). The impact of decarbonization investments on domestic output would be modest relative to the significant emissions reduction that this investment would bring, as GDP per capita would be only 0.04 percent lower in 2050 compared to the RS. The green transition will require significant retraining in Albania, beyond just the high polluting sectors, with 9.9 percent of the workforce requiring upskilling or retraining in the medium run. This will require the long-term reform of education and training systems to equip the population with the skills they will need for the green transition into the future.

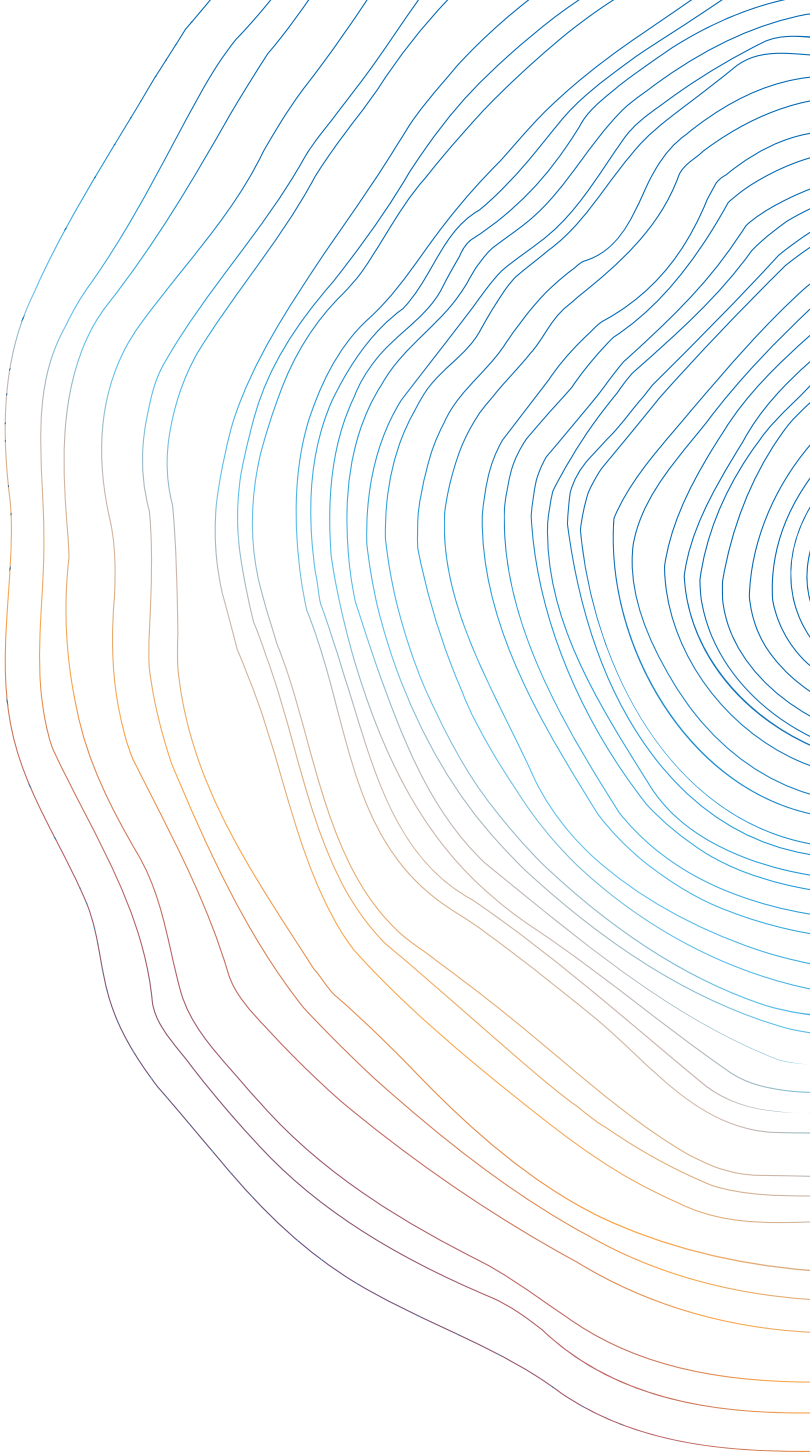
Albania needs to develop its green debt market, and leverage guarantees and PPPs to boost climate investment. Albania can tap into EU pre-accession financing and international finance institution financing to support climate action. However, under a net-zero emissions trajectory, the private sector is expected to do most of the investment in decarbonization (85 percent), especially in the transport, buildings, and power

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

sectors. Raising capital to finance climate change-induced investments will require an enabling regulatory environment, as the green finance landscape in the country is at its infancy. The country needs to implement a sustainable finance framework in alignment with the EU, that can support the issuance of thematic debt instruments such as green, social and sustainability-linked bonds. Guarantees can also help to crowd-in private investments. With the help of capital optimization instruments provided by international guarantee agencies (such as MIGA), international banks with subsidiaries in Albania can reduce the regulatory risk-weighting applied to their mandatory and voluntary reserves at the consolidated level, freeing up capital for their subsidiaries that can be used to finance climate mitigation and adaptation projects. Public–private partnerships (PPPs) are already being used in Albania to attract private sector investment, but improvements are needed, especially around risk management. Leveraging PPPs to fill Albania's infrastructure gap will require (i) additional capital financing, (ii) transparent frameworks for administrative tariffs, and (iii) enhanced institutional capacity and oversight capacity in the public sector.

Adaptation and mitigation can be part of a sustainable growth strategy that delivers higher productivity. Albania can use climate change adaptation and mitigation as an opportunity to achieve a more sustainable growth model with higher productivity. To do so, it will need to (i) invest in its people (ii) improve the foundations for business, entrepreneurship and international trade environment (iii) create fiscal space and improve the efficiency of public spending, and (4) strengthen institutional development. The public sector's response needs to be three-fold. First, to adopt policies that mitigate the economic and social impact of climate change by incentivizing private sector and household action (i.e. zoning, insurance, financing instruments, carbon pricing, incentives for research and innovation, etc.). Second, to strengthen efficiency of public spending (i.e. social assistance, education, pharmaceutical spending, etc.) and to ensure the availability of efficient social support mechanisms. Third, increase fiscal space by bolstering domestic revenue mobilization through the Medium-Term Revenue Strategy (MTRS), inter alia, increasing the taxation of environmentally- and health harmful products and activities, while reducing tax expenditures and increasing the tax base by reducing the informal economy. Albania would also need to actively monitor and manage fiscal risks from climate change.

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



Chapter 1

Introduction: Setting the scene

1.1. Climate and the development context

Albania is a small, open, upper-middle-income country aspiring to join the EU. Agricultural land covers a little over 41 percent of the country's surface area, with forests covering about 29 percent of total land area, the lowest share among the Western Balkan countries. Yet agriculture contributes a high share of GDP, above 18 percent. Albania's total resident population is 2.8 million, about 36 percent of whom live in rural areas. The country has achieved considerable progress in reducing poverty. Albania's poverty rate fell from 40 percent of the population in 2005 to 10 percent in 2019 (measured at US$5.50 per day in constant US dollars). Albania has also been narrowing its per capita income gap with the EU, albeit at a very modest pace. In 2019, its per capita income was still just 15 percent of the EU's, measured in current US dollars, and 31 percent measured in constant purchasing power parity US dollars. Energy poverty remains a concern, with 37 percent of the population spending more than 10 percent of their income on energy,[3] and, in 2020, 36 percent struggled to keep their home warm, compared to just 7.5 percent in the EU as a whole.[4]

EU accession, coupled with changes in the regulatory and trade environments, can offer opportunities to revive growth in a sustainable manner. Accession to the EU can be an anchor for future growth and development. In the context of limited fiscal space and ability to attract investment, Albanian firms can seek EU funds for research, development, and innovation in green and digital technology. The EU Growth Plan for the Western Balkans incentivizes the region's preparations for EU membership and accelerates reforms via the €6 billion Reform and Growth Facility in 2024-2027, with €922 million tentatively allocated to Albania, subject to the achievement of the payment conditions. The Government of Albania has prepared a plan of reforms to spur socio-economic convergence under the Growth Plan. The EU Carbon Border Adjustment Mechanism (CBAM), on the other hand, may pose a risk for targeted industries, as well as an opportunity for accelerating their decarbonization (refer to Section 1.3.2 in the Western Balkans 6 CCDR report).

Albania has both the lowest carbon and the lowest energy intensities in the Western Balkans region. Albania's carbon intensity is lower than the EU-27 average and approximately four times lower than that of Kosovo, Bosnia and Herzegovina, or Serbia (Figure 1.1) because of the high share of renewable energy in gross primary energy demand (45 percent).[5] Albania's electricity supply is nearly carbon-free as almost all electricity (95 percent)[6,7] is generated by hydropower plants. Albania's energy intensity is also lower than the EU and WB6 averages partly because of the relatively low share of energy-intensive industries in GDP.

Albania's contribution to global greenhouse gas (GHG) emissions is meager, agriculture being historically the main emitting sector. Between 2000 and 2019, Albania's GHG emissions averaged 10.9 $MtCO_2eq$/year, corresponding to approximately 10 percent of regional WB6 emissions. In 2019, Albania's per capita GHG emissions were 3.6 tCO_2e per capita, the second-lowest rank in WB6. The emissions have grown slightly over the past decade, and at a lower rate than GDP growth. A peak in emissions between 2011–2012 was caused by forest fires (Figure 1.2).[8] The land use, land use change, and forestry (LULUCF) sector in Albania makes a net contribution to emissions because of its inability to absorb more than it emits on an annual basis. This is the result of deforestation from illegal logging, fuelwood burning, and wildfires,[9] as clearing forests not only directly emits carbon dioxide into the atmosphere from the cleared trees and soil, but the removal of forests as a natural carbon sink reduces the ability of the environment to drawdown carbon. Albania also

---

3 World Bank, Eastern Europe and Central Asia (ECA) Poverty Database (ECAPOV)

4 Eurostat, Inability to keep home adequately warm – EU-SILC survey (2022), https://ec.europa.eu/eurostat/databrowser/view/ILC_MDES01/default/table?lang=en.

5 Energy Community, Albania Country Report (2022), https://www.energy-community.org/implementation/report/Albania.html.

6 World Bank, World Development Indicators (Washington, DC: World Bank, 2023), https://databank.worldbank.org/source/world-development-indicators.

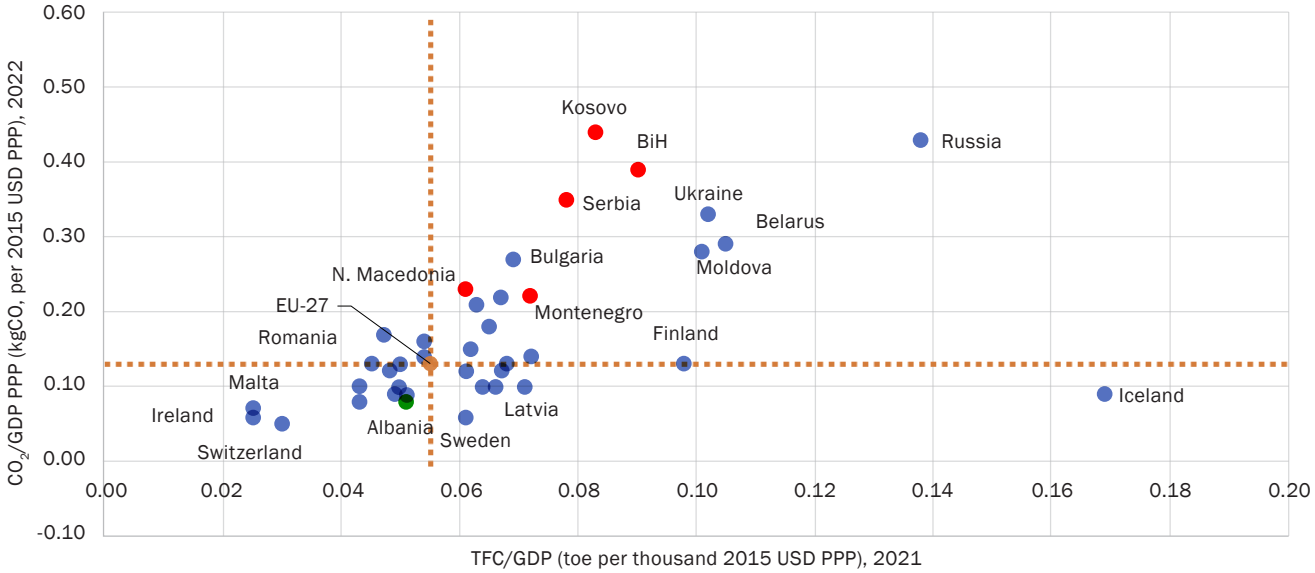
7 Government of Albania, Instat Albanian Institute of Statistics (2023), https://www.instat.gov.al/en/

8 United National Framework Convention on Climate Change (UNFCCC), Albania revised NDC (2022). https://unfccc.int/sites/default/files/2022-08/Albania%20Revised%20NDC.pdf

9 Invest in Albania, *Albania: 410 Hectares of Forests Destroyed in 5 Years*. (2020) https://invest-in-albania.org/albania-410-hectares-of-forests-destroyed-in-5-years/#:~:text=Like%20elsewhere%20in%20the%20world,logging%20remains%20a%20major%20concern

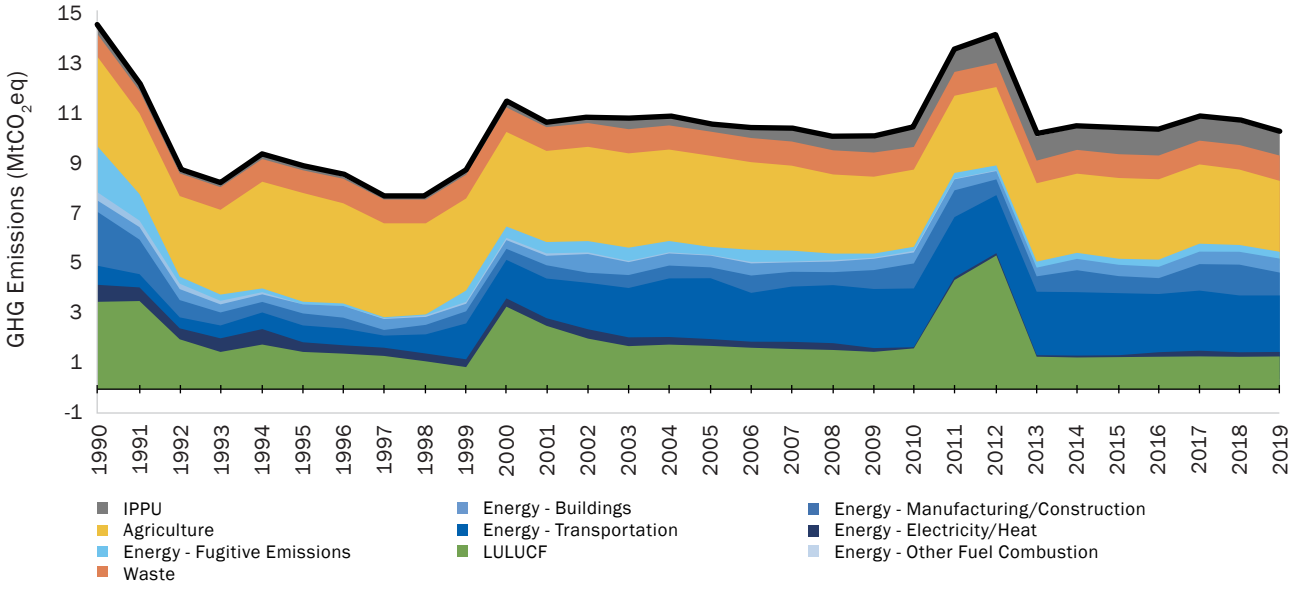
stands out in the Western Balkans due to its minimal emissions from electricity generation, which is the highest emitting sector in most Western Balkan countries. Instead, the highest emitting sector in Albania is agriculture, making up 27 percent of emissions (2019). The transport sector, at 22 percent, is the second-largest emitter in Albania, followed by industrial processes and waste, at 10 percent each.

FIGURE 1.1: Energy intensity vs. carbon intensity of European countries



Source: IEA (2021). World Indicators; IEA (2022) Indicators for CO_2 Emissions.

FIGURE 1.2: GHG emissions in Albania, by sector



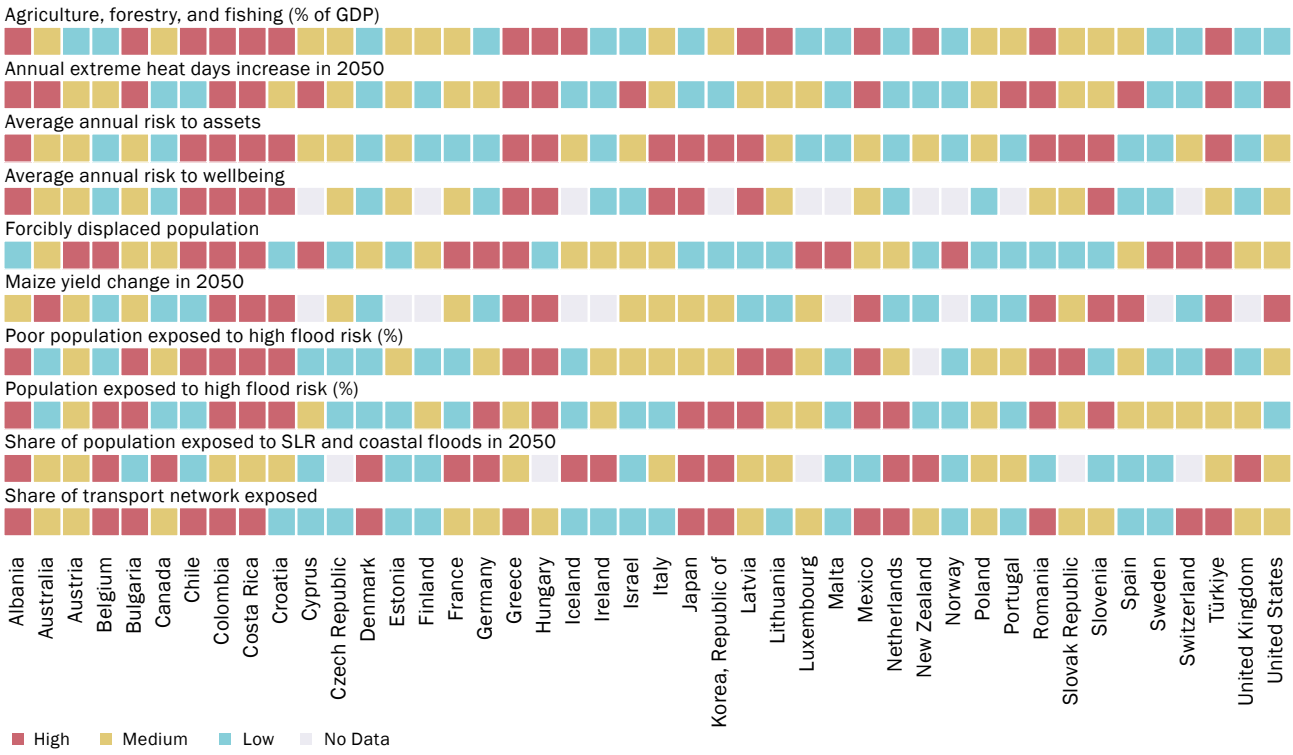
Source: CAIT (2023)

Albania's significant water resources, which play a critical role in the country's agriculture and food system, energy security, and biodiversity, are vulnerable to climate change. The availability of water resources is vital for Albania's economic development because of the prevailing share of hydropower in the energy mix, the socioeconomic role of agriculture, and the large land areas of high ecological value.[10] Agriculture accounts for 36 percent of total employment in Albania. Its share of GDP averages 19 percent but

[10] Austrian Development Corporation, Assessment of the Water-Energy-Food-Ecosystems Nexus in Albania (2022) https://www.gwp.org/globalassets/global/gwp-med-files/list-of-programmes/see-nexus/final-reports/albania-nexus-assessment_final.pdf

is as high as 45 percent in certain municipalities like Berat county.[11] Climate-related events such as floods, prolonged droughts, increasing temperatures, heat waves, and lower precipitation pose serious threats to both the agriculture sector and food security,[12] and to energy security, and could have massive repercussions on the economy. For example, the country was forced to import significantly more electricity in 2022 because of droughts.[13] Although Albania's Integrated Water Resources Management Strategy and the National Sectoral Programme on Water aim to reconcile various sectoral uses of water, there is still need for better synergies and improved coordination among policies related to water, energy, food/land use, and ecosystems.[14]

FIGURE 1.3: Climate risk and vulnerability in Albania compared to EU and OECD countries



Source: World Bank Climate Change Group

To better manage the power sector's high dependency on hydro resources, Albania is striving to enhance regional trade in electricity. For most of the last decade, Albania has been a net electricity importer, relying on costly imports during the dry season, most recently in 2022. Coupled with the energy crisis precipitated by Russia's invasion of Ukraine, this has translated into a high energy bill. During the wet season, Albania can produce more electricity than it needs for internal consumption and compliance with existing contractual obligations. But without a liquid regional market, Albania is compelled to discharge water or alternatively supply the excess electricity abroad on short notice and on uncertain terms. Enhanced regional electricity trade would enable Albania to make more efficient use of its hydro resources, improve energy security, and facilitate the integration of variable renewable energy such as wind and solar. Albania and Kosovo have started bilateral market integration in a step-by-step manner and have already reaped considerable benefits from cooperation in providing balancing and ancillary services to one another. In December 2022, the government of Albania welcomed the adoption of an ambitious legislative package by the Energy Community Ministerial Council, which aims at fully integrating South-East Europe's electricity markets with that of the rest of Europe.

[11] GoA. Instat Albanian Institute of Statistics.

[12] World Bank. Exploring the Potential of Agriculture in the Western Balkans: A Regional Report. Washington, DC: World Bank. (2018) https://openknowledge.worldbank.org/server/api/core/bitstreams/dc6bd2f3-5fa2-5f04-9a86-5e8e439ba250/content

[13] Reuter. Albania dims lights as drought, price spike spark energy crisis. (2022) https://www.reuters.com/world/europe/albania-dims-lights-drought-price-spike-spark-energy-crisis-2022-03-21/

[14] Austrian Development Corporation. Assessment of the Water-Energy-Food-Ecosystems Nexus in Albania. (2022) https://www.gwp.org/globalassets/global/gwp-med-files/list-of-programmes/see-nexus/final-reports/albania-nexus-assessment_final.pdf

1.2. Climate change commitments and strategies

Albania has taken a series of legislative steps demonstrating its increased attention to climate change adaptation, climate resilience, and mitigation. In 2016, Albania submitted its Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) and revised it in 2021. The Law on Climate Change, passed in 2020, provides the general national framework for climate action. The 2020–2030 National Strategy on Climate Change provides for medium-term planning of climate action, although long-term planning is still missing. This national strategy is aligned with the revised NDC and sets specific sector targets for energy, transport, agriculture, and LULUCF. The strategy was enacted together with action plans for both mitigation and adaptation. The priority measures set in the 2022–2030 National Strategy for Development and European Integration include the adoption of climate-related secondary legislation and climate budgeting. Table 1.1 sets out the status of key national laws and strategies for climate action.

TABLE 1.1: Key national laws and strategies as of December 2023

	Paris Agreement			Strategies				Laws			
	Entry into force	NDC last update	LT-LEDS	NECP	Climate change / Low-carbon Development Strategy	National Adaptation Plan	Energy Strategy	Law on Climate Change	Law on Air Quality	Law on Energy Efficiency	Law on Renewable Energy
Status	Nov 2016	Oct 2021	✗	✓ (until 2040)	✓ (until 2030)	✓	✓ (until 2030)	✓	✓	✓	✓

Legend: Green: document approved and valid. Red: document does not exist or has expired.
LT-LEDS: Long-term, low-emissions development strategy in accordance with Article 4 of the Paris Agreement.
Source: World Bank compilation of various energy national laws and strategies and the National Climate Actions Strategies & Policies Database (NCASPD).

1.2.1. Adaptation

The Strategy for Climate Change and its Plan for adaptation set the medium-term planning framework. The strategy provides a general framework for adaptation, including a summary of climate scenarios and their impacts on various sectors of the Albanian economy, along with measures for adaptation. The plan focuses on coastal ecosystems, flood protection, agriculture, settlements, and tourism. The focus on coastal ecosystems aims at safeguarding them through comprehensive management plans that enhance ecological health, prevent contamination, control unauthorized constructions, and expand protected areas. Flood protection measures involve riverbed cleaning, embankment maintenance, and real-time flow monitoring, with a proposal to establish a dedicated regional center for improved flood prediction. In agriculture, strategies include crop selection adjustments, technological enhancements in farming practices, and agroforestry for increased sustainability. In the area of population and settlements, a comprehensive adaptation communication strategy and wildfire risk awareness are the key components. Lastly, the plan encourages the tourism sector to engage in climate adaptation through information dissemination, training programs, and climate-aware financing.

The implementation of the National Adaptation Plan has fallen behind schedule, according to the first progress report for 2019-2023, published by the Ministry of Tourism and Environment in March 2023. Planning of adaptation will be facilitated by the hazard maps, using the flood hazard maps prepared by GIZ, and the civil protection department working on developing national-scale hazard maps for fires, droughts, and earthquakes. The integration of climate change into strategies of vulnerable sectors is emerging, as in the case of the National Strategy on agriculture, rural development, and fishery for the 2021–2027 period. An important milestone for the Adaptation & Resilience (A&R) planning was achieved with the enactment of the 2023–2030 National Disaster Risk Reduction Strategy and the 2023–2027 Action Plan. The National

Disaster Risk Reduction Strategy integrates climate change into the national disaster risk management (DRM) framework, and the Action Plan presents several measures for climate change adaptation (CCA), including further development of climate information services and the introduction of an impact-based, multihazard, early-warning and early-action system.

1.2.2. Mitigation

Albania's climate change commitments are primarily driven by its orientation toward the EU and reflect the low-carbon intensity of its economy. The medium-term mitigation targets are set in the NDC, the National Strategy on Climate Change and its Plan for Mitigation, and the National Energy and Climate Plan (NECP), adopted in 2021 and expected to be updated by June 2024. The NDC, NECP, and the Clean Energy Package adopted by the Energy Community in December 2022 set mitigation targets using different baseline years (Table 1.2). Most scenarios foresee an increase in Albania's GHG emissions by 2030, which can be explained by the economy's currently very low carbon intensity. The mitigation targets are formulated as a reduction in GHG emissions resulting from additional policies and measures, compared to the business-as-usual (BAU) scenario in NDC and the "with existing measures" (WEM) scenario in the NECP. As a signatory to the 2020 Sofia Declaration on the Green Agenda for the Western Balkans, Albania has in principle expressed its intention to contribute to the target of Europe becoming the first climate-neutral continent; but long-term planning toward a net-zero target is significantly missing.

Table 1.2: Albania's key mitigation targets for 2030

Net GHG emissions target (with LULUCF)			Level of GHG emissions ($MtCO_2eq$)			Share of energy from RES in gross final consumption*		Final energy consumption	
NDC**	NECP***	CEP	NDC	NECP	CEP	NECP	CEP	NECP	CEP
+18.1% from 2016 level in NDC scenario (-20.9% compared to BAU scenario)	+ 15.4% from 2018 level in WEM and -6.1% in WAM (WAM: -18.7% reduction compared to WEM)	+53.2% from 1990	12	10.2	12	54.4%	52%	-8.4% reduction compared to WEM scenario	2.4 Mtoe compared to the 1.86 Mtoe target for 2020

Sources: Nationally Determined Contribution (2021), NECP (2021), Energy Community Clean Energy Package: https://www.energy-community.org/implementation/package/CEP.html.

**The* actual share of renewable energy sources (RES) in gross final energy consumption was 41 percent in 2021, according to Eurostat.

***The* Nationally Determined Contribution compares emissions in the NDC scenario with the business-as-usual (BAU) scenario.

***The* NECP compares emissions in scenarios with existing measures (WEM) and scenarios with additional measures (WAM).

Albania has adopted sectoral targets and implementation plans for the main emitting sectors; implementation and enforcement of the envisaged policies and measures will be the key. The NECP outlines mitigation policies and measures along several dimensions, including energy efficiency improvements in various sectors and the deployment of renewable energy. Albania recently mandated that energy efficiency programs, as part of municipal energy management, be aligned with NECP targets. Other mitigation measures envisaged in the NECP include the introduction of an emission trading system (ETS) according to EU standards, and increasing the carbon sink capacity of forests and pastures. There are, however, limited financial resources and capacity allocated to managing forests.[15] Albania still has untapped hydro resources and plans for their further development, but for environmental and social reasons, the construction of new hydro plants could face local opposition. The deployment of renewable energy sources is supported by feed-in tariffs for small producers and auctions for Contracts for Difference (CfDs) for larger producers. Households and SMEs can also install small wind and solar power systems for their own consumption. Additionally, a long-term Building Renovation Strategy is being prepared.

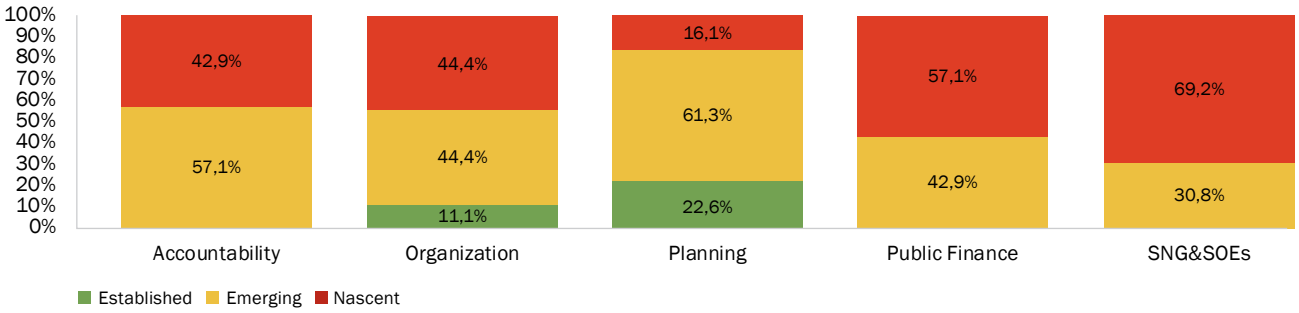
[15] European Commission. Albania 2023 Report. (2023) https://neighbourhood-enlargement.ec.europa.eu/system/files/2023-11/SWD_2023_690 Albania report.pdf

The monitoring, reporting, and verification (MRV) system is under preparation, with an anticipated finalization in 2025. The National Environment Agency (NEA) is mandated as the leading institution for MRV, and the rulebook on monitoring and reporting GHG emissions has been enacted. But the capacities of the NEA—the number and skills of its employees, and its logistics and technical equipment—need to be strengthened.

1.3. Institutions, policies, and capacities

Overall Albania appears to have nascent-to-emerging institutional maturity for addressing climate change, according to the World Bank's Climate Change Institutional Assessment (CCIA), which examines countries' capacity to plan, implement, and sustain climate change policies over multiple political cycles by analyzing 74 indicators across five pillars. The indicators measure different aspects of a country's institutional maturity for climate action as either Nascent, Emerging, or Established, with further a breakdown within each category. Given the fact that the CCIA is a point-in-time analysis, the findings may not capture recent developments because of the rapid pace of regulatory and institutional development across the region. Nevertheless, the assessment serves as a useful empirical baseline to highlight achievements and gaps across the region, which helps to inform peer learning and innovation in climate action. Annex A outlines the CCIA methodology and summarizes the results, which indicate that Albania's institutional maturity is slightly more advanced than the Western Balkans average in the Planning pillar, but less advanced in the Organization and Accountability pillars. Figure 1.4 shows the level of Albania's ability and action by pillar.

Figure 1.4: Albania CCIA overview, by pillar



Sources: Country Institutional Capabilities for Climate Change Action: Western Balkans Climate Change Institutional Assessment (CCIA); D4C National Climate Actions Strategies and Policies Database (NCASPD).

The organizational structures for climate change are only partially established, have insufficient capacity, and lack coordination. The Ministry of Tourism and Environment (MTE) leads climate change policy, while the National Environment Agency is responsible for measuring, reporting, and verifying GHG emissions and other climate change data. The European Commission has highlighted the very limited capacity of Albania's public administration to interpret climate change impacts and incorporate climate change into sectoral strategies and plans. While responsibilities for disaster risk management are clearly assigned with some national-level capacities, the situation at the local level is not so clear and varies by region. The Inter-Ministerial Working Group on Climate Change (IMWGCC), mandated to coordinate mitigation and adaptation efforts, meets irregularly and lacks comprehensive representation from all relevant government institutions, subnational governments, academia, and civil society organizations. Additionally, it lacks sufficient authority and an adequate advisory role.

Public finance management does not yet integrate climate change but the legal basis for this is being developed. The Ministry of Finance has defined the rules for integrating climate change budget requirements into its budget planning documents, but the legal basis for climate-informed public investment management is incomplete. The Law on Climate Change requires that all ministries consider climate change when developing projects or programs for public investment, but specific secondary legislation is missing. The Government Decision on Public Investment Management (2022) includes environmental and climate impact assessment as one of the principles used to propose, assess, and prioritize public investments. Overall, while steps are

being made towards integrating climate change into public finance management, more needs to be done to ensure this is done effectively and consistently.

Green public procurement (GPP) has been acknowledged as a need but it has not yet been implemented. GPP is a voluntary instrument foreseen by the Law on Public Procurement (2020), which defines all necessary dispositions in line with EU legislation, allowing all contracting authorities and entities to legally apply GPP procedures. The Agency on Public Procurement has issued guidelines and a methodology for the implementing GPP, including technical specifications, criteria for contract awarding, and contract conditions, but these have not yet been systematically applied.

Some financial instruments for emergency response are in place, but sustainable climate finance mechanisms are yet to be established. The yearly state budget includes a line on the Management of Natural Disasters. The fund is defined by the civil emergency program on a yearly basis and is managed by the Civil Emergency Committee. Additionally, the government has established contingent budgetary reserves that can be used in case of natural emergencies. But there is a lack of mechanisms for the sustainable financing of climate action at both the national and subnational levels. There is no collection of revenues earmarked for climate action. Local self-government (LSG) units receive funds from the national budget for climate change-related activities, such as forest management, but the periodic annual nature of such transfers creates both discontinuity and dependency and is an obstacle to long-term planning.

There are no dedicated funds for climate change adaptation measures, only isolated measures for agriculture and rural development or forest regeneration that fosters adaptation. There are no financial incentives for climate adaptation nor resilience measures. The government is working on a program to support and promote insurance in agriculture (crops, facilities, feed, produce) and on legislation to provide for mandatory household insurance (the draft of which was open for public consultation in September 2023). National support schemes for agriculture and rural development include support to improved irrigation schemes and equipment and crop protection measures such as hail protection. Additionally, some measures are related to forest regeneration.

The LSGs have limited functional assignment for mitigation or adaptation, but this is changing. In the past decade, 90 percent of local government units have drafted and approved their first integrated territorial development plans. This has been a crucial tool to ensure a more controlled and sustainable approach to development across the country. In addition, the Law on Energy Efficiency obliges municipalities to prepare municipal energy and climate action plans as part of energy management. The first municipal plans are in development and are expected to be aligned with the National Energy and Climate Plan. Municipalities are also obliged to develop local hazard risk reduction plans (that also cover climate-induced risks), but there is no legal obligation to develop specific climate change adaptation plans.

