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Green transition and Smart Specialisation in the Western Balkans

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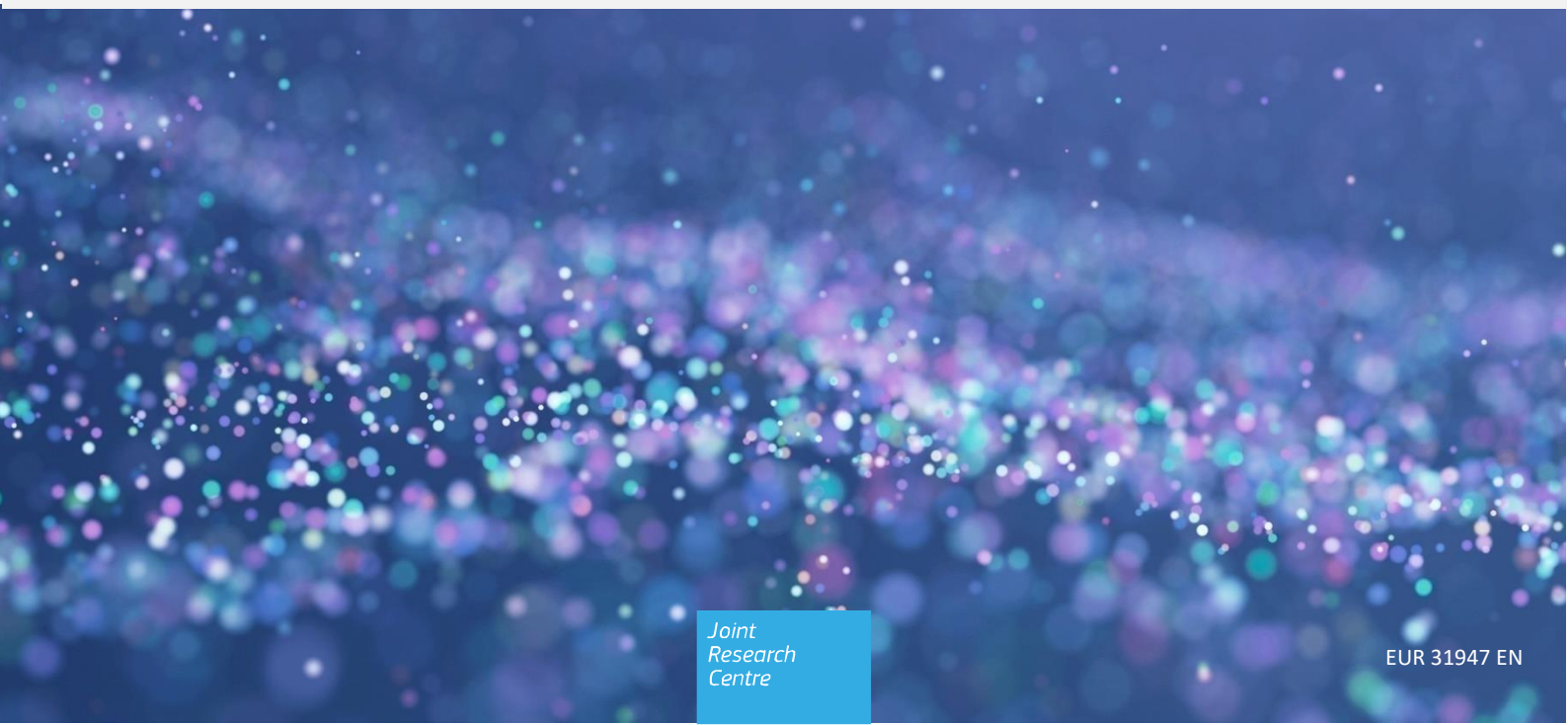

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Contents

Abstract

The Western Balkan region is in an advanced stage of the Smart Specialisation design process, with several economies deeply involved in its implementation. The commitment of these economies to adopt an EU-style, transformational innovation policy reflects a dedication to evidence-based and bottom-up innovation policymaking. This approach aims to enhance regional competitiveness sustainably. The EU Green Deal and the associated Green Agenda for the Western Balkans represent templates for transformative change that should underpin innovation policies. Strong parallels between this green transition and Smart Specialisation emerge in shared elements such as sustainability, environmental priorities, societal challenges, and digitalisation. This study investigates regional research and innovation capacities for the green transition through the lens of Smart Specialisation in the Western Balkan region. It proposes policy actions to leverage these capacities within both national frameworks and collaborative initiatives.

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Executive summary

The Western Balkan region, encompassing Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia and Serbia, spans approximately 208,000 km2 and is home to around 18 million people. The region's primary economic activities are concentrated in weather and climate-related sectors like agriculture, forestry, tourism, and their ancillary services. With a shared objective of increasing per capita income while reducing unemployment rates, these economies, aspiring for EU accession, are committed to adhering to the Paris Agreement and attaining the EU2020 and EU2030 targets for reducing Greenhouse Gas (GHG) emissions, enhancing energy efficiency, and boosting renewable energy production. Vulnerable to climate change and significantly impacted by global warming, the Western Balkan economies analyse and report on adaptation strategies while striving to prioritize mitigation measures in line with their limited human and financial resources. This scarcity underscores the need for renewed regional collaboration and development.

Smart Specialisation is a relatively recent approach gaining traction in the Western Balkan region, where economies seek to formulate an effective policy mix to enhance their competitiveness in promising domains and strategically allocate resources for economic transformation. By 2018, all Western Balkan economies have embarked on the Smart Specialisation journey under the technical support provided by the European Commission's Joint Research Centre. This support includes methodological guidance and assistance in aligning the actions in accordance with the Smart Specialisation design and implementation frameworks for the EU Enlargement and Neighbourhood Region, as well as with the local and regional contexts.

The Smart Specialisation approach, by concentrating efforts on priority areas, has the potential to optimize public funding and investments. In the last seven years, the Western Balkan economies have recorded a remarkable progress in developing their first Smart Specialisation strategies and mobilising a wide array of stakeholders in a national and regional discussions for building a robust innovation policy that looks to use true strength that an economy demonstrates. On the basis of transparency and participation, the stakeholders from the region are, together with the policy makers, proposing policy measures and instruments for building competitiveness based on evident innovation potential of economies.

One of the crucial steps in the Smart Specialisation design framework represents the analysis of strategic mandate, which includes internal discussion on the role of Smart Specialisation strategy for general development and competitiveness, taking into account relationships with other related policies. As perceived by the Smart Specialisation concept itself, the findings from the Smart Specialisation exercise should contribute to other policies, such as education, environmental, employment, industrial, regional and others. Within this scope, the priority areas and related actions in the Western Balkan economies should affect and be impacted by the drivers of green transition. Given the Western Balkan economies' commitment to key green transition drivers, including the SDGs, the European Green Deal, and the Green Agenda for the Western Balkans, it becomes imperative to enhance the implementation of objectives within these frameworks by leveraging Smart Specialisation.

This study delves into the pivotal role of Smart Specialisation strategies in promoting environmentally focused activities and facilitating the green transition in the Western Balkan Region. It offers an extensive examination of the status of Smart Specialisation processes in the Western Balkans, alongside the implementation of the Green Agenda for the Western Balkans. The conclusions drawn are supported by insights gleaned from a survey conducted among quadruple helix stakeholders across the region.

The analysis demonstrates that the application of the Smart Specialisation concept in the Western Balkans has not fully encompassed an environmental focus, possibly missing alignment with recent policies and initiatives, such as the Green Deal. Despite previous challenges, positive policy strides toward the green transition have emerged, primarily propelled by the EU accession process. Anticipated strengthening of priorities concerning environmental protection in future Smart Specialisation policy documents in the region is expected. This shift will have implications across diverse policy domains including innovation, industrial growth, environmental protection, education, employment, and beyond. Accordingly, this document outlines key challenges and offers recommendations for the seamless integration of the green transition into Smart Specialisation policies.

Key areas requiring improvement include fostering inter-ministerial communication and collaboration, actively engaging local stakeholders, promoting Smart Specialisation as a tool to address environmental challenges, and fostering the development of knowledge and cross-sectoral connections between these approaches.

* *This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence*.

Furthermore, there is a critical need for upskilling and reskilling across sectors, particularly within corporate settings, to facilitate a just transition. Increasing public awareness and fostering a shift in mentalities are pivotal aspects of the green transition. It is essential to consider local, regional, national, and transnational dimensions concurrently. Redirecting existing budgets towards identified promising areas for the future is paramount for the success of green transformation.

This report presents comprehensive recommendations for aligning future policy processes and effectively utilizing Smart Specialisation in green transition initiatives within the Western Balkan region.

1 Introduction

Since 2017, the Western Balkan economies and Türkiye have initiated their individual Smart Specialisation strategy design processes, supported by the Joint Research Centre of the European Commission. Currently, the Western Balkan economies are at various stages of their Smart Specialisation processes, with most having identified priority areas, many of which directly or indirectly align with the green transition efforts linked to EU accession. This advancement in Smart Specialisation directed the economies to discuss, propose and launch a set of policy measures and related instruments that tackle the green transition topic directly or indirectly. Moreover, the Western Balkan Agenda on Innovation, Research, Education, Culture, Youth, and Sport includes a thematic programme, the Green Agenda for the Western Balkans, aimed at implementing the EU Green Deal in the region.

Smart Specialisation is effectively contributing to green transitions by promoting circular economy approaches, which are a recurring and impactful element in many cases (Harding et al, 2021). These initiatives demonstrate economic and environmental benefits, indicating that investment in green innovation is financially viable. Additionally, skills development and stakeholder involvement in the Entrepreneurial Discovery Process and Smart Specialisation monitoring and evaluation mechanisms can enhance the implementation of green interventions.

The EU Green Deal's objective is to achieve net-zero greenhouse gas emissions by 2050, decoupling economic growth from resource use, and ensuring inclusive progress. The Green Agenda for the Western Balkans, endorsed by Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia during the Sofia Summit in November 2020, aligns with these climate targets. It was formally adopted on October 6th, 2020, and aims to establish stronger ties between climate actions, policy reforms, and EU approximation. Priority areas include reducing air pollutants and greenhouse gas emissions, intertwined with energy, transport, and health policies, among others. Digitalisation is proposed as a crucial facilitator in the dual green and digital transition concept across five pillars:

1. Transitioning to clean energy sources and climate protection.
2. Shifting towards a circular economy.
3. Depolluting air, water, and soil.
4. Developing sustainable agriculture and food systems.
5. Safeguarding biodiversity and ecosystems.

The EU intends to support the Green Agenda's implementation through the Instrument for Pre-Accession (IPA III), utilizing mechanisms like the Western Balkans Investment Framework and the European Fund for Sustainable Development Plus (EFSD+).

Focusing on implementation alongside technological progress and innovation, the Commission proposed the Economic and Investment Plan (EIP) with €9 billion in grants and an expected €20 billion in guarantees. By integrating the EIP and the Green Agenda and laying out implementation roadmaps, the EU emphasizes its readiness to translate its commitments into action.

The main research focus is on understanding the implementation of the green transition and Smart Specialisation strategies in the Western Balkan region. Key queries include determining the sources and influences of green transition directives, access to financial markets for green projects, future expertise requirements, educational restructuring, reskilling strategies for existing employees, education access for new green jobs, and academia adaptation.

This study recognizes the role of Smart Specialisation strategies in advancing activities aligned with the Green Agenda for the Western Balkans across the economies in the region.

2 The EU policy related to green transition

The climate change is upon us. The impacts of a changing climate are becoming more and more perceptible to all, leaving the real of science and entering everyone's daily lives. The fight against the climate change is needed. The urgency to address climate change is increasingly evident as its effects become more tangible in our daily lives. Combatting climate change is imperative and already underway. This involves urgent actions such as reducing greenhouse gas (GHG) emissions, primarily by transitioning away from fossil fuels. There's a global consensus that within the next decade, crucial political decisions must be made to set us on the path toward achieving net-zero emissions by the mid-21st century.

The impacts of climate change, environmental degradation, loss of biodiversity, and unsustainable resource use extend to various risks for human, animal, and ecosystem health. These risks encompass infectious and non-communicable diseases, antimicrobial resistance, and the scarcity of water resources. Addressing these challenges demands a collective effort on a global scale.

The Paris Climate Agreement (Paris Agreement – PA)[1]

At the UN Climate Change Conference (COP21) in Paris, on 12 December 2015, parties to the UNFCCC reached a landmark agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. The Paris Agreement brought all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. The Paris Agreement is a legally binding international treaty on climate change, which was adopted by 196 parties and entered into force on 4 November 2016.

The Paris Agreement's primary objective is to enhance the global response to the threat of climate change. It aims to limit the global temperature rise to well below 2 degrees Celsius above pre-industrial levels this century and strives for efforts to cap the increase at 1.5 degrees Celsius. Additionally, the agreement focuses on strengthening countries' capacity to address climate change impacts and aligning financial flows with low greenhouse gas emissions and climate-resilient pathways. Achieving these ambitious objectives involves mobilizing appropriate financial resources, establishing new technology frameworks, and enhancing capacity-building efforts. These measures aim to support actions by developing and vulnerable countries in alignment with their national objectives.

All Paris Agreement signatories committed to their best efforts through "nationally determined contributions" (NDCs) and pledged to enhance these efforts over time. This includes the requirement for all parties to regularly report on their emissions and implementation efforts. The Paris Agreement became effective on November 4, 2016, 30 days after meeting the "double threshold" criteria (ratification by 55 countries representing at least 55% of global emissions). Since then, more countries have ratified the agreement, and the total number of Parties has reached 195 as of 2023. The PA, adopted through Decision 1/CP.21, addresses crucial areas necessary to combat climate change. Some of the key aspects of the Agreement are set out below:

- Long-term temperature goal (Art. 2) – reaffirms the goal of limiting global temperature increase to well below 2 degrees Celsius, while pursuing efforts to limit the increase to 1.5 degrees.
- Global peaking and 'climate neutrality' (Art. 4) –need to reach global peaking of greenhouse gas emissions (GHGs) as soon as possible, recognizing peaking will take longer for developing country Parties, to achieve a balance between anthropogenic emissions by sources and removals by sinks of GHGs in the second half of the century.
- Mitigation (Art. 4) – PA establishes binding commitments by all Parties to prepare, communicate and maintain a nationally determined contribution (NDC) and to pursue domestic measures to achieve them. Developed countries should continue to take the lead by undertaking absolute economy-wide reduction targets, while developing countries should continue enhancing their mitigation efforts, and are encouraged to move toward economy-wide targets over time in the light of different national circumstances.
- Sinks and reservoirs (Art.5) – PA also encourages Parties to conserve and enhance, as appropriate, sinks and reservoirs of GHGs as referred to in Article 4, paragraph 1(d) of the Convention, including forests.