Although heavily impacted, SOEs are not obliged to prepare for and respond to climate change. The state-owned Electro Energy Corporation (KESH), Albania's largest energy company, operates on the Drin River cascade and is highly reliant on hydro resources for electricity generation. Although not legally obliged to prepare for and respond to climate change, KESH prepared a Climate Risk Management plan in 2018. So, while not legally obliged, some SOEs on their own take the initiative to respond to climate change.

The mechanisms for ensuring accountability could be strengthened. There is no evidence of Parliament exercising its power over the executive in the area of climate change. The Albanian Supreme Audit Institution (ASAI) has not been involved in the review of the implementation of climate change policy, according to publicly available information. Finally, there is no evidence of court authority to review climate inaction, although the number of court cases related to environmental crime is slowly increasing, which could act as potential precedents in enabling legal action against climate inaction.

Climate data collection and management could be improved, especially at the local level. Currently, substantial efforts have been made in collecting data at the national level, with some centralization and

standardization through the government's open data portal[16] as well as the national geospatial portal.[17] But it is difficult to operationalize information at the local level because of inadequate geographical granularity and a lack of data updates and maintenance.[18] Statistical processing and service modernization would enhance the cost-efficiency of official data and statistics but also increase public trust in the national statistical system.[19]

Albania's human capital will be critical for climate action, but its development faces significant challenges. The country's Human Capital Index score is 0.63, which means that Albania is not utilizing more than one-third of its human potential.[20] Recently released PISA (Programme for International Student Assessment) 2022 assessment results for Albania showed declining performance and below-average learning outcomes. Compared to 2018, the average 2022 results were down in mathematics, reading, and science. In 2020 and 2021, the COVID-19 pandemic exacerbated the challenges faced by Albania's education system. In particular, the state of the country's digital infrastructure posed great difficulties to the effective use of online and distance learning. Additionally, the disruptive effects of the 2019 earthquake and the pandemic in the following year may have negatively impacted the psychology and engagement of students in the 2022 PISA tests.[21] Albania's health system faces challenges that hinder its ability to respond effectively to climate-health risks. Health financing in the country, partly supported by a compulsory health insurance fund,[22] is low, accounting for just 6–7 percent of GDP.[23] The result is that there are limited resources available to support climate resilience measures in the health sector. Out-of-pocket spending is therefore high in Albania, especially for noncommunicable diseases.[24] There are Albanians that choose not to use the health services because of their cost,[25] which potentially restricts access to health care during climate-health emergencies, especially in the case of poorer households. In 2022, the employment rate reached a record high of 65 percent (71 percent among men, 59 percent among women). The rate of young people who are not in employment, education, or training (NEET, 23.3 percent) has been steadily decreasing but remains the second-highest in the Western Balkans, after Kosovo. At the same time, Albania's working-age population continues to shrink in size as people emigrate in search of better job opportunities. Indeed, the Albanian diaspora with approximately 1.4 million Albanians living outside the country, one of the highest proportions of diaspora in the world.[26] Overall, significant investments in developing human capital are necessary to ensure Albanians are ready to respond to the increased volatility associated with worsening climate change.

16 Government of Albania. Open Data Portal. (2023). https://opendata.gov.al/

17 ASIG. National Geospatial Portal. (2023). https://geoportal.asig.gov.al/en

18 Government of Albania. Strategjia Kombëtare për Zhvillim dhe Integrim Europian 2030. (2022). https://konsultimipublik.gov.al/documents/RENJK_538_Draft-Strategjia-Kombetare-per-Zhvillim-dhe-Integrim-2021--2030-.pdf

19 GoA. Strategjia Kombëtare.

20 The index is a summary measure of the amount of human capital a child born today can expect to acquire by age 18, given the risks of inadequate health and inadequate education that occur in the country where she or he lives.

21 Organization for Economic Cooperation and Development (OECD). PISA 2022 Results (Volume I and II) - Country Notes: Albania. (2023). https://www.oecd.org/publication/pisa-2022-results/country-notes/albania-1ccc35b9#chapter-d1e11

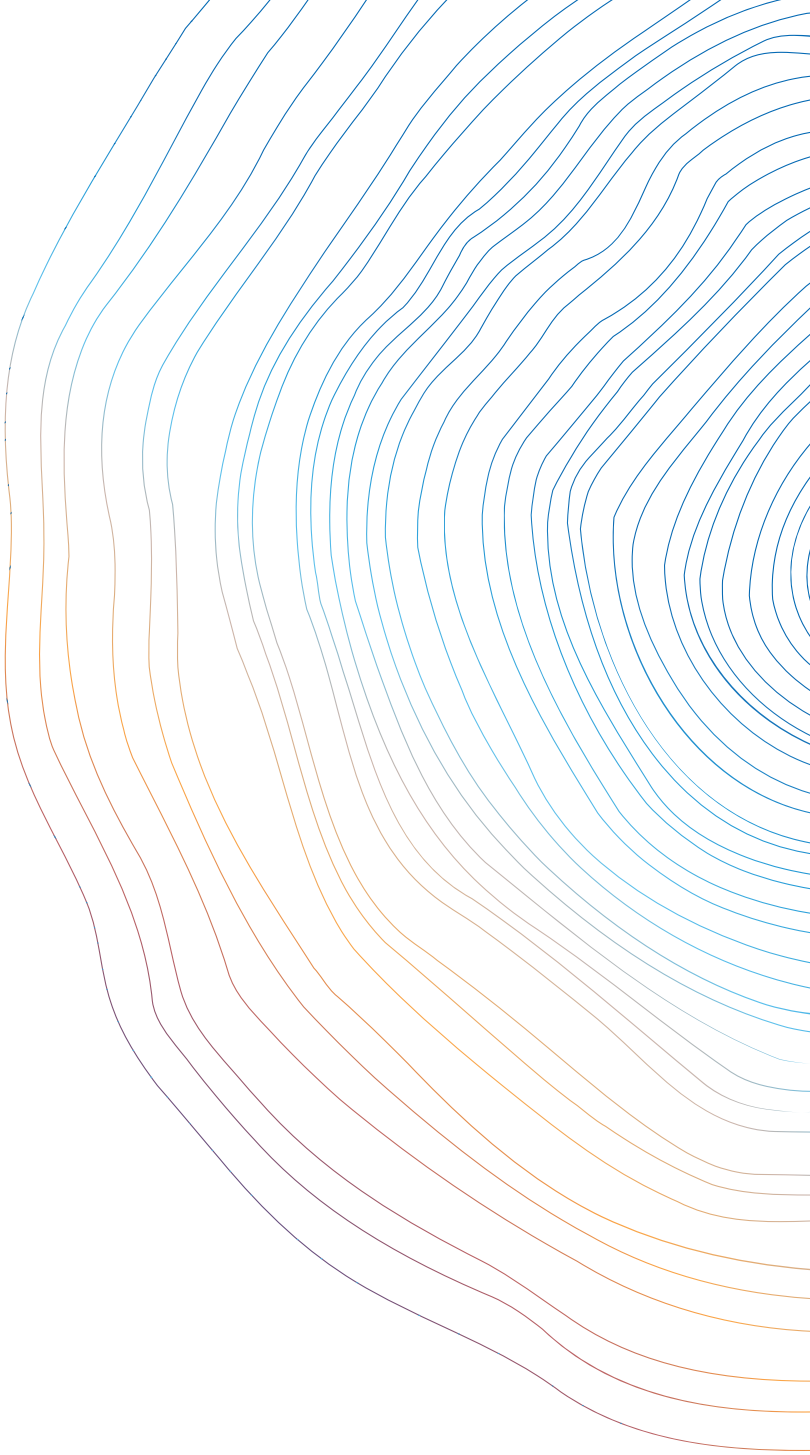
22 Visit World. Health care system of Albania: medical centers, spa treatment for tourists. (2022). https://visitworld.today/blog/861/health-care-system-of-albania-medical-centers-spa-treatment-for-tourists

23 International Trade Administration. Albania. (2024). https://www.trade.gov/healthcare-resource-guide-albania#:~:text=Public%20healthcare%20spending%20is%20partially,subsidized%20by%20the%20state%20budget

24 Gabrani, Schnidler, Wyss. Out of pocket payments and access to NCD medication in two regions in Albania. (2022). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9365190/.

25 USAID. Health Care System in Albania. (2013). https://pdf.usaid.gov/pdf_docs/PA00JVRJ.pdf

26 United Nations Migration. Engaging the Albanian Diaspora. (2018) https://www.iom.int/news/engaging-albanian-diaspora.



Chapter 2

Adaptation risks and opportunities

2.1. How is a changing climate affecting risks and opportunities?

Situated along the Adriatic and Ionian coast on the Balkan Peninsula, Albania is susceptible to a range of natural hazards, with flooding, seismic events, wildfires, sea-level rise, and extreme temperature fluctuations being the most prominent (Table 2.1). Notably, the 2019 World Risk Index report lists Albania alongside the Netherlands, Greece, Montenegro, and North Macedonia as the countries that have the highest levels of disaster risk and vulnerability in Europe.[27] Over the past two decades, 30,000 Albanians a year, on average, have experienced the adverse effects of natural disasters, and distressingly, more than 95 percent of Albanian municipalities have been affected by at least one disaster.[28]

TABLE 2.1: Main hazards in Albania and associated risk levels

Hazard	Risk level
River Flood	High
Urban Flood	High
Coastal Flood	High
Landslide	High
Earthquake	High
Wildfire	High
Extreme Heat	Medium
Water Scarcity	Medium

Source: World Bank and GFDRR, ThinkHazard – Albania (Washington, DC: World Bank, 2023), https://thinkhazard.org/en/report/3-albania

In spite of inconsistent data collection in the past, it is clear that the losses from natural disasters and environmental hazards are significant (Table 2.2) and expected to grow. Annual mean temperature has already risen by 1°C since the 1960s,[29] and a changing climate could increase annual mean temperature by 2.4°C to 3.1°C by 2050. Against that backdrop, a rise in extreme heat events would impact labor productivity, mortality and health, and trigger both wildfires and drought. AIR Worldwide estimates the average future damage from only earthquakes and flooding at US$147 million per year, with catastrophic events—meaning 1-in-100-year earthquakes—causing damage of over US$2 billion per event.[30]

In September and November 2019, Albania was struck by two powerful earthquakes of magnitude (Mw) 5.6 and 6.4, respectively.[31] The November earthquake caused US$1.1 billion in damage, the equivalent of 6.4 percent of 2018 GDP, and losses equivalent to another 1.1 percent. The cities of Tirana, Albania's main economic growth engine, and Durres, a central tourism hub, were hit especially hard. Only a few months later, the earthquake damage was compounded by the COVID-19 pandemic, which contracted the economy by 3.3 percent in 2020.[32] Although recent steps have been taken to reduce disaster risk and institute more integrated insurance schemes, Albania still has few prearranged risk financing instruments. To respond to disasters, which currently exceed an estimated $130 million a year on average,[33] the country relies on budget reallocation, ex-post (after the fact) borrowing, and donor aid.

---

27 RUB (Ruhr University Bochum) and IFHV (Institute for International Law of Peace and Armed Conflict). World Risk Report. (2022) https://weltrisikobericht.de/wp-content/uploads/2022/09/WorldRiskReport-2022_Online.pdf.

28 World Bank. Disaster Risk Finance Diagnostic Albania. Washington, DC: World Bank. (2020) https://www.financialprotectionforum.org/publication/disaster-risk-finance-diagnostic-albania

29 United States Agency for International Development (USAID). Albania Climate Change Risk Profile. Washington, DC: USAID. (2016) https://www.climatelinks.org/sites/default/files/asset/document/2016%20CRM%20Fact%20Sheet%20-%20Albania%20%28003%29.pdf

30 World Bank. Disaster Risk Finance Diagnostic Albania.

31 Mw, or moment magnitude, is a new and improved extension of the original Richter earthquake scale that uses a reworked formula – based on a metric called the seismic moment of the quake – to offer a measure of earthquake size more accurate than the Richter scale, which tends to underestimate earthquake energy in the case of very large quakes. Seismologists today universally regard the moment magnitude scale as the authoritative measure of earthquake size.

32 GoA. Strategjia Kombëtare.

33 World Bank. Disaster Risk Finance Diagnostic Albania.

Considered historically, the most destructive hazard is flooding. For instance, in 2015, according to one estimate,[34] floods in Albania affected 42,000 people including one fatality, damaged 2,000 houses, and flooded 17,000 hectares of land, with erosion identified as a major aggravating factor. Although a flood event is typically less damaging than a large earthquake, they can still cause significant damage, also often owing to their recurrence. Wildfires and heat stress are a rising concern, and the full impacts – direct and indirect – need to be better understood.

TABLE 2.2: Recorded damage by type of hazard 1995–2015

Type Of Hazard	No. Of Events	Total Damage (All)	Total Damage US$ (Scaled To 2019)
Flood	391	3,564,484,883	39,424,305
Flash Flood	130	3,793,399,995	30,020,367
Earthquake	162	2,357,968,376	27,201,225
Landslide	542	1,369,823,910	14,024,068
Storm	147	719,794,314	7,552,599
Other	1014	555,078,515	4,126,230
Snowstorm	444	105,601,290	1,089,813
Forest Fire	900	13,404,444	102,764
Hailstorm	29	4,554,700	50,902
Frost	40	N/A	N/A
Total	**3,799**	**12,484,110,427**	**123,592,274**

Source: World Bank, Disaster Risk Finance Diagnostic Albania
Note: The table presents aggregate impacts across different disasters from 1995 to 2015 as listed in the Desinventar database. N/A = data are not available. Data on disaster damages after 2015 are not available in the database.

Despite a projected annual rainfall decrease of 8.5 percent by 2050, seasonal rainfall variability is projected to increase, bringing extreme rainfall events and wildfires (23 percent of crop area is already under medium to high wildfire risk)[35] and droughts with significant impacts to agriculture and critical energy infrastructure. As a country where agriculture—largely rainfed and characterized by smallholder farming—represents 18 percent of GDP, Albania could face heightened food security and economic risk. By 2100, rainfall variability will increase the number of consecutive days without, rain up to 23 straight days in the northern region. Furthermore, cascading consequences will affect the hydropower energy infrastructure in the north—where the Drini River generates more than 90 percent of the electrical energy consumed by industry and households in Albania. Despite the overall trend of the region toward drier conditions, increased and unpredictable variability leads to the growing expectation of flood risk (with increased exposure and flash floods), with major events expected to occur once every 10 years in the north, and once every 20 years in the middle region of the country.[36] Albania has the highest proportion of land area at risk of landslides (66 percent) in the region, and this is expected to grow. Floods, landslides, and wildfires may also significantly impact agriculture, in particular livestock. In 2017, floods destroyed 15,000 hectares of crops and affected thousands of families through livestock losses.[37] Additionally, because of sea level rise, 32 percent of the coastal lowland regions—the economic drivers of agriculture and tourism—are expected to experience a significant increase of flooding and to lose large areas of arable land to inundation-derived salination. Protected coastal natural habitats, marshes, and lagoons are expected to be negatively impacted or even

[34] World Bank and Wood. DIVERSION report.

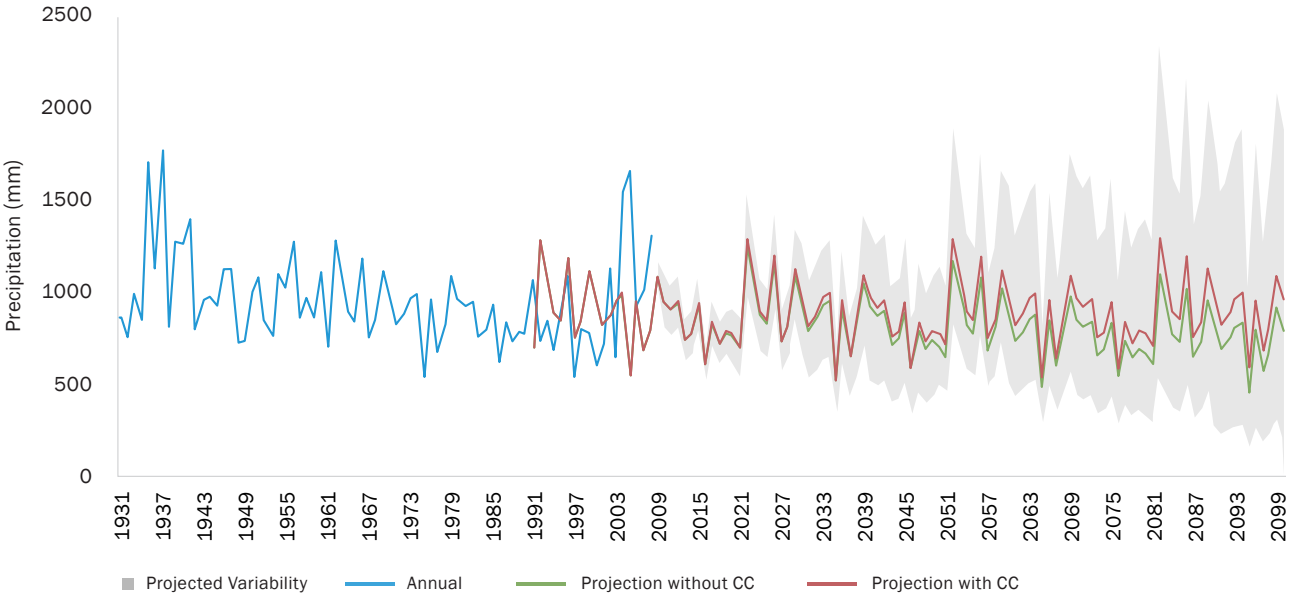
[35] Estimates from World Bank calculations, based on 2023 data from CIMA.

[36] Government of Albania. Strategjia e Ndryshimeve Klimatike dhe Planet e Veprimit (Climate Change Strategy and Action Plan). (2019) https://turizmi.gov.al/wp-content/uploads/2021/10/2.-Strategjia-e-Ndryshimeve-Klimatike-dhe-Planet-e-Veprimit_Qershor-2019_-1.pdf

[37] Reliefweb. Albania: Floods - Nov 2017. (2017) https://reliefweb.int/disaster/fl-2017-000174-alb

disappear, while coastal erosion will intensify, with the Adriatic coastland expected to move further inland.[38] Prioritizing studies on coastal erosion and emphasizing natural-based solutions related to tree planting and preservation of sand dunes is particularly important. Furthermore, a funding plan should be considered to support the adaptation of coastal areas to climate change, particularly in flood-prone regions.

FIGURE 2.1: Annual precipitation—projected variability



Source: Climate Change Strategy and Action - Government of Albania. Pg. 54 Link

Albania, as a whole, is depopulating, with the exception of certain urban areas that have been growing. Much of this growth, which occurred as part of the post-communist transition, has been unplanned and has been concentrated in at-risk areas. The Regional Western Balkans CCDR identifies 37 urban areas with population above 5,000 in Albania.[39] Only seven of these have been growing in the last two decades, but all of them have increased their urban footprint. This has resulted in a 4 percent increase in built-up area for the average city, compared to a 10 percent decrease in population, suggesting that Albanian cities have been expanding inefficiently. Indeed, on average, the extent of Albania's urban sprawl is among the highest in the WB6 region. New urban expansion in the last two decades has occurred on city parcels whose average exposure to floods is about 71 percent higher than the previously existing urban built-up area. That translates into an average increase in flood exposure of approximately 17 percent. Notably, Albania ranks among the worst 20 nations globally in terms of the establishment of new settlements in flood-prone areas.[40] The impact of increased flooding has worsened in the socially vulnerable, disadvantaged, informal communities along the riverbeds of Tirana, Durres, Vlora, Shkodra, and Lezha.[41]

Because of Albania's high level of unplanned urbanization, high dependency on hydroelectric power plants, and aging public assets, critical infrastructure is disproportionally impacted by disasters. Recent disasters and studies both underscore the fact that ensuring the climate-resilience of critical infrastructure is vitally important to the regional economy. For the transport sector, certain links such as Rrogozhine–Lushnje are particularly critical,[42] not only for Albania but for the Western Balkans region. Evaluation of

[38] GoA. Strategjia e Ndryshimeve Klimatike.

[39] See chapter 3 of the Western Balkans Country Climate and Development Report for further details on the identification of urban areas. https://www.worldbank.org/en/region/eca/publication/western-balkans-6-ccdr

[40] J. Rentschler, P. Avner, M. Marconcini, et al., Global evidence of rapid urban growth in flood zones since 1985, Nature 622, 87–92 (2023) https://doi.org/10.1038/s41586-023-06468-9

[41] GoA. Strategjia e Ndryshimeve Klimatike.

[42] Wood Environment & Infrastructure Solutions UK. Diagnosing Vulnerability and Economic Resilience of transport Systems, Infrastructure and Operations in the Western Balkans (DIVERSION). Washington, DC: World Bank. (2020)

the 2019 earthquake suggests that around 23 percent of the damage was to public assets.[43] Damage was reported to 321 educational institutions (24 percent), 36 health facilities (8 percent), three regional hospitals, along with river embankments, municipal buildings, prisons, and dams, with rehabilitation costs exceeding 150 million EUR.[44]

Overreliance and dependence on hydroelectric power plants is a double-edged sword. Earthquakes are not the only disasters that damage critical infrastructure. Albania's hydroelectric power plants (HPPs) in the north power more than 90 percent of the country, making Albania one of the top sources of sustainable energy generation in Europe. But if the HPPs are not managed properly, excessive rainfall in wet years can cause downstream flooding. On the other hand, drought years can cut in half the typical yearly production of HPP energy (almost 6,000 GWh). Historical examples of the direct impact of drought on electricity production include the energy crises of the early 2000s, 2007, and 2022, when drought forced the country to resort to energy rationing, power outages, and expensive emergency imports. It is projected that because of variability and climate risks, the yearly average production of Albania's large HPPs could decrease by 15–20 percent by 2050.[45],[46] With changing climate dynamics bringing less rainfall in the critical summer months, droughts also have an outsized impact on agriculture.[47] Additionally, critical road infrastructure is exposed to flooding. For example, the two main economic corridors – Corridor 4: Tirana–Durres and Corridor 5: Durres–Vlore –are vulnerable to flood events, with annualized damage that could be reach 13 million EUR.[48]

Exposure to natural hazards is linked with existing socioeconomic vulnerabilities and aggravates them. Albania's 61 municipalities face various levels of socioeconomic stresses that interact with, and are compounded by, climate shocks. Population decline represents a significant challenge. INSTAT data recorded a population decrease of over 1 percent per year since 2001 accelerating the steady trend that saw Albania's population fall from 3 million in 2001 to below 2.8 million in 2023. Accordingly, 87 percent of all municipalities have shrunk in the last two decades. Of the municipalities that are facing demographic decline, 75 percent are rural, and very isolated, as well as more exposed to hazards. The average declining municipality has a 31 percent higher exposure to wildfires (compared to an average growing municipality) and 21 percent higher exposure to landslides.[49] In each municipality it is possible to find areas of extreme localized flood exposure. For example, in March 2018, heavy rainfall, compounded by water released by the Fierza, Koman and Vau Dejes hydro-power stations, flooded vulnerable communities in the north of the country, affecting 21,000 people and forcing the evacuation of 1,575 persons. In the process, 3,500 houses were flooded, 65 bridges collapsed, 56 public schools were damaged and more than 15,000 hectares of land was brought under water, impacting agriculture and the availability of drinking water.[50]

Exposure to hazards related to climate change have a large impact on human health in Albania. During the earthquake of November 2019, health facilities suffered severe damage.[51] Health is impacted when a climate hazard damages health facilities. One channel is that it reduces the availability of health services for individuals seeking care. Additionally, extreme temperatures lead to heat waves that can increase morbidity

---

[43] Government of Albania, EU (European Union), UN (United Nations), and World Bank. Albania: Post-Disaster Needs Assessment, Volume A Report/ Tirana. (2020) https://reliefweb.int/sites/reliefweb.int/files/resources/albania_post-disaster_recovery_a_v9.0.pdf

[44] GoA et al., Albania: Post-Disaster Needs Assessment.

[45] GoA. Strategjia e Ndryshimeve Klimatike.

[46] The climate change risks related to hydro power are not incorporated in the KINESYS energy modeling. It projects a 20 percent increase in hydro power production by 2050.

[47] Government of Albania, Ministry of Tourism and Environment. Plani Kombetar i Pershtatjes se Shqiperise - Raporti i Pare i Progresit (National Adaptation Plan – First Progress Report). (2023). https://napglobalnetwork.org/wp-content/uploads/2023/09/napgn-al-2023-albania-progress-report.pdf

[48] World Bank. Climate Resilient Road Assets in Albania. Washington, DC: World Bank. (2019) https://documents1.worldbank.org/curated/fr/696431556877729366/pdf/Climate-Resilient-Road-Assets-in-Albania.pdf

[49] World Bank analysis (CIMA data); European Land Susceptibility (ELSUSV2); State Statistical Office.

[50] IFRC (International Federation of Red Cross). Albania: Floods – Emergency Plan of Action Final Report. (2018) https://m.reliefweb.int/report/2757019/albania/albania-floods-emergency-plan-action-final-report-operation-n-mdral007?lang=fr

[51] World Bank. Albania's Health Sector to Benefit From Additional World Bank Financing. (2021) https://www.worldbank.org/en/news/press-release/2021/12/01/albania-s-health-sector-to-benefit-from-additional-world-bank-financing

and mortality. During the two heat waves of 2017 in Albania, the total mortality rate from cardiovascular conditions increased.[52] Similarly, in 2023, a heat wave increased hospital admission rates for heat-related morbidities and led to heat-related deaths.[53] Projections estimate that, between 2030 and 2050, there will be about 70 additional deaths a year from heat waves in the Vjosa River basin.[54] In addition, increased temperatures have raised the incidence of gastroenteritis in the country.[55] The rise is due to bacterial infections resulting from consuming contaminated food or water, which can be linked to reduced precipitation levels.[56] As a result of climate change, it is projected that the age standardized rate of various infectious and parasitic diseases will increase in Vjosa Basin regions.[57] Specifically, between 2030 to 2050, climate change is expected to account for some 1,500 to 2,500 new cases of gastroenteritis every year, under the higher temperature scenario (RCP8.5).[58] It is also expected that a smaller number of other infectious or parasitic diseases will contribute to this count, with Fieri projected to be the most affected region.[59] Albania has experienced a significant reduction in air quality over the years, with pollutants such as particulate matter and nitrogen dioxide adversely affecting the health of Albanians.[60] In 2020, more than 3,600 premature deaths resulted from particulate matter that exceeded World Health Organization (WHO) guideline levels.[61] It is projected that because of climate change and the deterioration of air quality, 30 percent of pulmonary cases will suffer additional consequences.[62] Climate change has also increased the incidence of asthma in the country. There is evidence of a correlation between asthma and changes in temperature, wind, and humidity.[63]

Modeling the effects of climate change on GDP—be it shocks or slower-moving stressors – is a tricky science, even with the best tools econometrics has to offer. The channels via which impacts take place are difficult to account for exhaustively. This is further compounded by the uncertainties in climate and exposure data, especially when projected, and the difficulty of calibrating vulnerabilities. For instance, while overall flooding risks are expected to fall in Albania, the incidence of flash floods is expected to rise. More generally, modeling fails to fully capture the impacts of certain extreme events. Wildfires are a case in point. Historical data rapidly become sparse as one goes back in time; impact channels are multifaceted and seldom well understood; and projections of the hazard in question are often yet to be tested. Modeling impacts at the annual level is next to impossible for highly nonlinear climate shifts whose dynamics are not yet fully captured in climate models—the hydrological cycle, for instance—and they yield large uncertainties, once again expensive to propagate. Finally, as discussed earlier, climate hazards interact with and compound one another; yet models, at best, capture dynamics critical to a single climate hazard, missing the complexity of the links. Nonetheless, chapter 4 attempts provide the very best possible assessment of the likely lower-bound magnitudes of climate change-related damage and their impacts on GDP. Interpreting these estimates should be contextualized by an understanding of the extreme and often unpredictable nature of climate shocks and stressors, as described in this section.

---

52 Ministry of Tourism and Environment. The Fourth National Communication of Albania on Climate Change. (2022) https://unfccc.int/sites/default/files/resource/Fourth%20National%20Communication%20of%20Albania%20to%20the%20UNFCCC_EN.pdf

53 Livingston. Albania hits all-time high as heat blasts southern Europe and fires rage. (2023) https://www.washingtonpost.com/weather/2023/07/24/greece-southern-europe-heatwave-fires/

54 Ministry of Tourism and Environment. The Fourth National Communication of Albania on Climate Change. (2022) https://unfccc.int/sites/default/files/resource/Fourth%20National%20Communication%20of%20Albania%20to%20the%20UNFCCC_EN.pdf

55 Ibid.

56 Ibid.

57 Ibid.

58 Ibid.

59 Ibid.

60 European Union. Albania – air pollution fact sheet. (2023) https://www.eea.europa.eu/themes/air/country-fact-sheets/2021-country-fact-sheets/albania-air-pollution-country

61 Ibid.

62 Ministry of Tourism and Environment. The Fourth National Communication of Albania on Climate Change. (2022) https://unfccc.int/sites/default/files/resource/Fourth%20National%20Communication%20of%20Albania%20to%20the%20UNFCCC_EN.pdf

63 Ibid.

To counter the growing risks linked to the changing climate, Albania will need to consider large investments in adaptation—investments that will likely generate equally large benefits (see section 2.2). The cost of the proposed policy actions and investments for the initial adaptation package, which covers most sectors in Albania, totals approximately US$6 billion (see section 5.1) The sectoral estimates are US$205.3 million (DRM), US$754.9 million (urban), US$2.63 billion (water), US$242.2 million (forestry and biodiversity), US$293.9 million (agriculture), US$1.61 billion (transport), US$74 million (education, skills, labor markets), US$183 million (social protection systems), and US$28.76 million (health system). Multiple sources of information were used to estimate these needs. These included extracting identified needs and costs from the country's national strategic documents, for example, the National Adaptation Plan, CCSAP – Climate Change Strategy and Action Plan. This was supplemented by input from local and international sectoral experts and validated with costs from previous projects, including those previously financed by the World Bank Group. A technical annex (section 0) provides a detailed assessment of the methodology employed. The proposed measures cover a range of adaptation needs such as policies, and hard and soft infrastructure, with varying timelines and complexities depending on the area of focus. These are further elaborated on in chapter 5.

2.2. A changing climate comes with greater risks–but also greater opportunities

Investing in adaptation can yield substantial social, economic, and environmental benefits. These benefits can be expressed through a Triple-A Dividend framework. Reconciling perspectives from the humanitarian, environmental, and economic fields (see Figure 2.2),[64] the framework identifies three types of benefits: i) avoided losses and lives saved during a disaster or climate event; ii) accelerated economic potential because of stimulated investments and bolstered economic activities due to the reduction in background climate and disaster risks; and iii) the amplified social and environmental co-benefits of adaptation investments.

FIGURE 2.2: "Triple-A dividend of resilience" framework

1st Dividend: **Avoided** Losses & Lives Saved	**Damages and losses avoided from disasters and climate impacts:** ▪ Reduced fatalities, injuries, and people affected ▪ Reduced damages to infrastructures and other assets ▪ Reduced losses to financial flows and government liabilities ▪ Reduced days of school closures ▪ Reduced skills mismatch on the labor market inherent to the green transition
2nd Dividend: **Accelerated** Economic Potential	**Economic activities stimulated from adaptation and reduced climate risk:** ▪ Business and capital investments ▪ Job creation and enhanced labor productivity ▪ Land value increased ▪ Sustainable and circular economic growth
3rd Dividend: **Amplified** Social & Environment Co-benefits	**Social and environmental co-benefits of adaptation investments:** ▪ Positive human health effect and better learning outcomes ▪ Enhanced biodiversity and ecosystem services ▪ Recreational value and tourism gains ▪ Agriculture productivity gains

Source: Authors, adapted from an original figure in Tanner et al. 2015[65]

[64] The original term, "Triple Dividend of Resilience," has been modified here as "Triple-A dividend of resilience" to hint at the potential financial dividends from these economic and other co-benefits. The Triple Dividend framework was developed and presented in T. Tanner, et al., The Triple Dividend of Resilience: Realizing Development Goals through the Multiple Benefits of Disaster Risk Management (London and Washington, DC: Overseas Development Institute and World Bank, 2015).

[65] Tanner, T. et al. The Triple Dividend of Resilience: Realizing Development Goals through the Multiple Beneffts of Disaster Risk Management. Overseas Development Institute and World Bank, London and Washington, DC. (2015). https://documents1.worldbank.org/curated/en/993161515193991394/pdf/P151463-01-05-2018-1515193988640.pdf

***Avoided losses*: Investing in adaptation to climate risk and in financial preparedness for it are associated with significant human, physical and financial losses avoided.** Global research estimates that investing in adaptation globally could generate total net benefits of US$7.1 trillion from 2020 to 2030 and an average BCR (benefit–cost ratio) of 4. (BCRs typically range from 2.5 to 5.5 but some can exceed 10.)[66] For example, implementing much needed maintenance, replacement, and refurbishment of critical road infrastructure in Albania to adapt the country to the increased intensity of flooding is expected to yield a BCR of between 8 and 19, depending on the corridor. But considering the full economic impact that flooding would generate on critical infrastructure dramatically increases the BCR, especially for the critical Corridor 5 from Durres to Vlore.[67] Health climate actions, focusing on enhancing public preparedness and response to health risks, have an annualized cost of 12 million Local Currency Units (LCU) and an annual health cost avoided (in terms of reduced heat-induced fatalities and diseases) of 170 million LCU – a 14-fold benefit. In addition, investing in financial preparedness for disasters and climate events also avoids losses by reducing the level of government liabilities. A high-liability scenario for France shows that disaster risk finance (DRF) instruments, such as catastrophe insurance, can lead to a 3.6 billion EUR reduction in government liabilities for a 100-year return period.[68] Meanwhile, an EU-level funding gap assessment suggests that incentivizing disaster risk insurance programs could decrease government liabilities to 10 billion EUR for small disaster, and halve them to 50 billion EUR for very extreme scenarios.[69]

***Accelerated economic potential*: Climate change also provides opportunities for green and sustainable economic development, especially in sectors like agriculture and tourism.** According to the Economic and Investment Plan for the Western Balkans developed by the European Commission (EC), taking actions in climate adaptation and mitigation promotes circular economic growth and provides new business opportunities related to sustainability and energy efficiency.[70] Adaptation interventions in the tourism and agriculture sectors are crucial in ensuring dovetailed, synergetic growth of these two key sectors of the economy. In 2020, Albania received about 5.7 million tourists, with the tourism sector contributing some US$3.1 billion to the economy, approximately 17.4 percent of GDP, and positioning Albania as the 14th ranked country in the world for its contribution to the tourism industry's economic output. This industry, known for its labor-intensive nature, provided employment to about 226,000 workers, some 20 percent of Albania's employed workforce. At the same time, the agricultural sector, which is experiencing sustainable growth, contributed about 22 percent of the economy's total gross value added. In 2019, agriculture, dominated by small family farms, accounted for 36.4 percent of Albania's total labor force.[71] Besides employment, investing in adaptation also supports sustainable, climate-resilient urban development, although the country's education and training systems will need to adapt to equip learners with the skills required by these investments to be met.[72] With a changing climate, and adaptation, some jobs might be lost, but the net effect is expected to be positive. Moreover, the significant changes that will take place in many jobs will require additional (green and other) skills.[73] Increased retraining and overall improvement in education may also benefit the Albanian economy. According

---

66 Global Commission on Adaptation. Adapt Now: A global call for leadership on climate resilience (2019). https://gca.org/wp-content/uploads/2019/09/GlobalCommission_Report_FINAL.pdf?_gl=1*1gronxf*_ga*MTYwMzUzMjU2My4xNjk2NTgwOTA3*_up*MQ

67 World Bank, Climate Resilient Road Assets.

68 World Bank and European Commission. Economics for Disaster Prevention and Preparedness: Financial Risk and Opportunities to Build Resilience in Europe. (2021) https://documents1.worldbank.org/curated/en/231121622437102944/pdf/Economics-for-Disaster-Prevention-and-Preparedness-Financial-Risk-and-Opportunities-to-Build-Resilience-in-Europe.pdf

69 Ibid. The EU level funding gap analysis conducted in this study suggests that incentivizing insurance to encourage a higher uptake by households can halve government liabilities to €50 billion for very extreme scenarios and reduce them to €10 billion for smaller events. The magnitude of losses (for earthquake and ffoods combined) varies between €30 billion for small events to more than €100 billion for severe events (those that occur once in 100 years—that is, have a 1% probability of occurring in any given year.

70 European Commission. Economic and Investment Plan for the Western Balkans. (2020) https://www.wbif.eu/storage/app/media/Library/economic-and-investment-plan-brochure.pdf

71 GoA, Strategjia Kombëtare.

72 Gajšak et al., Study on the Climate-resilient Infrastructure in North Macedonia. (2022) https://api.klimatskipromeni.mk/data/rest/file/download/b8600f4a08a5020202a2deb79ef7b893eecb7173c1f001c5c96d9c1c791e5f0d.pdf

73 Javier Sanchez-Reaza, Diego Ambasz, Predrag Djukic, and Karla McEvoy. Making the European Green Deal Work for People: The Role of Human Development in the Green Transition Washington DC: World Bank. (2023). https://documents1.worldbank.org/curated/en/099041223115519641/pdf/P17594801e8f2f08909c1f06f456f192fdc.pdf

to a recent study, just one year of education strengthens pro-climate beliefs, stimulates pro-climate change behaviors, promotes green voting, with voting gains of 35 percent (Angrist et al. 2023).[74]

Accelerated economic potential: **Climate adaptation actions also yield substantial social and environmental co-benefits, safeguarding the health and welfare of citizens and the ecosystem.** In the Western Balkans, a range of local-level, low-cost, and nature-based measures are promoting adaptation through the sustainable use of natural resources, which benefits the ecosystem and local communities, especially those who live in mountainous and downstream areas.[75] Tirana has implemented a series of adaptation-oriented, urban development interventions that have served as flagship projects informing in the Urban Renewal program. With a core focus on the natural and environmental aspects of cities, the Urban Renewal program has implemented more than 581 projects at the national scale with a budget of 365 million EUR, including transforming 29 main squares, 7 urban boulevards, and 24 urban afforestation programs.[76] Investing in adaptation also supports employment and sustainable, climate-resilient urban development.

2.2. Enabling adaptation through improved human capital

Human capital is a cornerstone of adaptation efforts. Adaptation policies and investments require reforms and adjustments to which people will need to respond by changing their consumption and investment patterns, including in education, and, possibly, in employment. People-focused interventions are therefore required in education, health, and social protection to enable people to take advantage of these opportunities, while also protecting them from changes in access to resources and higher food and fuel prices, for example. Without such investments, there is a risk that some will be left behind, potentially weakening political support for climate change-linked investments.

Education and science play an important role in adaptation to climate change, but more attention is required at the national level. The education system issues to be tackled in Albania include quality of teaching,[77] digitalization and digital skills, the quality and relevance of vocational education and training, curricula modernization, access and equity, financing, governance, and early childhood education.[78] The results of the 2022 OECD PISA[79] showed that significant work needs to be done in Albania to improve declining and below-average performance in learning outcomes, and mitigate the harmful effects of the COVID pandemic. Educational improvement will require preparing all teachers in Albania for green education and may cost between US$4.2 million and US$12.8 million. Higher education and science would also play a significant role in advancing mitigation in the Western Balkans. Given the many common challenges and the limited resources, more collaboration projects among the Western Balkan countries should be promoted and supported. The role of higher education in providing skills and undertaking research and innovation in support of climate change adaptation could thus be strengthened. As part of the adaptation, the country will need to consider greening its schools and health facilities.[80]

---

[74] N.W. Angrist, K. Winseck, H.A. Patrinos, and J.S. Graff Zivin. Human Capital and Climate Change, NBER Working Paper no. 31000, https://www.nber.org/papers/w31000

[75] B. Alfthan, E. Krilasevic, S. Venturini, S. Bajrovic, M. Jurek, T. Schoolmeester, P.C. Sandei, H. Egerer, and T. Kurvits. Outlook on climate change adaptation in the Western Balkan mountains (Vienna, Arendal and Sarajevo: United Nations Environment Programme, GRIDArendal, and Environmental Innovations Association. (2015) https://www.researchgate.net/publication/307570598_Outlook_on_climate_change_adaptation_in_the_Western_Balkan_mountains

[76] BIRN (Balkan Investigative Reporting Network). Urban Renewal Database. (2020) http://rilindjaurbane.reporter.al/

[77] Almeida, Avitabile, Shmis. Beyond the learning drop: Why countries in Eastern Europe and Central Asia should act now to avoid a teacher crisis (2023) https://blogs.worldbank.org/en/education/beyond-learning-drop-why-countries-eastern-europe-and-central-asia-should-act-now-avoid

[78] Organization for Economic Co-operation and Development (OECD). Multi-dimensional Review of the Western Balkans: From Analysis to Action. Paris: OECD. (2022) https://www.oecd.org/en/publications/multi-dimensional-review-of-the-western-balkans_8824c5db-en.html

[79] Organization for Economic Cooperation and Development (OECD). PISA 2022 Results (Volume I and II) - Country Notes: Albania. (2023) https://www.oecd.org/publication/pisa-2022-results/country-notes/albania-1ccc35b9#chapter-d1e11

[80] Adrien Dozol, Diego Ambasz, and Tigran Shmis. Greening Public Human Development Buildings in Croatia: Support for the Implementation of the European Green Deal in the Croatian Health and Education Sectors. Washington, DC: World Bank. (2023), http://hdl.handle.net/10986/39825

A multifaceted approach is required to strengthen the preparedness and resilience of the health care system to manage and respond to climate change. Albania has shown commitment to improving its health care services, and to improving its ability to assess health impacts and health system adaptation needs. Enhancing the climate resilience of the country's health system requires strengthening resource mobilization efforts to ensure that there is adequate financing for climate resilience measures. In 2020, Albania ranked lowest among European nations in number of doctors and nurses per capita[81]—an estimated 1.9 physicians per 1000 population.[82] This dearth is partly the result of health care workers emigrating to larger economies.[83] Strategies to improve health worker retention need to be enhanced. This need is especially acute during emergencies such as those caused by climate-related hazards. Additionally, surveillance systems, including capacity building and training in the early identification of potential infectious disease risks and outbreaks, need to be strengthened. It is recommended that improved air quality in major urban zones needs to become a priority. This should include the implementation of air quality monitoring in areas like Tirana.[84] Albania's health care infrastructure and facilities also need to be upgraded to boost climate resilience to be able to withstand extreme weather events and support the necessary response capacities, especially in rural and poorer areas. The health care staff's understanding of the relationship between climate change, seasonal variability and health impacts needs to be improved. Finally, the health system needs to be able to respond adequately to the effects of climate-related exposures, be prepared to respond quickly to sudden events (like floods, heat waves, and epidemics), and be able to adapt to the changing disease burden in medium term.

To reduce the risks of climate change and the effects of uncertainty on people's income, consumption, and human capital investments, Albania's social protection systems need to increase in their coverage and adequacy. The country's social protection system is relatively well established, providing income protection to formal sector workers through social insurance, and to extremely poor households, people with disabilities, and older people through social assistance programs. Recent reforms of the Ndihma Ekonomike (NE), the country's main poverty-targeted cash transfer program, and the disability assessment system have improved the effectiveness of these programs. But coverage of these programs, and the adequacy of payments, remain low. Gaps within the social protection system limit its ability to support workers to transition between jobs, with critical gaps in coverage for those employed in the informal sectors. Albania has an unemployment insurance system, that, by design, covers only formal sector workers. But the effectiveness of this system may be limited: less than 5 percent of registered jobseekers receive unemployment benefits, and what they do receive does not provide meaningful income support because the benefit translates into a replacement ratio of 25 percent of the average wage (one of the lowest in the region). The ability of social assistance programs to provide any temporary income support to poor households that experience job loss or income shocks remains severely limited. Financial support to mitigate the impact of energy price increases is currently provided only to existing beneficiaries of the NE, such as those with disabilities, the elderly, and low-paid civil servants,[85] with no scope to extend this protection to additional households when energy prices increase. Recognizing these limitations, efforts are under way to consider how to establish a dedicated program for energy-vulnerable consumers.

Despite the recent reforms of the Ndihma Ekonomike, further investments are needed to increase the flexibility of the country's social protection system to shield households from climate shocks. Figure 2.3 presents an assessment of the capacity of the social protection system to respond to climate shocks along four lines: (i) programs and delivery systems, (ii) data and information, (iii) financing, and (iv) institutional

[81] A. Taylor for Euractiv. Albanian healthcare workers flee en masse, government unfazed. (2022) https://www.euractiv.com/section/politics/short_news/albanian-healthcare-workers-flee-en-masse-government-unfazed

[82] World Bank. Physicians (per 1,000 people) – Albania. (2024) https://data.worldbank.org/indicator/SH.MED.PHYS.ZS?locations=AL

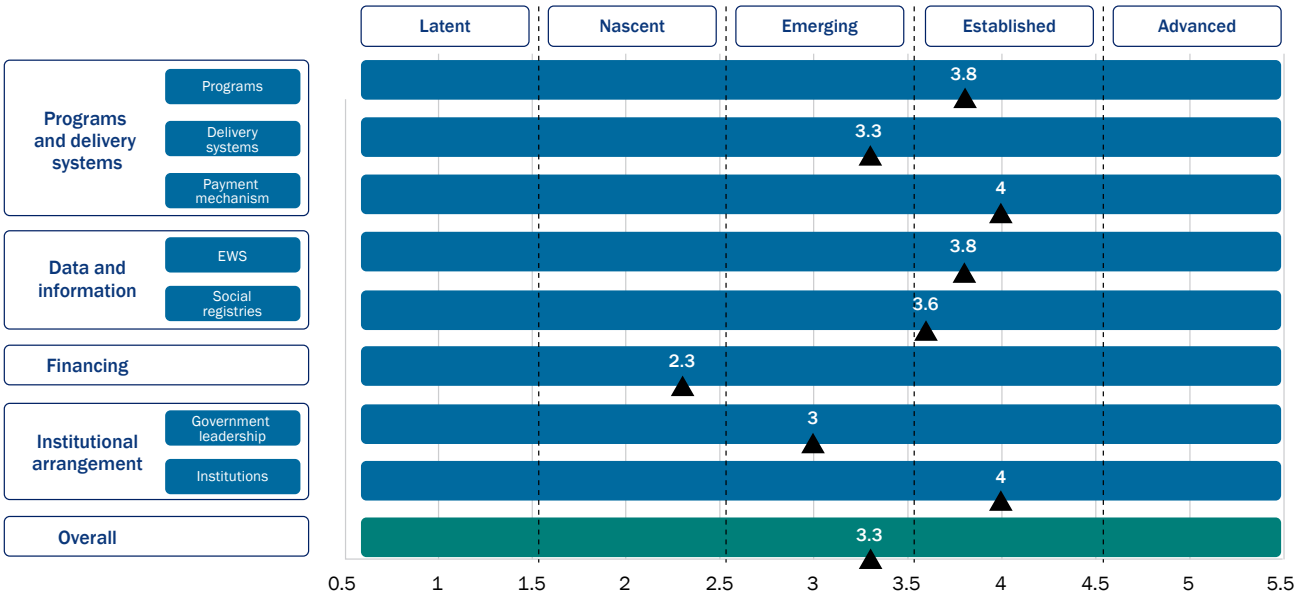
[83] https://www.euractiv.com/section/politics/short_news/albanian-healthcare-workers-flee-en-masse-government-unfazed/

[84] WHO – EU Office. Protecting health from climate change: a seven-country initiative. (2013) https://www.who.int/publications/i/item/WHO-EURO-2013-4506-44269-62533

[85] For the disability benefit and for civil servants, there is the additional requirement that no other household members be employed. For the old age pension, the additional requirement is that they have no employment income and/or that there by no working-age members in the household.

arrangements.[86] The results indicate that, although relatively well established, Albania's social protection system is not being used effectively to provide support to households affected by climate challenges. Social assistance programs as currently designed are unable to expand to reach additional poor and vulnerable households affected by climate shocks. The delivery systems that underpin the NE, however, offer some flexibility, as witnessed during the COVID-19 pandemic when the beneficiary information system of the NE was used to rapidly identify additional poor households for support; and during the 2019 earthquake, when social workers played a key role in the response. Albania is one of the only countries in the region not to have any one-off assistance grants for either idiosyncratic or covariate shocks. Considering this, there is a strong case to be made for introducing some form of scalability into the social assistance system to enable it to rapidly expand to additional households. This will ensure that poor households affected by climate shocks are prevented from falling deeper into poverty and/or enabled to bounce back as soon as possible. For this, the government will need to align social protection, DRM, and climate change adaptation legislation and policies to permit greater flexibility in the targeting and duration of assistance. Such investments will require the allocation of adequate financing, such as disaster risk financing, to fund an expansion of the system.

FIGURE 2.3: Albania's social protection system could be much better harnessed to protect households from climate-induced shocks while also bolstering their resilience



Source: Fizgibon C., Coll-Black S, 2023, Findings of the World Bank Stress Test in the Western Balkans Draft. Washington DC: World Bank.

[86] The World Bank's Social Protection Stress Test Tool assesses the readiness and ability of national social protection systems to adapt or scale-up in response to shock, thereby pinpointing areas for greater investment. https://documents1.worldbank.org/curated/en/559321634917529231/pdf/Stress-Testing-Social-Protection-A-Rapid-Appraisal-of-the-Adaptability-of-Social-Protection-Systems-and-Their-Readiness-to-Scale-Up-A-Guide-for-Practitioners.pdf

Chapter 3

Mitigation risks and opportunities

An energy system modeling analysis was carried out as part of the WB6 CCDR to assess sectoral decarbonization pathways for the economies of Albania and the other WB6 countries. The analysis aimed to develop possible decarbonization scenarios and compare them to a reference scenario, in order to highlight the extent to which the energy systems will have to transform to reach net zero GHG emissions by 2050, and to provide policymakers with recommendations on how this can be achieved, with a focus on short-term actions.

The analysis relied on the KINESYS-WB6 (Knowledge-based Investigation of Energy System Scenarios for the WB6) model, a global energy system model based on TIMES (The Integrated MARKAL-EFOM1 System) and applied to the WB6. KINESYS-WB6 explicitly covers GHG emissions from fuel combustion, and fugitive emissions from fossil fuel extraction and transport. To set economy-wide GHG emissions targets to model quantity-constrained scenarios, projections from official government strategies (especially the NECPs) were used for the sectors not included in the KINESYS-WB6 model to set targets for the energy-related sectors. The main scenarios modeled included the following: (1) the Reference scenario (RS), an unconstrained least-cost development scenario - this scenario is incompatible with the WB6 countries' aspirations of EU integration and their existing climate change commitments, but it provides a comparable baseline across the six countries for the decarbonization scenarios described below.; (2) the net zero emissions scenario (NZE), in which GHG emission constraints are imposed to achieve economy-wide net zero by 2050; (3) the net zero emissions scenario with higher growth (NZE-HG), which is similar to the NZE but assumes higher GDP growth rates for the WB6, countries; and (4) the carbon pricing scenario (CPS), a price-constrained scenario in which the WB6 countries are assumed to adopt an emissions trading scheme (ETS) that covers all sectors of the economy with an allowance price in line with the European Commission's projections for the EU ETS price in a net zero by 2050 scenario. All scenarios except for the NZE-HG rely on trend GDP growth assumptions. Further details on the modeling approach and assumptions are presented in the WB6 regional CCDR and the Mitigation Background Note accompanying the CCDR.

3.1. The Reference Scenario (RS) makes limited progress on climate change mitigation

In the RS, economy-wide GHG emissions (that is, including sectors outside the model's scope) for Albania would plateau at around 13 $MtCO_2eq$ per year, only about 10 percent lower than 1990 emissions levels (see row 1, Figure 3.1). Energy sector emissions would increase from about 4.2 $MtCO_2eq$ in 2019 to 5.5 $MtCO_2eq$ in 2050 due to a higher level of reliance on fossil fuels. In spite of this increase in emissions, however, the energy sector would continue to account for less than 50 percent of total emissions throughout the period because the contribution of non-energy-related GHG emissions to total emissions would remain strong. In 2050, GHG emissions from agriculture and industrial processes and product use (IPPU) would account for about 35 percent of the total (about 17–18 percent each), while land use, land use change, and forestry (LULUCF) emissions, and methane emissions from waste, would account for about 10 percent each.

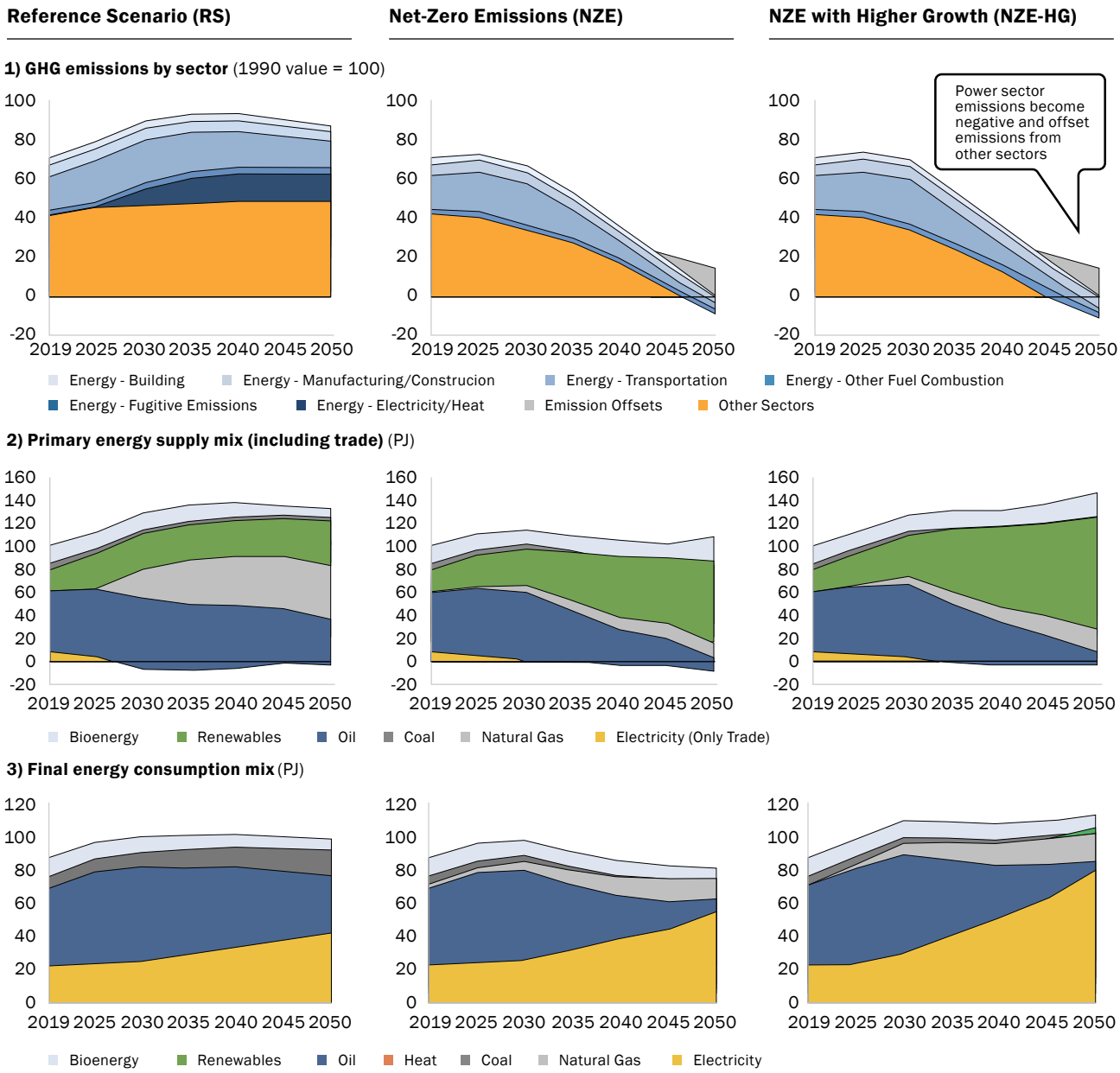
Nevertheless, even in the RS, Albania's energy mix would change drastically over the next decades because most of the incremental energy demand would be met by natural gas (see row 2, Figure 3.1). In 2050, natural gas would account for almost 40 percent of the total primary energy supply (versus almost zero in 2019). The share of renewables (mostly hydro and solar) would remain constant at 20–25 percent, while the share of oil and oil products would decrease substantially, from 50 percent of the total primary energy supply in 2019 to 30 percent in 2050.

In the power sector, while most of the incremental electricity generation after 2030 would come from natural gas (and to a lesser extent solar), hydro would continue to account for the largest share of total generation throughout the modeled period. As shown in row 2 of Figure 3.2, in 2030 hydro, other renewables, and natural gas could account for around 60, 10, and 30 percent of power generation, respectively. In 2050, the share of hydro generation would decrease to 45 percent, while solar and wind would increase to 20 percent, and natural gas to 35 percent. This implies a substantial change for Albania's power sector, which is today almost fully based on hydro and therefore almost carbon-neutral. The favorable economics of electricity

generation from hydro and natural gas—a result of the relatively easy access to existing international gas pipelines—could allow Albania to shift from being a net importer of electricity today to being a net exporter from 2030 onward.

The comparison of the unconstrained evolution of GHG emissions in the RS with the projections of the scenario "with existing measures" (WEM) defined in Albania's NECP highlights a certain lack of ambition in the definition of the WEM targets. Albania's energy-related GHG emissions resulting from the unconstrained least-cost energy sector development defined in the RS would be 6.5 $MtCO_2eq$ in 2040, compared to 7.0 $MtCO_2eq$ for the WEM target from the NECP for the same year. This suggest that the definition of the WEM scenario in the country's NECP is not particularly ambitious and does not represent an actual constraint on the development of Albania's energy sector.

FIGURE 3.1: System-wide indicators across the RS, NZE, and NZE-HG scenarios* for Albania



Source: World Bank analysis.

Note: *RS: reference scenario, NZE: net zero emissions scenario, NZE-HG: net zero emissions scenario with higher growth.

1 Includes non-energy-related sectors not covered by KYNESIS-WB6, namely, agriculture, waste, LULUCF, and IPPU (industrial processes and product use). 2 "Electricity" refers to the consumption of electricity in end-use sectors, while "renewables" refers to the direct use of renewable energy in end-use sectors.

3.2. Energy system transformation is required to achieve net zero by 2050

Achieving economy-wide, net zero GHG emissions by 2050 would require a significant expansion of investments to achieve negative emissions in the power sector and capture IPPU and energy-related industrial emissions. In the NZE scenario, it was assumed that non-energy-related emissions from the agriculture, waste, LULUCF, and IPPU sectors (excluded from the model scope) would follow the trends projected by Albania in the NECP WAM scenario. Based on the projection of these trends, in 2050 GHG emissions from these sectors would be 2.1 $MtCO_2eq$ (versus 7.2 $MtCO_2eq$ in the RS), coming mainly from IPPU (2.4 $MtCO_2eq$), agriculture (1.2 $MtCO_2eq$), and waste (0.7 $MtCO_2eq$), while LULUCF would become a carbon sink (-2.1 $MtCO_2eq$). As a result, for the country to achieve economy-wide net zero, in 2050 energy sector emissions (that is, the emissions included in the model's scope) would have to become negative[87] and reach -2.1 $MtCO_2eq$ to offset non-energy-related emissions. This would require a considerable level of effort, as discussed in the rest of this section.

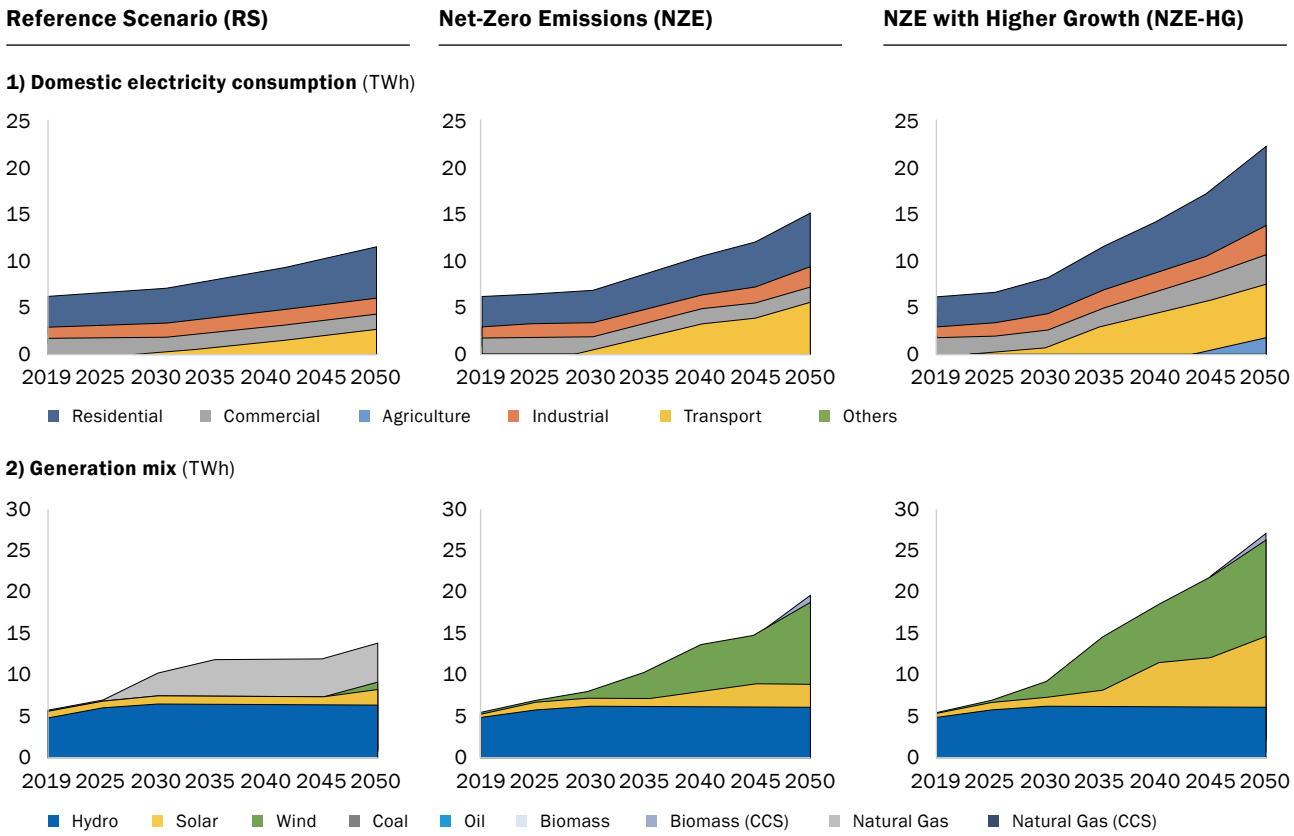
In a least-cost net zero scenario, hydropower, wind, solar and biomass, equipped with carbon capture and storage (CCS), would be Albania's main electricity sources, and there would be no role for natural gas in the longer term (see row 2 in Figure 3-2). In the 2050, wind would pass hydro as the main source of electricity because of the country's large and economically cost-attractive wind resources (mostly onshore). Hydro and biomass generation would balance intermittent generation from wind and solar. Biomass-fired plants equipped with CCS would be required to achieve negative emissions in the power sector.[88] As a result, electricity generation would be fully renewable and power sector emissions would decrease from about 0 $MtCO_2eq$ in 2019 to -0.7 $MtCO_2eq$ in 2050. To achieve this target, Albania would have to install about 3.5 GW of wind power by 2050 (versus 0.2 GW in the RS), 1.6 GW of solar capacity by 2050 (versus 1.4 GW in the RS), 200 MW of biomass (of which 100 MW would be equipped with CCS), and an additional 450 MW of hydro. Compared to today (where almost 100 percent of power comes from hydro), in the NZE the high level of diversification of power generation sources would reduce the vulnerability of Albania's power sector to shocks such as droughts. Albania would also become a large electricity exporter, selling about 10–15 percent of its power to neighboring countries.[89] Model results show that there would be no need to build additional natural gas capacity in the least-cost NZE scenario, because accelerating the scale-up of renewables and storage would be more economically viable. In this scenario, Albania could in the short term rely on the Vlora thermal power plant (currently being repurposed to use natural gas), but running it beyond 2030 could become uneconomical. The accelerated deployment of wind, solar PV, and biomass with CCS in the NZE would in the short term raise electricity generation and supply costs more than 50 percent higher than in the RS, but in the longer term, this increase would be limited to only about 20 percent. Assuming that these costs are fully passed onto customers, the increase in retail tariffs would be of a similar magnitude. While these tariff increases could be mitigated by the shift to liberalized wholesale markets and increased regional integration, the country would need to manage them carefully, by assessing their impacts on the population and businesses and implementing social security measures targeting lower-income and vulnerable consumers.

[87] Emissions are "negative" when GHGs are effectively captured or removed from the atmosphere instead of being emitted.

[88] It may be easier for Albania to scale up decarbonization in the non-energy sectors (especially in the agriculture and waste sectors) than resorting to biomass-fired power plants equipped with CCS to achieve net negative GHG emissions in the power sector.

[89] Achieving this level of electricity exports will require strengthening the interconnections with neighboring countries and defining an adequate cost recovery mechanism in the tariff-setting methodology so that the investments for the international interconnections are not fully borne by Albanian electricity consumers.

FIGURE 3.2: Power sector indicators across the RS, NZE, and NZE-HG scenarios for Albania



Source: World Bank analysis.

The least-cost pathway to achieving net zero by 2050 would require significant energy efficiency improvements and the large-scale use of electricity and zero-carbon energy carriers in end-use sectors. As shown in row 3 of Figure 3.1 (final energy consumption mix), in 2050 final energy demand in the NZE would need to be about 20 percent lower than the demand in the RS in the same year, or about 7 percent lower than in 2019. Achieving this goal would require ambitious policies to support energy efficiency improvements across all sectors. At the same time, the final energy mix would be significantly different in the NZE compared to the RS: in 2050, about 65 percent of final energy demand would be met by electricity (especially in the transport and heating sectors), versus about 40 percent in the RS, while oil and oil products would account for only some 10 percent of final energy demand, versus 35 percent in the RS. Natural gas would become relevant and meet 15 percent of the final energy demand (versus zero in 2019). Zero-carbon energy carriers (that is, biofuels, biomass, biogas, and hydrogen) would support the decarbonization of hard-to-abate sectors (for example, specific transport segments) and would account for about 10 percent of final energy demand in 2050 in the NZE, compared with 5 percent in the RS.

In the NZE, GHG emissions from the transport sector could be abated by almost 90 percent by adopting a three-pronged, Avoid-Shift-Improve strategy, consisting of demand reductions (Avoid), a shift of demand to more sustainable modes (Shift), and the adoption of more energy-efficient vehicles running on cleaner fuels (Improve). Avoid strategies (for example, integrated land use planning to reduce travel distances, digital accessibility, and remote working when possible) could help reduce total passenger transport demand in 2050 by 5 percent in the NZE compared to the RS, with most of the reduction accounting for urban transport. Additional policies and incentives could support the shift of the residual demand for transport services from more polluting modes of transport to less carbon-intensive ones. In 2050, private road transport would

account for 65 percent of motorized passenger transport activity in the NZE, versus 75 percent in the RS,[90] while rail would account for 8 percent of freight transport activity (versus 4 percent in the RS). But most of the GHG emission reductions in the transport sector would have to come from Improve strategies (that is, the adoption of more efficient vehicles and the transition to cleaner fuels). Specific energy consumption (that is, the amount of fuel energy required per vehicle-km) would have to improve substantially for both passenger and freight transport, and be 50–70 percent lower in 2050 than in 2019. By 2050, the share of electricity and biofuels in the fuel mix would be greatly increased. In the passenger transport segment, electricity would account for about 90 percent of total fuel energy demand in 2050. In the freight transport segment, electricity and biofuels would each account for about 40 percent of total fuel energy consumption in 2050, followed by traditional fuels.

The decarbonization of the buildings sector would require energy efficiency improvements on top of the RS, combined with higher levels of electrification of heating demand and a switch to cleaner heating sources. The implementation of energy efficiency measures could reduce primary energy demand for space heating in the buildings sector by almost 15 percent in 2050 in the NZE, compared to the RS. Oil products used for space heating would be almost fully phased out by 2050, while the share of biomass in total energy demand for space heating would drop from 55 percent in 2019 to less than 15 percent in 2050. Heat pumps would account for about half of the energy demand for space heating by 2050, while inefficient electric radiators would be completely phased out.

Decarbonization options for the industrial and energy transformation sectors would include energy efficiency, the replacement of coal and oil with natural gas for heat production, carbon pricing, the electrification of low-temperature industrial processes, and the adoption of CCS. The implementation of energy efficiency measures could reduce energy demand in these sectors by 5 percent by 2050 in the NZE compared to the RS. In the industrial sector, in the NZE, oil and coal would have to be replaced by natural gas and electricity, and after 2030–2035 CCS would become economically viable (unlike in the RS) and would be implemented to capture IPPU and energy-related industrial emissions. By 2050, CCS could remove about 2.5 $MtCO_2eq$/year of GHG emissions. A carbon price could complement other decarbonization options for the industrial sector, and the revenues generated from this fee could also help meet decarbonization investment needs. If the scope were extended to CBAM sectors, this would also reduce exposure to CBAM because importers can deduct the effective domestic carbon price from their CBAM compliance obligations. The CPS modeling scenario in the CCDR—the results are presented in the regional report—demonstrates how carbon pricing can help speed up the decarbonization trajectories of WB6 economies. Recent modeling carried out by the Energy Community also highlights how a carbon price can help drive renewable energy expansion, particularly across a common regional electricity market.[91]

Significant decarbonization efforts in the non-energy sectors (for example, waste, agriculture, LULUCF—not included in the modeling exercise described above) would be crucial to achieve economy-wide net zero GHG emissions in a cost-effective way. Stepping up GHG emissions reduction efforts in these sectors could reduce the need to resort to decarbonization solutions with a higher abatement cost in energy-related sectors (for example, biomass with CCS in the power sector). Albania should focus on reducing direct methane emissions from the waste and agriculture sectors, and on improving the carbon sink potential of its forests. Methane is a potent GHG, with a global warming potential (that is, the capacity to absorb infrared thermal radiation and warm up the atmosphere) that is about 30 times that of CO_2. It also contributes to the formation of ground-level ozone, a dangerous air pollutant.[92]

---

[90] This excludes the share of active mobility (walking and cycling), which is assumed to capture up to 4 percent of the passenger car demand by 2050 in the NZE.