[1] https://unfccc.int/most-requested/key-aspects-of-the-paris-agreement

- Voluntary cooperation/Market- and non-market-based approaches (Art. 6) – PA recognizes the possibility of voluntary cooperation among Parties to allow for higher ambition and sets out principles – including environmental integrity, transparency, and robust accounting – for any cooperation that involves internationally transferal of mitigation outcomes
- Adaptation (Art. 7) – PA establishes a global goal on adaptation – of enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change in the context of the temperature goal of the Agreement. It aims to significantly strengthen national adaptation efforts, including through support and international cooperation. The adaptation efforts of developing countries should be recognized
- Loss and damage (Art. 8) – PA recognize the importance of averting, minimizing, and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage.
- Finance, technology, and capacity-building support (Art. 9, 10 and 11) – PA reaffirms the obligations of developed countries to support the efforts of developing country Parties to build clean, climate-resilient futures, while for the first time encouraging voluntary contributions by other Parties. The agreement also provides that the Financial Mechanism of the Convention, including the Green Climate Fund (GCF), shall serve the Agreement.
- Climate change education, training as well as public awareness, participation, and access to information (Art 12) is also to be enhanced under the Agreement.
- Transparency (Art. 13), implementation and compliance (Art. 15) – PA relies on a robust transparency and accounting system to provide clarity on action and support by Parties, with flexibility for their differing capabilities of Parties. In addition to reporting information on mitigation, adaptation and support, the Agreement requires that the information submitted by each Party undergoes international technical expert review.
- Global Stocktake (Art. 14) – A “global stocktake”, to take place in 2023 and every 5 years thereafter, will assess collective progress toward achieving the purpose of the Agreement in a comprehensive and facilitative manner. It will be based on the best available science and its long-term global goal. Its outcome will inform Parties in updating and enhancing their actions and support and enhancing international cooperation on climate action.
- Decision 1/CP.21 also sets out a number of measures to enhance action prior to 2020, including strengthening the technical examination process, enhancement of provision of urgent finance, technology and support and measures to strengthen high-level engagement. The decision also welcomes the efforts of all non-Party stakeholders to address and respond to climate change, including those of civil society, the private sector, financial institutions, cities and other subnational authorities. Parties also recognized the need to strengthen the knowledge, technologies, practices and efforts of local communities and indigenous peoples, as well as the important role of providing incentives through tools such as domestic policies and carbon pricing.

2.1 EU and sustainable development

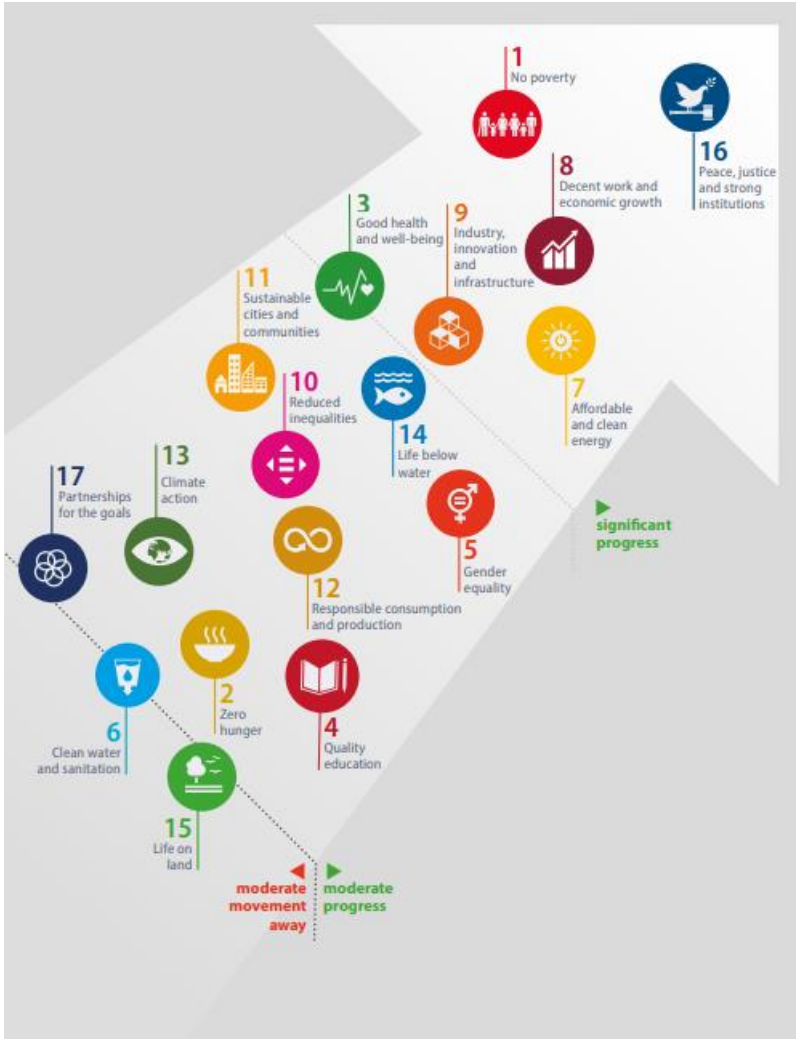
The 2030 Agenda for Sustainable Development, comprising 17 Sustainable Development Goals (SDGs) established by the United Nations (UN) in September 2015, outlines the global blueprint for sustainable development in this decade. The European Union (EU) is wholeheartedly dedicated to realising the 2030 Agenda, with the SDGs integrated into the European Commission's work program. In line with this commitment, the EU will present its inaugural Voluntary Review on the 2030 Agenda's implementation at the United Nations' (UN) High-Level Political Forum in July 2023.

This summary chapter offers a statistical overview of the EU's progress towards the SDGs. As some indicators lack sufficient long-term data, the assessment in this chapter focuses on the most recent five-year period ('short-term') based on EU SDG indicators. The subsequent figure illustrates the EU's advancement towards each of the 17 goals during this short-term period, as per the selected indicators. Over this timeframe, the EU has made substantial strides in ensuring decent work and economic growth (SDG 8), reducing poverty (SDG 1), and advancing gender equality (SDG 5). Additionally, commendable progress has been observed in reducing

inequalities (SDG 10), ensuring quality education (SDG 4), enhancing peace and personal security, and bolstering access to justice and trust in institutions (SDG 16). Noteworthy advancements have also been made in goals related to health and well-being (SDG 3) and innovation and infrastructure (SDG 9), despite challenges posed by the COVID-19 pandemic. Progress towards other goals, as indicated in the subsequent figure, has been less significant.

This year's SDG monitoring report underscores the EU's robust advancements in numerous socioeconomic goals over the recent five-year data period, while noting less favourable trends in the environmental domain. Anticipated progress is expected in three specific goals — climate action (SDG 13), life on land (SDG 15), and global partnerships (SDG 17). Notably, ambitious climate targets set by the EU for 2030 will necessitate increased efforts compared to past trends. The 'Fit for 55' package signifies the EU's commitment to implementing policies for achieving these targets. In the energy sector, the EU has established more ambitious 2030 targets, signalling projected advancements in energy efficiency and renewable energies. Despite an increase in terrestrial protected areas, further measures are imperative to reverse ecosystem degradation. The trend in partnerships for SDG 17 partially mirrors cyclical effects, notably the rise in public debt due to the COVID-19 crisis.

Figure 1. Overview of EU progress towards the SDGs (2015-2021)



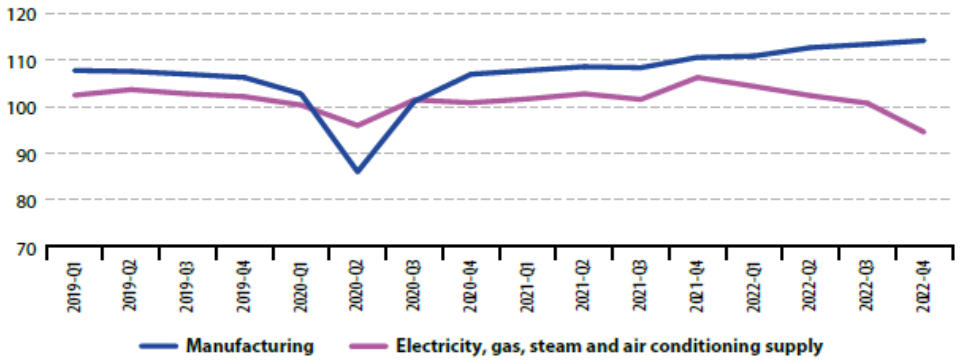
Source: Eurostat (2023).

The Russian invasion of Ukraine in February 2022 impacted Europe as it was in the process of recovering from the economic disruptions caused by the COVID-19 pandemic. Earlier, due to the lockdown measures imposed by EU Member States to curb the spread of COVID-19, the EU's economy (SDG 8) experienced a significant decline in real gross domestic product (GDP) per capita, plummeting by 5.7% in 2020 compared to 2019. However, by 2021, many economic indicators had nearly returned to pre-pandemic levels. From the second quarter of 2021,

the EU's GDP showed continuous growth, resulting in a 3.3% increase in real GDP per capita in 2022 compared to 2021.

Although overall industrial production (in value-added terms) (SDG 12) had notably declined in 2020 due to the pandemic, it has since experienced a substantial recovery and surpassed pre-pandemic levels by 2022, resulting in a 3.0% annual increase compared to the previous year. However, this resurgence was mainly driven by the manufacturing sector (see Figure 2).

Figure 2. Production in industry, EU, 2019–2022 (volume index of production, 2015 = 100)

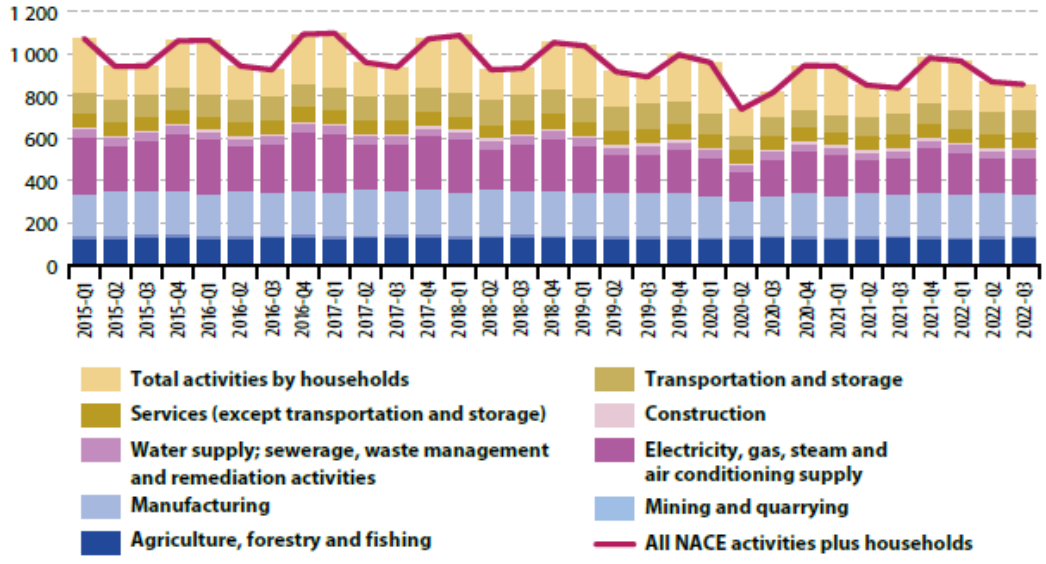


Source: Eurostat.

One of the most profound impacts of recent crises is the surge in the EU's inflation rate since the beginning of 2021, reaching a peak of 11.5% in October 2022, affecting the prices of most goods and services. The first quarter of 2022, marking the onset of the war in Ukraine, intensified this inflation, particularly for electricity, gas, solid fuels, and heat energy (SDG 7). The inflation rate continued to rise across all categories throughout 2022, hitting its highest point in October 2022, which coincided with the peak of the energy crisis in the EU. However, from October 2022 to March 2023, the rate has declined, registering values lower than those at the beginning of 2022 but still significantly higher than pre-pandemic levels.

Russia's invasion of Ukraine and the resulting sanctions have significantly impacted international trade in goods, causing disruptions in the trade of oil, natural gas, and coal (SDG 7), both directly and indirectly.

Figure 3. Quarterly greenhouse gas emissions, by economic activity, EU, 2015–2022 (million tonnes of CO2-equivalent)



Source: Eurostat.

Greenhouse gas emissions have declined since the beginning of 2022. However, the recent crises mentioned above have interfered with the EU's ambition to tackle the climate crisis. The COVID-19 pandemic and the

associated lockdown measures led to a short-term improvement in certain indicators used to monitor climate change mitigation, such as energy use and greenhouse gas (GHG) emissions (SDG 7 and SDG 13). Simultaneously, there is evidence indicating environmental harm (SDG 12 and SDG 15) due to increased pollution from single-use plastics, including masks, gloves, and take-away food containers.

Following the economic revival after the COVID-19 pandemic, the EU's greenhouse gas (GHG) emissions increased by 2% in the third quarter of 2022 compared to the same period in the previous year. However, relative to pre-pandemic levels, GHG emissions remained 4% below the level reported in the third quarter of 2019. The most significant increases in GHG emissions between the third quarters of 2021 and 2022 were observed in transportation and storage (9%), electricity and gas supply (5%), and services excluding transport and storage (4%). Conversely, GHG emissions from agriculture, manufacturing, and water supply declined slightly by around 1% or less over the same period. Despite the economic rebound, the EU's overall GHG emissions have declined since the beginning of 2022, indicating that the EU has managed to continue the long-term downward trend in GHG emissions.

2.2 EU Green Deal

The European Green Deal[2] lays out the blueprint for transformative change, with all 27 EU Member States committing to making the EU the first climate-neutral continent by 2050. To achieve this, they pledged to reduce emissions by at least 55% by 2030 compared to 1990 levels. This commitment aims to establish a Healthy Planet for All by ensuring improved monitoring, reporting, prevention, and remediation of air, water, soil, and consumer product pollution, among other aspects.

Climate change and environmental degradation pose existential threats to Europe and the world. The European Green Deal aims to transform the EU into a modern, resource-efficient, and competitive economy by ensuring:

- Achieving no net emissions of greenhouse gases by 2050.
- Decoupling economic growth from resource use.
- Ensuring no person and no place is left behind.

Introduced in 2019, the European Green Deal (EGD) forms an integral part of the European Commission's strategy to implement the United Nations' 2030 Agenda and achieve the sustainable development goals.

The primary objectives of the EGD are to attain a net carbon-neutral European Union by 2050 and to separate economic growth from resource use (see Fetting, 2020). The EGD serves as a comprehensive policy strategy, delineating ambitions and goals across various policy sectors. Its implementation involves revising existing regulations and standards over the coming years, alongside the development and enforcement of new laws and directives. The Green Deal encompasses eight key areas:

1. Enhancing the EU's climate ambition for 2030 and 2050.
2. Providing clean, affordable, and secure energy.
3. Mobilizing industry for a clean and circular economy.
4. Constructing and renovating buildings with energy and resource efficiency.
5. Aspiring to a zero-pollution environment for toxic-free surroundings.
6. Preserving and regenerating ecosystems and biodiversity.
7. Adopting the Farm to Fork strategy: promoting a fair, healthy, and environmentally friendly food system.
8. Accelerating the transition to sustainable and intelligent mobility.

The Green Deal outlines several initiatives that the Commission will progressively present in the upcoming years, with some expected in early 2020[3]:

- Proposal for a Just Transition Mechanism, including the establishment of a Just Transition Fund within the next Multi-annual Financial Framework.
- Commission proposal to enshrine the objective of achieving climate neutrality by 2050 ('climate law'), solidifying the EU's commitment to irreversible climate neutrality.

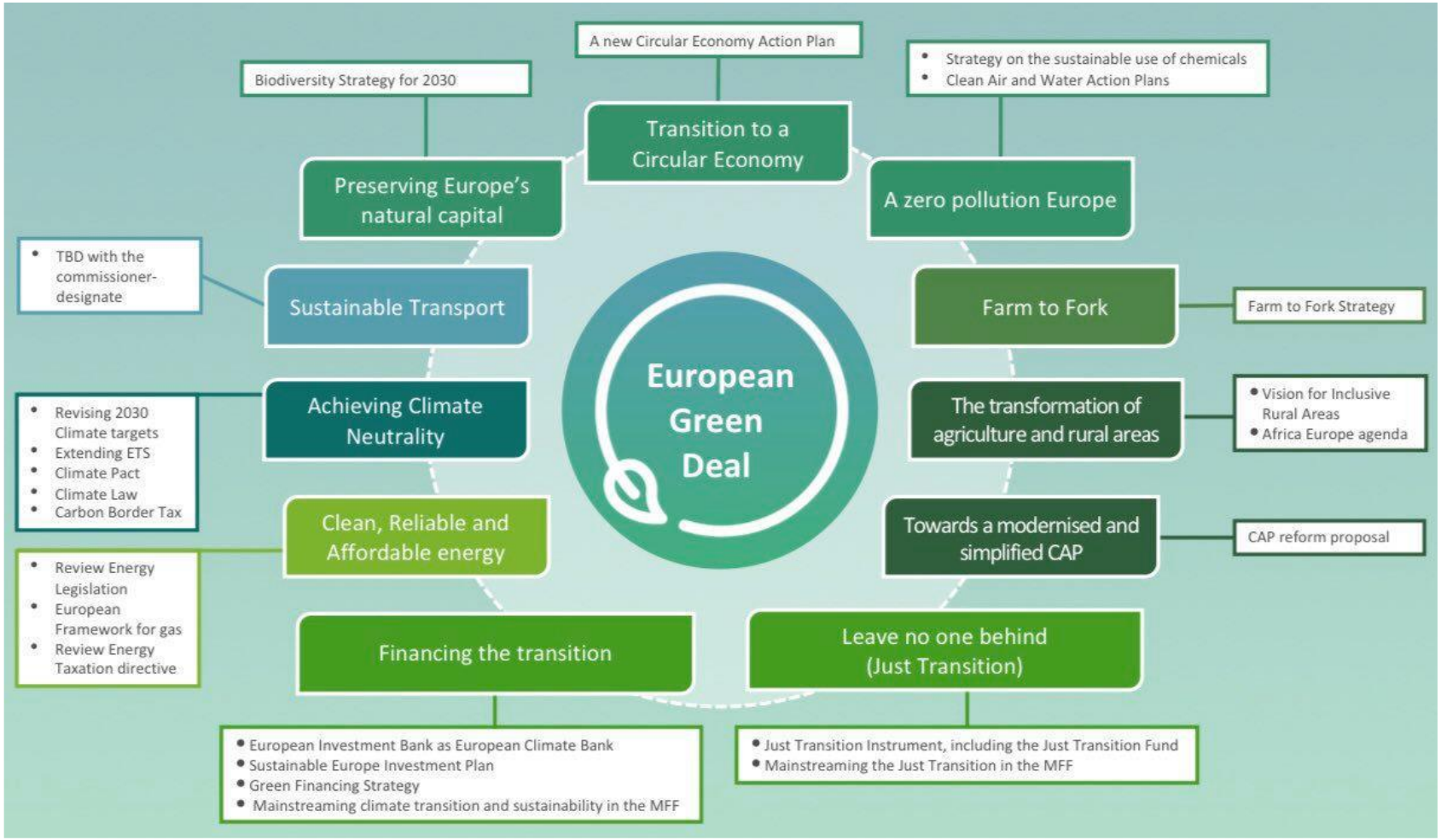
[2] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

[3] The European Green Deal: Questions & Answers, Brussels, 11 December 2019, European Commission, https://ec.europa.eu/commission/presscorner/detail/en/IP_19_6691

- Communication outlining the Commission's strategies to promote biodiversity domestically and internationally, ahead of the crucial UN Convention on Biodiversity conference in Kunming (China) in November 2020.
- Action plan promoting a more circular economy that addresses sustainable products and complements the new industrial policy strategy.
- The Green Deal Communication will catalyse efforts across various economic sectors, intending to develop and present interconnected initiatives due to their strong interlinkages. Key among these are:
    - Proposals to increase the Union's greenhouse gas emissions reduction targets for 2030 ahead of the UNFCCC's Conference of the Parties (2020).
    - Revisions to the Emissions Trading System for the EU's power sector and industrial installations, potentially extending emission trading to road transport, shipping, buildings' emissions, and revising Member States' targets for sectors beyond the ETS.
    - A strategy for clean and smart mobility announcing measures to reduce greenhouse gas emissions from land, waterborne, and air transport. This includes actions on cleaner fuels, electrical charging infrastructure, taxation, road pricing, and promoting rail freight.
    - A strategy to address chemicals, along with other initiatives targeting air and water pollution, aiming for a ‘Zero pollution ambition.'
    - A ‘Farm to Fork' strategy aimed at enhancing the sustainability of food production and distribution systems.
    - Strategies and measures to mobilize sustainable public and private investments to green the economy.
    - Specific actions within the European Green Deal will directly enhance public health and well-being. Initiatives to combat pollution of air, water, and hazardous chemicals directly impact human health.

Efforts to halt biodiversity loss will indirectly benefit by enhancing nature through ecosystem restoration, tree planting, and preserving carbon-rich ecosystems like peat bogs. On-farm actions to minimize pesticide volumes and risks will directly reduce public exposure to hazardous chemicals. Additionally, reinforcing efforts to adapt to climate change impacts, such as flooding or droughts, and embracing ‘green infrastructure' and nature-based solutions will enhance the built and natural environment's quality.

Figure 4. The components of the European Green Deal



Source: Implementing the European Green Deal: Handbook for Local and Regional Governments.

2.2.1 Decarbonisation and just transition

The concept of just transition originated in the United States of America (USA) when trade unions advocated for government support to 'wartime workers at risk of losing their jobs as a result of disarmament' (Cahil & Allen, 2020). Later, this concept extended to jobs affected by environmental regulations. In defending a just transition due to these regulations, the unions neither opposed environmental protection nor defended job maintenance at all costs.

Climate change and environmental degradation stand as significant contemporary challenges. At the 2018 Conference of the Parties to the United Nations Framework Convention on Climate Change (COP24), a green transition, ensuring a just transition for the workforce and creating decent work, was deemed crucial for effective, inclusive, and climate-resilient development. Skills development remains pivotal in enabling this just transition. While the shift toward a greener future is underway, it necessitates a coordinated policy approach to ensure fairness and inclusivity.

Decarbonisation, inherent in the concept of just transition, acknowledges that in transitioning to a low-carbon economy, 'the net impact of environmental policy measures will be positive,' yet 'job losses are likely in sectors, regions, and communities heavily reliant on fossil fuel resources, especially where economic diversification opportunities are limited.'

To meet the Paris Agreement's goal of limiting the global temperature increase to well below 2ºC, achieving a balance between anthropogenic emissions and greenhouse gas removals by sinks in the latter half of this century is imperative. The pathway to achieving this balance, termed carbon neutrality, demands significant transformations across all sectors of the economy, spanning agriculture to waste management, particularly emphasizing shifts in energy production and consumption. This transformation will reshape how people heat their homes, travel, make purchasing choices, and even select food and beverages.

2.2.1.1 Coal regions

The European coal sector currently employs nearly half a million people in direct and indirect activities. By 2030, an estimated loss of around 160,000 direct jobs is anticipated. Regional development, pivoting around a meticulously planned restructuring process where renewable energy assumes a central role, is envisioned to create novel employment opportunities (Alves Dias et al, 2018).

Historically, coal has been a primary fuel in the European economy, constituting 16% of gross inland energy consumption in the EU and 24% of the power generation mix. While its usage varies among EU Member States, six countries still rely on coal for at least 20% of their energy demand. However, the role of coal is diminishing in line with the ongoing energy system transformation.

The imperative to curtail greenhouse gas emissions has resulted in a growing share for renewables, accompanied by active discouragement of coal power generation through stringent post-2020 emission requirements, high CO2 emission allowance prices, and probable restrictions on coal eligibility for future capacity remuneration mechanisms. Yet, the potential adverse impacts of the ongoing contraction of the coal sector on employment and regional economies hosting hard coal and lignite mining activities and coal-fired power plants are often overlooked. Urgent measures are thus warranted to foster alternative business prospects, sustaining or augmenting regional employment and bolstering economic growth.

Most coal-fired plants in Europe were commissioned over 30 years ago, averaging 35 years old, with an estimated efficiency of 35%, considerably lower than current state-of-the-art standards. The initial wave of power plant retirements projected during 2020-2025, driven by competitiveness in a carbon-constrained world, could lead to the loss of 15,000 direct jobs in power plants. Coal mines are already shuttering due to lack of competitiveness, with an estimated 109,000 mining jobs at high risk.

The decline in coal-related activities will also impact other sectors. The European iron and steel industry heavily relies on domestic coking coal, meeting 37% of its needs. Hard coal mines capable of producing this type of coal could potentially continue operation solely for this sector if coking coal prices support mining operations.

Mining equipment manufacturers will also feel the effect. Research shows that innovation and manufacturing in mining are directly linked to mining activities, employing over 100,000 individuals in coal-producing countries.

The retirement of coal assets should coincide with a well-planned and gradual industrial restructuring process to aid redundant coal workers. New business prospects can be built upon the industrial legacy of affected regions, fostering competitive industries and services. Collaboration among companies, regulators, investors, land-use planners, and local communities is crucial to identify sustainable uses and maximize socio-economic development.

Though new employment opportunities should span all sectors, the energy sector can continue to drive regional development. Transitioning to wind or solar parks could offer reemployment opportunities for coal workers, leveraging their electrical and mechanical skills, experience in challenging conditions, and sophisticated safety expertise, highly valued in wind and solar energy industries. Furthermore, repurposing closed mines for geothermal energy or hydropower applications could offer jobs and socio-economic benefits to post-mining communities.

The transition toward inclusive and low-carbon economies must be just and fair, maximizing opportunities for economic prosperity, social justice, rights, and social protection for all, leaving no one behind (UNFCCC, 2016).

The International Labour Organization (ILO) has been engaged in the concept of just transition for many years. As part of this endeavour, the ILO has published the 'Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All.' According to the ILO (refer to ILO, 2015; ILO, 2018), a just transition is defined as a shift from a fossil-fuel-dependent economy to a green economy. This transition should not only diminish our environmental impact but also rectify existing socioeconomic disparities and prevent the creation of new ones. The guidelines outline nine crucial policy areas aimed at simultaneously addressing environmental, economic, and social sustainability to ensure a fair transition for all:

1. Macroeconomic and growth policies.
2. Industrial and sectoral policies.
3. Enterprise policies.
4. Skills development.
5. Occupational safety and health.
6. Social protection.
7. Active labour market policies.
8. Rights.
9. Social dialogue and tripartism.

The International Energy Agency (IEA) has released an updated edition of its Net Zero Roadmap, highlighting the urgent need for continued rapid growth in renewable energy, the phase-out of fossil fuels, and global cooperation to aid developing countries in their transition to clean energy.

The 2023 report[4] revises the IEA's original Roadmap published in 2021, taking into account the significant expansion of clean energy technologies, augmented investment in fossil fuels, and the unprecedented levels of global emissions in recent years. The IEA asserts that a departure from current energy and fossil fuel policies is imperative to restrict warming to 1.5 degrees Celsius.

Electric vehicle sales and the augmentation of solar power capacity are currently progressing toward achieving net-zero objectives. Together, these technologies contribute to one-third of the overall emissions reductions required by 2030. Technological advancements have played a crucial role in driving this growth, fostering affordability in electric vehicles and solar power.

The IEA urges advanced economies to accelerate their net-zero targets, thereby affording developing economies more time to catch up in the transition to clean energy. Increased investment in emerging and developing economies stands as a critical component in this transition.

Through global collaboration, the phase-out of fossil fuels coupled with the amplification of clean energy initiatives could lead to a 25% reduction in fossil fuel demand by 2030, accounting for a 35% decrease in emissions from the all-time high recorded in 2022. Along this trajectory, fossil fuel demand is projected to

[4] Net Zero Roadmap A Global Pathway to Keep the 1.5 °C Goal in Reach 2023 Update; International Energy Agency Website: www.iea.org

plummet by 80% by 2050, rendering new oil, gas, and coal projects unnecessary to meet global energy requirements.

2.2.1.2 Carbon Border Adjustment Mechanism

The Carbon Border Adjustment Mechanism (CBAM)[5] is a European regulation imposing reporting obligations and a carbon tax on EU imports of specific goods, aimed at curbing carbon emissions. On May 17, 2023, the CBAM (Regulation [EU] No. 2023/956) came into force. It serves as a pivotal element of the EU's 'Fit for 55' climate strategy, designed to complement the EU Emissions Trading System (EU ETS). Its primary goal is to ensure uniform emission costs for both imported goods and those produced within the EU, countering the challenge of 'Carbon Leakage' arising from the EU's stringent climate policy standards on a global scale.

Initially, CBAM will exclusively apply to imports of goods and intermediate products with notably high carbon intensity, posing a significant risk of carbon leakage. These encompass cement, iron, steel, aluminum, fertilizers, and hydrogen. The objective is to establish equitable conditions for European and foreign producers of CO2-intensive raw materials, preventing the relocation of production to third countries.

The CBAM Regulation officially commenced on May 17, 2023. It will be rolled out in phases, starting on October 1, 2023, and expected to be fully effective by January 1, 2026. CBAM Certificates will become mandatory in 2026. The clearer requirements and timeline for CBAM enable companies to proceed with their preparations for its implementation.

Box 1. Production with CBAM requirement

CBAM will initially apply to imports into the EU of the following goods, and processed products of those goods, as listed in Annex I of CBAM: (a) cement, (b) electricity, (c) fertilizers (including, for example, ammonia), (d) cast iron, iron, and steel, (e) aluminium and (f) chemicals (although for now only hydrogen is listed in the latter category).

To meet the upcoming reporting requirements, companies should take proactive steps, including:

- Reviewing and adjusting existing agreements with suppliers to gather all pertinent CBAM-related information, enhancing transparency across supply chains.
- Transferring the reporting obligation to transportation companies when necessary and mitigating risks contractually (e.g., concerning inaccurate or delayed reporting).
- Organising access to the CBAM registry/portal.
- Reviewing, finalizing, and submitting quarterly reports.
- Establishing and integrating business processes to ensure compliance with CBAM regulations.

The CBAM will encompass both direct and indirect emissions embedded in imported goods, excluding those covered by indirect cost compensation schemes under the EU ETS. In these instances, only direct emissions will be considered.

Table 1. Direct and indirect emissions

Sector	**Greenhouse gas**
Iron and steel	Carbon dioxide
Aluminium	Carbon dioxide and perfluorocarbons
Hydrogen	Carbon dioxide

[5] Document 32023R0956: Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism (Text with EEA relevance)

Fertilisers	Carbon dioxide and nitrous oxide
Electricity	Carbon dioxide
Cement	Carbon dioxide

Source: Authors.

The European Green Deal (EGD) outlines ambitious targets for 2030, aiming to reduce emissions by at least 55 percent and achieve net zero emissions by 2050. Central to this plan is the role of carbon pricing, coupled with the phase-out of environmentally harmful subsidies. The EGD includes several strategies: strengthening and expanding the Emissions Trading System (ETS), reforming the Energy Tax Directive to incentivize fuel switching, and introducing a Carbon Border Adjustment Mechanism (CBAM). The CBAM will impose a fee on covered emissions-intensive imports (such as iron and steel, cement, fertilizers, aluminum, electricity, hydrogen, and selected articles of iron or steel), incorporating the carbon content (direct and embedded CO2, N2O, and PFC emissions). This initiative sends a clear message to trading partners about the potential financial risks associated with a fossil fuel-centric economic model.

The CBAM is pivotal in the EU's efforts to level the playing field for domestic industries subjected to increasingly stringent carbon pricing. By extending the carbon pricing signal to imported carbon-intensive products, the CBAM aims to diminish the risk of carbon leakage—preventing the relocation of carbon-intensive production to countries outside the carbon pricing framework.

Importers handling materials covered by the CBAM will be required to report the embedded emissions of their products. Starting in 2026, the CBAM fee will be gradually introduced (reaching average EU ETS allowance price levels by 2034), while simultaneously phasing out the free allocation of allowances to EU ETS entities over the same period.

Box 2. Just transition and the SDGs

The just transition is an integral part of Agenda 2030, and directly contributes to the achievement of most of the SDG Goals. Notably, a well-managed green transition:

- creates decent work and economic growth (SDG 8), contributing to lowering poverty (SDG 1).
- mitigates climate change pressure (SDG13) and reduces pollution and ecosystem degradation (SDG 14 and 15).
- locks in research and development programmes that produce important innovations (SDG 9).
- produces income opportunities in rural areas, reducing migration pressure on urban centres (SDG 11).
- has numerous spillover effects on good health and well-being (SDG3) from better air quality.
- promotes participatory decision-making that en-hances equality (SDG10) and gender parity (SDG 5).