[91] Kantor E3M. A carbon pricing design for the Energy Community Final Report. (2021). https://www.energy-community.org/dam/jcr:82a4fc8b-c0b7-44e8-b699-0fd06ca9c74d/Kantor_carbon_012021.pdf

[92] Climate and Clean Air Coalition (CCAC) and United Nations Environment Programme (UNEP). Global Methane Assessment. (2021) https://www.ccacoalition.org/resources/global-methane-assessment-full-report

Establishing of thoroughly functional waste management system would be essential to curbing methane emissions and making the waste sector more resilient amid climate-related shocks. In 2019, the waste sector accounted for about 11 percent of Albania's total net GHG emissions and 33 percent of the country's direct methane emissions.[93] In the absence of action, these emissions would continue to increase. To reduce emissions from the waste sector, priority should be given to increasing waste collection, minimizing open dumping and uncontrolled landfilling, managing landfill gas, and diverting organic waste from landfills. This should be accompanied by measures to integrate sector development, minimize and separate waste, increase and improve treatment, and improve sector governance, especially with regard to the availability and predictability of operational financing. Better waste management would also bring other positive environmental and health outcomes, such as a reduction in soil and marine pollution (including from plastics) and better local health and environmental outcomes. Additionally, better waste management would accelerate economic development by improving access to public services, helping to create jobs, and enhancing livability. Box 31, below, shows a specific case where open, uncontrolled waste burning in high-wildfire-risk areas poses challenges to local residents and contributes to more methane emissions.

BOX 3.1: Poorly managed waste exacerbates hazards and contributes to climate change

Landfill fires both cause and spread wildfires in Albania—largely due to the widespread practice of the open burning of waste. The effects of waste disposal sites on wildfires have become a growing issue in Albania in the recent years. Albania has the highest percentage of waste disposal sites in very high-risk wildfire zones, such as the Sharra site.[94] In addition to wildfires, 50 percent of waste disposal sites are in areas at very high risk of landslides. There are 47 landfills located in Sharra, Bushat, Bajkaj, Maliq, and Elbasan and 9,046 illegal dumpsites in Albania. Most municipal landfills operate without permits and environmental impact analyses. As a result, none have the conditions or design needed for safe waste disposal to reduce the risk of fires, air, water, and soil pollution.[95]

Waste disposal sites already cause substantial health and environmental problems fro, air pollution and GHG emissions, and compound hazards such as wildfires may exacerbate these. Fires at waste disposal sites further change the air quality because fires emit additional air pollutants. When plastic is burned, it emits substances with negative health impacts such as dioxins, furans, and polychlorinated biphenyls. At Sharra solid waste dump, near Tirana, the average concentration of PM_{10} is almost ten times higher than the WHO standard. The amount of highly toxic chemicals (dioxins and furans) released into the environment from burning activities at Sharra landfill is the same as the total emissions of these pollutants from the rest of Albania.[96,97,98] In the waste sector, methane is generated mainly when organic waste decomposes in anaerobic conditions (for instance, in waste dumps and landfills) and is emitted in gaseous form into the atmosphere in the absence of proper landfill gas management system. Methane emissions from waste disposal sites multiply or intensify when organic waste undergoes incomplete combustion from unregulated burning processes like open-air burning, wildfire activity at waste disposal sites, and poorly managed landfill fires.[99]

93 Climate Watch (CAIT). Country Greenhouse Gas Emissions Data. (2023) https://www.wri.org/data/climate-watch-cait-country-greenhouse-gas-emissions-data

94 Besnik Baraj Merita Mansaku. Hotspot: Sharra Dumpsite in Tirana, Albania. Meksi EDEN Center. (2006) https://ipen.org/sites/default/files/documents/alb1_sharra_dump_in_albania-en.pdf

95 Milošević, L., Mihajlović, E., & Malenović, N. J. Analysis and measures of landfill fire prevention. Safety Engineering, 11(1), 25-30). (2021) See also https://thebalkanforum.org/

96 European Environment Agency. European air quality maps for 2019. (2021) https://www.eionet.europa.eu/etcs/etc-atni/products/etc-atni-reports/etc-atni-report-1-2021-european-air-quality-maps-for-2019-pm10-pm2-5-ozone-no2-and-nox-spatial-estimates-and-their-uncertainties/@@download/file/ETC-ATNI_2021-1_European_AQ_maps_for_2019_final_for_publishing.pdf

97 Calculated from Sentinel-5P TROPOMI (TROPOspheric Monitoring Instrument) and NOAA Global Monitoring Laboratory.

98 Odeta Jahaj. Integrated Solid Waste Management in Albania: a case study of MSW in Tirana, (2016) https://unipub.uni-graz.at/obvugrhs/content/titleinfo/1390246/full.pdf

99 Calculated from Sentinel-5P TROPOMI (TROPOspheric Monitoring Instrument) and NOAA Global Monitoring Laboratory. https://sentinels.copernicus.eu/web/sentinel/data-products/-/asset_publisher/fp37fc19FN8F/content/tropomi-level-2-methane

Methane emissions from agriculture would also have to be actively monitored and reduced. The main source of agriculture emissions is livestock production, including cattle and small ruminants, generated from enteric fermentation, manure left on pastures, and poor manure management. In the agriculture sector, methane emissions reduction measures could include improving the genetic makeup of the livestock (through breeding), optimizing animal feed, establishing a system of safe disposal of animal byproducts, and improving manure and pasture management. According to the Greenhouse Gas Abatement Cost Model (GACMO) tool, a 10 percent reduction in the nitrogen excretion rate through improved feed (by adding fat) can reduce methane emissions by 4 percent, for each 1 percent of fat added to livestock feed.[100]

In an optimistic growth scenario, Albania would have to make additional efforts to achieve economy-wide net zero targets. In 2050, Albania's GDP is assumed to be 63 percent higher in the NZE-HG than in the NZE and RS, which would correspond to a similar increase in the demand for services. But efforts to further improve energy efficiency could lead to an increase in final energy demand of just about 40 percent, compared to the NZE, by 2050. In addition, in the NZE-HG, meeting decarbonization targets would require resorting to higher levels of the penetration of cleaner technologies in all sectors. For example, in the NZE-HG, Albania would have to install about 5.5 GW of solar capacity (versus 1.8 GW in the NZE) and about 4.1 GW of wind capacity (versus 3.5 GW in the NZE). In the NZE-HG, electricity generation and supply costs would be slightly higher than in the NZE in the medium term, but would converge toward the NZE values in the long term.

3.3. Incremental investments needed for decarbonization

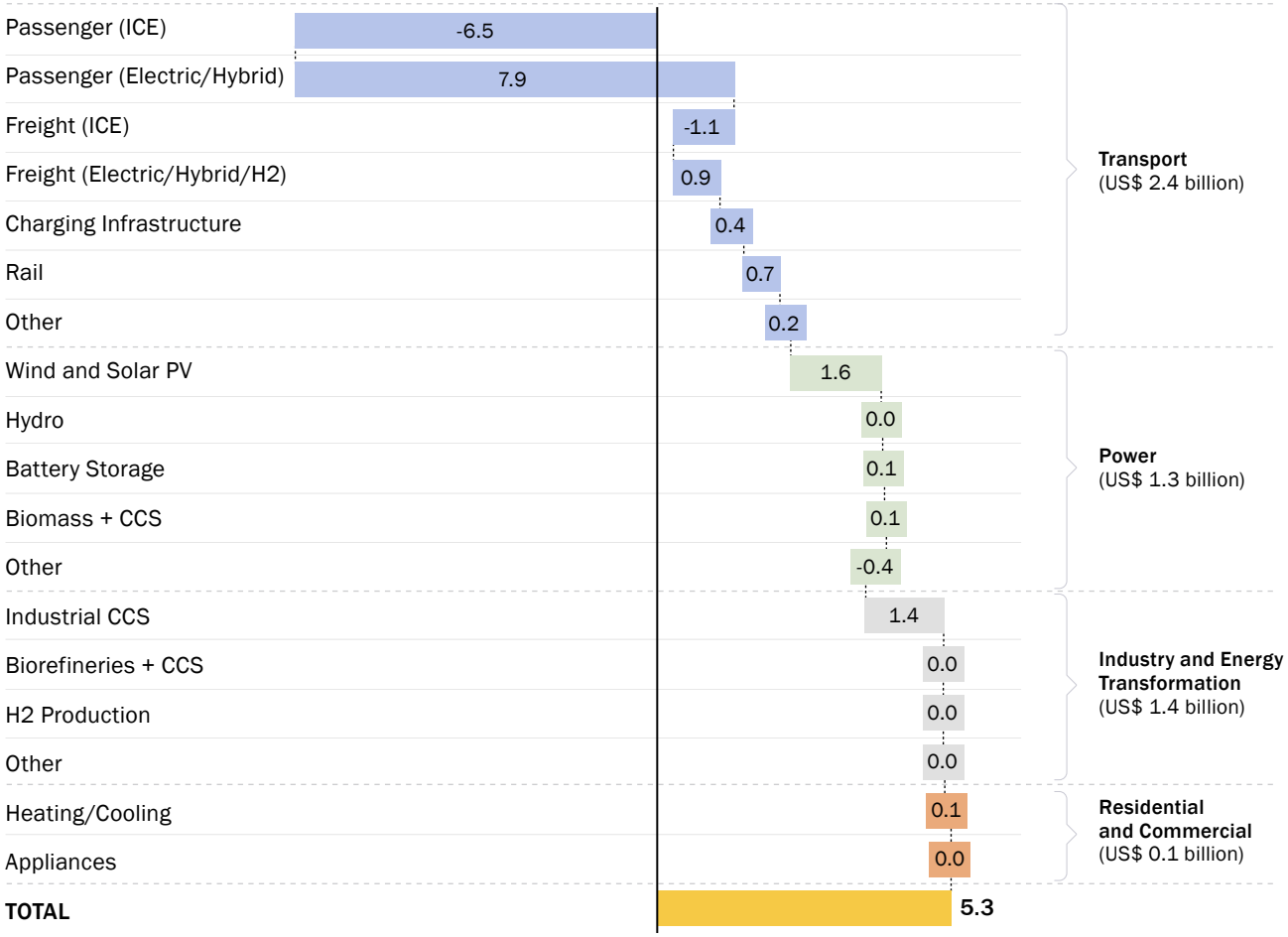
Overall, compared to the RS, in the NZE Albania would need to invest in the energy system an additional US$200 million until 2030, and US$5.3 billion until 2050 (in 2020 dollars expressed at present values) to achieve economy-wide net zero. These investments are in addition to the discounted investments required in the RS, which amount to US$25.4 billion until 2030 and US$57.5 billion until 2050 (in 2020 dollars). The incremental investment is equivalent to about 0.2 percent of GDP until 2030, and 2.5 percent until 2050. Approximately 85 percent of the investments could come from the private sector (including households). But the higher investment required would be at least partially compensated by lower operating costs, estimated at -0.9 percent of GDP per year on average through 2050. The relatively small magnitude of the incremental investments until 2030 suggests that to embark on a path toward full decarbonization, Albania would need only small course adjustments until 2030 to redirect its energy sector investments. Until 2030, most of the incremental investment would be directed toward enabling investments that could facilitate the energy transition in the longer term (for example, rail network expansion and rehabilitation, or power interconnections with neighboring countries).

Most of the incremental investment until 2050 would go to the transport sector. The incremental investment by 2050 (US$5.3 billion, in 2020 dollars) is composed of investments in the transport sector (US$2.4 billion), industry and energy transformation sector (US$1.4 billion), power sector (US$1.3 billion), and the residential and commercial sectors (US$0.1 billion).[101] Figure 3.3 shows the breakdown by subsector. In the transport sector, a large share of the incremental investment would be used to finance the purchase of vehicles running on electricity and hydrogen and the modernization and expansion of the rail network. In the power sector, the incremental investment would ramp up after 2030, and most of it would be directed toward the scale-up of wind and solar PV capacities. On the other hand, the incremental investment in the residential and commercial sectors would be relatively low because investments in energy efficiency and cleaner heating sources are already largely economically viable in the RS.

[100] UNDP and GEF. The Fourth National Communication of Albania on Climate Change. (2022). https://unfccc.int/sites/default/files/resource/Fourth%20National%20Communication%20of%20Albania%20to%20the%20UNFCCC_EN.pdf

[101] Dollar amounts are all in 2020 US dollars.

FIGURE 3.3: Discounted investment gap (i.e., the difference between NZE and RS) until 2050, by subsector (US$ billion)



Source: World Bank analysis.

While the energy transition would be even costlier in absolute terms in the NZE-HG (as a larger economy corresponds to higher levels of energy demand), the required investments would be similar to the NZE in terms of share of GDP. In the NZE-HG, to achieve economy-wide net zero, Albania would need to invest US$81.7 billion in the energy system until 2050 (versus US$62.8 billion in the NZE), all expressed at present values and 2020 dollars. But in the NZE-HG the incremental investments (calculated compared to a different reference scenario in which GDP growth is the same as in the NZE-HG) would correspond to about 3 percent of GDP on average until 2050, which is in line with the value for the NZE.

3.4. Human capital and labor market transformations

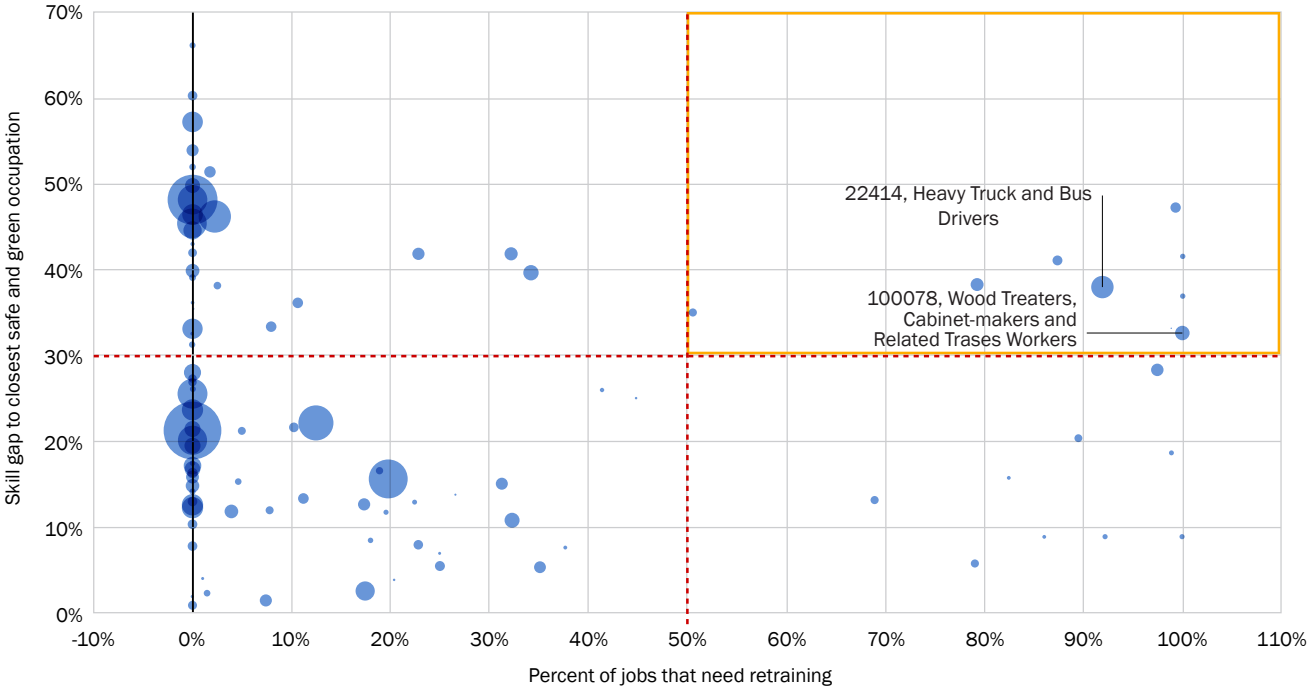
The green transition will require significant worker retraining in all of Albania, not just in the high-polluting sectors. Transitioning to greener forms of production, distribution, and consumption could affect the labor market either positively or negatively. The effects go beyond the most polluting industries (for example, coal mining); significant transformations will be seen in other occupations (for example, mechanical engineering). This will require investment in retraining and upskilling for employees to remain productive in a given occupation or to move to another occupation with similar skill requirements. The extent of this reskilling will depend on the gap between the current and future skills required. Reskilling and upskilling can be considered short-term investments, but shifting demand for labor will require longer-term investments to enhance the human capital needed for Albania to reach net zero by 2050. This means that structural reforms in the education system will be necessary.

A green transition requires a comprehensive reform of education and training systems. Taking advantage of green growth opportunities could lead to significant changes in occupational standards and skills needs. Education must provide students with the skills and competencies needed in the current and future labor markets and should be supported by active labor market policies to reskill and upskill those affected by the green transition. Considering the sizeable proportion of the labor force at risk and with significant retraining needs, it is critical for Albania to start adapting its entire education system—from early learning, to technical and vocational education and training (TVET), and to higher education levels—in a way that enables the education system to equip young Albanians with the green skills needed for the emerging economy.

The skills impact on the Albania's economy will go beyond just brown industries, with 9.9 percent of the workforce requiring upskilling or retraining in the medium run. Approximately 3.4 percent of jobs in Albania are in the brown industry, but the green transition will affect approximately one out of five workers in the entire labor force because of changes in technology or business models. Currently, 55,000 Albanians work in occupations in which a high percentage of jobs will need retraining and for which the skills gap is large and are therefore most at risk. Missing the required investments in retraining and upskilling will put individuals at risk of unemployment and firms at risk of missing growth opportunities because of inadequate workforce (Figure 3.4). On average, low-educated workers and men are expected to be disproportionately affected by the change in the nature of work associated with the green transition.

The skill gaps for workers in at-risk occupations will require large investments. The transition costs in each at-risk occupation depend on the size of the skills gap—how similar their skills are to the ones required in the closest occupation in terms of skillset. On average, workers in affected occupations will need to acquire about one quarter of the total skills required to transition to a green occupation. At the same time, they may transition to safe occupations that are not green but will remain relevant for the economy.

FIGURE 3.4: Occupations and number of workers that need retraining



Source: Garrote, Gukovas and Makovec (2024): "Jobs, Skills and the Green Transition in ECA" Data from Labor Force Survey of Albania (2021)
Note: The yellow rectangle area shows the most affected.

The most necessary skills needed for the transition involve cognitive abilities and knowledge in STEM—science, technology, engineering, and mathematics. In comparison to physical, psychomotor, or sensory abilities, developing cognitive and STEM skills typically requires long stretches of time. Other skills such as complex problem solving, critical thinking, and equipment maintenance are also needed, while gaps in social

skills are of second order importance in meeting the needs of the green transition. To facilitate this change, Active Labor Market Policies (ALMPs) supporting on-the-job training or upskilling for unemployed people will not be sufficient on their own. They will need to be complemented with long-term education and training reforms. This also requires adjustments on the supply side of training provision, including training for adult workers, with an increasing role for the private sector to play. Our estimates show that the cost of retraining and reskilling of the most at-risk workers could be as high as US$59 million per year if they are retrained into safe occupations, and up to US$231 million per year if they are retrained into green occupations.

For climate change mitigation, green technologies must be absorbed, developed, and adapted to local needs and circumstances. Although catching-up economies rarely operate at the technology frontier, their rate of economic growth depends on their capacity to absorb institutional and technological advancements that bring them closer to the more developed economies. Technology absorption refers to the acquisition, development, assimilation, and utilization of technological knowledge and capability by firms and other entities from external sources. It entails mastering specific technologies, adjusting them to local needs, and creating rich knowledge spillovers that can then lead to further innovations. Two key components in the adoption and absorption of green technologies are the development of skills and enabling cooperation between the public and private sectors through the sharing of research and cofinancing.

Chapter 4

Economic impacts and growth opportunities

Economic impact analysis was carried as part of the WB6 CCDR to assess the economic and distributional impacts of pathways presented in the earlier sections. The analysis assessed the economic impact of climate-intensified damage, and the economic and poverty impacts of decarbonization pathways, using the Macro-Structural Model with climate module (CC-MFMod) developed by the World Bank, together with the Carbon Price Assessment Tool (CPAT) developed jointly by the World Bank and the IMF. Based on this analysis, the chapter also identifies financing needs and structural and regulatory issues that need to be addressed to capitalize on the need for adaptation and mitigation, by investing in a greener and more productive economy. While increased and more diversified trade is an integral part of any strategy for growth and for resilience, especially for the Western Balkans, this section also points out opportunities in green value chains that could be further explored.

4.1. Macroeconomic impact

4.1.1. Impact of adaptation risks on the economy

Albania is vulnerable to natural hazards that can worsen in frequency and intensity as a result of climate change shocks. According to the results of a modeling exercise of climate damages from three channels -riverine floods, droughts (via impact wheat and maize yields), and heat (via impact on labor productivity) - Albania's per capita income in 2050 could be 7.16 percent lower than the baseline for that year. See table 4.1 (top panel). Yet for Albania, the low climate change scenario, RCP 2.6, which is characterized by higher precipitation and lower temperature, has the highest impact on GDP per capita; it yields a 7.54 percent lower GDP per capita in 2050 relative to the baseline.[102] The effects of riverine floods alone are expected lead to a 6.67 percent reduction in GDP per capita in 2050 under RCP 2.5; higher RCPs have less precipitation and yield lower damages. The exercise should be taken as indicative as it needs to be complemented with more precise, validated, local data because of inherent biases and limitations in climate projections from global models—flash flood extremes are likely to increase significantly because of higher volatility in precipitation.

The heat stress on the labor supply is also an important driver of climate damage in all climate scenarios. Labor productivity is expected to decline significantly because of the anticipated rise in temperatures and in heat stress. Notably, scenarios characterized by more substantial temperature increases suggest more pronounced losses. By 2050, for example, owing to labor heat stress, it is estimated that per capita GDP will be 0.67 percent, 1.16 percent, and 1.65 percent lower than in the baseline, for RCPs 2.6, 4.5 and 8.5, respectively.

Droughts significantly affect the Albanian economy, but their estimated impact is small because the modeling exercise captured only their impacts on two crop yields such as maize and wheat. Droughts result in a GDP loss between 0.25 and 0.45 percent across all three RCPs by 2050. The estimated impact of droughts is measured through a combined assessment of maize and wheat yields. Their impact is limited not only because these crops represent a relatively small portion of total agriculture—only 5.2 percent and 3.7 percent, respectively—but also the model does not consider the impact of droughts on other sectors such as power generation, forestry, and ecosystems. For example, because 2022 was especially dry, Albania was compelled to increase electricity imports substantially (see sections 1 and 2).

Although not a climate-related shock, the impact of earthquakes was found to be more damaging than the three climate challenges assessed. Even though the modeling approach could not fully capture actual extreme events that cause significant loss of life and output, it is expected that, of all natural disasters and shocks, earthquakes will have the largest impact on the Albanian economy, reducing per capita GDP by 6 percent by 2030, 11.55 percent by 2040, and up to 15.69 percent by 2050.[103]

[102] The different climate change scenarios or Representative Concentration Pathways (RCPs) foresee different average increases in temperature by 1.0, 1.8 and 3.7 degree Celsius for the RCP 2.6, 4.5, and 8.5 respectively.

[103] The modeling approach to earthquakes is based on expected annual losses, applied to the level of capital stock for each year. This modeling approach yields an expected average loss for each year but would understate the true impact of a once-in-a-100-year event occurring in a specific year. Nevertheless, when one looks at the sum of the expected annual losses though 2050, the approach can offer a realistic cumulative impact through that year.

The adverse impact of climate damage on GDP per capita is reduced slightly under the optimistic growth scenario. It is evident that the economy consistently lags what would have been achieved without climate-related influences. As expected, this detrimental effect on GDP intensifies with the escalation of emissions, worsening from RCP 2.6 to RCP 4.5 to RCP 8.5. By 2050, relative to the baseline, GDP is projected to decline by 6.82 percent, 6.52 percent, and 6.51 percent, respectively, under the optimistic growth scenario. By comparison, the GDP drop due to earthquakes under the high-growth scenario is estimated at 14 percent by 2050.

The effect of climate damages on fiscal aggregates appears to be relatively subdued: public debt is expected to slightly increase, less so in the high-growth scenario. Both revenues and expenditures are estimated to experience modest increases as a share of GDP, while the fiscal deficit is expected to deteriorate mildly. Consequently, the trajectory of public debt is also characterized by modest increments between 2030 and 2050—between 1 and 3 percent in the trend and optimistic growth scenario, under the three RCPs.

The deterioration in the current account balance is expected to be limited. The current account's projected deviation from the baseline is a fall of around 1.4 percentage point of GDP by 2050, under both the trend and optimistic growth scenarios. Damages from earthquakes, instead, would generate a bigger drop in the current account deficit, about 3 percentage point of GDP by 2050. The relatively limited impact on current account balances can be attributed primarily to a reduction in domestic demand due to the negative GDP impact, and therefore to improved net exports.

TABLE 4.1: Economic impacts of climate change under the trend growth

Impact on real GDP as a percentage deviation from baseline*	RCP 2.6			RCP 4.5			RCP 8.5		
Without adaptation investments									
	2030	**2040**	**2050**	**2030**	**2040**	**2050**	**2030**	**2040**	**2050**
Heat	-0.23	-0.44	-0.67	-0.40	-0.77	-1.16	-0.57	-1.08	-1.65
Drought (wheat and maize)	-0.19	-0.27	-0.26	-0.24	-0.33	-0.43	-0.17	-0.24	-0.25
Floods	-2.45	-4.82	-6.67	-2.07	-4.07	-5.65	-1.94	-3.83	-5.31
All combined	-2.87	-5.49	-7.54	-2.70	-5.12	-7.16	-2.67	-5.10	-7.11
With adaptation investments									
	2030	**2040**	**2050**	**2030**	**2040**	**2050**	**2030**	**2040**	**2050**
Heat	-0.13	-0.26	-0.42	-0.22	-0.47	-0.78	-0.32	-0.70	-1.18
Drought (wheat and maize)	0.00	-0.01	0.00	-0.01	-0.01	-0.01	0.00	-0.01	-0.01
Floods	-1.55	-3.07	-4.27	-1.12	-2.22	-3.10	-0.99	-1.96	-2.73
All combined	-1.68	-3.33	-4.68	-1.35	-2.69	-3.87	-1.31	-2.65	-3.89

Note: *The changes in the level of GDP or output are equivalent to changes in GDP per capita as the population figure is the same with and without the climate damage.
Source: World Bank staff estimates with inputs from JBA, IIASA and CIMA.

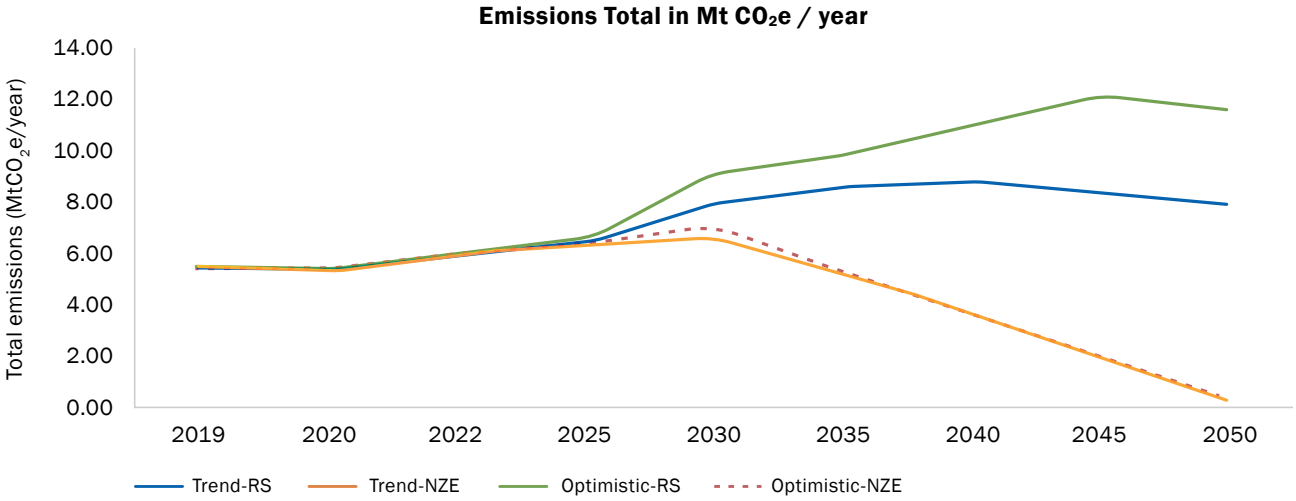
Looking at the adaptation investments needed to cope with the three channels selected, the largest investment needs are for coping with heat stress and droughts. Yet, the smaller investments needed to cope with riverine flooding bring significant returns. The adaptation investment package (reflected in table 4.1, bottom panel), under trend growth, adjusted for the impact of climate damage, reduces the economic impact of the damage. The adaptation investments are front-loaded and quite stable across all climate scenarios, whereas the benefits increase rapidly in later years; higher returns to adaptation investments are obtained in climate scenarios with higher temperatures. This underscores the importance of front-loading adaptation investment to buffer more severe damage in the mid-century/different climate scenarios. In case that all adaptation investments undertaken by the public sector, the fiscal implications, are significant.

Public debt can be expected to increase by about 24 percentage points of GDP in 2050 over the baseline under the trend growth, and 15 percentage points of GDP under optimistic growth. This underscores the need for early policy decisions and financing mechanisms to encourage the private sector and households to adjust behaviors and take on some adaptation investments. It also underscores the need for benefit–cost analysis to assess the benefit of each lek spent in each area (or sector) for adaptation.[104]

4.1.2. Impact of mitigation on the economy

If the energy system transformation were to lead the transition to lower emissions, the investments required would be significant. Albania is the lowest emitter of greenhouse gases among the Western Balkan countries, yet reaching net zero would require significant transformation of the energy system (all the sectors are discussed in chapter 3). The RS under trend growth only foresees a small reduction in emissions after 2040, while emissions would increase by almost one-third if growth were to double, that is, under the high-growth scenario (Figure 4.1). In short, reaching net zero would require a substantial reduction in emissions.

FIGURE 4.1: Total emissions of the economy for the NZE and RS scenarios, under trend and optimistic growth (in $MtCO_2$ per year)



Source: World Bank staff estimates.

Until 2030, the investments in the NZE scenario would be slightly larger than the RS scenario (Figure 4.2 and Figure 4.3). This highlights the fact that, till 2030, efforts should be directed toward laying the groundwork for the creation of an enabling environment for the subsequent scale-up of investments in the following decades. There should be a focus on stepping up investments in renewables. In the transport sector, there would be a shift in investments from privately owned road vehicles to public transit and rail. Besides redirecting some investments, until 2030 Albania, like other WB6 countries, should focus on creating an enabling policy and regulatory environment to accelerate the energy transition in all sectors of the economy and support the scale-up of investments after 2030.

The incremental investment needs would ramp up significantly after 2030, especially in the transport, industry (CCS), and power sectors. The annual incremental (NZE-RS) investment will average approximately 3 percentage points of GDP a year. In the transport sector, most of the incremental investment would be for purchasing new electric vehicle cars, and for the industrial sector to install CCS technologies in existing

[104] A scenario without adaptation investments assumes no investments in response to damage from climate change. The net result is a smaller economy, but with a similar fiscal stance as before.

industries. In the power sector, most of the incremental investment would be directed toward the scale-up of solar PV and wind generation, and to a lesser extent hydropower and battery storage. Around 2045–2050, investments would be needed in building a limited amount of biomass-fired generation capacity equipped with CCS, which would support the achievement of negative emissions in the power sector to abate emissions from other sectors like agriculture.

Similarly to other Western Balkan countries, the accelerated decarbonization pathway to NZE by 2050 would bring Albania benefits in the form of lower operational expenditures. While the incremental CAPEX would ramp up over time starting in 2035, in the short and medium terms the incremental OPEX would be very small and negative (relative to GDP), which would translate to cost savings for the economy. After 2040, when the investment in the energy systems is operational, the incremental annual OPEX saved would be even larger (reaching just under 2 percent of GDP, in both the trend and optimistic scenarios), driven by savings from future natural gas imports, and partially offset by CO_2 storage and the need to run CCS equipment.

FIGURE 4.2: Incremental CAPEX and OPEX of the energy system (incl. transport) under trend growth

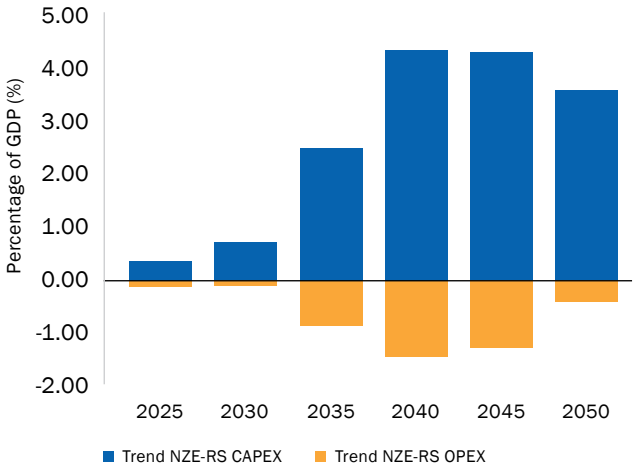
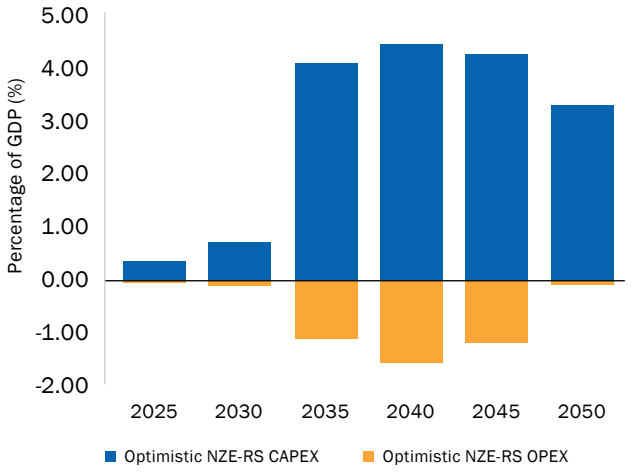


FIGURE 4.3: Incremental CAPEX and OPEX of the energy system (incl. transport) under high-growth growth



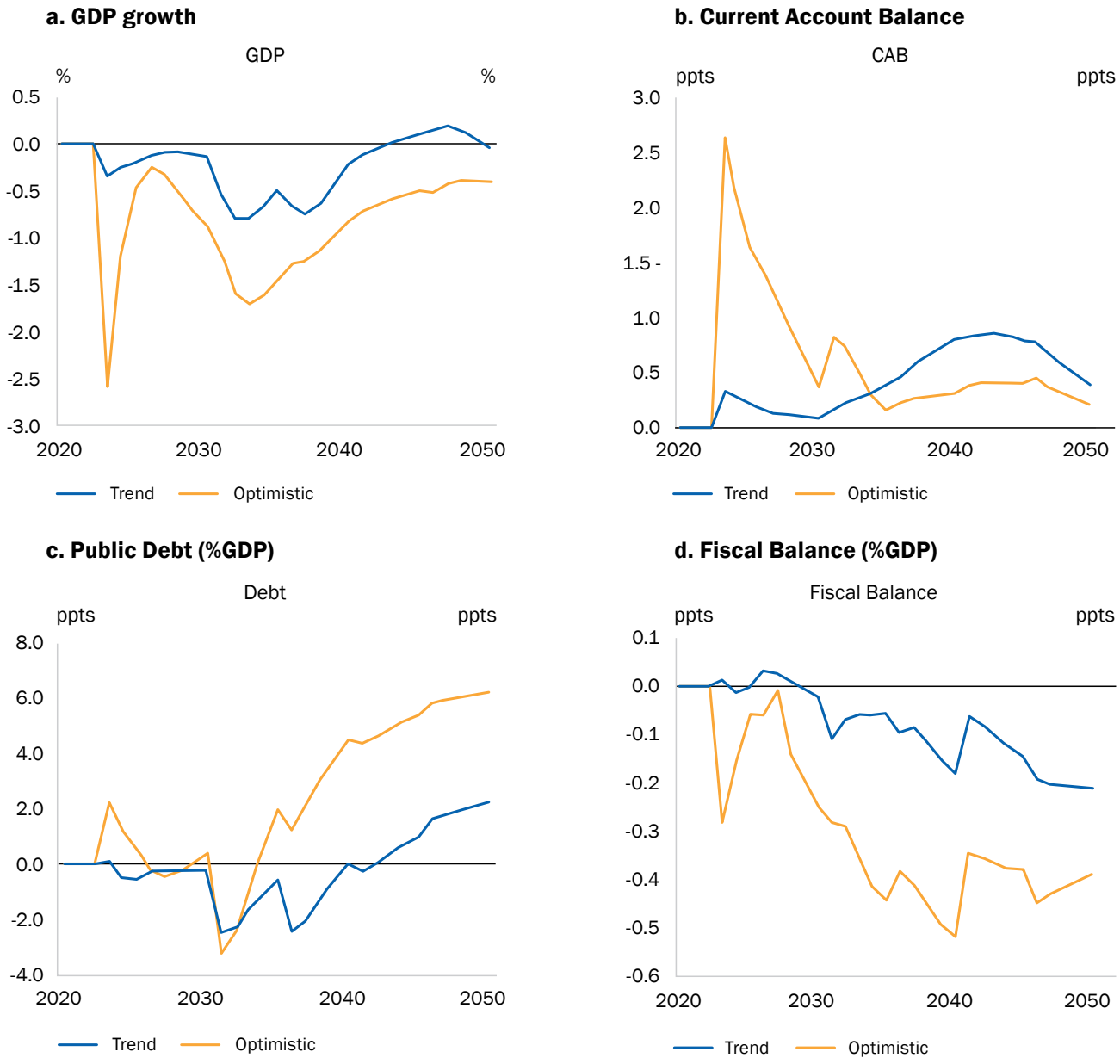
Source: World Bank staff estimates based on TIMES model inputs

Reaching net zero by 2050 can be achieved with the economy's current growth potential. After an initial acceleration largely by 2030, under the trend scenario, projected growth rates start to decelerate toward 1 percent in 2050 as aging of the population cuts into the potential growth rate. That notwithstanding, GDP per capita (in US$ 2020 terms) in 2050 is expected to be about 40 percent higher than in 2030 in the net zero scenario with trend growth projections. The decarbonization impact on domestic output, including also transport costs and co-benefits, is modest relative to the significant emissions reduction, as GDP per capita is only 0.04 percent lower in 2050 than in the baseline. Co-benefits include the number of working days lost and health expenditures. Co-benefits can be negative (in other words, worse than the RS) if the NZE scenario sees an increase in the use of biomass and biofuels, which contribute to PM2.5 air pollution but not to overall GHG emissions.