2.2.2 Clean industrial development and circular economy

The circular economy[6] represents a model of production and consumption that emphasizes sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products for as long as possible, thereby extending the life cycle of products.

Practically, it involves minimizing waste. When a product reaches the end of its life, efforts are made to retain its materials within the economy through recycling, allowing these materials to be reused productively, generating further value in the process.

[6]Europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits#:~:text=The%20circu

This stands in contrast to the traditional linear economic model, which follows a take-make-consume-throw away pattern. This linear model heavily relies on abundant quantities of inexpensive, easily accessible materials and energy.

Transitioning to a climate-neutral and circular economy necessitates the full engagement of the industry. Although the EU's industry has initiated this shift, it still contributes to 20% of the EU's greenhouse gas emissions. Its reliance on a largely linear model entails continuous extraction, trade, and processing of new materials into goods, leading to eventual disposal as waste or emissions. Currently, only 12% of the materials used by the industry come from recycling processes.

The waste hierarchy forms the fundamental principle of EU waste policies (Art. 4 of the Waste Framework Directive), prioritizing waste prevention as the highest goal, followed by preparing for reuse, recycling, and other recovery methods, and finally disposal as the least favourable option. Advancing towards a circular economy in the EU involves efforts to enhance resource efficiency, reduce waste generation, and treat waste as a valuable resource. Figure 5 provides an overview of key EU policy objectives and targets related to waste and resources, outlining their binding force.

Figure 5. Overview of selected EU policy objectives and targets related to waste and resources

Policy objectives and targets	Sources	Target year	Agreement
Resource use and efficiency			
Improve resource efficiency	7th EAP (EU, 2013); Roadmap to a resource efficient Europe (EC, 2011a)	2020	Non-binding commitments
Strive towards an absolute decoupling of economic growth and environmental degradation	7th EAP (EU, 2013)	2020	Non-binding commitments
Create more with less, deliver greater value with less input, use resources in a sustainable way and minimise their impacts on the environment	7th EAP (EU, 2013)	2050	Non-binding commitments
Achieve the sustainable management and efficient use of natural resources	SDG 12.2 (global, national) (UN, 2015); 7th EAP (EU, 2013)	2030	Non-binding commitments
Waste generation and management			
50%/55%/60%/65% of municipal waste is prepared for reuse or recycled (differing calculation method for the 50% target)	Waste Framework Directive (EU, 2008, 2018b)	2020/2025/2030/2035	Legally binding
Reduce landfill of biodegradable municipal waste to 75%/50%/35% of the same waste generated in 1995	Landfill Directive (EU, 1999)	2006/2009/2013	Legally binding
Reduce landfill to a maximum of 10% of municipal waste generated	Landfill Directive (EU, 1999, 2018a)	2035	Legally binding
Specific targets for collection, recycling and/or recovery of packaging waste, construction and demolition waste, WEEE, end-of-life vehicles, batteries, single-use plastics (incl. market restrictions and requirements for recycled content)	Waste Framework Directive (EU, 2008, 2018b), Packaging Waste Directive (EU, 1994, 2018c), WEEE Directive, ELV Directive (EU, 2000), Batteries Directive (EU, 2006); Single-use Plastics Directive (EU, 2019b))	2008-2035	Legally binding
All plastic packaging should be recyclable	EU plastics strategy (EC, 2018a)	2030	Non-binding commitments
Waste generation to decline absolutely and per capita, and reduction and sound management of hazardous waste	7th EAP (EU, 2013)	2020	Non-binding commitments
Energy recovery to be limited to non-recyclable waste	7th EAP (EU, 2013)	2020	Non-binding commitments
Halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	SDG 12.3 (UN, 2015)	2030	Non-binding commitments

Source: EEA, 2020.

The EU Industrial Strategy, unveiled in March 2020, focuses on three core priorities:

- Ensuring global competitiveness and maintaining a level playing field.
- Achieving climate neutrality by 2050.
- Shaping Europe's digital future.

Concerning climate change mitigation and adaptation, the strategy aims to decarbonize most economic sectors while supporting sustainable and smart mobility industries. It envisions establishing a clean hydrogen alliance followed by alliances focused on low-carbon industries and others.

This transition presents an opportunity to expand sustainable, job-intensive economic activities. The global market shows significant potential for low-emission technologies, sustainable products, and services. The circular economy also offers considerable prospects for new activities and employment opportunities. However, the pace of transformation remains slow, lacking widespread and uniform progress.

The Action Plan on Circular Economy explicitly targets decoupling economic growth from resource use. The Commission estimates that implementing circular economy principles could boost GDP by an additional 0.5% and generate up to 700,000 jobs. The plan includes proposals to regulate product design to enhance durability, reusability, repairability, and upgradeability. Additionally, the Commission plans to introduce a ban on destroying unsold durable goods. The plan covers regulations on packaging, batteries, construction, buildings, food, and specific actions to reduce waste.

The circular economy action plan introduces a 'sustainable products' policy, promoting circular design across all products based on shared methodology and principles. It prioritizes reducing and reusing materials before recycling, encouraging new business models, and setting minimum requirements to prevent environmentally harmful products from entering the EU market. There's also a focus on strengthening extended producer responsibility. While guiding the transition across all sectors, specific emphasis is placed on resource-intensive sectors like textiles, construction, electronics, and plastics.

The EU has yet to establish quantitative targets for resource usage or improvements in resource productivity, although some member states have included national targets in their strategies. Recent policies increasingly address resource use security, particularly concerning access to critical raw materials.

2.2.3 Environmentally friendly food system

The Farm to Fork (F2F) Strategy[7] was published on May 20, 2020, comprising several strategies, directives, and action plans that the Commission is set to develop between 2020 and 2023. It will be financed through various mechanisms, including the Regional Development Fund and Invest EU.

The primary objective of the strategy is to establish European food systems that are equitable, healthy, and environmentally sustainable. A sustainable food system is expected, among other goals, to have a neutral or positive environmental impact, contribute to climate change mitigation and adaptation, reverse biodiversity loss, and ensure public health and nutrition.

All EU policies are expected to play a role in preserving and restoring Europe's natural capital. The Farm to Fork Strategy, outlined in section 2.1.6, will specifically address the use of pesticides and fertilizers in agriculture.

2.2.4 A zero pollution for a toxic-free environment

Creating a toxic-free environment requires more action to prevent pollution from being generated as well as measures to clean and remedy it. To protect Europe's citizens and ecosystems, the EU needs to better monitor, report, prevent and remedy pollution from air, water, soil, and consumer products. To achieve this, the EU and Member States will need to look more systematically at all policies and regulations. To address these interlinked challenges, the Commission adopted in 2021 a zero-pollution action plan for air, water and soil[8].

[7] https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en
[8]https://environment.ec.europa.eu/strategy/zero-pollution-action-plan_en

2.2.5 Business and the EU Green Deal

The transition outlined in the European Green Deal presents an opportunity for businesses to modernize and enhance their competitiveness. With support from investment and innovation programs within the Multi-annual Financial Framework, industries will be encouraged to develop cutting-edge, environmentally friendly technologies and sustainable solutions. The European Green Deal, along with its subsequent actions, outlines a strategy that offers predictability and a regulatory framework to unlock investments, prevent stranded assets, and incentivize innovation. The Commission's efforts to mobilize sustainable private finance will further cater to the investment needs of these industries. Moreover, transitioning to a more circular economy and expanding the secondary raw materials market should reduce industries' reliance on critical raw materials.

Promoting new collaborations with industries and investing in strategic value chains are essential endeavours.

Digital technologies serve as critical enablers for achieving the sustainability goals set forth in the Green Deal across various sectors. The Commission will explore measures to ensure that digital technologies such as artificial intelligence, 5G, cloud and edge computing, and the Internet of Things can accelerate and maximize the impact of policies addressing climate change and environmental protection. Digitalization also offers new opportunities for remotely monitoring air and water pollution, as well as optimizing the utilization of energy and natural resources. Simultaneously, Europe requires a digital sector that prioritizes sustainability. The Commission will consider measures to enhance the energy efficiency and circular economy performance of the sector itself, encompassing broadband networks, data centers, and ICT devices.

2.2.6 Mainstreaming sustainability in EU policies

To fulfil the ambitions outlined in the European Green Deal, significant investment needs exist:

- A Sustainable Europe Investment Plan.
- A target of 25% of the budget for climate mainstreaming across all EU programs.
- A contribution of at least 30% of the Invest EU Fund to combat climate change.
- Establishment of a Just Transition Mechanism, including a Just Transition Fund, to ensure no one is left behind.
- Exploration of additional sources that could be mobilized and innovative methods to do so as part of the Sustainable Europe Investment Plan.
- A crucial role of the private sector in financing the green transition, necessitating long-term signals to direct financial and capital flows towards green investment and prevent stranded assets.
- Recognition of the pivotal role national budgets play in the transition.
- Well-designed tax reforms capable of boosting economic growth and resilience to climate shocks, contributing to a fairer society and facilitating a just transition.
- Mobilization of research and encouragement of innovation; New technologies, sustainable solutions, and disruptive innovation are pivotal in achieving the objectives of the European Green Deal.
- Utilization of the full spectrum of instruments available under the Horizon Europe program to support the necessary research and innovation efforts.
- Activation of education and training: Schools, training institutions, and universities are well-positioned to engage with pupils, parents, and the broader community regarding the changes essential for a successful transition.
- Proactive re-skilling and upskilling are vital to harness the benefits of the ecological transition. The proposed European Social Fund+ will play a significant role in helping Europe’s workforce acquire the necessary skills to transition from declining sectors to growing sectors and adapt to new processes.

2.2.7 European Innovation Scoreboard 2023

Research and development (R&D), innovation, sustainable industries, and infrastructures are crucial for achieving the SDGs. Monitoring SDG 9 in the EU context focuses on elements like R&D intensity and personnel,

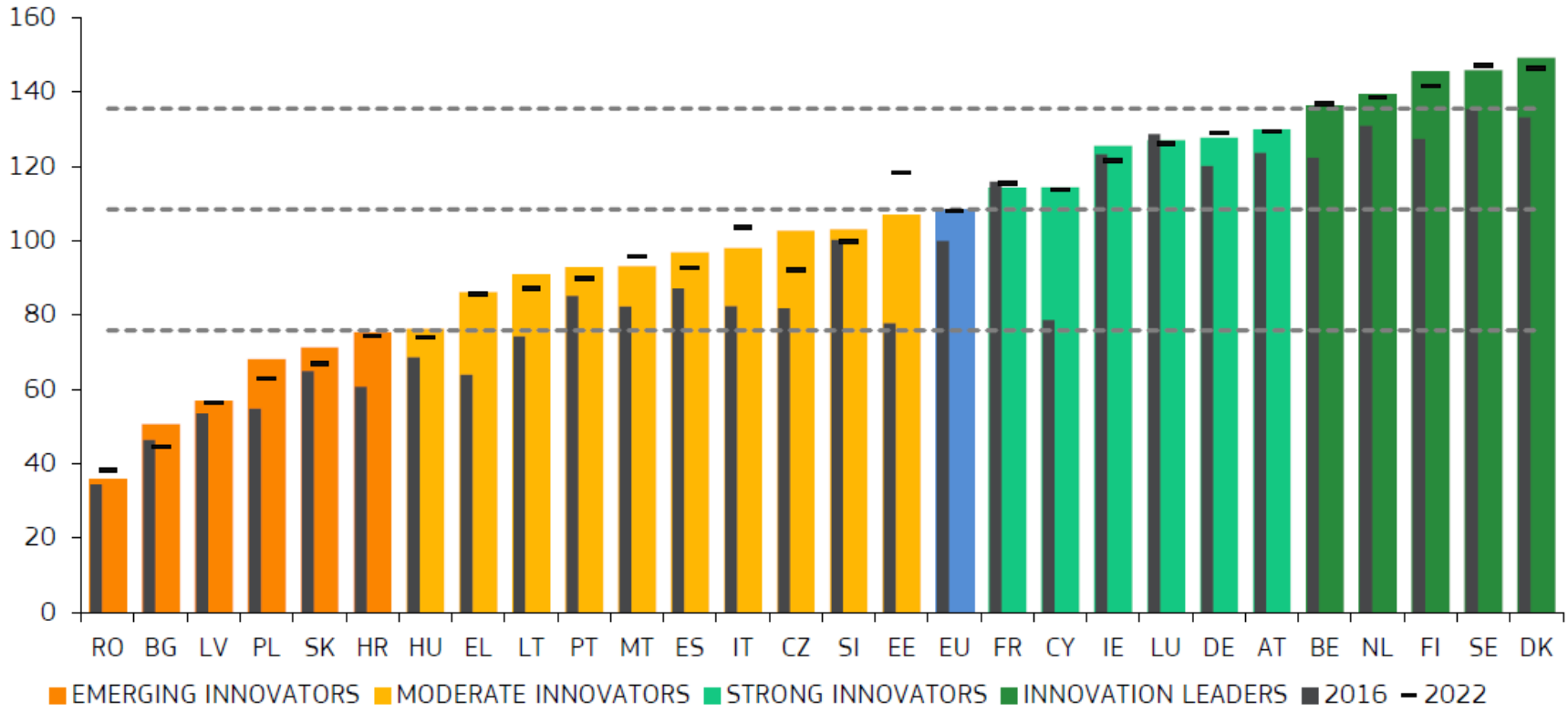
patent applications, air emissions intensity of industry, and modal splits in passenger and freight transport. Over the five-year period assessed in this study, the EU has made significant progress in many of these indicators. However, there have also been recent unfavourable trends, particularly concerning the use of environmentally friendly modes in freight and passenger transport.

The European Innovation Scoreboard 2023 affirms Europe's dedication to innovation. Innovation performance in Europe has increased by about 8.5% between 2016 and 2023 (Figure 6). During this period, the innovation performance of most EU Member States has improved, indicating that the EU provides a conducive environment for innovation. Nonetheless, an innovation divide persists, as countries with less robust innovation systems are progressing at a slower pace than the EU average.

Within this context, the New European Innovation Agenda, adopted in July 2022 and currently being implemented, aims to position Europe as a leader in the new wave of deep tech innovation and start-ups.

Horizon Europe, the European Framework Programme for Research and Innovation, is designed to promote excellence-based Research and Innovation and support top-quality researchers and innovators to realise the EU's objectives. Cross-border cooperation on technology development in European Partnerships with industry, including Clean Hydrogen, Clean Steel, Processes4Planet, Innovative Health Initiative, and Key Digital Technologies, is crucial to supporting innovative technologies for climate-neutrality, independence from fossil fuels, and circularity.

Figure 6. Performance of EU Member States' innovation systems



All performance scores are relative to that of the EU in 2016. Coloured columns show countries' performance in 2023, using the most recent data for 32 indicators. The horizontal hyphens show performance in 2022, using the next most recent data. Grey columns show countries' performance in 2016. The dashed lines show the threshold values between the performance groups, where the threshold values of 70%, 100%, and 125%, when using the latest 2023 data, have been adjusted upward by multiplying with 1.085 to reflect the performance increase of the EU between 2016 and 2023 as the graph shows performance scores relative to the EU in 2016.

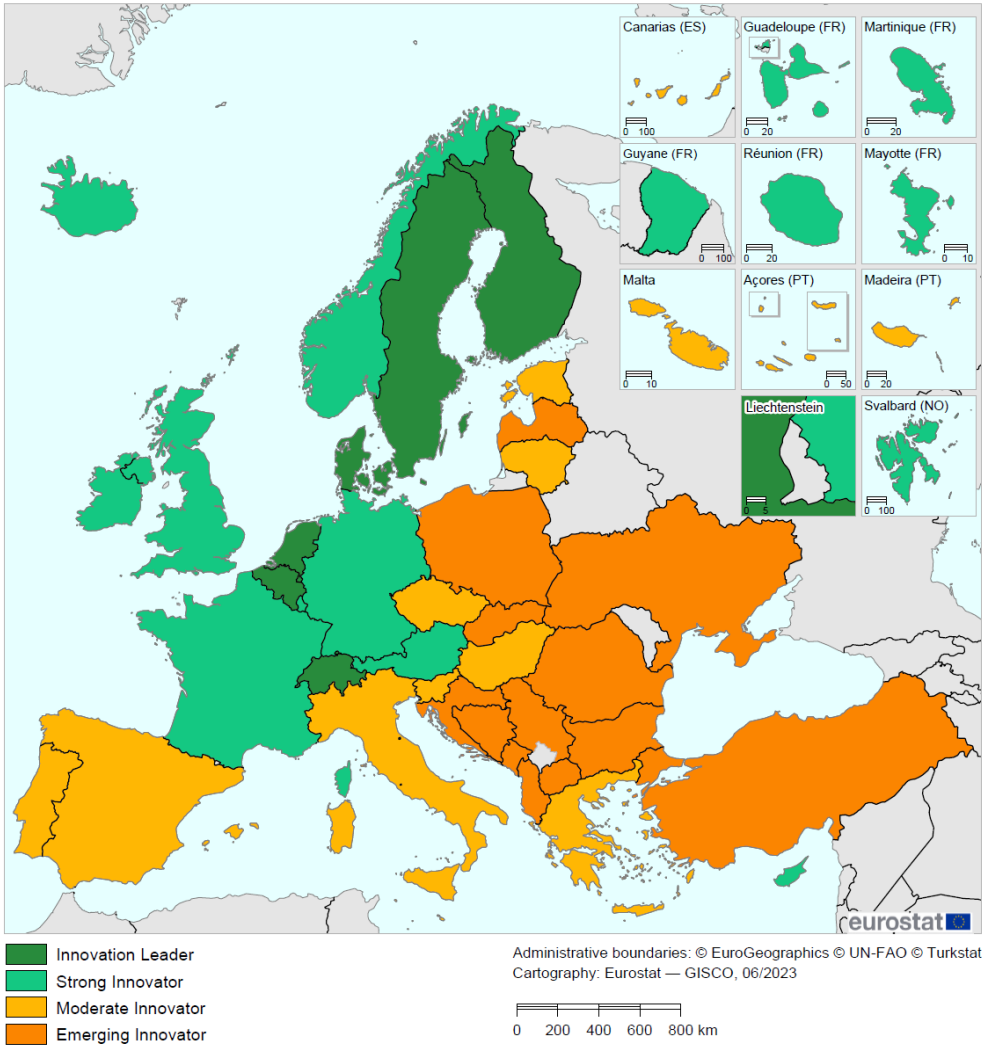
Source: European Innovation Scoreboard 2023.

Table 2. Framework for achieving results

FRAMEWORK CONDITIONS	INNOVATION ACTIVITIES	INVESTMENTS	IMPACTS
Human resources	**Innovators**	**Finance and support**	**Employment impacts**
1.1.1 New doctorate graduates (in STEM) 1.1.2 Population aged 25-34 with tertiary education 1.1.3 Lifelong learning	3.1.1 SMEs with product innovations 3.1.2 SMEs with business process innovations	2.1.1 R&D expenditure in the public sector 2.1.2 Venture capital expenditures 2.1.3 Direct government funding and government tax support for business R&D	4.1.1 Employment in knowledge-intensive activities 4.1.2 Employment in innovative enterprises
Attractive research systems	**Linkages**	**Firm investments**	**Sales impacts**
1.2.1 International scientific co-publications 1.2.2 Top 10% most cited publications 1.2.3 Foreign doctorate students	3.2.1 Innovative SMEs collaborating with others 3.2.2 Public-private co-publications 3.2.3 Job-to-job mobility of Human Resources in Science & Technology	2.2.1 R&D expenditure in the business sector 2.2.2 Non-R&D innovation expenditures 2.2.3 Innovation expenditures per person employed in innovation-active enterprises	4.2.1 Medium and high-tech product exports 4.2.2 Knowledge-intensive services exports 4.2.3 Sales of product innovations
Digitalisation	**Intellectual assets**	**Use of information technologies**	**Environmental sustainability**
1.3.1 Broadband penetration 1.3.2 Individuals who have above basic overall digital skills	3.3.1 PCT patent applications 3.3.2 Trademark applications 3.3.3 Design applications	2.3.1 Enterprises providing training to develop or upgrade ICT skills of their personnel 2.3.2 Employed ICT specialists	4.3.1 Resource productivity 4.3.2 Air emissions by fine particulates PM2.5 in Industry 4.3.3 Development of environment-related technologies

Source: European Innovation Scoreboard 2023 Methodology Report.

Figure 7. Map showing the performance of European countries' innovation systems



Source: European Commission.

The EIS 2023 distinguishes between four main types of activities – Framework conditions, Investments, Innovation activities, and Impacts – with 12 innovation dimensions, capturing in total 32 indicators. Each main group includes an equal number of indicators and has an equal weight in the average performance score, or the Summary Innovation Index (SII). Within each group every indicator has the same weight. Indicators that are included in the measurement framework are presented in the Table 2.

Table 3. Indicator measuring progress towards SDG 9

Indicator	Period	Annual growth rate	Trend
R&D and innovation			
Gross domestic expenditure on R&D	2006–2021	Observed: 1.5% Required: 2.2%	↗
	2016–2021	Observed: 1.3% Required: 2.5%	↘
Patent applications to the European Patent Office	2007–2022	1.1%	↑
	2017–2022	1.1%	↑
R&D personnel	2006–2021	3.0%	↑
	2016–2021	4.0%	↑
Tertiary educational attainment (*)	2007–2022	Observed: 2.5% Required: 1.9%	↑
	2017–2022	Observed: 2.2% Required: 1.4%	↑
Sustainable industry			
Air emissions intensity of industry	2008–2020	– 3.7%	↑
	2015–2020	– 2.6%	↑
Gross value added in the environmental goods and services sector (*)	2005–2020	3.5%	↑
	2015–2020	3.4%	↑
Sustainable infrastructure			
Share of buses and trains in inland passenger transport	2005–2020	– 2.0%	↓
	2015–2020	– 6.2%	↓
Share of rail and inland waterways in inland freight transport	2006–2021	– 0.8%	↘
	2016–2021	– 2.3%	↓
Share of households with high-speed internet connection (*)	Time series too short for long-term assessment		:
	2016–2021	Observed: 22.7% Required: 10.3%	↑

Source: EIS, 2023.

2.2.8 EU Eco-Innovation Index

A climate-neutral circular economy is the overarching objective enshrined in European Green Deal's vision for the future European economy. Hence, the monitoring and measurement of the progress with regard to eco-innovation (see Al-Ajlani et al., 2022) is crucial in order to ensure that Europe is moving towards such a vision.

The Eco-Innovation Index is based on five thematic areas:

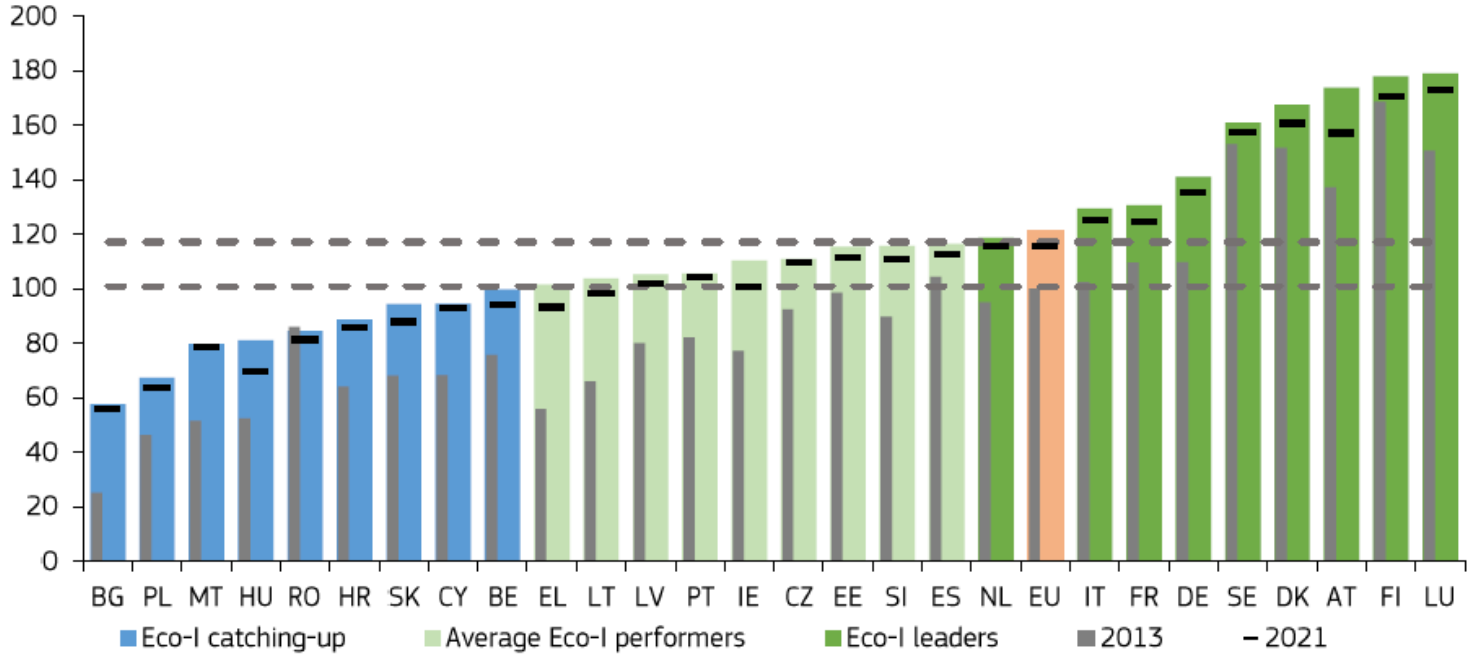
1. Eco-innovation inputs, which includes financial and human capital investment in eco-innovative activities;
2. Eco-innovation activities, which defines the extent to which companies in a given country are active in eco-innovation;
3. Eco-innovation outputs, which measures the output of eco-innovation activities concerning the number of patents and academic literature;
4. Resource efficiency outcomes, which pinpoint a country's efficiency of resources and GHG emission intensity and
5. Socio-economic outcomes, which aims to measure the positive societal as well as economic outcomes of eco-innovation.

The environmental innovation performance of EU Member States is measured by the summary Eco-Innovation Index, which is a composite indicator obtained by taking an unweighted average of the 12 indicators included in the measurement framework.[9]

Figure 8 shows the scores of this summary index relative to the performance of the EU in 2013 for all EU Member States in 2022. The 27 EU Member States are divided in three equally sized performance groups, where the top-9 countries belong to the eco-Innovation leaders, the 10th to 18th ranked countries belong to the average eco-Innovation performers, and the 19th to 27th ranked countries belong to the group of countries catching-up with Eco-Innovation.

[9] https://ec.europa.eu/environment/ecoap/indicators/index_en

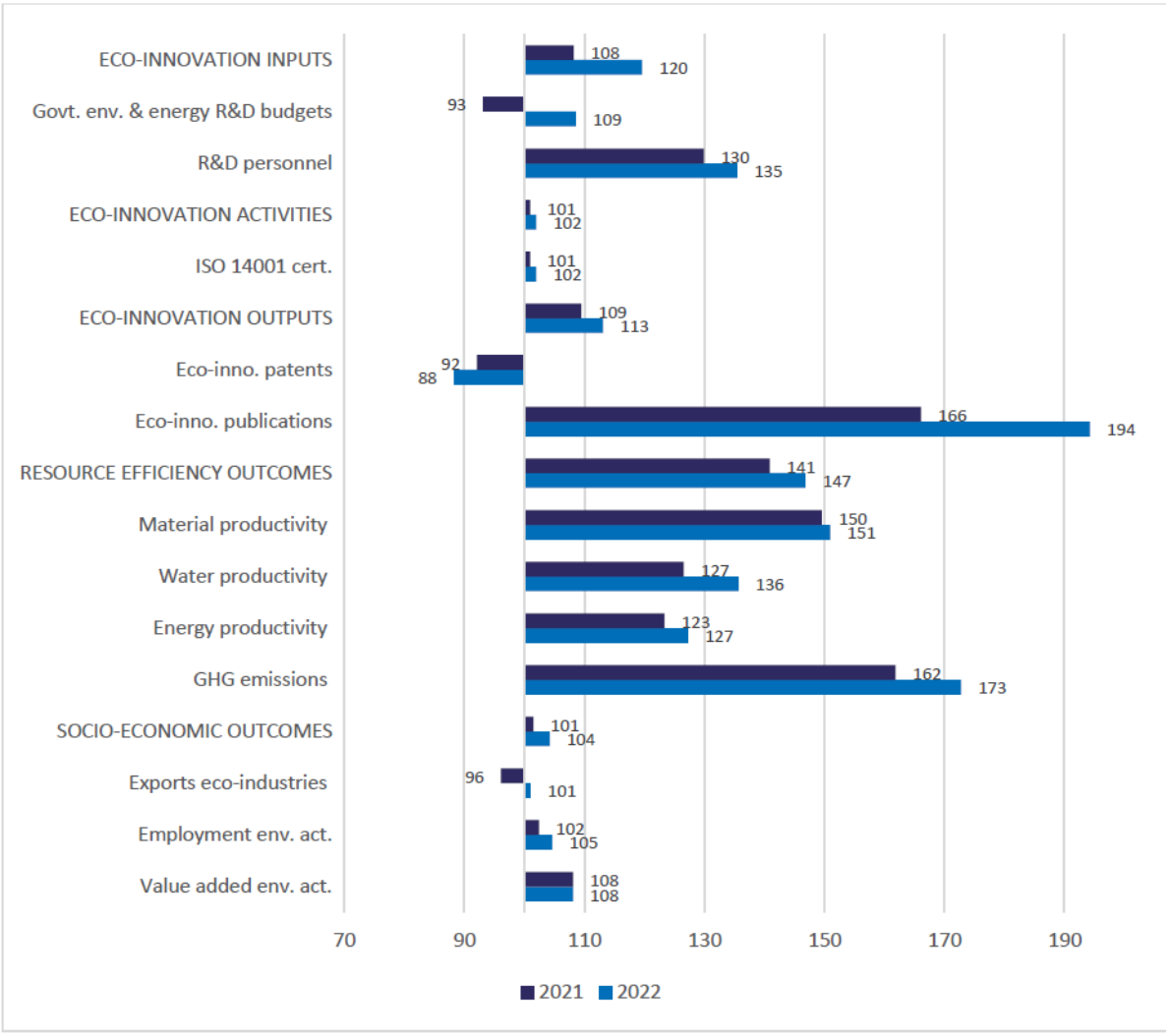
Figure 8. Performance of eco-innovation systems in 2022, 2021 and 2013



Note: Coloured columns show countries' performance in 2022, using the most recent data for 12 indicators, relative to that of the EU in 2013. The horizontal hyphens show performance in 2021. For all years, the same methodology has been used. The dashed lines show the threshold values between the performance groups, where the threshold values of top 33.3% percentile and 66.7% percentile have been adjusted upward to reflect the performance increase of the EU between 2013 and 2022.

Source: Al-Ajlani et al., 2022.

Figure 9. EU performance change



Note: normalised scores in 2022 (blue coloured bars) and 2021 (dark blue bars) relative to those in 2013
Source: Al-Ajlani et al. (2022)

The change in Eco-innovation indicators on the EU level in 2021 and 2022 relative to 2013 is summarised in the Figure 9. Over the last 10 years, the largest noticeable improvement is with respect to two indicators: eco-innovation related publications and GHG emission productivity.