The incremental impact of the NZE scenario over the RS on GDP is small but negative, and larger in the high-growth scenario (Figure 4.4a). Early in the projection horizon, incremental investment in power utilities to replace existing capacity (peaking at about half a percent of GDP in 2025) will have an adverse effect on GDP, reducing its level by 0.1 percentage points in 2030 in the trend growth, and up to 3 percent in the high-growth scenario. In subsequent years, the net impact of the transition on GDP, including transport infrastructure and co-benefits, diminishes. By 2050, the GDP is expected to be about 0.04 percent smaller than in the baseline under trend growth, and 0.4 percent smaller under optimistic growth.

The incremental impact of the NZE scenario vis-à-vis the RS is very small and positive on the external account, with the CAD decreasing, and negative on fiscal deficit and public debt after about 2030 (Figure 4.4b, c and d). The net incremental impact on the external account diverges in the immediate years of the transition in the trend scenario. From 2030 onward, the improvement in the external deficit reaches up to about 0.8 percent of GDP by 2040 with trend growth, and about 0.5 percent of GDP under optimistic growth, driven by the decrease in the import bill, because achieving the NZE scenario relies, among other things, on the import of biomass and biofuels. A deterioration in fiscal accounts—with rising fiscal deficit and debt with respect to the RS—accelerates after 2030, as CAPEX needs to significantly increase, owing to the assumption—common across the six countries – that the central government budget takes on about 15 percent of the incremental investment. Another contributor to the rising debt is the lower GDP relative to the baseline, especially in the 2030–2040 period. The deterioration is more pronounced under the high-growth scenario.

FIGURE 4.4: Incremental impact of NZE vs RS, under trend and high growth (including transport costs, and CPAT co-benefits)



Source: World Bank staff estimates.

4.1.3. Poverty and distributional impact of mitigation

The anticipated co-benefits resulting from reduced air pollution, diminished road accidents, and decreased road damage amount to nearly US$ 0.435 billion (Figure 4.5). Air pollution currently ranks as the seventh risk factors contributing to death and disability in Albania, taking the lead among environmental risks within the country. Specifically, the economic value associated with the reduction in air pollution mortality is estimated at US$0.326 billion.

Achieving these benefits relies on emissions reductions in key sectors such as transport, industry, and power sectors. Notably, the transport sector offers additional co-benefits, including reduced mortality from road accidents (US$98 million) and decreased costs associated with road maintenance (US$11 million). But given the foreseen increase in biomass use in the residential, it would be imperative to enforce stringent emission standards to mitigate these negative health impacts effectively.

In net terms (considering all price rises and drops), reaching the NZE Scenario is expected to raise the cost of both final energy and non-energy products consumed by households. The transition to NZ entails in general both positive (that is, price increases, such as for electricity and coal) and negative (that is, price decreases, such as for natural gas, gasoline and diesel by 2050) variations in prices, which will translate into both losses and gains in terms of household consumption across the income distribution respectively. Electricity sees the most material price changes over time, and this brings a large distributional impact, since electricity represents more than 10 percent of the budget for household fossil fuel consumption for the bottom decile, while the share is at 5 percent for the top decile.

On average, Albanian households are expected to lose more than 2 percent of total consumption per year during the period 2030-2050 (Figure 4.6). Specifically, the NZE Scenario would lead to increased average annual losses of 4.17 and 4.60 percent of total household consumption in 2030 and 2035, respectively. These net losses are expected to fall to about 1.00 percent of total household consumption by 2050. Almost the entirety of the aforementioned consumption losses can be explained by the higher electricity bills faced by households (that is, the "direct" incidence effect) as opposed to the consumption of fossil fuel-intensive non-energy products by households (that is, the "indirect" incidence effect).

While being roughly equally distributed among urban and rural, household consumption losses stemming from the NZE Scenario are expected to be regressively distributed across (consumption) deciles (Figure 4.7). This is due to the higher electricity share in the consumption basked of the poorest, and the higher relatively price increase of electricity with respect to other fuel sources. The regressive nature of the NZE scenario is reflected in a resultant average rise in the consumption-based Gini coefficient by more than 1.00 percent in 2035.

FIGURE 4.5: Present value of externalities in 2023 (flows until 2050, discount rate of 6%) in 2021 $US million, under trend growth

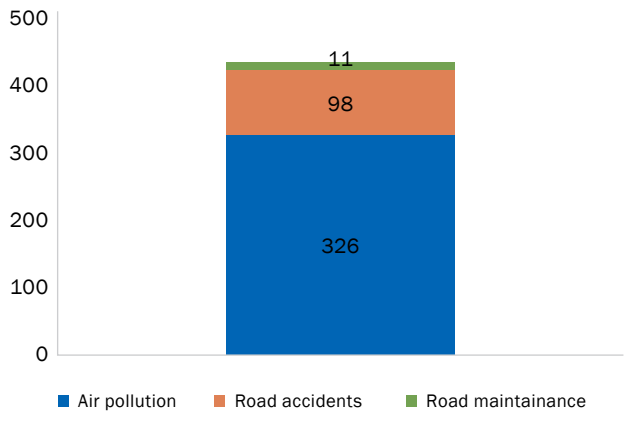
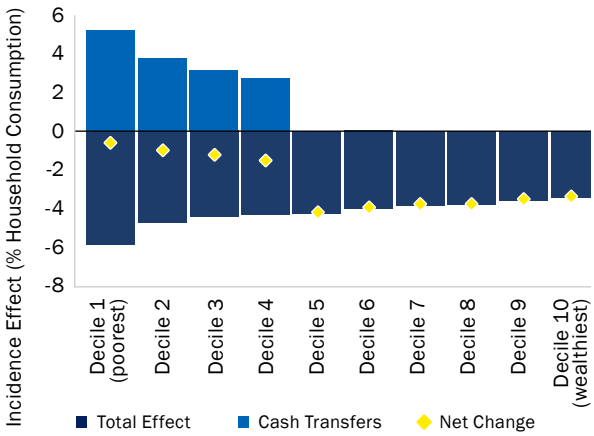


FIGURE 4.6: Mean household incidence before vs. after revenue recycling by welfare decile, 2030
(in Percent of household consumption, by country for NZE vs. RS)



Source: World Bank staff calculations, based on TIMEs model results, using the Climate Policy Assessment Tool (CPAT)

Revenue recycling from an increased carbon tax could substantially attenuate initial household consumption losses under the NZE Scenario (Figure 4.7).[105] For instance, in year 2030, recycling revenues raised from the policies under the NZE Scenario into targeted transfers to the bottom 40 percent of the consumption distribution could offset around 35 percent of the mean household consumption loss, on average, with larger gains for rural households. By construction, the targeted cash transfers would boost overall progressivity under the NZE Scenario, since they would entail lower consumption for the first four consumption deciles. This higher degree of progressivity is illustrated in sizable reductions in the Gini coefficient for consumption.

4.2. Financing needs and sources

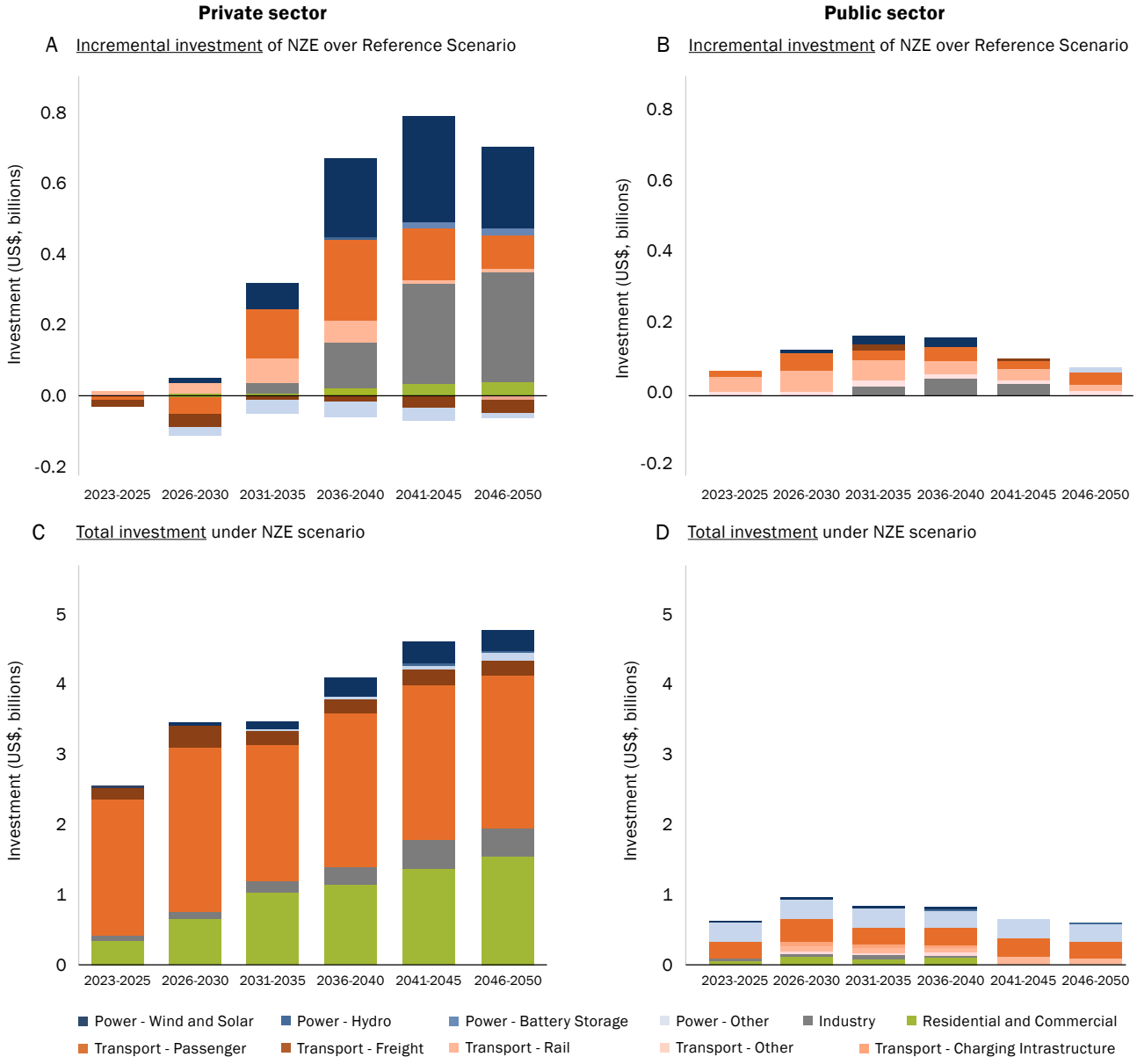
Albania's additional annual adaptation and mitigation investment needs come to 0.8 percent and 2.5 percentage points of GDP respectively for 2025-2050. The estimates come from the two separate modeling exercises reported in the preceding sections. They relied on the same GDP baseline and were run for trend growth and optimistic growth scenarios. The adaptation modeling exercise (based on adaptation investments to mitigate riverine floods, drought impact on maize and wheat, and labor heat stress) suggests average annual incremental investment rates of 1.0, 0.8, and 0.7 percentage points of GDP for 2025-30, 2031-40, and 2041-50 respectively. The mitigation exercise suggests average annual incremental investment rates of 0.2, 3.0, and 3.5 percentage points of GDP for 2025-30, 2031-40, and 2041-50 respectively. The incremental investment rates that emerge from the analysis in this report are significant. Incremental adaptation investments will need to be front loaded while mitigation investments will need to be back loaded. Albania's incremental investment needs are similar to the Western Balkan's average, of 1.3 and 1.9 percentage points of GDP for 2025-50 for adaptation and mitigation respectively.[106]

For mitigation, the net zero scenario under trend growth requires total public and private investment between 2026–2050 is US$ 121.74 billion (in 2020 dollars, not discounted). Chapter 3 (Figure 3.3) showed the discounted investment gap, the difference between NZE and RS investments at the sector level through 2025 in discounted dollars. A temporal breakdown of the undiscounted investment differences, presented in figure 4.7 (A and B, top row) shows that the incremental government investment (Figure 4.7B) is largely concentrated in rail and road transport, followed by industry, and renewable energy (solar and wind power). By contrast, the incremental private investment (Figure 4.7A) is backloaded and largely concentrated in industrial decarbonization, followed by renewable energy (solar and wind power), and transport (EVs and charging infrastructure). Looking at total investment under the NZE scenario, Figures 4.7 C and D (bottom row) show that the private sector is expected to do most of the investment (USD 103.39 bn, 84.9 percent), while the public sector investment accounts for 15.1 percent (USD 18.35 bn). The major investment tickets by sector between 2026–2050 include transport (USD 71.06 bn, 58.4 percent of the total, 87.6 percent private and 12.4 percent public), for residential and commercial buildings (USD 30.09 bn, 24.7 percent, 94.6 percent private and 5.4 percent public) and power (USD 13.18 bn, 10.8 percent, 46.8 percent private and 53.2 percent public). Importantly, the areas for investment between the public and private sector are expected to differ, with EVs being a common interest. Private sector is expected to focus on freight transport and EV charging infrastructure, renewable energy (solar and wind power) and residential and commercial buildings, while the public sector is expected to focus on power transmission and distribution and rail transport.

[105] For the modeling of revenue recycling (which focuses on year 2030), the amount of revenue raised from carbon pricing under the NZE versus RS Scenario was used as a proxy for the gross (monetary) household gain. The recycled revenue amounts (as a percentage of GDP) were obtained as follows. First, the analysis considered the 2030 country-specific carbon prices (in real 2020 US$/ton CO_2e) under the NZE versus RS Scenario, which were generated by the TIMES model and capped at the projected European Union Emissions Trading System (EU ETS) price in 2030 (that is, 96.09 US$/ton CO_2e in 2020 real dollars). The TIMES-generated carbon prices were subsequently scaled down by 50 percent to reflect the fact that the NZE versus RS Scenario greenhouse gas (GHG) emissions reductions would be achieved via a combination of pricing instruments (for example, carbon tax) and nonpricing (for example, regulation) instruments. CPAT was then used to estimate the additional revenues (as a percentage of GDP) that would be raised from the scaled-down carbon prices in 2030. The resulting revenue amounts were assumed to be recycled into new, targeted cash transfers for households.

[106] The results from the current adaptation and mitigation exercises cannot be added for two reasons. First, the adaptation results refer to shares of GDP from a smaller economy than the mitigation exercise. Second, a joint modeling exercise, while extremely complex, would have included interactions of adaptation and mitigation variables that could have altered the adaptation and mitigation investment needs. Nevertheless, looking at the two results in tandem is instructive for showing the scale of additional investments needed.

FIGURE 4.7: Absolute (NZE scenario) and incremental (NZE vs RS scenarios) investments in US$ billions. Numbers represent undiscounted annual investment, averaged over the period.



Source: World Bank analysis based on TIMES modeling inputs

The green finance landscape in Albania is at a very early stage. Albania has a bank-centric financial sector with shallow capital markets.[107] The country does not have a sustainable finance framework in place, but the Bank of Albania (BoA) is taking action to identify, monitor and manage climate-related risks. In 2020, the BoA joined the Central Banks and Supervisory Network for Greening the Financial System (NGFS), and in 2024 joined the Sustainable Banking and Finance Network (SBFN). In May 2023, the Supervisory Council of the BoA approved the phase I (2023-2025) of the roadmap for the management and supervision of climate-related financial risks in the financial sector, created in cooperation with the World Bank[108].

[107] The assets of the 12 banks operating in the country amount to about US$19 billion (1,800 billion Lek) and account for 89.5 percent of total financial assets. Source: Bank of Albania. The management and supervision of climate-related financial risks in the financial sector. (2023). https://www.bankofalbania.org/rc/doc/Strategjia_GREEN_anglisht_final_with_cover_25494.pdf

[108] Bank of Albania. The management and supervision of climate-related financial risks in the financial sector. (2023) https://www.bankofalbania.org/rc/doc/Strategjia_GREEN_anglisht_final_with_cover_25494.pdf

The roadmap addresses some of the climate-related physical and transition risks faced by the Albanian banking sector and outlines the action plan for the years 2023-2025 for green finance in the BoA. Going forward, the country needs to implement a sustainable finance framework in alignment with the EU. The key components of such framework include the adoption of a green taxonomy (a classification system to clarify which economic activities are environmentally sustainable), a sustainable disclosure framework for financial and nonfinancial companies, and a standard for the issuance of thematic corporate and sovereign bonds (including green, social, sustainable, and sustainability-linked bonds).

Albania is well positioned to attract investment in the car manufacturing sector and move into the EV value chain. Albania's nascent auto-parts industry is smaller than those of its regional peers (auto parts account for less than 1 percent of the total merchandise exports). But Albania's geographical position and close trade ties with the EU and other countries in the European periphery regional value chain underpin the growth potential of its automotive sector. In recent years, foreign investors have established a small but growing auto-parts industry in Albania, which offers lower labor costs than other regional countries, as well as relative economic stability, an improving investment climate, and fiscal incentives[109]. Albania can exploit emerging niches in the automotive value chain. Policies that foster the growth of specific production segments, including electronic components, high-voltage distribution units and harnesses for e-mobility, cabling systems, and wire-harnesses, among others, could enable Albanian suppliers to expand their in-house capabilities and move up the value chain.

PPPs are currently being used in Albania to attract private sector investment, but improvements are needed, especially around risk management. The average PPP investment in Albania between 2000–2019, was 0.78 percent of GDP, the highest in the Western Balkans region.[110] While the government has succeeded in using PPPs to mobilize private capital, the excessive use in a context of limited transparency and weak institutional oversight has resulted in the accumulation of significant contingent liabilities.[111] In Albania, unsolicited proposals are subject to the same standards as government-initiated projects. But unsolicited proposals represent a sizable share of PPP contracts, especially in the energy sector, which may signal lack of competition.[112] Going forward, the country needs to make sure it can provide a competitive and transparent procurement process, to align PPPs projects with national and sectoral strategies, and that the GoA can identify, assess, and manage properly the exposure of long-term PPP projects to climate-related risks. Leveraging PPPs to fill Albania's infrastructure gap will require (i) additional capital financing, (ii) transparent frameworks for administrative tariffs, and (iii) enhanced institutional capacity and oversight capacity in the public sector.[113]

Guarantees can help to free up capital and crowd-in private investments. With the help of capital optimization instruments provided by international guarantee agencies (such as MIGA), international banks with subsidiaries in the country can reduce the regulatory risk-weighting applied to their mandatory and voluntary reserves at the consolidated level, freeing up capital for their subsidiaries. The freed-up capital can be used to finance climate mitigation and adaptation projects. Additionally, political risk guarantees covering War and Civil Disturbances, Breach of Contract, Transfer Restriction and Inconvertibility of local currency into hard currency, and Expropriation by governments can be used to de-risk investments and mobilize private capital in support of projects in strategic sectors, such as power, transport, green buildings, and contribute to the green and resilience agenda.

For adaptation, Albania has several options for adaptation investments, but these require it strengthen its capacity to access EU and international donors, to access the private sector and to build better capacity

[109] World Bank Group. Creating Markets in Albania. (2022). https://documents1.worldbank.org/curated/en/099659008052217301/pdf/IDU02235bcb30f375041850bc960174e301a0024.pdf

[110] Based on data from the IMF Investment and Capital Stock Dataset. The dataset does not include Kosovo.

[111] According to Open Data Albania, the contingent liabilities deriving from PPP concessions between 2015 and 2021 increased from 4.4 to 11.4 percent of GDP, with a peak in 2020 of 13.2 percent (Open Data Albanian https://ndiqparate.al/; IMF Albania Article IV Consultation 2023, IMF Country Report No. 24/7).

[112] IMF Albania Article IV Consultation. IMF Country Report No. 24/7. (2023)

[113] World Bank. Albania Country Private Sector Diagnostic: Creating Markets n Albania. (June 2022).

in the public sector to assess risks and to access financing Instruments. Analysis suggests that national authorities currently lack the tools to assess their financial needs for adaptation and to access the resources required.[114] Thus, Albania will need to step up its capacity to access international donors and private investment, and the public sector will have to play its role. In particular:

- **At the international level, financial support from the EU and other international donors for climate actions could be further utilized to promote adaptation and sustainable economic development.** The Sofia Declaration on the Green Agenda for the Western Balkans, the new Growth Plan and the EU Adaptation Strategy all aim to increase international climate finance for adaptation.[115] The Economic and Investment Plan (EIP) also provides a long-term investment package that will mobilize up to 9 billion EUR to support green transition and climate actions, with the potential to attract an additional 20 billion EUR investment in climate actions with the crowding-in of private investors. Other funds such as the Adaptation Fund, the Green Climate Fund, and the Special Climate Change Fund, have also deployed billions of dollars in adaptation and could be leveraged further. For instance, under the Special Climate Change Fund, the "Building the Resilience of Kune-Vaini Lagoon through Ecosystem-based Adaptation (EbA)" project was launched with a total of US$ 1.9 million, which restored degraded forest and coastal dunes restored with climate-resilient species and increased the awareness among local communities of effective EbA actions.[116]
- **At the private sector level, commercial banks and firms have much to contribute.** To Incentivize the private sector to participate in adaptation finance, a higher level of collaboration between the public and private sectors is required. Government authorities play a crucial role in mobilizing private sources of finance toward adaptation actions. According to Albania's NAP, to support adaptation, traditional grant and loan financing should be complemented by approaches to blend private and public funds (such as public-private-partnerships), as well as more innovative approaches (such as payment for environmental services and risk insurances).[117] In addition, adopting EU market guidelines and joining international platforms can also help. For instance, the Coalition of Finance Ministers for Climate Action has "mobilizing climate finance" as one of its principles and provides member countries guidelines in "mobilizing private sources of finance toward climate action in their capacity as Finance Ministers, and by complementing Central Banks and market regulators."[118] Research shows that there is a growing market for climate adaptation that could be worth US$2 trillion annually within the next five years.[119]
- **At the national level, public financing schemes and budgetary planning for adaptation need to be enhanced.** The government should allocate adequate financial sources to support adaptation, identify the responsibilities of relevant institutions, and mainstream climate into budgetary planning at national and municipal levels. In Albania, the NAP mainstreams climate change into national development planning and budgeting as well as fiscal policy options through its implementation.[120] A list of priority adaptation measures was outlined, accompanied by the estimated adaptation costs and immediate and short-term implications for the national budget and international funds. In addition, disaster risk financing also needs to be enhanced to strengthen the country's financial resilience amid climate disasters and yield substantial benefits in terms of reducing the level of government liabilities.

---

[114] B. Alfthan, E. Krilasevic, S. Venturini, S. Bajrovic, M. Jurek, T. Schoolmeester, P.C. Sandei, H. Egerer, and T. Kurvits. Outlook on climate change adaptation in the Western Balkan mountains. Vienna, Arendal and Sarajevo: United Nations Environment Programme, GRIDArendal, and Environmental Innovations Association. (2015), https://www.researchgate.net/publication/307570598_Outlook_on_climate_change_adaptation_in_the_Western_Balkan_mountains

[115] European Commission. Forging a Climate-Resilient Europe – The New EU Strategy on Adaptation to Climate Change. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions. (2021) https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:82:FIN.

[116] United Nations Environment Programme (UNEP). Ecosystem-based Adaptation in Albania. https://www.unep.org/ecosystem-based-adaptation-albania

[117] Republic of Albania. National Adaptation Planning (NAP) to Climate Change in Albania Framework for the Country Process. (2021) https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Albania.pdf

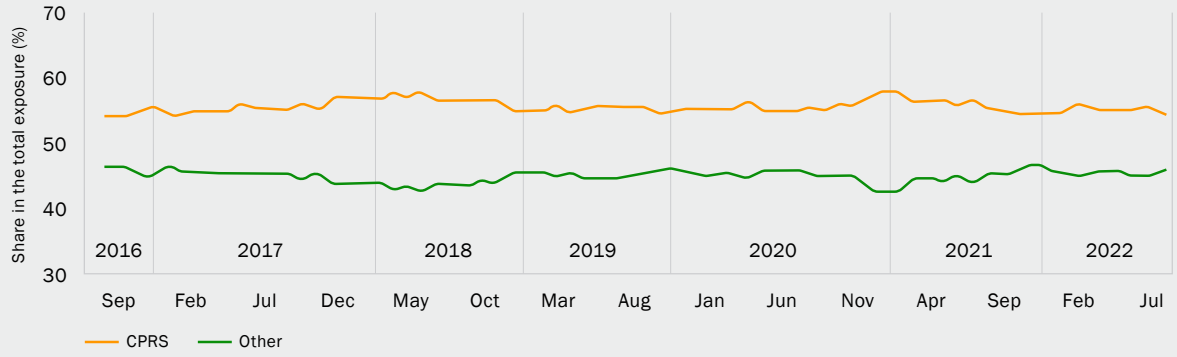
[118] The Coalition of Finance Ministers for Climate Action. About the Coalition. (2021), https://www.financeministersforclimate.org.

[119] Timothy Randall, Jens Sedemund, and Wiebke Bartz-Zuccala. Private investment for climate change adaptation – difficult to finance or difficult to see the finance? UNDRR PreventionWeb. (March 16, 2023). https://www.preventionweb.net/news/private-investment-climate-change-adaptation-difficult-finance-or-difficult-see-finance.

[120] Republic of Albania. National Adaptation Planning (NAP) to Climate Change in Albania Framework for the Country Process. (2021) https://unfccc.int/sites/default/files/resource/National_Adaptation_Plan_Albania.pdf

BOX 4.1: Preserving the financing capacity of the banking sector

Banking sector portfolios demonstrate high exposure to physical risks and to transition risks. Distribution of loans by sectors and regions provides a good overview of a potential double impact of climate change on banks, through geographic concentration (and natural hazards) and exposure to Climate Policy Related Sectors (CPRS). With respect to transition risks, based on CPRS methodology, Albania's exposure is 45 percent. For the remaining Western Balkans for which data is available have the following exposure: 55 percent in North Macedonia; 40 percent in Bosnia and Herzegovina, Respublika Srpska 35 percent.



Source: World Bank and Central Bank of Albania

Central banks can take a proactive role in managing the climate-related risks in their financial systems. A national overarching strategy and roadmap on green finance is necessary to prioritize actions; set the division of labor; and ensure the coordination among key actors, including central banks, and ministries of finance and economy. Central banks typically have five stages in managing the climate-related risks in their financial systems: (1) risk assessment / surveys / data collection; (2) preparing regulations / guidelines; (3) incorporating climate risks in supervision; (4) conducting stress testing; and (5) setting capital requirements for climate risks. Central banks in the region are mostly in the first phase; some of them advanced to second phase recently (e.g., North Macedonia).

4.3. Structural and regulatory issues

4.3.1. Supporting the transformation of the economy

For the Albanian economy to respond to the challenges posed by climate change, it will have to address structural and regulatory challenges that are also needed for achieving a more sustainable economic model. The Albania Country Economic Memorandum (CEM) identified four building blocks for such a model: (1) investing in people (2) improving the foundations for business, entrepreneurship and international trade environment (3) creating fiscal space and improving efficiency of public spending, and (4) strengthening institutional development.[121] These building blocks would strengthening productivity in Albania, which is low relative to comparators and has stalled in recent years. Taken together, the building blocks would help Albania develop a Greener, more Resilient and more Inclusive Development model (GRID), which is important for Albania given its significant reliance on precious natural resources in its economy (tourism and hydro).[122]

Addressing climate change requires progress on structural reforms. The findings emerging this report are fully consistent with the CEM recommendations. They map eloquently to the priorities identified in the CEM, and they deepen and enrich that discussion. In particular:

[121] World Bank, Albania Country Economic Memorandum: Strengthening the Sustainability of Albania's Growth Model. (September 2023).

[122] The tenets of the GRID model are (i) decarbonization and environmental sustainability of the economy, (ii) reinforcing resilience against natural disasters, and (iii) protecting vulnerable groups.

- ***Investing in people***: Sections 2.3 and 3.4 of this report underscore the importance of investing in people to overcome adaptation and mitigation challenges. New skills are important for the labor respond to the new opportunities provide by the green economy and to enable a Just Transition. Upgrading the skills of the labor force to meet the demands of a GRID economy requires addressing constraints to learning in K-12 education, improving VET and ALM programs, and upgrading the university system.

- ***Improving the business, entrepreneurship and international trade environment***. Large private sector financing needs emerging from the adaptation and mitigation analysis suggest that climate change will bring structural shifts to the economy. Albania will need a business environment (broadly defined here to include the regulatory and competition environment) that will enable these shifts and make them efficient and attractive for investors. Box 4-2 highlights the importance of incentives (price/carbon and diffusion and research) and market contestability, especially in the energy sector, as policy anchors to support the necessary shifts in the economy. These anchors would motivate the adoption and diffusion of new technologies and motivate and discipline incumbents, including SOEs. Reform areas identified in the CEM include the adoption of a new investment legal framework, strengthening of contract enforcement and legal security, and continuing to streamline government-business interactions and the digitalization of government services. Critically, Albania will need to increase access to finance, ensuring proactive and continuing support to entrepreneurs throughout the life of the business. However, with Albania's domestic savings rate of about 10 percent of GDP (during 2011-2022) and investment rate of [20] percent of GDP, Albania will need to rely on foreign resources to find its investment needs in the short to medium term. It also has an opportunity to increase its domestic savings rate in the medium to longer term. Another important factor to encourage such investments from the private sector is to educate businesses about incentives for private investment into green technologies and opportunities to access green finance.

- ***On creating fiscal space and improving efficiency of public spending***. Based on the analysis of the previous section, the impact of climate hazards on the public debt can be high (if no action is taken from households and firms) while the impact of mitigation seems manageable. Both adaptation and mitigation needs will however motivate a change in the mix of public investment (more of one and less of the other, or different way of designing programs or projects) and potentially require additional investment, should fiscal space permit. Albania does suffer an infrastructure deficit, and climate change as well as potential damages from earthquakes, will create urgencies that can put additional pressure on the public finances and could squeeze out important spending on more traditional areas such as health and education. The public sectors response needs to be three-fold. First, to adopt policies that mitigate the economic and social impact of climate change be incentivizing prevention (i.e. zoning, mandatory insurance, developing financing instruments, carbon pricing, incentives for research and innovation, etc.). Second, review and strengthening efficiency of existing programs (i.e. social assistance, education, pharmaceutical spending, etc.). Third, increase fiscal space by bolstering domestic revenue mobilization (bolstering personal income taxation, reduce VAT exemptions, and implement its Medium Term Revenue Strategy (MTRS). Albania can also upgrade the organic budget law and strengthen the implementation of its fiscal rule.[123] Fourth, actively monitor and manage fiscal risks from climate change. The ongoing efforts to improve monitoring and management of fiscal risks are in the budget process are in the right direction.

- ***Investing in government capacity to ensure successful implementation.*** Finally, the CEM recommends that Albania will need to complement policy changes with firm political commitment and invest in government capacity to ensure successful implementation. The evolving policy agenda will need to be embedded into the agenda of top-level Albanian decision-makers, adopting the necessary changes in the country's legal framework, and ensuring that ministries and local officials translate policy changes into actual improvements in the daily lives of Albanians. This will also require that institutional capacity of concerned government bodies be enhanced in terms of human resources, mandates, and accountability frameworks.

[123] The CEM also notes (i) making healthcare more accessible (e.g., by reducing out-of-pocket expenditure); (ii) creating a more meaningful unemployment insurance framework (e.g., by increasing the benefit level); and (iii) broadening the coverage of the social safety net. Spending increases need to be gradual and consider the available fiscal space and their effects on incentives in the labor market.

Albania will also need to improve its innovation framework. The CEM and the WDR (Box 4-2) underscore the importance of innovation in raising productivity and enabling the structural shifts in the economy that are needed to address climate challenges. Albania ranks 83rd among the 132 economies featured in the Global Innovation Index (GII) 2023 and 39th among the 39 economies GII ranks in Europe. According to GII, Albania exhibits strengths in its institutional environment, marked by operational stability for businesses and government effectiveness, alongside a favorable regulatory framework with good regulatory quality and relatively low redundancy dismissal costs. Additionally, the country demonstrates a positive trajectory in market sophistication, boasting a high level of domestic industry diversification and a considerable domestic market scale. However, significant weaknesses persist, notably in human capital and research. According to the GII, Albania faces challenges in education, with lower school life expectancy and tertiary enrollment rates despite moderate expenditure. The country also lags in research and development (R&D), with minimal investment in R&D and a lack of significant global corporate R&D investors, highlighting the need for substantial improvements in research capabilities and innovation. Furthermore, deficiencies in infrastructure, particularly in general infrastructure and logistics performance, represent additional areas requiring attention to enhance overall economic competitiveness and development.