Advancing eco-innovation is an objective shared among various European initiatives and policies. Establishing the link between the Eco-Innovation Index and relevant indices is vital to understanding the overall performance of EU Member States.

2.2.9 EU as the global leader in addressing climate change

The global challenges of climate change and environmental degradation require a global response. The EU will continue to promote and implement ambitious environment, climate and energy policies across the world. The EU will continue to ensure that the Paris Agreement remains the indispensable multilateral framework for tackling climate change.

In parallel, the EU will step up bilateral engagement with partner countries and, where necessary, establish innovative forms of engagement. The EU will put emphasis on supporting its immediate neighbours. The EU will use its diplomatic and financial tools to ensure that green alliances are part of its relations with Africa and other partner countries and regions, particularly in Latin America, the Caribbean, Asia, and the Pacific.

The EU's international cooperation and partnership policy should continue to help channel both public and private funds to achieve the transition.

Box 3. Green Deal

The European Green Deal is not a single strategy that provides the solution for Europe's many environmental and climate related challenges. Rather, it presents a collection of targets, intentions and objectives that will be implemented over the next ten years. It provides the overarching framework for the necessary green transition.

The European Innovation Scoreboard (EIS) and the Eco-Innovation Index share a common goal of measuring innovation. The EIS is an annual index that provides a comparative assessment of the research and innovation performance of EU Member States and selected third countries, and the relative strengths and weaknesses of their research and innovation systems.

The two indices also have one common thematic area that they measure: environmental sustainability. The EIS uses three indicators to measure environmental sustainability: 1) resource productivity, 2) development of environment-related technologies, and 3) air emissions by fine particulates (PM2.5). The first and second of these indicators are also included in the Eco-Innovation measurement framework.

2.3 Transformational aspects of Smart Specialisation

Smart specialisation (RIS3) approach, based on the Entrepreneurial Discovery Process (EDP) and the selection of a limited number of thematic priorities, allows policy makers to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts (Radovanovic and Bole, 2024; Perianez-Forte and Wilson, 2021; Marinelli and Perianez-Forte, 2017; Kyriakou et al, 2016; Gianelle et al, 2016; Foray, 2015; Foray and Goenaga, 2013; Foray and Rainoldi, 2013; Foray et al., 2009; Kelchtermans et al, 2021). The Smart Specialisation strategy may take the form of, or be included in, a national or regional research and innovation (R&I) strategic policy framework. The adoption of national and/or regional Research & Innovation Smart Specialisation Strategies (RIS3) was a formal requirement (the so-called ex-ante conditionality) for allocating R&I budgets from the European Structural and Investment Funds (ESI Funds).

The RIS3 approach is relevant to all three priorities of Europe 2020 i.e. smart, sustainable and inclusive growth. The Smart Specialisation strategy is about defining existing specialities and developing new ones, and involves all forms of innovation (not only high-tech). It represents an inclusive, bottom-up approach adding users and civil society to innovation ecosystem while being 'evolution- driven' by the entrepreneurial discovery process.

Box 4. Definitions of RIS3

National/regional research and innovation strategies for smart specialisation (RIS3) are integrated, place-based economic transformation agendas that do five important things:

- They focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development, including ICT-related measures.
- They build on each country's/region's strengths, competitive advantages and potential for excellence.
- They support technological as well as practice-based innovation and aim to stimulate private sector investment.
- They get stakeholders fully involved and encourage innovation and experimentation.
- They are evidence-based and include sound monitoring and evaluation systems.

The key element for the successful design and implementation of the strategy is *the entrepreneurial discovery process (EDP),* which in fact represents *a continuous public-private dialogue among four helices of the modern innovation society (so-called quadruple-helix), consisting of academia, industry, government sector and civil society.*

Smart Specialisation strategies addressing the SDGs aim to mobilise research and innovation to respond to localised sustainability challenges (Miedzinski et al., 2022). The initial development of Smart Specialisation was mainly focused on fostering industrial transformation and enhancing regional competitiveness. The new directionality towards sustainability raises the ambition for innovation to respond to societal challenges and foster systemic changes in key societal systems, such as energy, food, mobility or housing.

Embedding the SDGs into Smart Specialisation strategies requires an explicit focus on 'transformative change', as in the "third frame" of innovation policy (Schot and Steinmueller, 2018). Transformative innovation policy involves the explicit mobilisation of science, technology, and innovation to tackle societal challenges of sustainability.

Box 5. Smart Specialisation

It is important to emphasise that Smart Specialisation is not a finished concept but subject to continuous debate, criticism and evaluation, both in academic and policy circles. Adding a sustainability aspect to the Smart Specialisation concept has considerable implications for substantive and procedural elements of the approach. A fundamental challenge is responding to the transformative ambition of the Agenda 2030 and the SDGs.

2.3.1 Monitoring and evaluation

Challenges for S3 monitoring and evaluation arise from the distinctive elements of these strategies, especially the novelty of the S3 approach concerning the entrepreneurial discovery process. The Smart Specialisation strategy is an example of a complex innovation strategy in which instruments derived from different theoretical logics coexist, while a wide range of regional stakeholders from the quadruple helix of government, business, research, and civil society are involved. This implies that the monitoring and evaluation process are required to embrace and meet the needs of broader groups in society, on which policies can have varied impacts (Hegyi and Prota, 2021).

Recognising the increasing complexity associated with innovation policies makes apparent the need for system-wide evaluation exercises that measure the effectiveness of the overall strategy. This means taking into account changes in behaviour of actors that have not been supported by policy measures included in the strategy, not only changes in behaviour in the target groups of the various interventions but also the presence of multiple operating and interacting interventions, which create difficulties identifying the effects of one intervention over another.

The Entrepreneurial Discovery Process, with its experimental nature, adds further complexity. As well-known, the EDP is not just a process referring to the identification of investment priorities in research and innovation (priority areas) and exploring new techno-economic opportunities through stakeholders' engagement; it is a social and political process where issues such as power, vested interests of different groups, etc., need to be taken into account. In addition, conceptually, the EDP has evolved from being an element of the design phase of a smart strategy into a continuous activity (Radovanovic and Bole, 2024). In terms of evaluation methodology, this entails moving from traditional approaches towards participatory approaches in which the focus is on supporting the learning capacity of the system by strengthening feedback loops and improving access to information.

Other challenges for evaluation relate to uncertainty in the nature and timing of impacts arising from interventions and the necessity to pay particular attention to context, as economic and innovation systems differ over time and space.

Finally, since policymakers need accurate and real-time input to assess socio-economic problems and propose effective strategies for tackling them, evaluation should occur concurrently alongside program development and implementation. A sound S3 monitoring system 'acts as an early warning mechanism signalling critical aspects of policy implementation' that provides inputs for S3 evaluation. This requires a monitoring and evaluation (M&E) system in place that collects and manages accurate, complete, and relevant data, driving data- and evidence-driven decision-making.

While supporting the re-examination or validation of earlier policy decisions and advancements regarding strategic objectives, the M&E framework enables policymakers to make better-informed decisions when determining the impact and effectiveness of a policy program (OECD, 2009). Hence, in line with the European Commission's Smart Specialisation implementation guide, monitoring and evaluating the implementation of innovation policies contribute to minimizing duplication and fragmentation of efforts while providing policy evaluators a basis for comparison and benchmarking of policies and policymakers a basis for preparing for the next programming period (Gianelle et al., 2016).

2.4 Green skills

The transition to a low-carbon, resource-efficient economy requires systemic changes that will result not only in new products and services but also in changes in production processes and business models. This greening of the economy will inevitably change the skills required and the tasks involved in many existing occupations.

According to the UNIDO definition[10], green skills encompass the knowledge, abilities, values, and attitudes needed to live in, develop, and support a sustainable and resource-efficient society. The Green General Skill index identifies four groups of work tasks crucial for green occupations:

- **Engineering and Technical Skills**: Hard skills involving competences related to the design, construction, and assessment of technology, typically mastered by engineers and technicians. This expertise is essential for eco-buildings, renewable energy design, and energy-saving research and development (R&D) projects.
- **Science Skills**: Competences stemming from broad knowledge essential to innovation activities, such as physics and biology. These skills are in high demand in value chains and the utility sector, providing basic amenities like water, sewage services, and electricity.
- **Operation Management Skills**: Know-how related to changes in organisational structure required to support green activities and an integrated view of the firm through life-cycle management, lean production, and cooperation with external actors, including customers. These skills are crucial for roles like sales engineers, climate change analysts, sustainability specialists, chief sustainability officers, and transportation planners.
- **Monitoring Skills**: Technical and legal aspects of business activities, assessing the observance of technical criteria and legal standards. Examples include environmental compliance inspectors, nuclear monitoring technicians, emergency management directors, and legal assistants.

In addition to these skills, various soft skills are considered increasingly important, not only for green skills but also for "skills of the future," including design thinking, creativity, adaptability, resilience and empathy.

Climate action is already providing jobs and opportunities for the future. The transition to a climate-neutral economy will lead to fundamental changes in various sectors, creating new jobs while redefining others.

There is a need to:

- Promote and support green employment;
- Address the skilling and reskilling of workers; and
- Anticipate changes in the workplaces of the future.

The European Commission officially launched the Pact for Skills on November 10, 2020, a shared engagement model for skills development in Europe. The Climate Pact will continue the EU's work, actively supporting labour organisations, educational bodies, and public authorities in helping individuals seeking employment in the green economy through activities such as:

- Encouraging businesses and organisations to participate in the Pact for Skills for up- and re-skilling workers.
- Spreading good practices and success stories from European programs.
- Facilitating access to the European Social Fund, enabling training for five million people in green jobs and the green recovery.
- Collaborating with Erasmus+ and other programs providing opportunities for developing forward-looking skills and partnership projects.
- Encouraging stakeholders, local authorities, and communities to utilize the Just Transition Mechanism for promoting re-skilling, active inclusion of workers, jobseekers, and creating new local jobs in targeted regions.

[10] https://www.unido.org/stories/what-are-green-skills

- Providing support programs for higher education institutions developing and teaching courses on environmental and climate impacts.

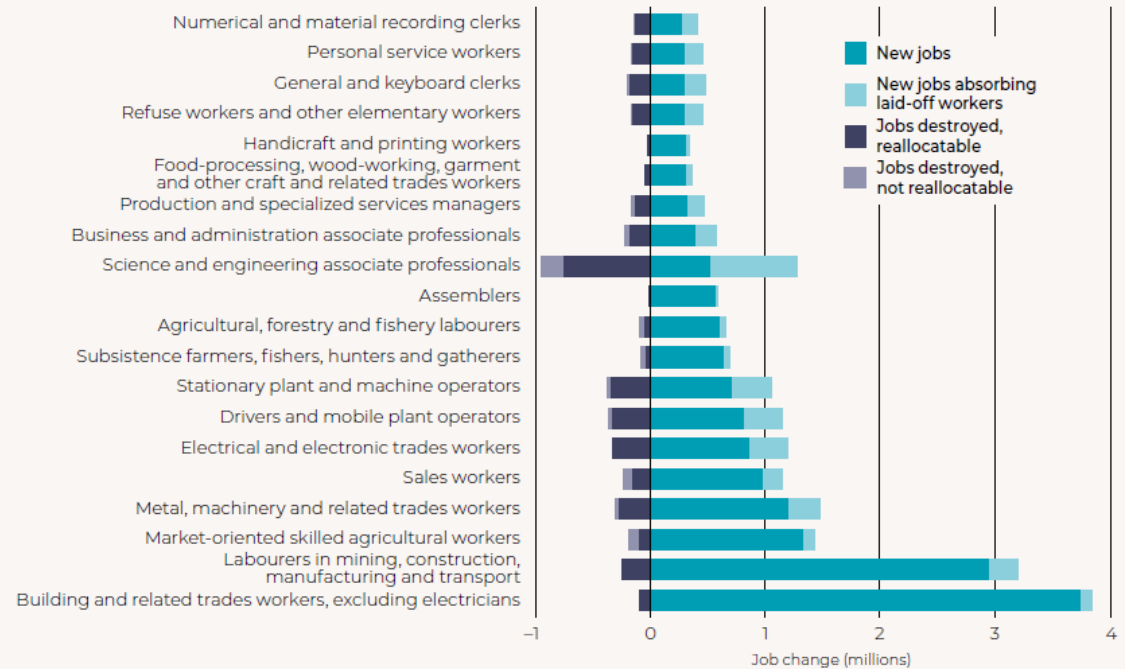
Companies, workers, national, regional, and local authorities, social partners, cross-industry and sectoral organisations, education and training providers, chambers of commerce, and employment services all play a key role.

Climate change and environmental degradation are among the greatest challenges of our times. At the 2018 Conference of the Parties to the United Nations Framework Convention on Climate Change (COP24), a green transition that is also a just transition for the workforce and the creation of decent work were declared crucial to effective, inclusive, and climate-resilient development. Skills development is a cornerstone of that just transition. The availability of the right skills paves the way for a productive green transformation and decent job creation. Skills development also serves as a buffer against the effects of transitory disruptions. The transition to a greener future is happening, but it requires a coordinated policy approach to make it just and inclusive.

The International Labour Organization has mobilized the efforts of three departments to produce the Study Skills for a Greener Future.[11] The right skills for jobs are an essential prerequisite for the transition to environmentally sustainable and socially inclusive economies.

The ILO has produced estimates of the impact that the transition to energy sustainability by 2030 will have on employment. The extension of this analysis shows that almost 25 million jobs will be created and nearly 7 million lost globally. Of the latter, 5 million can be reclaimed through labour reallocation – that is, 5 million workers who lose their jobs because of contraction in specific industries will be able to find jobs in the same occupation in another industry within the same country. This means that between 1 and 2 million workers are likely to be in occupations where jobs will be lost without equivalent vacancies arising in other industries and will require reskilling into other occupations. Massive investment will be needed to train workers in the skills required for close to 20 million new jobs (see figure 11).

Figure 10. Occupations most in demand across industries in a global energy sustainability scenario, 2030



Note: Difference in employment between the sustainable energy scenario (the 2°C scenario) and the business-as-usual scenario (the 6°C scenario) of the International Energy Agency (IEA) by 2030. Detailed information on the methodology is described in ILO, 2018a, pp. 39, 170-172).

Source: ILO calculations based on EXIOBASE v3 and national labour force surveys.

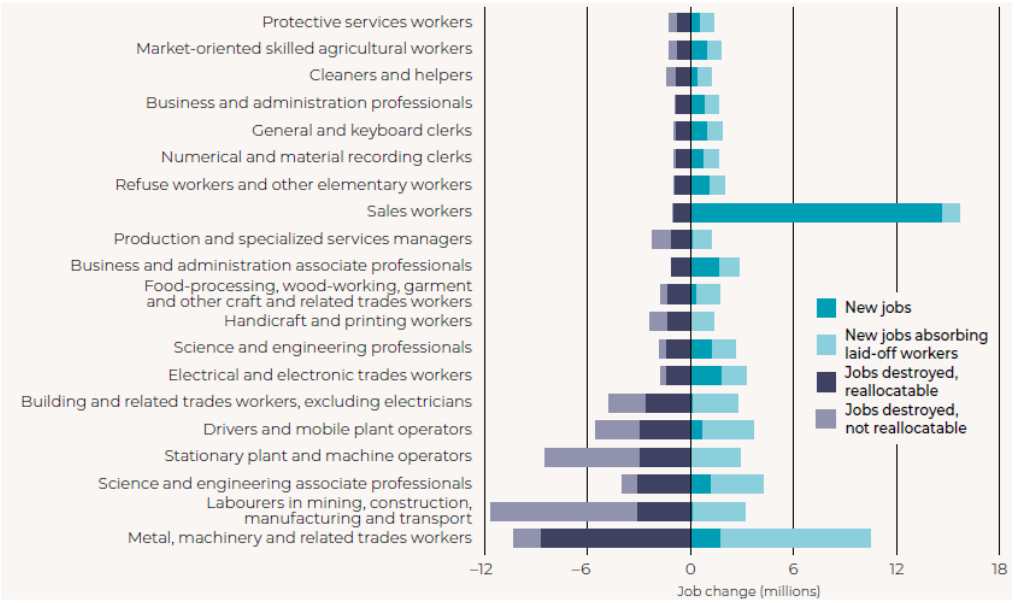
[11] Skills for a greener future: A global view based on 32 country studies International Labour Office – Geneva: ILO, 2019 ISBN 978-92-2-031439-5 (print) ISBN 978-92-2-031440-1 (web pdf)

The ILO also estimates that, in working towards a circular economy, a net total of between 7 and 8 million new jobs will be created by 2030, as compared to a business-as-usual scenario. The extension of these estimates shows that in the circular economy scenario, nearly 78 million jobs will be created and almost 71 million destroyed. Of those workers whose jobs are destroyed, a large proportion – nearly 49 million – will find vacancies in the same occupation in other industries within the same country, through reallocation.

As for the remainder, close to 29 million jobs will be created without reallocation, and a little under 22 million will be destroyed without vacancies in the same occupation opening in other industries. Figure 12 shows the 20 occupations that will figure most prominently in job destruction and reallocation in the circular economy scenario.

Even workers in the jobs that are expected to disappear with no equivalent vacancies in other industries – possibly over 1 per cent of the global workforce – may well be able to use their skills in growing industries with some additional training. There is a set of core and technical skills that are potentially transferable, within occupations, from declining to growing industries; but retraining will be needed to enable workers to acquire new skills for use in the latter.

Figure 11. Occupations most susceptible to job destruction and reallocation across industries in a global circular economy scenario, 2030



Note: The figure shows difference in employment between the scenario of a sustained 5% annual increase in recycling rates for plastics, glass, pulp, metals and minerals across countries and related services, and a business-as-usual scenario (the 6°C scenario). Detailed information on the methodology is described in ILO, 2018a, pp. 39, 162-170).
Source: ILO calculations based on EXIOBASE v3 and national labour force surveys.

Box 6. New skills

However, the transition to environmentally sustainable and inclusive economies and societies cannot take place if the skills demanded by new jobs are not available in the labor market. The transition is therefore conditional on investment in training to develop skills to meet new requirements and avoid skills mismatches.

Forward-looking skills strategies are necessary to train young people and reskill the current workforce to meet the skills needs of the new jobs generated in the transition process in expanding sectors.

Green transition needs a new approach for workers' skills:

1. The growth in demand for skills for green jobs continues to be driven by environmental change, government policy, technology and markets. The changing environment, policies and regulations, green technology and innovation, green productivity, and green markets are all stimulating demand for skills for green jobs, both directly and indirectly through supply chains. Green technologies

continue to advance, linked to growth in consumer markets for green products and services in high-income countries (HICs) and increasingly in low-income countries (LICs) too, as technologies become more affordable and efficient, and owing to technological diffusion through global trade and investment as well as growing awareness about issues of climate change vulnerability and the need for adaptive measures.

2. Skills gaps and shortages are increasing, posing a challenge to the green transition. The most widespread effect of the green transition on employment is the need to reskill or upskill within existing occupations. New and emerging green occupations are rarer and tend to emerge at higher skill levels. Low-skilled occupations tend to require limited adaptation to greener work processes such as simply greater environmental awareness.

Table 4. Changes in skills required, by skill level of occupation

SKILL LEVEL	NATURE OF CHANGE	TYPICAL SKILLS RESPONSE	EXAMPLE OCCUPATIONS
Low-skilled occupations	Occupations change in a generic way, e.g. requiring increased environmental awareness or simple adaptations to work procedures	On-the-job learning or short reskilling and upskilling programmes	Refuse/waste collectors, dumpers
Medium-skilled occupations	Some new green occupations Significant changes to some existing occupations in terms of technical skills and knowledge	Short to longer upskilling and reskilling programmes; TVET courses	*New occupations:* wind turbine operators; solar panel installers *Changing occupations:* roofers; technicians in heating, ventilation and air conditioning; plumbers
High-skilled occupations	Locus of most new green occupations Significant changes to some existing occupations in terms of technical skills and knowledge	University degree; longer upskilling programmes	*New occupations:* agricultural meteorologists, climate change scientists; energy auditors, energy consultants; carbon trading analysts *Changing occupations:* building facilities managers; architects; engineers

Source: "Skills for green jobs" country reports, ILO, 2018.

Jobs in the transition to more sustainable economies require both technical (specific to each occupation) and core (soft) skills. Although data are scarce, there are enough examples to suggest that gaps in and shortages of both kinds of skills are likely to be widespread, especially in low-income countries, and that these may constitute a constraint on the transition to an environmentally sustainable economy. Developing countries are especially challenged by a lack of professionals and a shortage of university graduates in general, especially those trained in science, technology, engineering, and mathematics (STEM) skills.

Even in high-income countries, including those with well-developed skills anticipation systems, a lack of both technical and transferable core skills remains a significant cause of recruitment problems for employers.

To seize the momentum, countries will need to integrate forward-looking skills strategies into their climate and environmental policies.

The transition to an environmentally sustainable and low-carbon economy will generate many new jobs, cause some job losses, and alter the skills composition of most jobs. Skills development strategies will need to support displaced workers while enabling the green transition and encouraging job generation.

The Guidelines for a just transition towards environmentally sustainable economies and societies for all highlight the importance of inclusive skills development policies. Skills development is an important pillar in a just and inclusive transition, but other measures will be equally important.

Table 5. Main core skills required for green jobs, by skill level of occupation

REQUIRED ACROSS THE LABOUR FORCE	REQUIRED IN MEDIUM- TO HIGH-SKILLED OCCUPATIONS
• Environmental awareness and protection; willingness and capability to learn about sustainable development • Adaptability and transferability skills to enable workers to learn and apply the new technologies and processes required to green their jobs • Teamwork skills reflecting the need for organizations to work collectively on tackling their environmental footprint • Resilience to see through the changes required • Communication and negotiation skills to promote required change to colleagues and customers • Entrepreneurial skills to seize the opportunities of low-carbon technologies and environmental mitigation and adaptation • Occupational safety and health (OSH)	• Analytical thinking (including risk and systems analysis) to interpret and understand the need for change and the measures required • Coordination, management and business skills that can encompass holistic and interdisciplinary approaches incorporating economic, social and ecological objectives • Innovation skills to identify opportunities and create new strategies to respond to green challenges • Marketing skills to promote greener products and services • Consulting skills to advise consumers about green solutions and to spread the use of green technologies • Networking, IT and language skills to perform in global markets • Strategic and leadership skills to enable policy-makers and business executives to set the right incentives and create conditions conducive to cleaner production, cleaner transportation

Source: "Skills for green jobs" country reports, ILO, 2018.

Coordination with macroeconomic, sustainable investment, industrial, and enterprise policies, including incentives for knowledge transfer and technology diffusion, will be essential in enabling businesses to implement greener and resource-efficient production practices, align the supply of skills with growing demand, and facilitate the efficient reallocation of workers to newly created green jobs. The ILO Human Resources Development Recommendation (ILO, 2004) recognizes that education, training, and lifelong learning are of fundamental importance and should form an integral part of, and be consistent with, comprehensive economic, fiscal, social, and labour market policies. Action planning on skills development will have to be integrated with key climate and environmental policies and regulations, including NDCs, to ensure that skills needs are met and climate commitments are implemented. Furthermore, skills policies and training measures will need to adopt a longer-term and systematic approach to skills development in the context of greening.

The new jobs created in the environmentally sustainable economy will require somewhat higher qualifications and new sets of skills. Upskilling and reskilling workers, especially those most affected by the transition, will mean implementing lifelong learning strategies rather than front-loading qualifications that are expected to suffice for an entire career. The green transition will not be a single force claiming a massive adjustment of the current and potential workforce. Automation, demographic change, global trade, and other megatrends will also have substantial impacts. Multiple changes will require multiple transitions managed throughout careers. Access to skills training, raising environmental awareness and climate literacy for current workers, even those not affected by job displacement, will be essential for the implementation of greener ways of production and service delivery.

The Global Commission on the Future of Work has stressed the importance of investment in people's capabilities and universal entitlements to lifelong learning (ILO, 2019). It has also underlined the need to step up investments in labour market institutions to support people through future work transitions. Other systemic elements of lifelong learning will need to include innovative and diverse ways of financing, combining private and public contributions, and allowing individuals to access funding and gain recognition for their learning outcomes,

whether attained formally or informally. Social dialogue will remain part and parcel of the provision of learning and skills for a just transition and sustainable development.

3 The Western Balkans outlook related to green transition

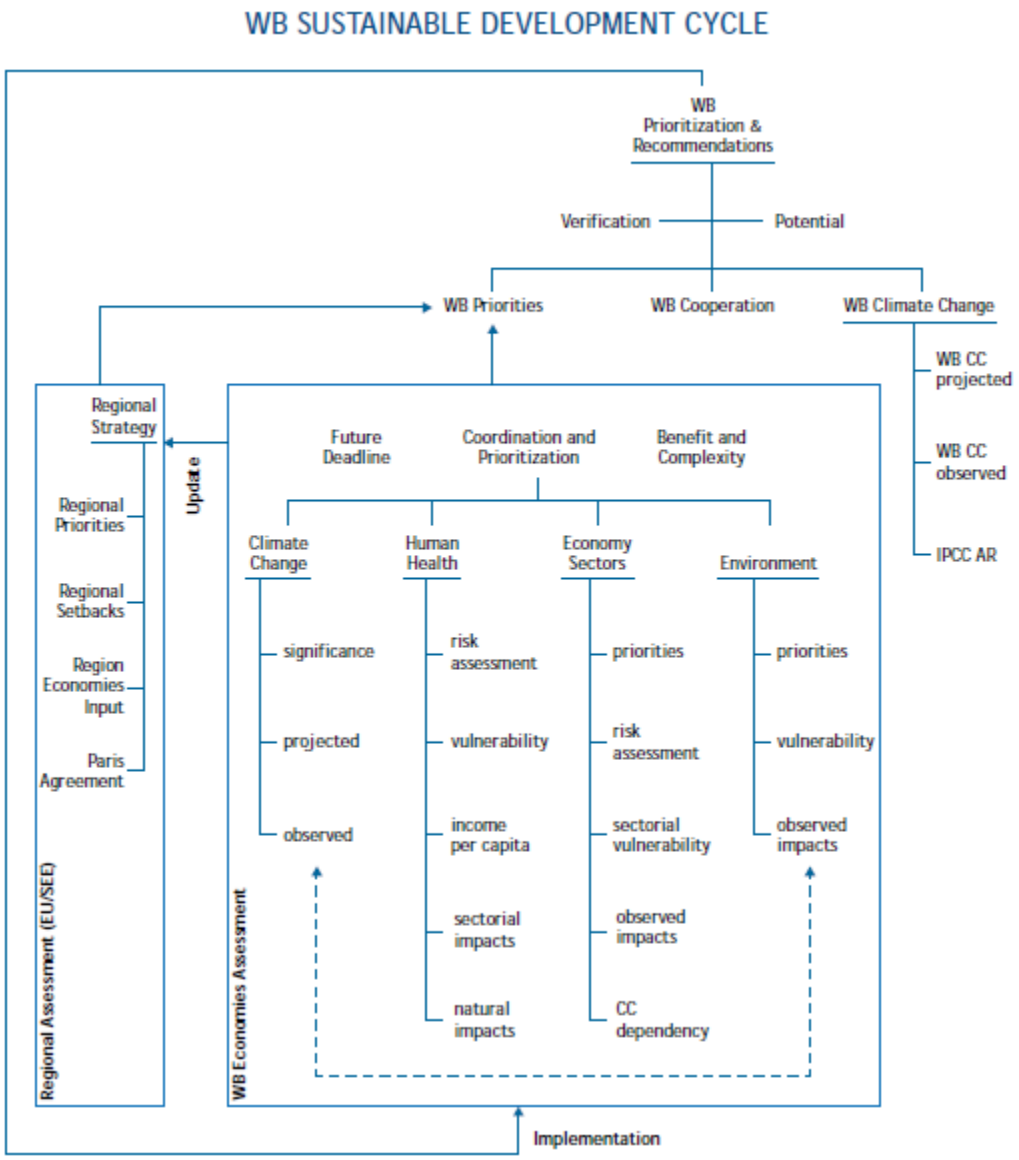
The Western Balkans (WB) region consists of six economies (Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, Serbia, and North Macedonia), covering an area of about 208,000 km2 with a population of approximately 18 million. The region spans the low-altitude Pannonia valley to the north, hilly and mountainous regions towards the central-south and west, and the coastal area of the Adriatic Sea. The spatial climate variability, ranging from coastal subtropical to temperate continental with high mountains in between, results in a rich diversity of vegetation cover, considered a natural treasure of the region. The population is primarily engaged in weather and climate-related sectors such as agriculture, forestry, tourism, and supporting services. All economies share the common goal of increasing per capita income while reducing unemployment rates. As candidates and potential candidates for EU accession, they are committed to respecting the Paris Agreement and achieving EU2020 and EU2030 goals in greenhouse gas (GHG) emission reduction, increased energy efficiency, and energy production from renewable sources. Faced with the significant impact of global warming and vulnerability to climate change, the WB economies analyse and report on adaptation options, emphasizing the optimal selection and prioritization of measures in line with mitigation strategies. The challenge of addressing climate change issues within each economy is hindered by the shortage of human and financial resources, necessitating the renewal and development of regional collaboration (Vukovic and Vujadinovic Mandic, 2018).

The EU and the Western Balkans share a common culture and history, with closely interlinked societies and economies. Albania, Montenegro, North Macedonia, and Serbia are candidate countries for EU membership, while Bosnia-Herzegovina and Kosovo are potential candidates. The EU provides financial assistance in various areas to support progress towards membership, coupled with aid for meeting EU standards across all sectors.

3.1 Western Balkans' sustainable development cycle

Similar to natural cycles, human activities must be coordinated by artificially created cycles aligned with nature to sustain survival. Efforts to restore the natural balance and sustainability of human development have led to the establishment of a global sustainable development cycle (SDC) that must be supported by regionally created gear wheels or regional SDCs. The chart (Figure 13) illustrates a simplified workflow or "cycle" of the functioning mechanism required for ensuring human livelihood quality and sustainable development in the Western Balkans (WB) region.

Figure 12. WB Sustainable development cycle



Source: Vukovic and Vujadinovic Mandic (2018).

The foundation of the WB SDC is information provided by the economies, mainly through their climate change policy framework. The main branches of assessments performed by the economies include climate change (climatological parameters and indices) and impacts on human health, economic sectors, and the environment reflected through various indicators (Vukovic and Vujadinovic Mandic, 2018). Horizontal connections between activities related to these branches are complex but crucial within economies' self-assessment. All branches systematically trace climate change impacts from the bottom up. The link between environment and climate change, marked with a dashed line, has a significant global impact due to natural processes triggered by global warming, leading to increased climate change signals. Economies' self-assessment must align with regional and global strategies, emphasizing the need for regional collaboration to address the challenges posed by climate change.

The common needs identified in the WB region include a lack of human resources to address climate change issues and high vulnerability, necessitating coordinated regional efforts to ensure sustainable development and improve life quality. A regional approach, driven by the implementation of the SEE 2020 Strategy, should involve an integrated analysis of present and future climate change impacts for the entire region, ensuring compatibility with the Intergovernmental Panel on Climate Change 5th Assessment Report (IPCC AR5). The SEE 2020 Strategy outlined in this document reflects the determination of all the governments in South East Europe to embrace

the bold policy approaches required to attain the levels of socioeconomic growth necessary to improve the prosperity of all its citizens and to facilitate eventual integration with the European Union (EU). The Strategy pursues a holistic pattern of development for the region and seeks to stimulate the key long-term drivers of growth such as innovation, skills and the integration of trade.