BOX 4.2: Can the net zero transition be a path to high-income status for the WB6?

The energy and macro modeling approaches in this report aimed to make a direct comparison of the energy system costs and its macro impact between the net zero scenario and the RS for the same level of energy demand. This ensured that the comparison was made for the same size of the economy and the same GDP growth rates (The analysis was undertaken for two sizes of an economy, one that grew at trend growth and one that grew at optimistic growth.). The results, which include externalities from lower pollution, show that about half of the WB6 economies can achieve net zero emissions without compromising their per capita growth rate level relative to the RS. This result holds for both trend growth and optimistic growth scenarios.

However, a net zero transition can have a longer-term impact on GDP growth through increased trade, investment, and finance, contingent on structural reforms and country specific conditions. The potential longer-term impact is not modeled in this or the regional report but can be expected to materialize as higher trade, investment, and financing opportunities would very likely result in a higher GDP growth rate, provided that the prerequisite structural reforms are made to increase potential GDP. Country-specific conditions such as technological capabilities, access to resources, and preferences can also play determining roles. The context for these opportunities is the EU's commitment to achieving net zero emissions by 2050. To support this goal, the EU Green Deal, the Western Balkans Growth Plan, and CBAM are in place. In contrast to the opportunities presented under the net zero transition, under RS countries could face penalties in their economic relation with the EU as their emissions targets are inconsistent with EU policy goals. These penalties could not only come through the CBAM but also through reduced investment and finance opportunities.

To capitalize on the energy transition, the WB6 will need to increase their productivity. Middle-income countries are able to transition to high-income countries by improving their productivity. The World Development Report (WDR 2024) looks at the transition from upper middle income to high income status and makes several important points. First, while in early stages of development, when countries are far from the technological frontier, investments contribute significantly to economic growth, while in the middle stages of development, infusion of technologies (adoption and diffusion of technologies created elsewhere) makes an increasingly large contribution to growth alongside investment, and in the later stages of development, homegrown innovation plays the largest role in improving productivity. An economy's technological frontier can be pushed forward by infusion and innovation brought by new entrants into the market, as well as by incumbents (including SOEs). Second, a combination of carbon pricing and support programs would encourage the adoption of lower carbon technologies and spur competition through infusion and innovation, as long as markets are competitive. Energy efficiency gains will lower costs for households and businesses. Third, incumbents, which often seek to preserve their dominant status in a market, can be disciplined through competition policies. SOEs, as incumbents, can

be encouraged to innovate through shareholder action, governance or regulatory actions. Existing market leaders can only maintain their market share if they adapt to current incentives, such as finding more efficient ways to use and produce energy in the power and transportation sectors. Entrants and incumbents can be incentivized, as necessary, with subsidies for infusion and innovation. The implication for the energy transition of the WB6, where SOEs play a significant role in each economy, is that energy markets need to be contestable, using programs and policies to incentivize this competition. Furthermore, the ECA Companion Report to the WDR (2024, forthcoming) notes that the transition to net zero needs to be based on (i) continued economic transformation, (ii) integration into global markets and value chains to bring in more energy efficient technology, regulations on energy efficiency, and the introduction of renewables. Implementation of a strong reform agenda is needed to meet these objectives.

4.3.2 Managing the role of the state and its implications for climate transition

In Albania, SOEs play a significant role in sectors that are vulnerable to the negative effects of climate change.[124] Of all 162 SOEs in Albania, 56 percent operate in such climate-vulnerable sectors, compared to a global average of 44 percent. Most of the SOEs that are at risk from climate change-induced extreme weather events are municipal water and waste management companies, but also companies in digital / telecom and transportation (Figure 4.1). Climate change effects could threaten waste management, a key service every city and municipality provides. Flooding can impact disposal sites and damage processing facilities, heavy rains can cause dangerous leaching and run-offs into the groundwater, requiring these companies to invest in costly resilient waste management systems.

The large majority of SOEs in climate-vulnerable sectors are loss-making which poses challenges to financing the required adaptation investments (Figure 4.2). In the case of SOEs, adaptation investments are likely to require public funding because the concerned entities are unlikely to have the cash flow to fund adaptation investments, nor are they likely to have access to capital markets due to their poor financial performance, as 72 percent of them are loss-making. In the extreme case, damages to firm assets of SOEs can also call for funding of urgent recovery work, which in turn can have negative repercussion effects on the fiscal space of the country. Such a potential fiscal drain can jeopardize the ongoing fiscal consolidation of Albania. The country was able to reduce the fiscal balance from -4.6 percent of GDP to -2.3 percent of GDP between 2021 – 2024, shrinking its debt level from 75 percent of GDP to 61 percent of GDP during the same time period.[125] To continue this pathway of fiscal consolidation, climate change risks from BOSs need to be factored in. With a decentralized ownership structure – 77 percent of these SOEs report to subnational entities, like municipalities – coordinating and financing these adaptation investments may be difficult.

In sectors that are responsible for high levels of GHG emissions, i.e., carbon-intensive sectors, the state plays a somewhat minor role but often operates in competitive markets that are better served by the private sector. Only 12 percent of BOS in Albania operate in carbon-intensive sectors, compared to a global average of 18 percent. Beyond energy, where 37 percent of BOS in carbon-intensive sectors operate, manufacturing and transportation see a sizeable state footprint, with 26 percent and 32 percent of BOS, respectively. Almost two-thirds of these BOS (58%) are not generating profits. It is unlikely, therefore, that these BOS will have the cashflows for the required mitigation investments. A large share of BOS in carbon-intensive sectors (37%) operate in competitive markets where their economic rationale is weak and where the private sector is more suited to deliver services.

[124] In this section, references to SOEs refer to any enterprise in which the state has more than 10 percent direct or indirect ownership.

[125] World Bank. Europe and Central Asia - Macro Poverty Outlook Country-by-Country Analysis and Projections for the Developing World : Annual Meetings 2023. Washington, D.C.: World Bank Group. (2023) https://documentsinternal.worldbank.org/search/34175581.

FIGURE 4.8: Distribution of BOS in climate-vulnerable sectors in Albania, based on revenues of enterprises

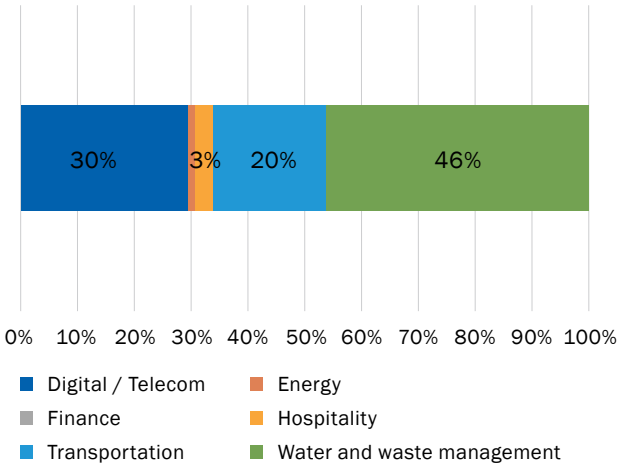
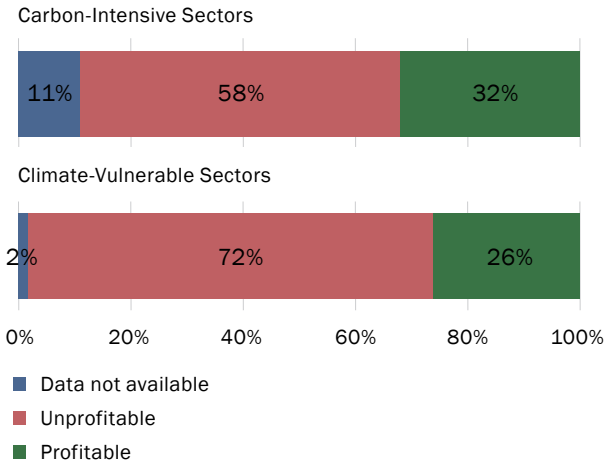


FIGURE 4.9: Distribution of BOS in carbon-intensive and climate-vulnerable sectors, by performance



Source: WB Global BOS database.

For a successful adaptation and mitigation strategy, the government of Albania will need to ensure that SOEs in climate-vulnerable and carbon-intensive sectors can respond to the emerging investment needs by adopting necessary reforms. Reform efforts should continue to focus on streamlining ("right-sizing") the state presence across the economy, in particular in competitive markets where private operators are better suited to deliver services, thus avoiding that the country spends public funds on climate action where, in fact, the private sector should step in. For SOEs in climate-vulnerable sectors, like water and waste management, telecom, and transportation, that often work in contestable and natural monopoly markets, reforms should aim at enhancing the performance of these BOSs so they can raise the required funds for adaptation investments. In addition, SOEs can aid government efforts to manage fiscal risks by preparing long-term corporate plans that assess the financial exposure of SOEs to climate risks. For SOEs in carbon-intensive sectors, the government could mandate them to embed climate objectives in their decision processes for major investment, in particular to (i) avoid carbon-lock-in (i.e., long-term investment in carbon-intensive technologies); and (ii) promote the application of carbon-efficient technologies and processes.

4.4. Trade opportunities

Albania needs to leverage its trade opportunities to maximize its development potential – quality infrastructure is an importance concern. While Albania's exports have been growing rapidly since 2000, and the country's exports of goods and services relative to GDP reached 40 percent of GDP in 2023, the trade ratio is the lowest in the Western Balkans. According to the CEM, Albanian products need to gain access to foreign markets and to become competitive in them. The CEM notes that Albania needs to upgrade its national quality infrastructure. Albania is quite well integrated with the Europe in terms of trade, as 74 percent of exports went to the EU (and UK) and 62 percent of imports came from the EU (and UK).

Albania's trade in environmental goods is still developing, consistent with progress in other Western Balkans countries. Environmental goods are goods that directly and positively contribute to green growth and sustainable development. Figures 4.4.1 and 4.4.2 show that exports of environmental goods have been stable as percent of GDP and as share of total exports, while imports of environmental goods have been increasing as a share of GDP and as share of total imports. While the ratios are small, they are not inconsistent with exports and imports of the Western Balkans partners.

FIGURE 4.10: Albania – Trade in environmental goods as percent of GDP

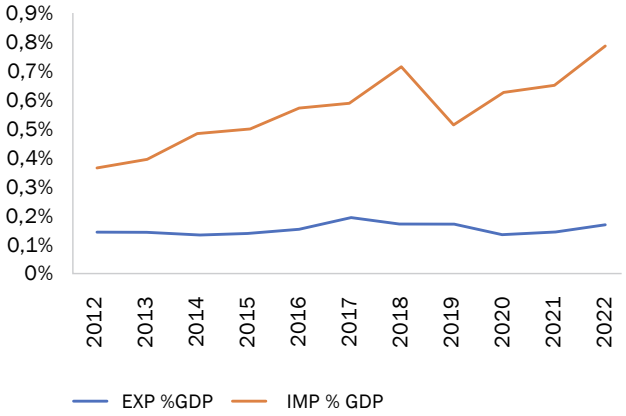
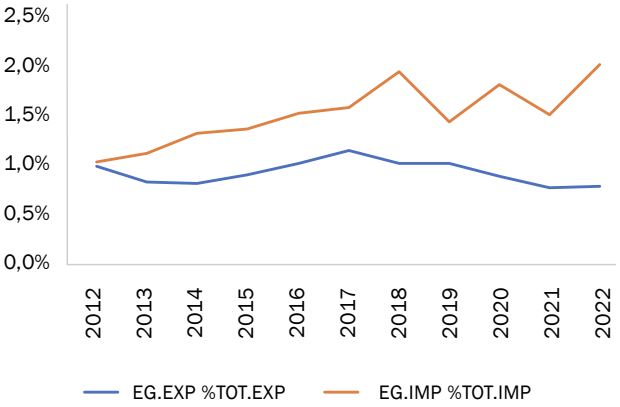


FIGURE 4.11: Albania – Share of environmental goods in percent



Yet, Albania has opportunities in green value chains, especially in the solar and wind, but also in electric vehicles. Albania has competitive strengths in solar (i.e. iron and steel structures, transformers, in copper ores and concentrates), in wind (i.e. electric motor parts, steel bars) and in EVs (i.e. nickel and ore concentrates). However, each part of the value change has particular challenges and requires investments to overcome. For Albania, the products with the greatest value added, but relatively hard to transition, are mostly for the solar and wind value chains.

FIGURE 4.12: Competitive strengths products with export competitiveness (RCA≥1)

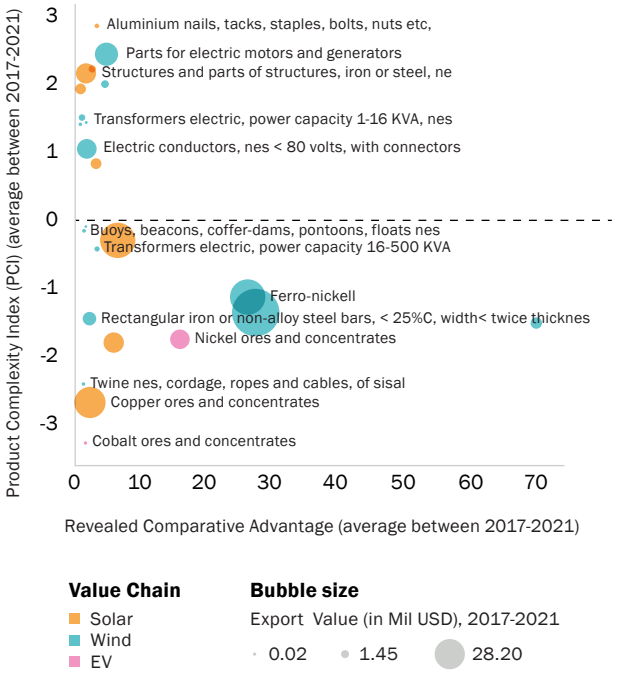
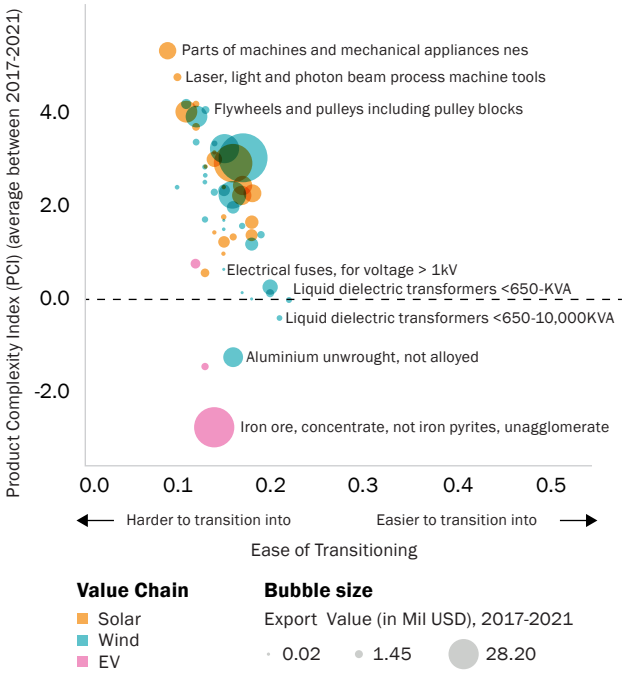
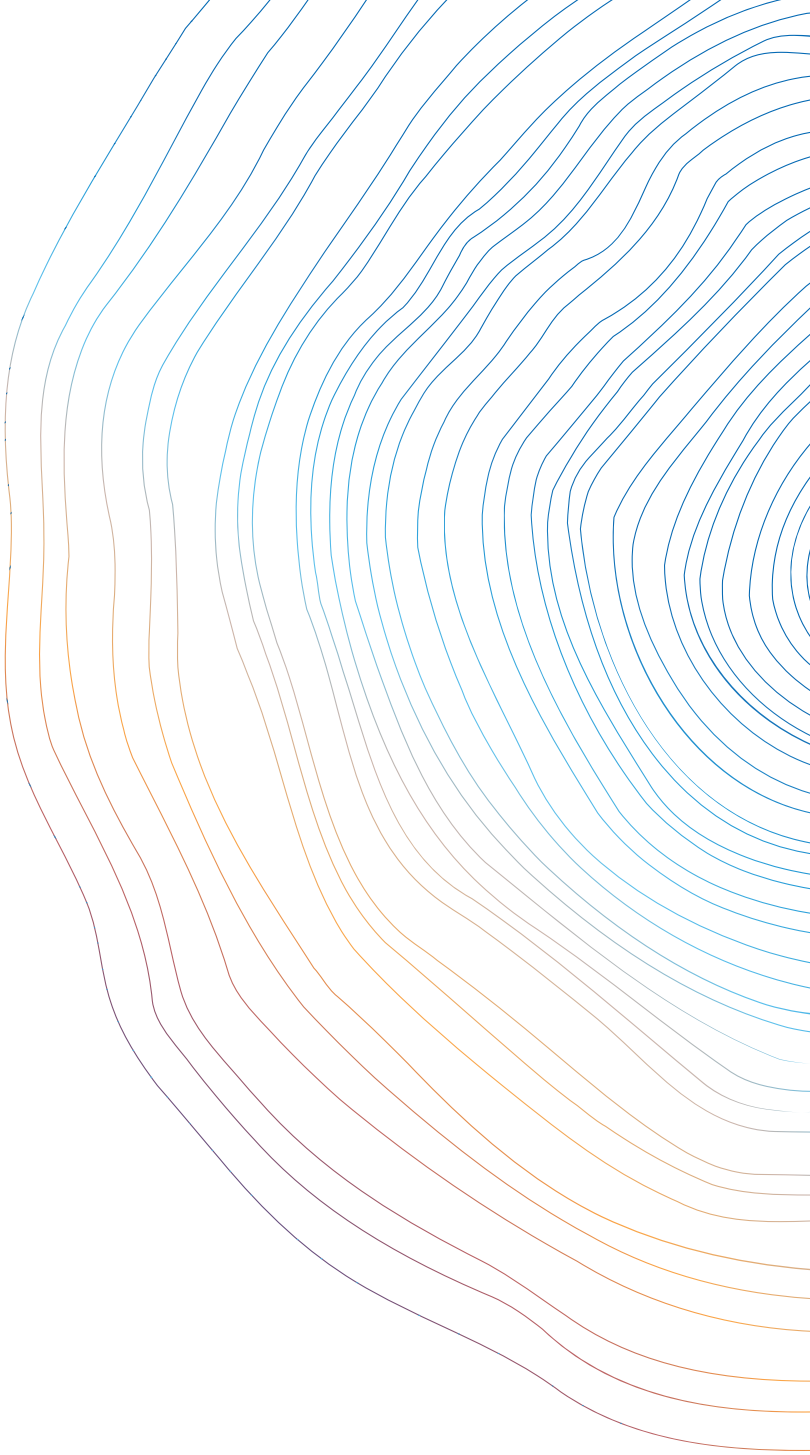


FIGURE 4.13: Potential opportunities products without export competitiveness (0.1<RCA<1)



Finally, Albania can be better integrated into the global economy by adopting border trade facilitation measures, upgrading national quality infrastructure to ensure that Albanian products meet the standards necessary to access advanced markets such as the EU; and scaling up Albania's foreign direct investment (FDI) attraction and retention programs.



Chapter 5

Conclusions and Recommendations

The following table highlights recommended policy actions and investments, with an associated prioritization, split by policy area. The urgency and ease of implementation of actions have been marked as high (●●●), medium (●●○), or low (●○○). The EU tag highlights actions that are aligned with the legal obligations already undertaken by Albania within the EU accession process or based on their membership to the Energy Community.

Policy Actions	Investments	Prioritization
Policy area: Resilience and adaptation		
RA1: Disaster risk management[126]		
▪ Improve the institutional and legislative framework for CCA and DRM, including these steps: i) Enhance full implementation of the National Adaptation Plan and address gaps in climate risk assessment, ii) Develop the legal basis that defines the roles and ensures the proactive involvement of line ministries on CCA actions, and iii) Enhance full implementation of the Civil Protection Law (2019) and disaster reduction strategies. EU ▪ Enhance adaptation financing through i) improving policies on disaster risk finance and allocation of DRM budget to reduce financial disparities at the municipal level, and ii) decentralizing disaster risk financing efforts by establishing a risk-sharing facility for local governments to pool risks and share disaster-related costs. EU ▪ Enhance disaster and climate risk insurance through i) improving and incentivizing access to insurance for public assets, households, and light industry, and ii) disaster risk transfer by implementing insurance instruments to protect public budgets, with a focus on catastrophe insurance for households, public asset insurance, and smallholder farmer agricultural insurance ▪ Enhance preparedness capacity through the establishment of training and operation guidelines for first responders (deployed by municipalities) to disasters and emergencies. EU ▪ Promote implementation of the Adaptation Strategy for the Health Sector to improve preparedness for extreme events such as a heatwave. EU	▪ Improve information and data management for CCA and DRM by i) improving data access and technical expertise on climate change for line ministries, and ii) establishing an information and data management system for disaster risk to inform more efficient decision-making and post-disaster responses. EU ▪ Enhance the climate resilience of CIs by i) developing a database of the structural properties of buildings, public infrastructure, and critical infrastructure, ii) retrofitting buildings against seismic and other hazard risks and for energy efficiency, and iii) improving the disaster and climate resilience of critical infrastructure and public buildings. EU ▪ Strengthen hydro-meteorological forecasts and services to monitor and provide timely warning of floods and other extreme water events, and to enhance flood-resilience, especially in the agricultural sector. EU ▪ Support improvements in first response capacity through investment in resilience upgrading of buildings, personnel, and equipment. EU ▪ Develop a comprehensive Disaster Risk Finance Strategy to identify the optimal risk-layering approach, with clear priorities in DRF. EU ▪ Enhance institutional expertise on, and public awareness of, climate change through i) promoting education programs that enhance institutional and public awareness of the effects of climate change, and ii) improving the understanding of risk by building a comprehensive understanding of the available data, increasing the use of disaster data for financial decision-making, and improving the understanding of disaster risk and contingent liabilities. EU	Urgency ●●○ Ease of implementation ●●○

[126] Disaster risk management and urban climate adaptation measures are mostly linked to the following EU legislation and strategies:

Legislation: European Climate Law (https://climate.ec.europa.eu/eu-action/european-climate-law_en), Directive on the resilience of critical entities (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022L2557)), Eurocode building codes (https://eurocodes.jrc.ec.europa.eu/policies-standards/en-eurocodes-and-related-standards#the-european-standardisation-system). and other relevant construction laws (such as the revised Energy Performance of Buildings Directive EU/2024/1275 and the revised Energy Efficiency Directive EU/2023/1791), Floods directive (https://www.eea.europa.eu/themes/water/interactive/by-category/floods-directive) UCPM legislation (https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/eu-civil-protection-mechanism_en).

Strategies, frameworks, programs and best practice networks: EU Adaptation Strategy (https://climate.ec.europa.eu/eu-action/adaptation-climate-change/eu-adaptation-strategy_en), EU Disaster Resilience Goals (https://civil-protection-humanitarian-aid.ec.europa.eu/what/civil-protection/european-disaster-risk-management/european-disaster-resilience-goals_en), EU Mission Adaptation to Climate Change (https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/adaptation-climate-change_en), EU level technical guidance for adaptation of buildings (https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2023-04/Technical%20Guidance%20adapting%20buildings.pdf).

The measures particularly support progress on areas presented in Chapter 27 Environment of the acquis (https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/glossary/chapters-acquis-negotiating-chapters_en).

The EU tag indicates that these measures are directly or indirectly linked or go beyond requirements included in EU legislation or strategies.

Policy Actions	Investments	Prioritization
RA2: Urban		
▪ Develop strategies and plans to increase urban climate resilience by i) developing a distributed system-based strategy rather than a project-based strategy that would showcase urban acupuncture (revitalizing urban areas) through a distributed set of climate-aware projects (this would be a resilient approach not dependent on singular signature interventions), ii) drafting urban cooling plans, and iii) developing neighborhood regeneration projects involving the upgrading and transforming run-down and disadvantaged residential neighborhoods. EU ▪ Develop legislative and regulatory measures that would ensure that the design and location of waste management facilities considers safety standards for high multihazard risks (wildfires, landslides, flooding, earthquakes), that waste management processes mitigate GHG emissions, and that measures are implemented to monitor health risks and methane emissions in surrounding areas. EU	▪ Invest in green nature interventions, including i) increasing vegetation coverage through intensive tree planting campaigns, ii) designing, upgrading, and retrofitting recreational and flashflood mitigating green roofs, and iii) investing in green infrastructure, such as rain gardens, and resilience functions such as emergency shelters when creating urban infrastructure through adopting a resilient approach that is not dependent on singular upgrading public spaces. EU ▪ Invest in urban flood prevention measures such as i) building/upgrading infrastructure and providing incentives to reduce the risk of flash flooding in urban centers, and ii) improving the urban drainage system using nature-based solutions. EU ▪ Investment Action RA2.3: Invest in climate-resilient neighborhoods through i) heat island reduction investments (cool roofs and pavements), ii) improving and upgrading neighborhood-level infrastructure and shared public spaces around private buildings. EU	Urgency ●●● Ease of implementation ●●○
RA3: Water		
▪ Complete the development of integrated River Basin and Flood Risk Management Plans covering the whole area of the country, including climate change adaptation measures in the Programs of Measures ▪ Develop financing strategies for the implementation of the Programs of Measures of existing River Basin Management Plans	▪ A structured transformation of green and greywater infrastructure aiding in flood resilience through nature-based draining infrastructure (filtration / reuse / permeability), flood protection and resilient landscaping interventions, scheduled infrastructure maintenance programs, slope and riverbank stabilization, elevating critical infrastructure prone to flooding, pumping stations, and so on ▪ Invest in the transformation to a more efficient, climate-resilient, and sustainable agricultural system, including the modernization of the irrigation and drainage systems ▪ Implement strategies and action plans to reduce the high levels of nonrevenue water to increase the efficiency and resilience of the water supply systems	Urgency ●●● Ease of implementation ●●○
RA4: Forestry and biodiversity		
▪ Preserve coastal ecosystems through the formulation and implementation of comprehensive management strategies designed to augment the ecological wellbeing of these vital regions, mitigate the impact of contamination and pollution, and regulate unauthorized construction activities ▪ Encourage afforestation and reforestation initiatives, with a particular emphasis on overseeing areas of heightened vulnerability while expanding designated protected zones, in order to safeguard and conserve natural habitat ▪ Consider climate change scenarios in strategic documents for the forestry sector	▪ Enhance coastal protection through i) applying EU instruments and policies about maintaining ecosystems and biodiversity related to coastal areas, including marshes and lagoons, ii) improving legislation related to construction management on coastal areas, and iii) coast-wide actions to keep coastal erosion under control ▪ Strengthen the controls on illegal deforestation ▪ Take reforestation action in areas damaged by wildfires or illegal deforestation. ▪ Draft a national strategy and national program on forests and pastures ▪ Create a national wildfire database and improve forest fire preparedness in areas with a high risk of wildfires ▪ Use afforestation as a solution to climate adaptation and biodiversity conservation in protected areas	Urgency ●●● Ease of implementation ●●○

Policy Actions	Investments	Prioritization
RA5: Agriculture		
▪ Promoting climate-smart and climate-resilient value chains that are aligned with Albania's National Strategy for Development and Integration (NSDI) in the focus areas of European integration, growth and competitiveness and the sustainable use of resources	▪ Modernize selected irrigation and drainage schemes (including using renewable energy powered systems) for high-value agricultural production in line with the 2017 "Promoting the Use of Energy from Renewable Sources" Law, which allows households and SMEs to install wind and solar power systems with a capacity of up to 500 kW for own consumption ▪ Promote the dissemination and adoption of CSA technologies and digital agricultural extension advisory services. For example, establish a CSA IT platform to collect all relevant information such as soil type, hydrometeorological data, and agriculture practices, including the use of fertilizers, pesticides, and irrigation. This platform will guide evidence-based decision-making for more resilient and sustainable agri-food systems. These efforts should align with the objectives of Albania's SARDF 2021–2027, which aims to promote sustainable food production and quality through the development of a competitive and innovative agri-food sector. Additionally, it seeks to strengthen the sustainable management of natural resources and improve the response to climate change. ▪ Invest in micro food hubs (MFHs) and Clusters that support short supply chains and resilience in the urban food supply, and contribute to the reduction of food loss and waste by providing refrigerated storage capacity. The MFHs should include a dedicated channel for sales from women farmers, along with information campaigns to recruit them	Urgency ●●● Ease of implementation ●●○
RA6: Transport		
▪ Update engineering design standards, particularly for bridges and culverts, in view of the vulnerability of Albania's road infrastructure to flooding risk ▪ Strengthen the road asset management system by including link-level climate hazard exposure, vulnerability and criticality data, and a multiyear maintenance and rehabilitation prioritization function, with emphasis in ensuring the adequate preventive maintenance of vulnerable, highly critical bridges and culverts ▪ Create a system for monitoring national passenger and cargo transport volume ▪ Promote a healthy, efficient, clean, and sustainable approach to urban mobility through integrated planning, with a focus on multimodal transport, transport-land use integration, active mobility (biking/walking), fleet electrification, and resilient public transport (BRT networks)	▪ Retrofithigh-priority—that is, high-volume, highly exposed, highly vulnerable, and critical—sections of road (and rail) infrastructure through the medium term (for example, by end of 2030) ▪ Increase multimodality by improving the quality of public transport and reducing the number of private automobile trips ▪ Expand railway infrastructure and rolling stock, vehicle-charging infrastructure, and non-motorized mobility	Urgency ●●● Ease of implementation ●●○
RA7: Education, skills and labor markets		
▪ Reform education and training systems to prepare the flow and the stock of workers with the skills needed for new jobs, by increasing the links between the education and training system and the labor market, including through greater involvement of the private sector	▪ Establish mechanisms (for example, skills development funds) co-led by the private sector to support reskilling and upskilling on a larger scale	Urgency ●●● Ease of implementation ●○○

Policy Actions	Investments	Prioritization
▪ Develop national plans for fostering green values, attitudes, and behaviors in children at an early age and throughout the education and training system ▪ Decarbonize education delivery, adapt school infrastructure to climate change, and create modern learning environments ▪ Promote science and R&D to adapt to climate change ▪ Reform the financing and design of upskilling and reskilling programs to expand opportunities for lifelong learning, including on-the-job learning ▪ Assess how well current labor regulations and tax and benefit systems balance the need to be flexible to allow firms to adapt to economic changes, and the need to protect workers	▪ Invest in green school infrastructure—energy-efficient buildings and compact structures—and embed energy-efficient technology in the curriculum to foster climate education (as part of DRM and Urban Policies) ▪ Invest in R&D and innovation to facilitate adaptation to the green economy ▪ Invest in the conditions needed for training that is larger in scale and more responsive to the labor market (curricula, teachers/instructors, infrastructure, equipment) ▪ Develop tools for National Agency for Employment and Skills (NAES) labor market observatory to regularly identify changes in skills demand associated with the greening of the labor market ▪ Invest in labor mobility schemes to support the fluid geographical reallocation of jobs and workers	
RA8: Social protection systems		
▪ Modify legislation to (i) allow social protection programs to expand coverage to additional people in response to disasters and climate impacts; and (ii) establish mechanisms to respond to localized shocks rapidly and transparently, through the social protection system ▪ Align social protection, disaster risk management, and climate change legislation to (i) recognize the role of social protection in supporting adaptation, (ii) strengthen the use of early-warning systems to inform a scaling up of social protection programs, and (iii) enable disaster risk financing or pre-positioned resources to be channeled through these programs to reach affected people directly ▪ Strengthen labor income protection systems, including for informal workers, to respond to a likely increase in job-related shocks	▪ Invest in social protection delivery systems to enable a quick identification of people in need of support, their enrollment and payment, supported by robust complaints and grievance mechanisms. This includes (i) investments in the interoperability of social protection information systems with other government databases to allow for the rapid identification of eligibility; and (ii) the establishment of standard operating procedures to ensure system capacity during disasters, supported by capacity building and staff training ▪ Establish and finance a contingency budget that will fund the expansion of social protection systems when shocks occur[127] ▪ Support dedicated outreach by social protection systems to poor and vulnerable communities to ensure their understanding of the benefits that are available to support climate adaptation ▪ Invest in efforts to better understand the individual- and household-level impacts of disasters and climate impacts, including through the tracking of damage and losses	Urgency ●●● Ease of implementation ●●○
RA9: Health system		
▪ Strengthen the plans for health system response to health emergencies, including climate-related ones ▪ Establish mechanisms to respond rapidly to localized shocks through the health system ▪ Improve data sharing with other sectors on the surveillance and monitoring of emerging new diseases and climate-related health emergencies	▪ Establish technical prerogatives for robust connections with other sectors for disease surveillance and monitoring, including investments in the interoperability of health information systems with other government systems and databases ▪ Make strategic investments to strengthen the response to climate-related hazards and other health emergencies, including enabling health facilities to rapidly expand bed capacity ▪ Invest in the capacity building of health staff and in health facilities to respond to changed disease burden	Urgency ●●● Ease of implementation ●●○

[127] For budgeting purposes, the maximum amount per year would be allocated, with the assumption that it is triggered every year; although, in practice, disbursements would be needs based.

Policy Actions	Investments	Prioritization
Policy Area: Decarbonization and mitigation		
DM1: Energy pricing		
▪ Complete the liberalization of the electricity market including gradual removal of price regulation and strengthen regulatory institutions. EU ▪ Converge toward cost-reflective electricity tariffs and supply prices to end customers to the extent regulated to ensure the financial viability of the power sector. EU ▪ Increase fuel levies and other environmental taxes to EU levels. EU ▪ Strengthen targeted social protection measures for vulnerable and energy poor customers in parallel to price reforms. EU ▪ Deploy instruments for carbon pricing, with revenue recycling to provide sustainable financing for climate action and to help vulnerable and low-income groups.		Urgency ●●● Ease of implementation ●●○
DM2: Power sector transformation		
▪ Develop spatial plans for identifying priority zones for RE development. EU ▪ Prepare a pipeline of RE projects with clear timelines and support schemes. EU ▪ Strengthen planning capacity for the grid integration of RE (at both the transmission and distribution levels). EU ▪ Develop the legal and regulatory framework for battery storage. EU	▪ Develop and implement national transmission grid modernization programs to enable the grid to integrate renewable electricity. EU ▪ Support investments in hydropower rehabilitation and expansion ▪ Support investments in battery storage ▪ Support private sector-led investments based on competitive selection processes (for example, RE auctions) in solar and wind capacities	Urgency ●●● Ease of implementation ●●○
DM3: Transport sector		
▪ Transition to concession-based models for public transport where providers are paid based on indicators of service delivered (performance-based contracts), aiming at improving service and accelerating the transition to e-buses. Increase the bankability of bus concessions through standardization at national and regional levels ▪ Improve the coordination of international rail freight traffic at the corridor level. EU ▪ Introduce fuel efficiency standards for vehicles, and tighten second-hand import regulations. EU ▪ Introduce carbon-differentiated vehicle taxation to incentivize the adoption of cleaner vehicles ▪ Improve the governance and enforcement of emission testing in roadworthiness inspections. EU ▪ Introduce regulatory requirements for early electrification of highly utilized fleets (buses, taxis, ride-sharing, and public fleets) ▪ Establish a clear policy framework for the deployment of charging infrastructure, facilitating private sector participation ▪ Prioritize collective and active mobility over private, motorized transport in urban and metropolitan areas	▪ Finance pilot projects to start developing EV-charging infrastructure along main corridors ▪ Support low-interest finance for the early e-mobility transition of highly utilized fleets ▪ Introduce dedicated infrastructure for the exclusive circulation of public transport vehicles along key urban corridors ▪ Invest in continuous, integrated, and safe non-motorized transport infrastructure (for instance, bicycling)	Urgency ●●● Ease of implementation ●●○
▪ Introduce minimum regulatory requirements for the rollout of publicly accessible EV charging points, gradually converging with those of the EU alternative fuels infrastructure regulation (AFIR) for both light- and heavy-duty vehicles. EU ▪ Introduce low-emission zones with gradual and growing levels of restriction over time	▪ Invest in improved public transport and pedestrian and cycling accessibility to low-emission zones	Urgency ●●○ Ease of implementation ●●○

Policy Actions	Investments	Prioritization
▪ Introduce parking management strategies to discourage private car use and recover public space (including controlled parking zones and parking charges) ▪ Explore alternative financing schemes for urban mobility, such as land value capture for transformative projects ▪ Expand private sector participation in infrastructure, services, and emerging transport modes (for example, Mobility as a Service (MaaS) and urban logistics) through PPPs ▪ Improve the market orientation of transport operators and encourage private participation ▪ Reform state-owned transport enterprises, enable their access to finance, appoint professional boards of directors, and divest state-owned enterprises of non-core business activities. EU	▪ Support, with decreasing participation over time, the roll-out of publicly available charging infrastructure for electric mobility ▪ Upgrade and expand infrastructure at border-crossing points on critical transport corridors within WB6 to achieve fully functioning one-stop shops, and between WB6 and EU neighbors. EU	
▪ Gradually phase out internal combustion engine (gasoline and diesel) vehicles among new registrations	▪ Revitalize and expand rail infrastructure through investment, improving service quality and competitiveness for both passenger and freight transport. If core rail network were to be compliant with TEN-T standards by 2035 as per the Western Balkans Sustainable and Smart Mobility Strategy (for example, completing the rehabilitation of the Durrës-Tirana railway), it would enable a gradual shift from private road transport to rail for both passengers and freight	Urgency ●●○ Ease of implementation ●○○
DM4: Residential and commercial sector		
▪ Enhance energy efficiency (EE) standards for buildings and reinforce compliance. EU ▪ Develop a roadmap for sustainable heating	▪ Set up national programs to improve the energy efficiency of public buildings ▪ Provide incentives for EE and distributed RE in private buildings, including the electrification of heating through heat pumps, and installation of rooftop solar PV systems	Urgency ●●● Ease of implementation ●●●
DM5: Industry		
▪ Enhance EE standards for industry and enforce compliance. EU ▪ Enable the cement industry to import, co-process and utilize alternative fuels and alternative raw materials instead of fossil fuels (refer to Annex E)		Urgency ●●● Ease of implementation ●●●
	▪ Provide incentives for selected pilot investments for industrial CCS and green hydrogen production	Urgency ●●○ Ease of implementation ●○○
DM6: Education, training and skills		
▪ Retrain current workers to adapt to the transition ▪ Support mitigation studies and research activities, including scientific research on decarbonization, absorption (forestry, nature preservation, and so on) ▪ Implement the measures listed in RA7 above: many of them will facilitate not only adaptation but also mitigation and decarbonization	▪ Invest in upskilling and reskilling to improve the employability of the labor force and mitigate climate change in key economic sectors, and retrain workers in the most vulnerable occupations toward safe or green occupations (US$59.8 million to US$231.8 million) ▪ Invest in research and development in the area of mitigation (US$1.8 million to US$3.7 million] ▪ Implement the investments listed in RA7 above: many of them will facilitate not only adaptation but also mitigation and decarbonization	Urgency ●○○ Ease of implementation ●●●

Policy Actions	Investments	Prioritization
Policy Area: Macroeconomy and financing		
MF1: Macroeconomic stability		
▪ Enforce fiscal rules, and maintain debt at sustainable levels. EU ▪ Create fiscal buffers to better manage uncertainty while balancing support to priority policies and investments ▪ Improve the quality of macro framework through strengthened macro-fiscal and climate modeling capacity ▪ Adopt revenue strategy to strengthen domestic revenue mobilization		Urgency ●●○ Ease of implementation ●●○
MF2: Fiscal reforms		
▪ Scale up social safety nets to provide comprehensive support to vulnerable populations during times of economic and environmental transition ▪ Link intergovernmental fiscal transfers to climate goals ▪ Implement tax reforms that increase the carbon tax for coal and LGN ▪ Implement revenue recycling measures such channeling funds from carbon taxes or gains from subsidy removals toward initiatives that help offset the burden on low-income households ▪ Mobilize green financing through the issuance of debt instruments ▪ Take a proactive stance in fostering an enabling environment for green finance	▪ Develop a comprehensive green taxonomy that identifies environmentally friendly activities and assets ▪ Set up capital requirements for climate risks to ensure that financial institutions maintain adequate capital buffers to absorb potential losses stemming from climate-related events	Urgency ●●○ Ease of implementation ●●○
MF3: Public finance management		
▪ Strengthen governance in state-owned enterprises (SOEs) and public–private partnerships (PPPs) related to energy, water, and transport to better respond to climate needs, reduce fiscal risks, and improve SOEs' balance sheets. EU ▪ Review electricity and water tariffs ▪ Introduce climate budgeting to identify, allocate, and track spending related to climate mitigation and adaptation efforts ▪ Implement green public procurement ▪ Conduct periodic reviews of social policies to ensure that new needs emerging from physical risks and transition risks are addressed while maintaining economic stability ▪ Introduce climate- and natural disaster-related risks into financial risk planning. Extend the implementation of green budgeting ▪ Enhance local government units' financing and transfers from the central government, with a focus on key decentralized services like forestry management ▪ Accelerate the greening of the agricultural sector by learning from the EU's green transition and Common Agricultural Policy (CAP) and by a better use of the existing public funds available for agricultural development	▪ Implement green public investment management ▪ Mainstream sustainable forest management to enhance carbon sinks and manage climate risks, with investment in landscape restoration through reforestation, forest and grassland rehabilitation, cropland management, and wetland conservation	Urgency ●●○ Ease of implementation ●●○

Policy Actions	Investments	Prioritization
MF4: Climate finance		
▪ Develop an enabling environment for green finance. Adopt a Sustainable Finance Framework, in alignment with the EU regulation. Develop a green taxonomy, implement financial disclosure standards, and adopt international benchmarks for the issuance of GSS bonds. ▪ Mobilize green financing through the issuance of debt instruments. ▪ Promote green financing by creating incentives for both private and public investments in green projects, sustainable technologies, and climate-resilient businesses. ▪ Provide education to the private sector on green financing options. ▪ Promote the adoption of climate insurance across multiple sectors. ▪ Strengthen the public-private partnerships and concession policy framework to facilitate and streamline investments in green and climate-resilient projects. ▪ Develop the market for green bonds. ▪ Develop the Green Equity Fund. ▪ Consider mechanisms that allow quick financial response to disasters and access to social protection payments.	▪ Invest in green bonds issued by governments, municipalities, and corporations to finance environmentally friendly projects. ▪ Invest in measures to mitigate climate change impact on the financial sector to increase resilience and reduce risk premiums associated with climate related events. ▪ Develop and deepen local capital markets to support the issuance GSS bonds and trading in secondary markets.	
MF5: Financial sector regulatory and supervision framework		
▪ Employ event or scenario-based stress tests to evaluate climate-related risks comprehensively to assess their potential impact on financial institutions and the broader financial system. ▪ Develop guidelines for integrating climate risk into risk management, governance structures, disclosure practices, and supervisory scoring models and approaches to ensure consistent and thorough assessments. ▪ For financial sector and private sector update accounting and auditing legislation to capture exposure to climate risks	▪ Invest in the development and deployment of advanced risk assessment and compliance monitoring tools that can identify potential violations and emerging climate-related risks in financial institution. ▪ Establish a comprehensive national strategy and roadmap for green finance. ▪ Set up capital requirements for climate risks to ensure that financial institutions maintain adequate capital buffers to absorb potential losses stemming from climate-related events.	
MF6: Resilient and sustainable growth		
▪ Provide policy certainty for investors in climate responsive sectors, by regularly updating them on adaptation and mitigation policies and plans. ▪ Strengthen contestability in the economy, especially for sectors that are critical to respond to climate change; ensure regulatory frameworks are in place. ▪ Capitalize on policies and support programs to incentivize investment in adaptation and mitigation (see EF2). ▪ Re-evaluate the role of SOEs to ensure they actively contribute to country climate goals, by strengthening governance and management practices, removing subsidies, and fostering participation in competitive markets or contestable markets. Support SOEs in programs where private sector is supported (i.e. for technology adoption or diffusion) but ensure SOEs do not inhibit entry or contestability, or benefit from unfair advantages.	▪ Develop an open data system to track adaptation and mitigation challenges, making it valuable for consumers, entrepreneurs, and investors. For energy, provide detailed information on grid capacity and demand, particularly addressing price uncertainty, to inform energy and infrastructure planning. ▪ Appraise entrepreneurs, especially SMEs, on evolving needs for energy efficiency and for adaptation action. ▪ Promote training programs for green jobs to prepare the workforce for sustainable employment opportunities and the transition to a green economy. ▪ Enhance the EV supply chain by developing skills, improving regulations, and supporting SMEs through targeted programs. ▪ Develop R&D and support the commercialization and transfer of technologies specifically aimed at climate change solutions.	

Policy Actions	Investments	Prioritization
▪ Adopt an economy-wide approach to the Just Transition ensuring reforms are in place (i.e. human capital improvement, market contestability, business environment) to capitalize on adaptation and the green transition. ▪ Prepare in advance for the advent of CBAM through the use of cleaner energy. ▪ Identify and leverage areas where Western Balkan economies have a comparative advantage in environmental goods and green product manufacturing and could become part of the green global value chains. ▪ Ensure policies for skills development, regulatory improvements, and SME capabilities are aligned to supporting green growth (see DM8).		
Policy Area: Institutional / regulatory readiness for climate cange action		
IR1: Planning		
▪ Set a 2050 net zero target. EU ▪ Set up an MRVA system compliant with the EU acquis.[128] EU ▪ For LSGs, introduce mechanisms for obligatory alignment of their strategic and spatial plans with climate policy		Urgency ●●● Ease of implementation ●●○
IR2: Institutional framework		
▪ Ensure overarching coordination on climate issues from the Prime Minister's Office ▪ Ensure that the Inter-ministerial Working Group on Climate Change (IMWGCC) is transformed into a strong National Climate Change Committee with an active advisory and coordinating role. EU ▪ Introduce a mechanism for coordinating with LSGs to promote their role as agents of change	▪ Ensure that the line ministries, sub-national governments, and other relevant institutions have enough staff to manage climate change and continue bolstering their technical capacities ▪ Set up a capacity building/training plan and introduce climate change training modules for the public administration	Urgency ●●● Ease of implementation ●●○
IR3: Accountability and citizen engagement		
▪ Set up a committee for climate change in the Parliament ▪ Give ASAI a clear mandate to implement climate policy ▪ Improve stakeholder engagement (public participation) on climate policy	▪ Improve platforms and mechanisms to enable public access to reliable information on climate change to raise awareness and increase public pressure for responsive accountability	Urgency ●●○ Ease of implementation ●●●

[128] The European Union acquis communautaire, or "EU acquis" – French for that which has been acquired, received, or obtained – refers to the accumulation of common rights, legislation, court decisions, policy objectives, directives, principles, treaty provisions, resolutions, regulations, and obligations that constitute the body of European Union law. It is currently made up of 31 chapters.

Annex A. Climate change institutional assessment: key findings

BOX A.1: Climate change institutional assessment (CCIA) methodology

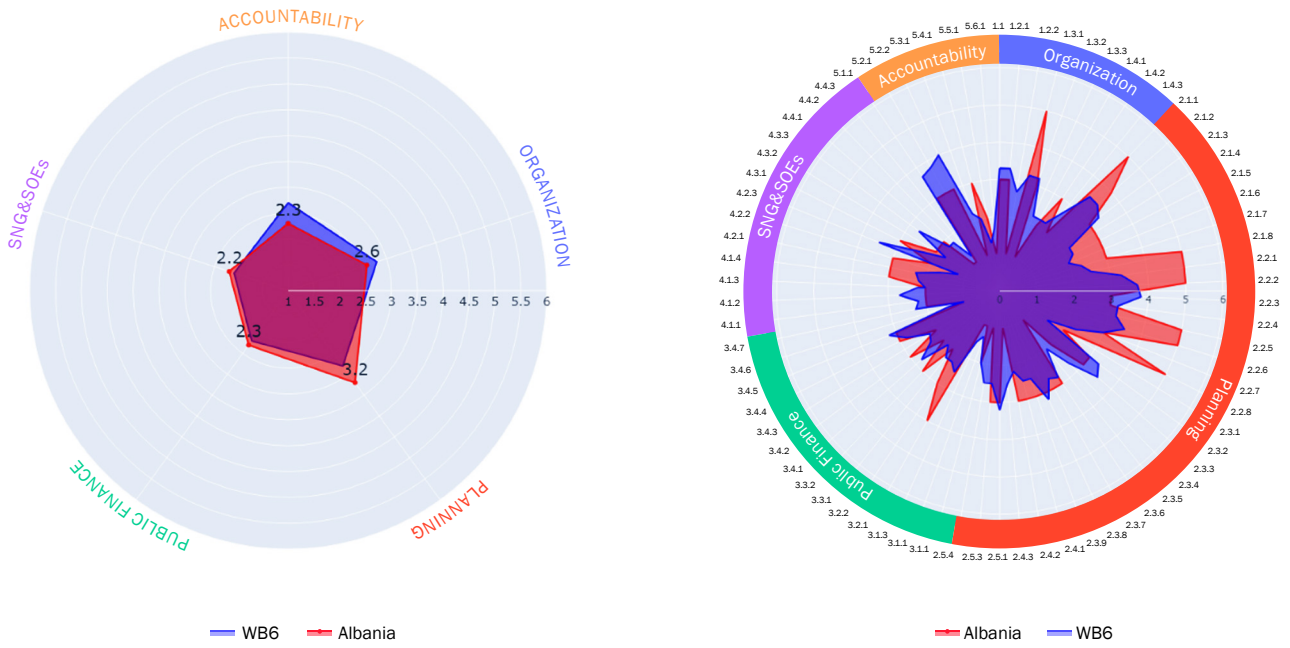
Country institutional capabilities are critical for reaching medium- and long-term climate action results. A Climate Change Institutional Assessment (CCIA) helps prioritize and sequence measures to enable countries to meet their climate change mitigation/de-carbonization and Adaptation and Resilience (A&R) objectives. The institutional performance is assessed by examining the suitability of the institutional framework to plan, implement, and sustain a credible and long-term commitment to increasing ambitious climate change policies over multiple political cycles. The assessment covers the functional pillars for organization, planning, public finance, subnational governments (SNG)/state-owned enterprises (SOE), and accountability.

The Climate Change institutional capabilities of the Western Balkans have been assessed by applying a maturity benchmarking framework. The quantitative benchmarking covers 74 indicators across the five CCIA pillars. The indicators can be read in both level terms, as well as relative to comparator countries (including EU-27 illustrations, such as Austria). The indicators are measured in overview terms of nascent, emerging, and established); and they are further detailed within the bands of innocent/aware, developing/competent, and optimizing/excellent. These maturity scores should not be read as objectives in their own right but rather in terms of how they contribute to climate change action outcomes.

The level of ambition in terms of climate mitigation or A&R is subject to a range of results metrics, including institutional abilities and actions. In the planning pillar, the CCIA captures the priorities and sequencing for climate action for both mitigation and adaptation. Climate change mitigation ambitions may be reflected in key climate action strategies and policy documents. These include objectives for GHG emissions reductions/net zero by 2030 and 2050, as well as shifts away from fossil fuels to low-carbon energy sources. The expectations for green transition trajectories— and consequently the institutional demands required for these whole-of-economy structure transformations—will depend on current baselines. A&R outcomes are subject to more diverse metrics, including expected changes in adverse climate exposure. In many cases, it still should be considered in terms of prospective loss and damage risks mitigated due to a range of proactive measures over time (including information, insurance and social protection measures, building standards, and land use planning).

The CCIA Country Reports explore in more depth the institutional measures likely to enhance and sustain climate action ambitions, ability, and actions. The CCIA dialogues identify relative strengths and possible binding constraints to deliver climate change action across the medium (2030) and longer terms (2050). These include ambitions—both for mitigation as well as for an articulation of climate A&R risks— and revealed abilities and actions to address these credibly across regional, national, and local levels. The CCIA recommendations also note the sectoral diversity that current mitigation and A&R challenges represent across the countries' socioeconomic structures. Institutional development recommendations are consequently organized by highlights across the five CCIA pillars. Figure A.1 depicts the country institutional capacities for climate change action compared to the WB6, split by the five CCIA pillars. Table A.1 provides highlights of achievements and gaps by pillar.

FIGURE A.1: CCIA country benchmarking: summary and indicators, by pillar



Sources: Country Institutional Capabilities for Climate Change Action: Western Balkans Climate Change Institutional Change (CCIA); D4C National Climate Actions Strategies and Policies Database (NCASPD).

TABLE A.1. CCIA pillar: highlights and gaps

	Achievements	Gaps
Organization	▪ Inter-Ministerial Working Group on Climate Change (IMWGCC)	▪ Weak mandate
Planning	▪ National Strategy on Climate Change 2020-2030	▪ No long-term strategy ▪ No net zero target
Public finance	▪ The Law on Climate Change and the 2022 Government Decision on Public Investment Management note concern for climate change mitigation and adaptation ▪ Green public procurement (GPP) enabled by policies	▪ Measures such as the systematic assessment of budget program submissions or execution are not evident in practice ▪ Lack of implementation and integration of the National Climate Change Strategy 2030 into the budgetary process and medium-term planning for green priorities, including in energy sector ▪ Lack of implementation, and no key performance indicators (KPIs) reported
SNG / SOEs	▪ Climate Change Law mandate for SNGs to collect, organize, and maintain their own climate-related data, including reports on mitigation and/or adaptation measures ▪ Obligation under the Law on Energy Efficiency to prepare municipal energy and climate action plans ▪ Electro Energy Corporation (KESH) prepared a Climate Risk Plan in 2018	▪ Limited fiscal transfers to incentivize and address climate change actions at the local level ▪ Action plans remain untested at end of 2023
Accountability	▪ Climate Change Law contains provisions dedicated to awareness raising and public participation	▪ Role of independent expert advice is not regulated in the Law on Climate Change ▪ No Parliament or audit oversight

Annex B. Adaptation needs estimation methodology

In estimating Albania's urban adaptation needs, we used data from the Albanian Urban Regeneration Initiative. Led by the Prime Minister's Office, this high-priority urban regeneration program was implemented, and mostly financed, by the Government between 2013 and 2017 at a cost of 365,689,753 EUR. It provides a good estimation of what is pragmatically achievable in urban interventions with the full support of the central government and collaboration with local government units. The program financed 581 projects distributed among all 61 municipalities. Urban road infrastructure, schools and kindergartens, urban revitalization projects, squares, and green projects were some of the more prominent project typologies, encompassing 401 out of the 581 projects.

Although not all the projects had adaptation as a focus, a program that addresses the needs of Albania's urban environments could be designed to pay special attention to urban adaptation interventions. To estimate future urban adaptation needs, the inflated yearly expenditure of the urban regeneration program was extrapolated by using World Bank urban demographic projections to 2050. An annualized population trend was built using data from the 2030 and 2050 demographic projections, and the rate of yearly change was then used to extrapolate the final expenditures estimated to 2030 (706,760,218 EUR) and 2050 (3,109,339,254 EUR). The extrapolated expenditure does not account for future inflation.

The table below provides undiscounted costing details of the measures prioritized in the policy table. It includes the narrative by sector, and both the policy and investment measures are denoted with an alphanumeric code corresponding to each measure in the policy table. This estimate is more comprehensive than the adaptation estimate undertaken by the hazard exercise that was part of the macro-modeling (#4.1), because of the limitations of that modeling exercise. Following the table is a description of the challenges, methodological issues, and semantic choices made in the endeavor to develop a coherent narrative on adaptation based on quantitative estimates.

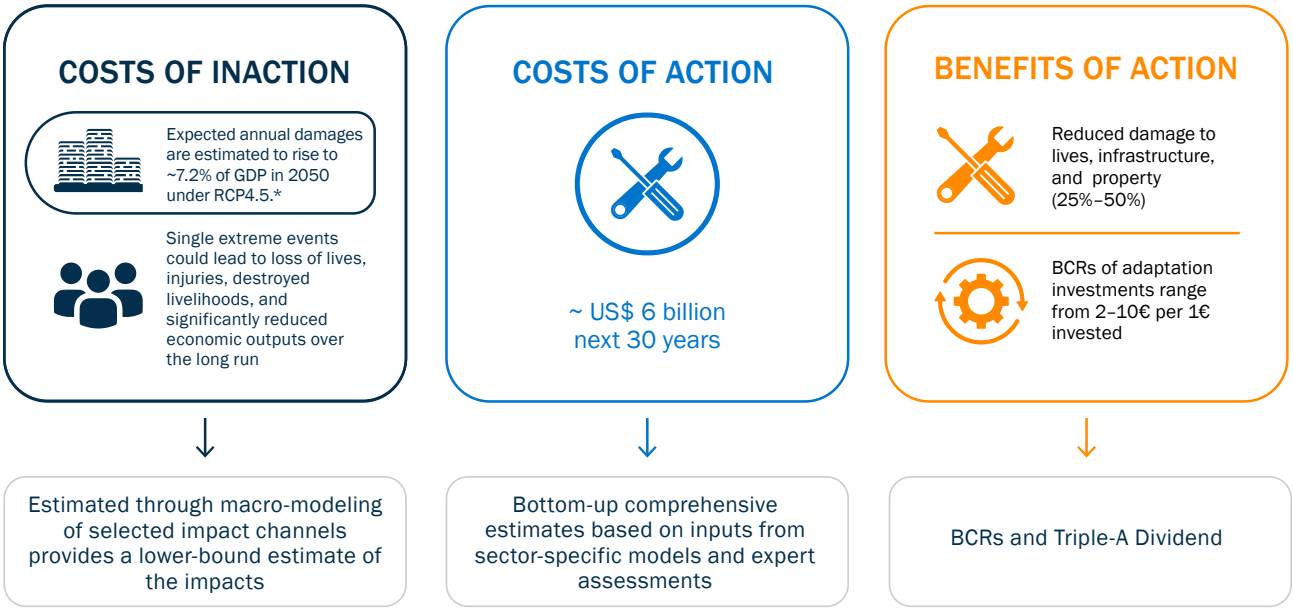
TABLE B.1: Estimate of adaptation needs

Policy Area	Total cost (2020 US$)	Total Cost (€)	Estimate
RA1: DRM	205.3 million	193.1 million	RA1.1 ~ €5.9 million
			RA1.2 ~ €1.1 million
			RA1.3 Inspiration from World Bank Group. Disaster Risk Finance Diagnostic Albania, ~ €500,000
			RA1.4 Inspiration from Albania earthquake capacity building case study in World Bank and European Commission. 2021. "Economics of Prevention and Preparedness: Investment in Disaster Risk Management in Europe Makes Economic Sense." Background Report. World Bank, Washington DC. ~ €6 million
			RA1.5 ~ €1.4 million
			RA1.6 ~ €13.2 million
			RA1.7 ~ €3 million
			RA1.8 ~ €1 million
			RA1.9 ~ inspiration from Serbia's Ready 2 Respond investment plan relevant measures and cost estimates: - Firefighter response stations throughout Serbia (US$ 8,000,000) - Establish a multi-agency training center (US$ 11,755,000) - Invest in a network of predetermined shelter locations US$(3,190,000) - Assess equipment needs / procure equipment (US$40,200,000) = US$63,145,000, ~ €59 million + €100 million to account for the retrofitting of buildings cost = €159 million
			RA1.10 ~ €1.1 million
			RA1.11 ~ €900,000

Policy Area	Total cost (2020 US$)	Total Cost (€)	Estimate
RA2: Urban	754.9 million	710 million	Inspiration from WB6 country level worksheet: Urban Regeneration Program Albania 2013-2017; national urban population data from 2020 and national urban built up data from 2020, ~ €710 million
RA3: Water	2.63 billion	2.471 billion	RA3.1 inspiration from Bosnia and Herzegovina, "Integrated Flood Risk Management Plans Including Comprehensive Programs of Measures." ~ €5.6 million
			RA3.2 ~ €3.7 million
			RA3.3 ~ €79.4 million
			RA3.4 World Bank Irrigation Albania Country Overview, US$309.9 million, ~ €283 million
			RA3.5 Costing inspiration from Water Global Practice assessments: Investment needs of €2.1 billion to reduce non-revenue water (NRW) levels from current 67 percent to EU average of 25 percent
RA4: Forestry and diversity	242.2 million	227.8 million	RA4.1 ~ €4.7 million
			RA4.2 ~ €43.7 million
			RA4.3 ~ €2.5 million
			RA4.4 ~ €16.4 million
			RA4.5 ~ €121.4 million
			RA4.6 ~ €5.8 million
			RA4.7 Inspiration from Albania's Climate Change Strategy and Action Plan (CCSAP), "L23, Creation of forest fire database – 137,300,000 AAL", ~ €1.3 million
			RA4.8 ~ €32 million
RA5: Agriculture	293.9 million	276.4 million	RA5.1. ~ €235.4 million
			RA5.2 Cost inspiration from Albania's National Adaptation Plan, "Priority Action 7: Irrigation, drainage, and flood protection, US$20,256,500 / 1,841,500,000 AAL", ~ €17.64 million
			RA5.3 ~ €9.2 million
			RA5.4 ~ €14.2 million
RA6: Transport	1.61 billion	1.512 billion	Institutional activities: ~ €39 million + Retrofitting program €193 million total over 2024-2030 + New infrastructure investment and maintenance program ~ €1.28 billion (total over 2024-2030). Aggregate cost of ~1.3 percent of 2024-2030 cumulative GDP
RA7: Education, skills and labor markets	74 million	69.6 million	RA7.7 [€4.6 million to €31.3 million] range provided by other global practice colleagues, ~ €31.3 million
			RA7.9 [€1.7 million to €3.4 million] range provided by other global practice colleagues, ~ €3.4 million
			RA7.10 [€3.9 million to €11.9 million] range provided by other global practice colleagues, ~ €11.9 million
			RA7.11 [€2.5 million to €5 million] range provided by other global practice colleagues, ~ €5 million
			RA7.12 [€8.4 million to €18 million] range provided by other global practice colleagues, ~ €18 million
RA8: Social Protection Systems	183 million	172 million	RA8.4 Estimated by Social Protection Global Practice colleagues, €2 million
			RA8.5 Estimated by Social Protection Global Practice colleagues, €169 million
			RA8.6 Estimated by Social Protection Global Practice colleagues, €500,000
			RA8.7 Estimated by Social Protection Global Practice colleagues, €500,000

Policy Area	Total cost (2020 US$)	Total Cost (€)	Estimate
RA9: Health system	28.76 million	27.05 million	RA.9.1 Estimated by Health, Nutrition, and Population Global Practice colleagues, US$200,000 ~ €178,540
			RA9.2 Estimated by Health, Nutrition, and Population Global Practice colleagues, US$500,000 ~ €446,340
			RA9.3 Estimated by Health, Nutrition, and Population Global Practice colleagues, US$1 million ~ €892,700
			RA9.4 Estimated by Health, Nutrition, and Population Global Practice colleagues, US$3 million ~ 2.68 million
			RA.9.5 Estimated by Health, Nutrition, and Population Global Practice colleagues, US$15.3 million ~ 13.66 million
			RA9.6 Estimated by Health, Nutrition, and Population Global Practice colleagues, US$10.3 million ~ 9.195 million

FIGURE B.1. Summary of adaptation investment narrative



Source: World Bank analysis
Note: GDP = gross domestic product, RCP = representative concentration pathway, BCR = benefit-cost ratio.
* The macroeconomic model yields annual estimates for damages based on the expected annual loss from each climate hazard. The expected damages are projected to grow over time, reflecting increasingly unpredictable and volatile climate conditions. Combined damages from the drought impact on maize and wheat, heat stress on labor productivity, and riverine floods, are estimated to be 7.2 percent of GDP under RCP 4.5 in 2050 for Albania.

The business of modeling the effects of climate change—whether shocks or slower-moving stressors—on GDP is tricky. The estimates are therefore grossly undervalued. But why is that? The channels via which impacts occur are difficult to account for in a comprehensive way. Additionally, EP (Exceedence Probability, or loss) curves carry large uncertainties that stem from uncertainties in climate and exposure data, especially when they are projected, together with the difficulty of calibrating vulnerabilities. Propagating these uncertainties through macro-modeling exercises would have been prohibitively expensive and complex for this CCDR. For instance, while overall flooding risks are expected to fall in the Western Balkans, the incidence of flash floods is expected to rise, and even though this is understood, propagating the joint uncertainty in impacts would be prohibitively expensive. More generally, modeling does not capture the impacts of certain extreme events. Wildfires are a case in point—historical data quickly become sparse as one goes back in time, impact channels are multifaceted and seldom understood, and projections of the hazard in question are often yet to be tested. Modeling the impacts at an annual level is next to impossible for nonlinear climate shifts (for

instance, the hydrological cycle) whose dynamics are not yet fully captured in climate models and yield large uncertainties, once again expensive to propagate. And finally, climate hazards, as this CCDR demonstrates, interact and compound one another. Yet models can best capture dynamics critical to a given climate hazard – but they miss the complexity of the linkages. Modeling an example of a future with compound shocks is possible, but capturing the breadth of uncertainty that accounts for the correlated risk is next to impossible at this stage given current knowledge and computing capacity. With examples from the region and a literature review that provide some information on the direction and magnitude of the uncertainties and the way certain hazards may interact, this CCDR offers some avenues to think through the enormity of the costs of inaction, and hints at solutions to deal with the matter of uncertainty, including better data collection.

This estimate is based on a comprehensive, bottom-up approach, with a clear (and verifiable) methodology, that brings immense value to clients grappling with similar issues. Note that a large part of these investments are in hard infrastructure, and this cost could be reduced by developing more detailed feasibility studies, combining investments (EE and seismic), and improving building codes to higher standards to avoid retrofitting, which is generally more costly. Additionally, some of these investments—water systems efficiency, irrigation schemes, social protection schemes, and so on—are investments that are in any case essential for the development of sectors, the economy, and society. The benefits of these investments, grounded in reality, are only very partially captured by the macro-modeling, which estimated by hazard rather than by sector and is partial because of the modeling framework's current limitations. Besides, the positive impacts of investments on growth and employment and co-benefits are not fully captured by the macro-modeling exercise. In this report, we therefore have a lower-bound estimate of the costs of inaction, the positive impact of adaptation action on GDP from the macro-modeling, and a more comprehensive cost-of-action estimate.

Benefits of action – the Triple-A dividend

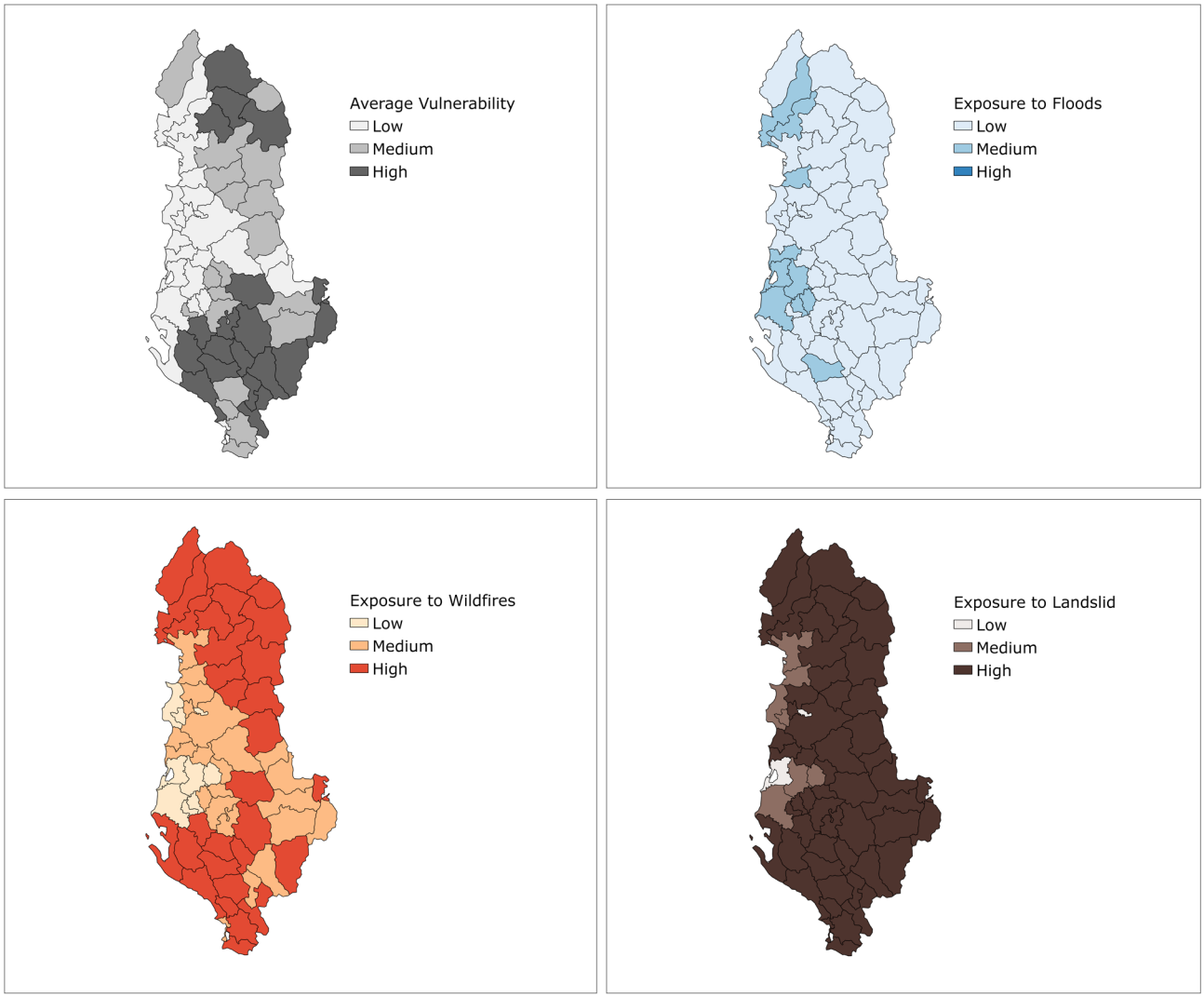
Investing in adaptation can yield substantial social, economic, and environmental benefits that can be expressed through the Triple-A Dividend. The Triple-A Dividend framework reconciles perspectives from the humanitarian, environmental, and economic fields (Figure 2.2). It identifies three types of benefits: i) ***avoided*** losses and lives saved during a disaster or climate event; ii) ***accelerated*** economic potential as a result of stimulated investments and bolstered economic activities due to the reduction in background climate and disaster risks; and finally, iii) the ***amplified*** social and environmental co-benefits of adaptation investments.

The urgency-of-action framework could also be applied to specific sectors, for which the costs of inaction numbers (that is, the damage done) are available and linked to specific hazards. That exercise could be useful for sector-specific or ministry-level dialogue.

Note that, except for costs of action that are between now and 2050, the estimates are for 2050 only, and for RCP 4.5 only. The benefits of action in Figure B.1 are not fully captured by the macro-modeling exercise, which considers only certain channels and does not fully account for accelerated economic potential and co-benefits.

Annex C. Exposure to hazards and socioeconomic vulnerability on the municipal level

FIGURE C.1: Overlapping vulnerabilities in Albanian municipalities



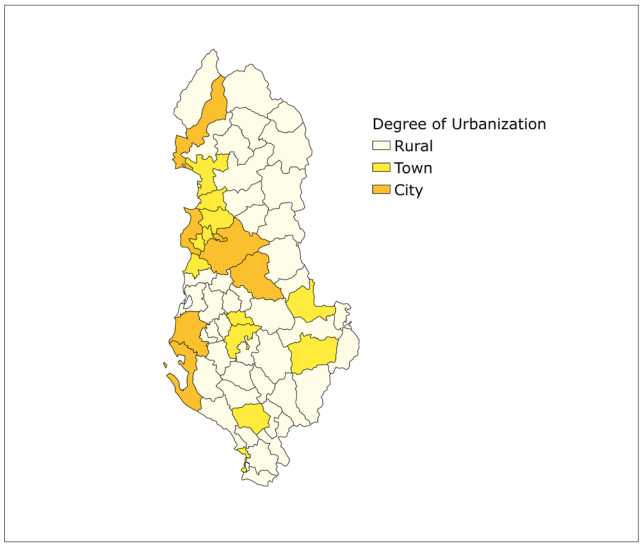
Source: World Bank, GHS-POP R2023A (Global Human Settlement dataset), OpenStreetMap, JBA, CIMA, ELSUS v2.
Note: Average vulnerability is measured as the arithmetic mean of 1–4 scores assigned to each municipality based on the quartiles of the distributions of: 1. population growth/decline from 2000 to 2020, 2. access to markets. High flood exposure indicates a municipality's average raw depth of half a meter or higher for a flood event (fluvial or pluvial), with a 1 percent yearly probability of occurrence. Low flood exposure indicates a depth of less than 20 cm for a similar event. High wildfire risk represents an average municipality score of 3 or higher, based on CIMA's wildfire hazard grid, which assigns to each 100x100 m cell a score from 1 (very low) to 6 (very high). High landslide risk is similarly defined as an average municipality score of 3 or higher based on the ELSUS v2 landslide hazard grid, which assigns to each 200x200 m cell a score from 1 (very low) to 5 (very high). For both wildfires and landslides, low risk is defined as an average below 2.

TABLE C.1: The most highly exposed municipalities ranked from highest to lowest exposure, by hazard type

Vulnerability	Dropull, Këlcyrë, Përmet, Kolonjë, Fushë Arrës, Mallakastër, Tropojë, Memaliaj, Selenicë, Himarë, Pukë, Poliçan, Skrapar, Pustec, Kukës, Tepelenë, Libohovë, Gramsh, Devoll
Floods	Fier, Lushnje, Shkodër, Roskovec, Divjakë, Rrogozhinë, Dimalm Vau i Dejës, Tepelenë, Kurbin
Wildfires	Pukë, Fushë Arrës, Mirditë, Himarë, Delvinë, Malësi e Madhe, Pustec, Kukës, Finiq, Memaliaj
Landslides	Fushë Arrës, Skrapar, Tropojë, Tepelenë, Himarë, Klos, Librazhd, Përmet, Dibër, Kukës

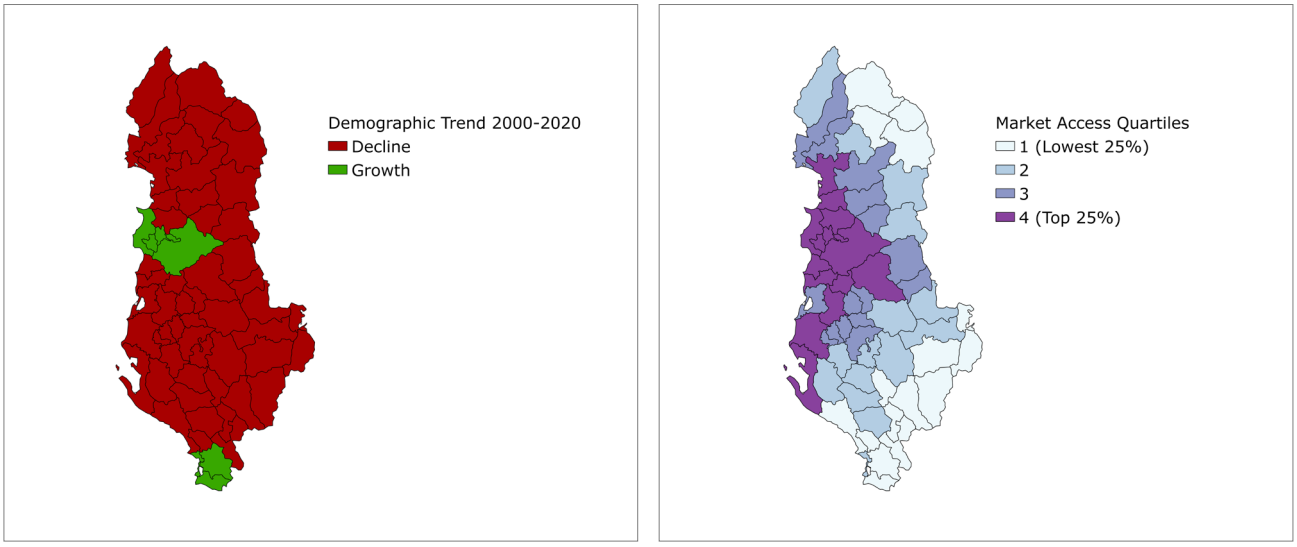
Source: World Bank, GHS-POP R2023A, OpenStreetMap, JBA, CIMA, ELSUS v2.
Note: Includes socioeconomic vulnerability.

FIGURE C.2: Degree of urbanization of Albanian municipalities



Source: World Bank, GHS-POP R2023A
Note: The classification is based on the European Commission's Degree of Urbanization methodology, applied to the GHS 1 km² population grid dataset. Cities are areas where more than 50 percent of the population live in an urban center (defined as a contiguous area with a minimum density of 1500 inhabitants per km² and a minimum population of 50,000 inhabitants). Towns are areas that do not meet the City classification threshold but where more than 50 percent of the population live in urban clusters (defined as contiguous areas with a minimum density of 300 inhabitants per km² and a minimum population of 5000 inhabitants).

FIGURE C.3: Determinants of socioeconomic vulnerability



Source: World Bank, GHS-POP R2023A, OpenStreetMap
Note: The figure shows the distribution of individual determinants of the average vulnerability measure in table C.1. Market access is measured as the population potential using the routing distance in km from the centroid of the municipality to all urban areas (identified using the European Commission's definition of urban clusters) in 2020, restricted to only markets in the same country.

Annex D. Macro model, growth scenarios and detailed mitigation results

A structural macroeconomic model (MFMod) was used to model the impact of climate change on GDP and to assess its macroeconomic implications. It models key variables in the economy such as national accounts, the balance of payments, labor markets variables, and financial sectors. The model estimates the economic and behavioral determinants of economic variables. The relationships are consistent with economic theory and the observed dynamics of the economy. The model traces the interactions between climate change and economic activity. The model was used to explore the impact of global climate scenarios selected (RCPs 2.6, 4.5 and 8.5) on each WB6 economy and to simulate aggregate economic effects of mitigation and adaptation investments in each economy through to 2050.

The "Trend growth" and "optimistic growth" were two growth scenarios used to assess the impact of climate change on the Western Balkan economies. Trend growth is a business-as-usual scenario, extending historical policy trends into the projection horizon to 2050. Growth is driven by production factors that are close to historical realizations; they ensure continuity of labor supply, investment, and productivity over the forecast horizon. Population projections are taken from the UN and follow the notion that all countries in the region face a long-term population decline due to aging and outmigration. Optimistic growth is built on the assumption that the convergence rate with EU per capita income will double by 2050 (relative to trend growth) due to accelerated structural reforms and increased access to EU funds for countries in the Western Balkan region. Structural reforms would boost productivity, close governance and institutional gaps, improve market competition and support private sector participation, and such reforms can help address labor market challenges and improve investment outcomes for the region. In addition, the transition to a low-carbon economy may itself lead to higher productivity and potential growth in the long-run. Reform efforts can be further supported with pre-accession funds that are becoming increasingly available to support the aspirations of the Western Balkan countries to join the EU. Table D.1 shows assumptions for the trend and optimistic growth scenarios for all the WB6 economies.

TABLE D.1: Average annual GDP growth rates, 2025–50

	Albania	Bosnia and Herzegovina	Kosovo	Montenegro	North	Serbia	WB6
Trend growth	1.5	2.2	2.6	1.7	1.5	1.7	1.9
Optimistic growth	3.2	4.4	4.0	4.1	4.2	4.0	4.0

Source: World Bank analysis

The macroeconomic impact of climate change was assessed relative to a baseline. Each of the two growth scenarios was used to separately assess the impact of climate damages and adaptation investments, on the one hand, and mitigation efforts, on the other. For adaptation, the analysis looked at three specific damages, riverine floods, drought impact on maize and wheat production, and heat stress and its impact on GDP (and other macroeconomic variables) under the 3 RCPs, relative to historical occurrences of the damages. The historical occurrences comprised the baseline. The results in the report are presented as differences from the baseline.

For the macroeconomic impact of mitigation, the reference scenario (RS) was used as a baseline. For each growth scenario, a reference scenario (RS) level of energy demand was assessed, with commensurate levels of energy system investments. In addition, for the same level of energy demand, the net zero (NZE) scenario was developed, with commensurate levels of energy system investments, as output from the energy sector model. For each growth scenario, the incremental cost of the NZE scenario relative to the RS was assessed. Investment needs from the energy model were input into the macro model. The benefit of this approach is that it provides a comparison of the macroeconomic impact of the net zero transition for the same level of GDP (and energy demand) as the RS. The drawback of the approach is that it does not quantify higher order effects of a net zero transition, such as the development of new sectors or of additional exports, given the availability of the greener economy. Such higher order effects can be significant if they are accompanied by reforms that alleviate structural bottlenecks.

Analysis of the macroeconomic impact of mitigation found small impacts of the net zero scenario on GDP per capita. Table D.2 shows the differences in GDP per capita growth rates and the level of GDP per capita between the net zero and the RS for the six economies. Two findings are apparent. First, the differences between the two growth scenarios are small. Second, whether the impact is positive or negative for most countries depends on the year under consideration. The driver for the difference is largely the timing of the additional investments needed under the mitigation scenario and any need to replace existing capacity with new generation capacity. For the average growth rate of the WB6, one-half of the countries has a positive growth rate difference between the net zero and the RS for 2030 and 2040, although most have a negative difference in 2050. The levels of GDP per capita turn negative early in the projection horizon, but in most cases, the difference is less than one percent of GDP.

TABLE D.2: Real GDP per capita: differences between NZE and RS scenarios 2030, 2040, and 2050

Differences in growth rates (percentage points)						
	Trend growth			**Optimistic growth**		
	2030	**2040**	**2050**	**2030**	**2040**	**2050**
Albania	-0.031	0.219	-0.102	-0.183	0.157	-0.014
WB6 Avg.	-0.013	-0.057	-0.170	-0.011	-0.125	-0.176
Differences in GDP levels (percent difference between NZE and RS)*						
	Trend growth			**Optimistic growth**		
	2030	**2040**	**2050**	**2030**	**2040**	**2050**
Albania	-0.130	-0.200	-0.039	-0.872	-0.812	-0.395
WB6 Avg.	-0.189	-0.360	-0.535	-0.352	-0.583	-0.603

* The changes in the level of GDP per capita are equivalent to changes in the level of GDP or output as the population figure is the same in *the* NZE and RS scenarios; these terms are used interchangeably in the report when discussing the level impact of the transition.
Source: World Bank.

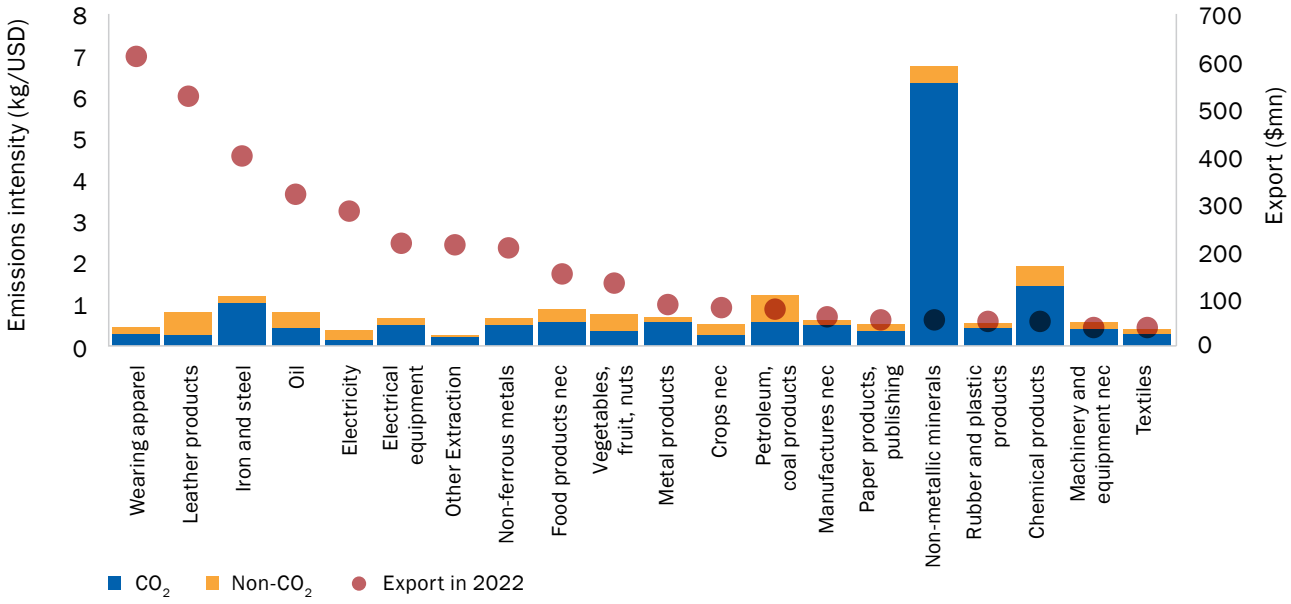
Annex E. Greenhouse gas competitiveness and CBAM impact

Greenhouse gas (GHG) competitiveness

This annex looks at the GHG competitiveness of Albania. Greenhouse gas emissions (emanating from CO_2, CH4, N_2O and F-gas) can be categorized in three groups: scope 1, scope 2, and scope 3. Essentially, scope 1 are those direct emissions that are owned or controlled by a company. Scope 1 emissions arise directly from owned or controlled sources, such as fuel combustion for onsite boilers and operation of company vehicles. On the other hand, scope 2 and 3 indirect emissions are a consequence of the activities of the company but occur from sources not owned or controlled by it. Scope 2 covers indirect emissions from the generation of purchased energy, heat, steam or cooling. For example, the emissions caused when generating the electricity that we use in our buildings would fall into this category. Scope 3 emissions encompass all other indirect emissions that occur in a company's value chains. An example of this is when we buy, use and dispose of products from suppliers. Scope 3 emissions include all sources not within the scope 1 and 2 boundaries.

Most of Albania's key exports, including apparel, leather, iron and steel, show low carbon intensity, except non-metallic mineral products (Figure E.1). In 2022, apparel exports recorded about USD 600 million of total exports worth USD 3.8 billion. The GHG emission intensity of Albanian apparel exports registers 0.5 kg/USD. Of the 20 most important export sectors, products made from non-metallic minerals (7.2 kg/USD) are the most GHG-intensive, followed by chemical products and petroleum and coal products. The main destination of Albanian exports is the EU.

FIGURE E.1: GHG emissions intensity of exports in top 20 export sectors



Sources:

Chepeliev, M., and Corong, E. Revisiting the environmental bias of trade policies based on an environmentally extended GTAP MRIO Data Base. Center for Global Trade Analysis, Purdue University. (2022)

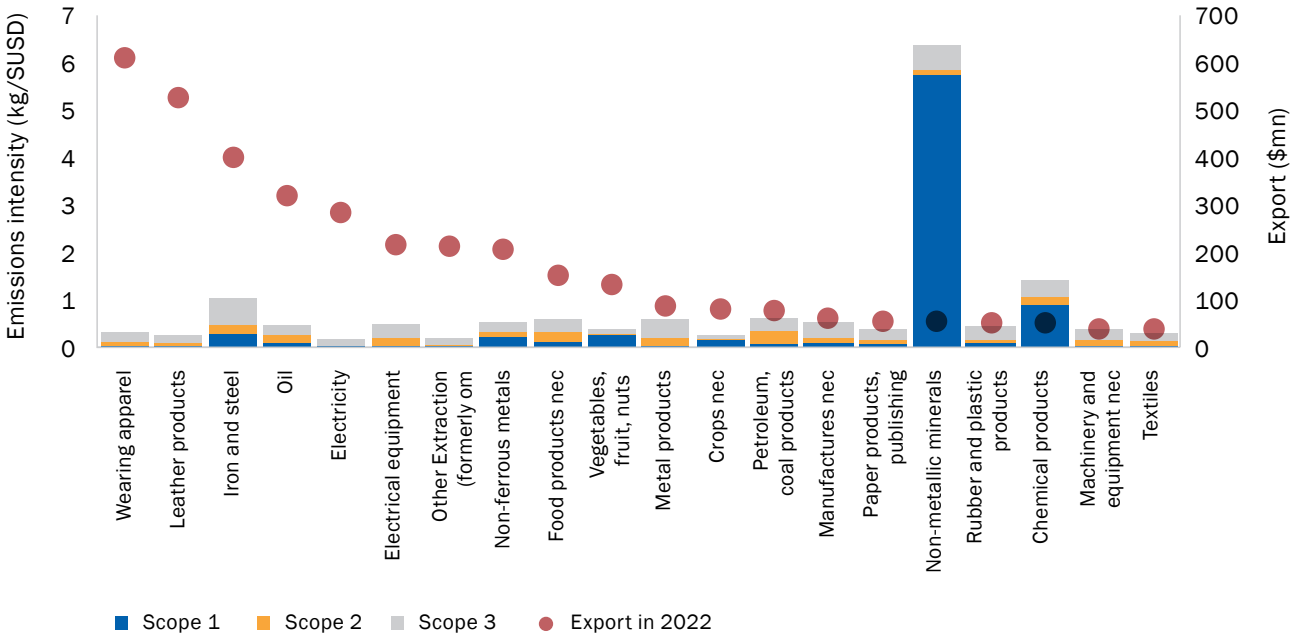
Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugghe, D. EU Green Deal and Circular Economy Transition: Impacts and Interactions. Paper presented at the 25th Annual Conference on Global Economic Analysis (Virtual Conference). (2022)

https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6607

WITS mirror data. 2024. https://wits.worldbank.org/countryprofile/en/country/wld/year/ltst/summary

In Albania, the carbon emission intensity of key exports largely consists of indirect emissions from energy generation (scope 2) and from suppliers' inputs (scope 3). In the apparel industry, direct emissions only account for less than 4 percent of total GHG emissions intensity (Figure E.2). At the same time, indirect emissions from supply chains play a significant role in GHG intensity in all sectors of the country, suggesting that Albania's export activities are integrated into global/regional value chains. Direct emissions play a greater role for non-metallic minerals and chemical products.

FIGURE E.2: Carbon emissions intensity of exports, by scope



Sources:

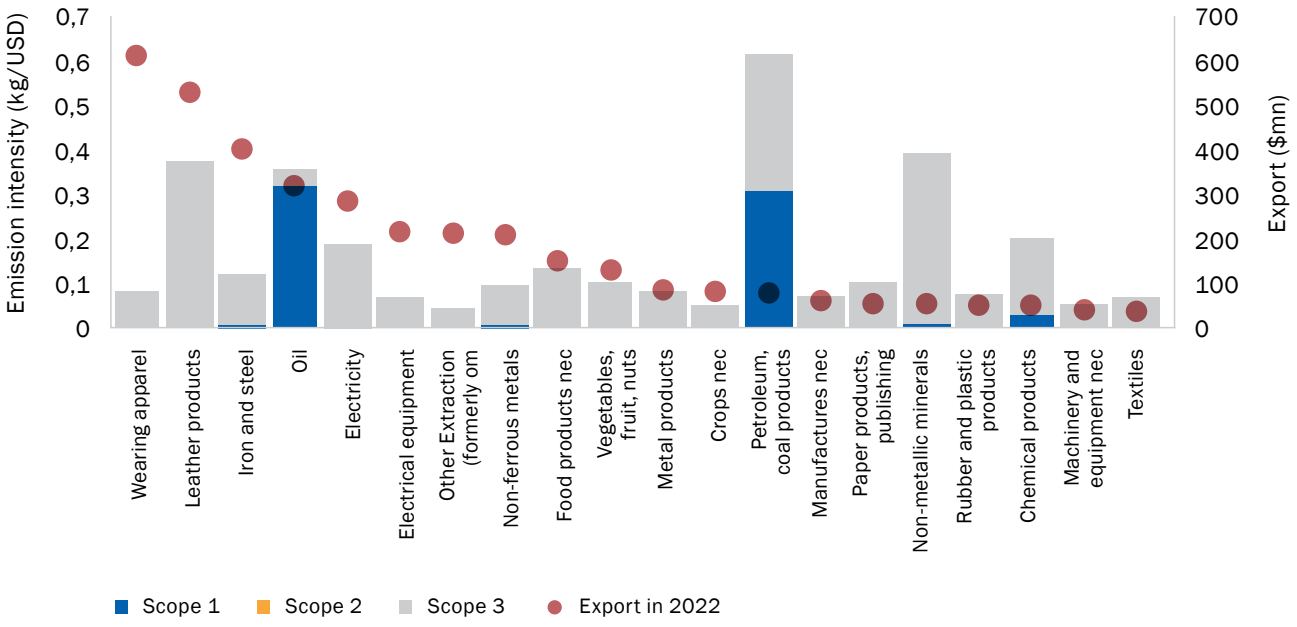
Chepeliev, M., and Corong, E. Revisiting the environmental bias of trade policies based on an environmentally extended GTAP MRIO Data Base." Center for Global Trade Analysis, Purdue University. (2022)

Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugghe, D. EU Green Deal and Circular Economy Transition: Impacts and Interactions. Paper presented at the 25th Annual Conference on Global Economic Analysis (Virtual Conference). (2022)

https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6607

WITS mirror data. 2024. https://wits.worldbank.org/countryprofile/en/country/wld/year/ltst/summary

Figure E.3: Methane emissions intensity of exports, by scope



Sources:

Chepeliev, M., and Corong, E. Revisiting the environmental bias of trade policies based on an environmentally extended GTAP MRIO Data Base. Center for Global Trade Analysis, Purdue University. (2022)

Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugghe, D. EU Green Deal and Circular Economy Transition: Impacts and Interactions. Paper presented at the 25th Annual Conference on Global Economic Analysis (Virtual Conference). (2022)

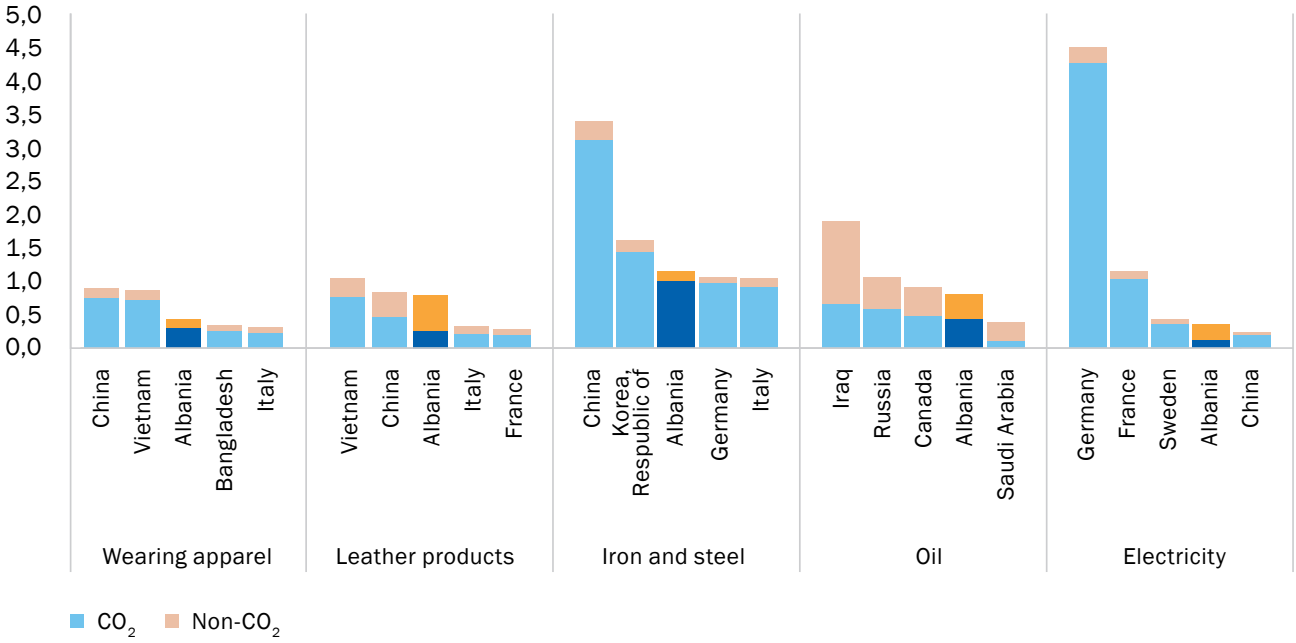
https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6607

WITS mirror data. 2024. https://wits.worldbank.org/countryprofile/en/country/wld/year/ltst/summary

However, Albania's methane intensity in the most important export sectors is quite low (Figure E.3). Most sectors have a methane emission intensity of less than 0.5 kg/USD. The most important export sector, the apparel industry, emits 0.08 kg of methane per US dollar of export volume. The petroleum and coke sector is the most methane-intensive among 20 sectors at 0.6 kg/USD, followed by leather. Scope 3 dominates methane emissions in all sectors, with the exception of the fossil fuel sectors.

In terms of GHG emission intensity, Albania's top five export sectors are considered GHG competitive, compared to global exporters (Figure E.4). There is a large GHG emission intensity gap between Albania's emissions intensity and that of the first comparator country, particularly in the iron and steel and electricity sectors. For iron and steel, China has a GHG intensity of 3.4 KG/USD, while Albania has 1.2 KG/USD. For electricity, Germany has a GHG emission intensity of 4.5 kg/USD, while Albania achieves 10 percent of Germany's emission intensity, mainly thanks to the fact that that Albania has an abundance of hydropower plants.

FIGURE E.4: Country comparison: greenhouse gas emission intensity of key export sector (kg/USD)



Sources:

Chepeliev, M., and Corong, E. Revisiting the environmental bias of trade policies based on an environmentally extended GTAP MRIO Data Base. Center for Global Trade Analysis, Purdue University. (2022)

Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugghe, D. EU Green Deal and Circular Economy Transition: Impacts and Interactions. Paper presented at the 25th Annual Conference on Global Economic Analysis (Virtual Conference). (2022) https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6607

WITS mirror data. 2024. https://wits.worldbank.org/countryprofile/en/country/wld/year/ltst/summary

EU Carbon Border Adjustment Mechanism (CBAM)

The EU Carbon Border Adjustment Mechanism (CBAM) could have a significant impact on the competitiveness of developing countries that mainly export these goods to the EU. The CBAM will enter into force on January 1, 2026, after a transition period starting in October 2023. The CBAM covers iron and steel, aluminum, cement, fertilizer and electricity, and requires the purchase of CBAM certificates that report direct and indirect carbon emissions of these goods.

CBAM exposure index is measured by multiplying the export share by the embodied carbon payment per dollar of export to the EU (the exporter's emission intensity times USD 100 per ton carbon price). This index represents potential CBAM cost for exporters. The Relative CBAM Exposure Index[129] is designed

[129] Detailed methodology is found here: https://www.worldbank.org/en/topic/trade/brief/technical-note-for-the-cbam-exposure-index

to identify countries with the excess of carbon emissions to the EU average. It recognizes cost changes in the EU market, where EU producers also bear emissions costs, enabling relatively clean exporters to gain competitiveness despite the requirement to purchase certificates. A negative index indicates relatively clean exporters may gain competitiveness in the EU market. The aggregate relative index represents the trade-weighted relative exposure across all CBAM products. However, the global trade analytics project (GTAP) dataset provides aggregate sectors with a different composition of products, as well as underlying emission intensities. Variation in product composition can affect the index more than differences in emission intensity of production processes at the product level. (e.g., fertilizer in chemical and cement in non-metallic minerals).

Albania is found to gain CBAM related export competitiveness in the EU market. While Albania's exporters of CBAM products are faced with rising costs in absolute terms, its electricity exporters are becoming more competitive in relative terms (Figure E.5). This is mainly due to the high EU share in electricity exports and the low carbon emission intensity (Table E.1). This means that Albania's electricity is generated more cleanly than the EU average, mainly due to the country's hydropower. Figure E.6 shows the carbon intensity by direct and indirect emissions. Considering Albania's clean energy sources, the intensity of Scope 2 emissions is much lower than that of Scope 1, which means that the Albanian production process of CBAM products should be decarbonized. Albania's heavy reliance on hydropower for its electricity supply gives the country an advantage in decarbonizing its power sector, but also makes it highly vulnerable to climate change.

FIGURE E.5: Albania's CBAM exposure Index

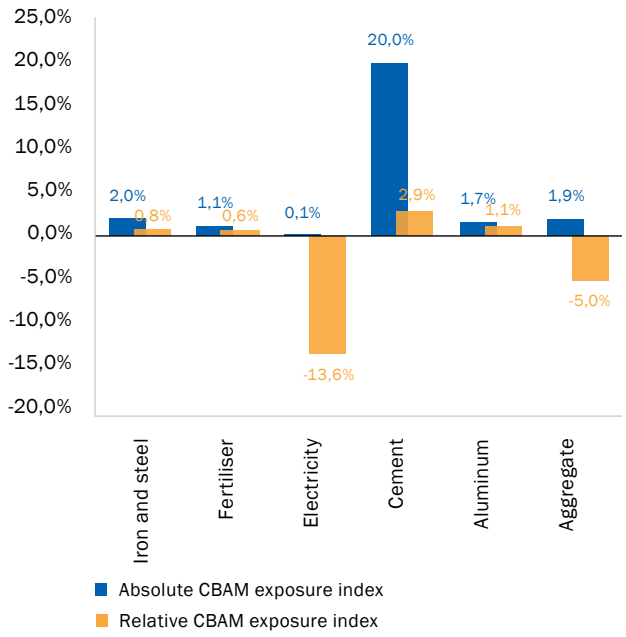
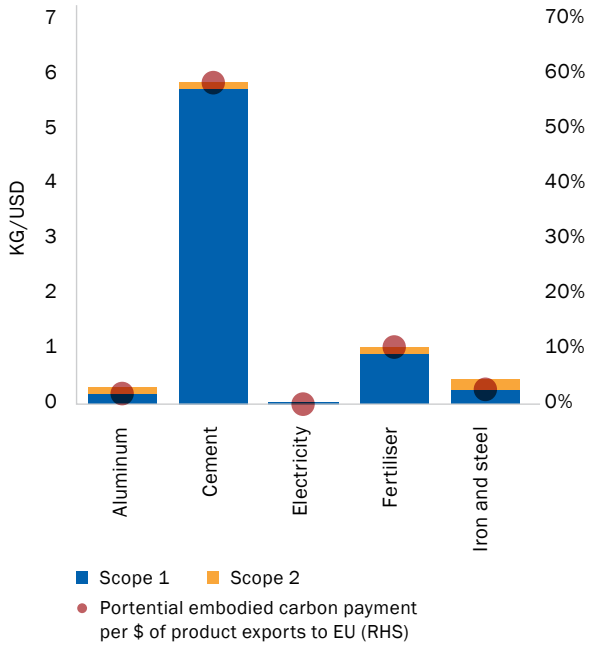


FIGURE E.6: Albania's carbon emissions intensity



Sources:

Chepeliev, M., and Corong, E. Revisiting the environmental bias of trade policies based on an environmentally extended GTAP MRIO Data Base. Center for Global Trade Analysis, Purdue University. (2022)

Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugghe, D. EU Green Deal and Circular Economy Transition: Impacts and Interactions. Paper presented at the 25th Annual Conference on Global Economic Analysis (Virtual Conference). (2022)

https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6607

WITS mirror data. 2024. https://wits.worldbank.org/countryprofile/en/country/wld/year/ltst/summary

Note: emissions intensity of EU average is based on GTAP 10 database and 2019 export data while emissions intensity of Albania based on GTAP 11 database and 2022 export data.

TABLE E.1: Carbon emissions intensity and exports of CBAM products to EU in Albania

	Albania		
	Carbon emissions intensity (kg/USD)	**Exports to EU ($mn)**	**Exports to EU (% of product exports to world)**
Aluminum	0.205	101.6	81%
Cement	5.824	10.8	34%
Electricity	0.006	262.5	93%
Fertilizer	1.035	2.3	11%
Iron and steel	0.265	168.4	76%
CBAM		545.7	80%

Sources:
Chepeliev, M., and Corong, E. Revisiting the environmental bias of trade policies based on an environmentally extended GTAP MRIO Data Base. Center for Global Trade Analysis, Purdue University. (2022)
Chepeliev, M., Aguiar, A., Farole, T., Liverani, A., and van der Mensbrugghe, D. EU Green Deal and Circular Economy Transition: Impacts and Interactions. Paper presented at the 25th Annual Conference on Global Economic Analysis (Virtual Conference). (2022)
https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=6607
WITS mirror data. 2024. https://wits.worldbank.org/countryprofile/en/country/wld/year/ltst/summary

As the industry with the highest carbon emissions intensity, the Albanian cement industry can reduce its GHG emissions, including by replacing fossil fuels with alternative fuels and alternative raw materials, but the regulatory framework needs to be improved to enable such practices. Table E.1 demonstrates high carbon intensity of the cement production in Albania. The use of alternative fuels and alternative raw materials (non-hazardous waste) such as refuse derived fuel (RDF), solid recovered fuel (SRF) and fly ash captured after coal combustion – along with energy efficiency improvements and carbon capture and storage (CCS) – can reduce GHG emissions significantly. The Albanian Climate Change Strategy and Action Plan (2019) stipulate the use of alternative fuels and materials in the cement industry, and the latter has declared its willingness to invest in the existing infrastructure for this purpose. However, there are no sustainable supply streams of RDF/SRF and fly ash locally. Therefore, the cement industry would benefit from the Government allowing imports of alternative fuels and materials, particularly RDF, which would allow the cement plants to invest in the necessary infrastructure to substitute up to 60% of fossil fuels in the short term, thereby contributing to a significant reduction in CO_2 emissions. The development of the necessary infrastructure to reprocess and utilize RDF is expected to accelerate sustainable landfill management within the country, therefore reducing the need for imports in the future. The preparation of the new draft Law on Integrated Management of Waste could be an excellent opportunity to define the conditions and enable controlled imports of alternatives fuels and materials for cement plants.