The Western Balkan economies provided data, analysis and proposed measures related to climate change issues, adaptation and mitigation, with distinguished similarities which include, inter alia:

- Undoubtedly proving and recognising that climate and, consequently, living environment and economic practice (except the introduction of new technologies) are no longer static or slowly evolving, but rather characterised by significant trend of change;
- High motivation to meet the requirements related to EU accession;
- Highlighting the priority and necessity of integration of climate change aspects in existing environmental and other relevant policies;
- Introduce climate change in education and raise awareness; coordinate the inter-disciplinary and cross-sectorial collaboration through representative body (for example national committee), which consists of parties from academia, government bodies, private sector and civil society and is under the responsibility of ministry of environment or other ministries with environmental obligations;
- Besides other obstacles, all economies outlined a lack of sufficient human resources as significant problem to comprehend the wide range of activities and commitments under the UNFCCC.

3.2 Western Balkans economic performance

3.2.1 Overview

The resilience of the six economies of the Western Balkans has been tested over the last three years (World Bank, 2023). Growth in these economies started strong in early 2022 but moderated toward year-end. Major shocks, such as electricity and heating outages, had a less severe impact than expected. Inflation surged to a two-decade high in 2022 in almost all economies, with elevated price pressures continuing into early 2023.

Table 6. Table Western Balkan outlook 2020-25

	2020	2021	2022e	2023f	2024f	2025f
Real GDP Growth (percent)						
Albania	-3.3	8.9	4.8	2.8	3.3	3.3
Bosnia and Herzegovina	-3.0	7.4	4.0	2.5	3.0	3.5
Kosovo	-5.3	10.7	3.5	3.7	4.4	4.2
North Macedonia	-4.7	3.9	2.1	2.4	2.7	2.9
Montenegro	-15.3	13.0	6.1	3.4	3.1	2.9
Serbia	-0.9	7.5	2.3	2.3	3.0	3.8
WB6	*-3.0*	*7.8*	*3.2*	*2.6*	*3.1*	*3.5*
Real GDP Components Growth (percent)						
Consumption	-1.1	4.6	3.3	1.9	2.1	2.6
Investment	-1.6	2.0	2.5	0.9	0.9	1.2
Net exports	-0.3	-0.1	-2.7	-0.2	0.2	-0.3
Exports	-5.9	9.7	7.7	2.3	2.8	3.4
Imports (-)	-5.6	9.8	10.4	2.5	2.6	3.6
Consumer Price Inflation (percent, period average)	1.0	3.3	11.8	7.0	3.4	2.9
External Sector (percent of GDP)						
Goods exports	27.2	32.5	36.8	37.0	37.0	37.1
Trade balance	-14.0	-13.0	-15.3	-14.7	-14.1	-13.7
Current account balance	-5.5	-4.8	-6.9	-6.3	-5.8	-5.5
Foreign direct investment	5.2	5.8	7.0	5.8	5.7	5.8
External debt	88.9	83.8	78.4	75.6	73.8	72.3
Public Sector (percent of GDP)						
Public revenues	34.7	36.0	35.6	35.9	35.6	35.7
Public expenditures	42.5	38.9	38.6	38.7	38.1	37.9
Fiscal balance	-7.9	-3.0	-3.0	-2.7	-2.4	-2.0
Public and publicly guaranteed debt	60.5	56.6	51.0	50.9	51.3	50.7

Note: e = estimate, f = forecast.
Source: National statistical offices; ministries of finance, central banks; World Bank staff estimates.

Higher food and energy prices have disproportionately affected low-income households, resulting in a slower pace of poverty reduction in 2022 despite universal government support.

Box 7. Outlook for WB

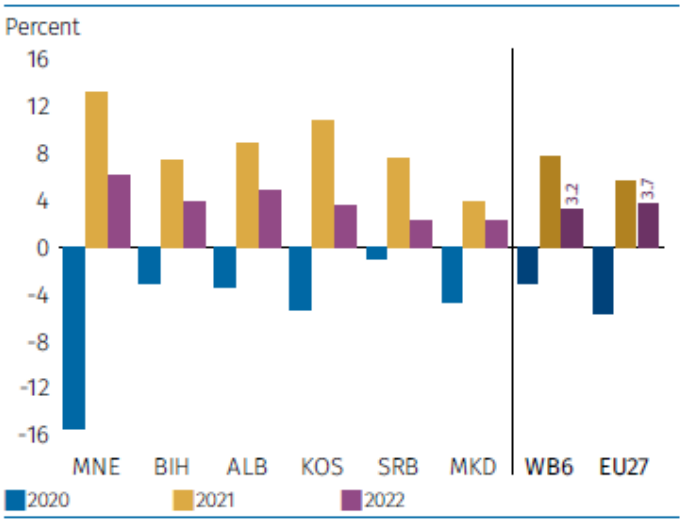
The outlook for the Western Balkans remains subdued and uncertainty remains high (World Bank, 2023). In the short term, growth outcomes are expected to be driven by economic performance in the EU, the course of energy and food prices, and the fight against inflation.

In the medium term, the Western Balkans continues to have a positive outlook, but reforms are needed to rebuild buffers, accelerate the green transition and to address key structural challenges. The ongoing energy crisis has highlighted the need to accelerate the green transition across Europe, including in the Western Balkans. The key starting point in this regard is to accelerate the move toward carbon pricing and to increase the use of environmental fiscal measures that incentivize households and firms to shift toward lower carbon intensity with respect to economic activity.

Further, as governments across the region look toward rebuilding their fiscal buffers, there are high returns to no-regret reforms that would boost productivity over the medium term, such as accelerating regional integration, increasing levels of market competition, attracting higher quality investments, and addressing barriers that limit labour force participation (especially among women). Finally, securing alternative energy resources, including through the acceleration of investment in renewables, needs to be a priority ahead of the next winter.

The economic performance of the Western Balkan economies reflects synchronization with the EU, which, having avoided a recession in the last quarter, is estimated to have grown at 3.7 percent in 2022, despite the effect of rising energy and food prices on consumption and investment and the weather-induced impact on agriculture and energy production due to a particularly dry year. Overall growth for the year came in at 2.1 percent in North Macedonia, 2.3 percent in Serbia, 3.5 percent in Kosovo, 4.0 percent in Bosnia and Herzegovina, 4.8 percent in Albania, and 6.1 in Montenegro.

Figure 13. Real GDP growth slowed in 2022



Source: National statistical offices; IMF; World Bank staff.

Investments in the Western Balkans have remained resilient. The service sector leads the growth recovery, while industrial activity lags, except in Kosovo. Construction has driven growth in Albania, while industrial production contracted across the region in 2022, except in Kosovo and Serbia, where it bounced back in the last quarter. Unfavourable weather negatively impacted electricity production and agriculture, with Albania and Montenegro particularly affected by energy shocks. Investments in energy efficiency are crucial to mitigate the impact of such shocks on firms' profits. The agricultural sector faced challenges due to unfavourable weather conditions, affecting agricultural production in Serbia and leading to modest growth of 0.13% in Albania. The agricultural sector in Albania accounts for almost 18% of GDP, more than double the average share for other Western Balkan economies.

3.2.2 Employment

Despite experiencing initial employment growth, job creation weakened across all Western Balkan economies in the second half of 2022. While employment increased in early 2022 in all economies (except North Macedonia, due to the adjustment to the new census-informed sample), by year-end, the situation had reversed. In December 2022, employment dropped in all economies except Albania and Montenegro compared to the end of 2021. Overall, annual employment in the Western Balkans contracted by over 1 percent by year-end, equivalent to a net loss of 72,000 jobs. The largest annual drop was observed in North Macedonia, followed by Serbia and Kosovo. However, employment levels across all economies, except North Macedonia, are still above pre-crisis levels (World Bank, 2023).

Wage pressures increased by the end of 2022 due to the inflation surge, despite a slowdown in employment. In Montenegro, the average net monthly wage increased by 18.7 percent in real terms in 2022, attributed to a reduction in labour taxes and an increase in the minimum wage. In Albania, a nominal wage rise of 10.8 percent by December 2022 (or 3.4 percent in real terms) reflected increased labour demand by the private sector. The average wage in Serbia increased by 13.8 percent in nominal terms or 1.7 percent in real terms, reflecting shortages of skills in the service sectors, whereas public sector wages increased by 7.3 percent. Led by a rise in the minimum wage and demand for workers in accommodation and recreation services, manufacturing, and the retail trade, nominal wages in North Macedonia increased by 11 percent in 2022. Yet, double-digit inflation meant that real net wages declined. In Bosnia and Herzegovina, nominal wage growth was 14.2 percent, and it

was broad-based, with the highest increase in services and the least in the public sector. However, in real terms, wages declined by 0.5 percent in December.

3.2.3 Trade and regional integration

Trade facilitation and regional integration are crucial for the economic growth and competitiveness of the WB economies, which currently face challenges due to fragmentation and being small economies. The Common Regional Market initiative[12], covering the four freedoms (digital, investment, innovation, and industry policy), is an essential step towards integrating these economies with each other and with the EU economy. Recent efforts have focused on improving trade facilitation, upgrading transport and connectivity infrastructure, and leveraging deep trade agreements within the region and with the EU.

World Bank research (2023) quantifies the economic and social benefits of regional economic integration in the Western Balkans using a general equilibrium model. It assesses the impacts of trade facilitation reforms, accession to the EU, and new infrastructure. The region's economic integration is essential for fully integrating with the EU, which is already the largest trading partner, with over 70 percent of exports from the region going to EU member states. The EU is also the biggest source of foreign direct investment (FDI) in the region, accounting for around 70 percent of total FDI and offering access to a market of more than 500 million high-income consumers.

3.2.4 SME in WB

Small and medium-sized enterprises (SMEs) contribute to the economic performance and sustainable and inclusive development of societies. SMEs in Albania, Bosnia and Herzegovina, Kosovo, Montenegro, the Republic of North Macedonia, Serbia, and Turkey (the seven pre-EU accession economies, note that Turkey ids not in scope of this Study) account for almost three quarters of private-sector employment and generate around 60% private-sector value added (OECD, 2022a).

Hit hard by the pandemic, the SME sector bounced back quickly. About half of enterprises in the Western Balkans had to suspend their business activity temporarily due to COVID-19. Nevertheless, the number of SMEs per 1000 inhabitants rose by 13% over the last couple of years. Governments expanded their range of advisory services and training (including on digitalization) to help SMEs weather the crisis. Newly introduced or further strengthened credit guarantee funds eased lending, while tax measures and debt moratoria relieved the debt burden.

SMEs have increasingly adopted digital tools. Successive pandemic lockdowns accelerated firms' adoption of digital technologies, including by SMEs, which increasingly integrated online sales channels. Governments in the region implemented programs that supported SME digitalization, including e-commerce. Nevertheless, SMEs in the region lag their EU peers when adopting more advanced digital transformation technologies (e.g., cloud computing services, AI, big data).

Progress was made in SMEs' greening through new financial incentives. Since 2019, financial incentives for greening available to SMEs have multiplied, albeit unevenly across the region. During the same period, the average regional share of SMEs offering green products or services increased by 5 percentage points to 25%, approaching the EU average of 32%. Most SMEs took at least one action to become more resource-efficient, often minimizing waste or saving energy or water.

While the role of green funds in supporting SME greening efforts has grown through dedicated programs and credit lines, they remain dependent on external financial support. Environmental aspects have rarely been included in post-COVID recovery programs, pointing to a lost opportunity to enhance SMEs' greening.

While SMEs are receiving more support to help grow exports and shift to higher value-added activities, a more systematic approach is needed. However, the provided support often takes the form of ad hoc educational and training activities rather than being integrated into a broader systematic approach. The focus is on enhancing the business environment to offer opportunities for self-employment and start-ups. The Western Balkan region faces high levels of long-term unemployment and youth not in employment or education, and low rates of employment for youth (15-to-24-year-olds), women, and low-skilled workers. At 34%, the average youth unemployment rate in the region was double the EU-27 rate (17%) in 2020.

[12] https://www.rcc.int/pages/143/common-regional-market

3.2.4.1 Conclusions for future work on greening SMEs

According to the OECD (2022a, 2022b), the following actions are important in this field:

- Ensure a level playing field for SMEs. All enterprises should compete under the same market conditions. Governments must improve the business environment: strengthening the rule of law, fostering transparency of business operations, ensuring regulatory stability, combatting corruption and improving the overall quality of public governance.
- Expand SME data collection and ensure regular evaluations. SME-specific data collection and co-ordination of the collection process should be improved, especially for interdisciplinary areas such as greening, digitalisation or access to finance.
- Boost digital transformation efforts and adopt user. Driven approaches to service delivery-Governments should adopt a wider framework for the digital transformation of society at large, involving a variety of stakeholders.
- Reinforce the SME greening momentum for sustainable development. Governments need to step up existing efforts for implementation and cross-sectoral policy co-ordination, while scaling up incentives and instruments for SME greening. Energy-price volatility and uncertainty, induced by recent external shocks, can generate specific challenges for the growth and survival of SMEs. At the same time, SMEs can be a source of innovative solutions to address these challenges.
- Boost entrepreneurial skills to help SMEs grow and contribute to social cohesion. Domestic SMEs are more likely to remain in low-value added sectors and create lower-paid jobs than are large enterprises. Government support for entrepreneurial learning and the development of enterprise skills is vital to help SMEs overcome potential financial and other barriers.
- Increase SME competitiveness through regional co-operation. Expanded regional co-operation represents a unique opportunity for Western Balkan economies to scale up and boost growth by making the most of intensified economic integration. Through resource- and knowledge-sharing networks, together with an enhanced regional trade, they are more likely to increase their productivity and competitiveness. Strengthened economic integration will also result in greater resilience to external shocks.

3.2.5 Status of environment and climate in the Western Balkans

The Western Balkan region is highly diverse in terms of its ecosystems, ethnic groups, religions, cultures, economies, and geographies, which include four of Europe's bio-geographical areas: Mediterranean, Central European, Alpine, and Pannonic. Several factors have contributed to environmental degradation in the WB region, including economic growth, industrial development, and modern consumption patterns. These factors are compounded by socio-economic challenges such as weak or recovering economies with limited budgets for addressing environmental protection issues, insufficient environmental regulation or implementation, limited public participation, poverty, limited access to cleaner technology and environmental information, and political tensions. These challenges have led to the pollution of soil, air, and water in the region.

Key environmental challenges on the regional level in the Western Balkans include threats to biodiversity, climate change mitigation and adaptation, degradation of water resources, high levels of air pollution, unsustainable infrastructure development, contamination of soil and water, trends towards more intensive farming in agriculture, poorly enforced waste and recycling legislation, and concerns related to mining and potential transboundary risks.

Despite significant improvements in the alignment of climate and greenhouse gas (GHG) emissions monitoring and reporting legislation and progress in air and water pollution areas in the last two years, the implementation of the EU acquis is still lagging in the WB. The overall air quality situation in the WB is still critical, with an often-upward pollution trend, despite decreases in PM10 and PM2.5 concentrations in certain areas. Due to its dominant impact on mortality, PM2.5 is considered the main pollutant to target in the WB. The energy sector, particularly coal-fuelled power plants, is the major source of SO2 and CO2 emissions and an important source of other pollutants, offering a concrete opportunity for co-benefits between air quality and climate policies.

The increase in intensity and frequency of summer heatwaves in the latest decades is an indicator of climate change in the WB and emphasizes the need to design appropriate adaptation plans to cope with it. The status of water bodies in the WB can generally be assessed as unsatisfactory, with a significant percentage failing to reach good status in both chemical (45%) and ecological (54%) assessments. Soil degradation, mainly through erosion and pollution, is prevalent throughout the WB region. A recent study by the Regional Cooperation Council reports an alarming increase in temperature in the region, with an observed temperature increase of 1.2 degrees Celsius soon, destined to warm further by 1.7 – 4°C and even exceeding 5°C by the end of the century, depending on global efforts in greenhouse gas (GHG) emission reduction.

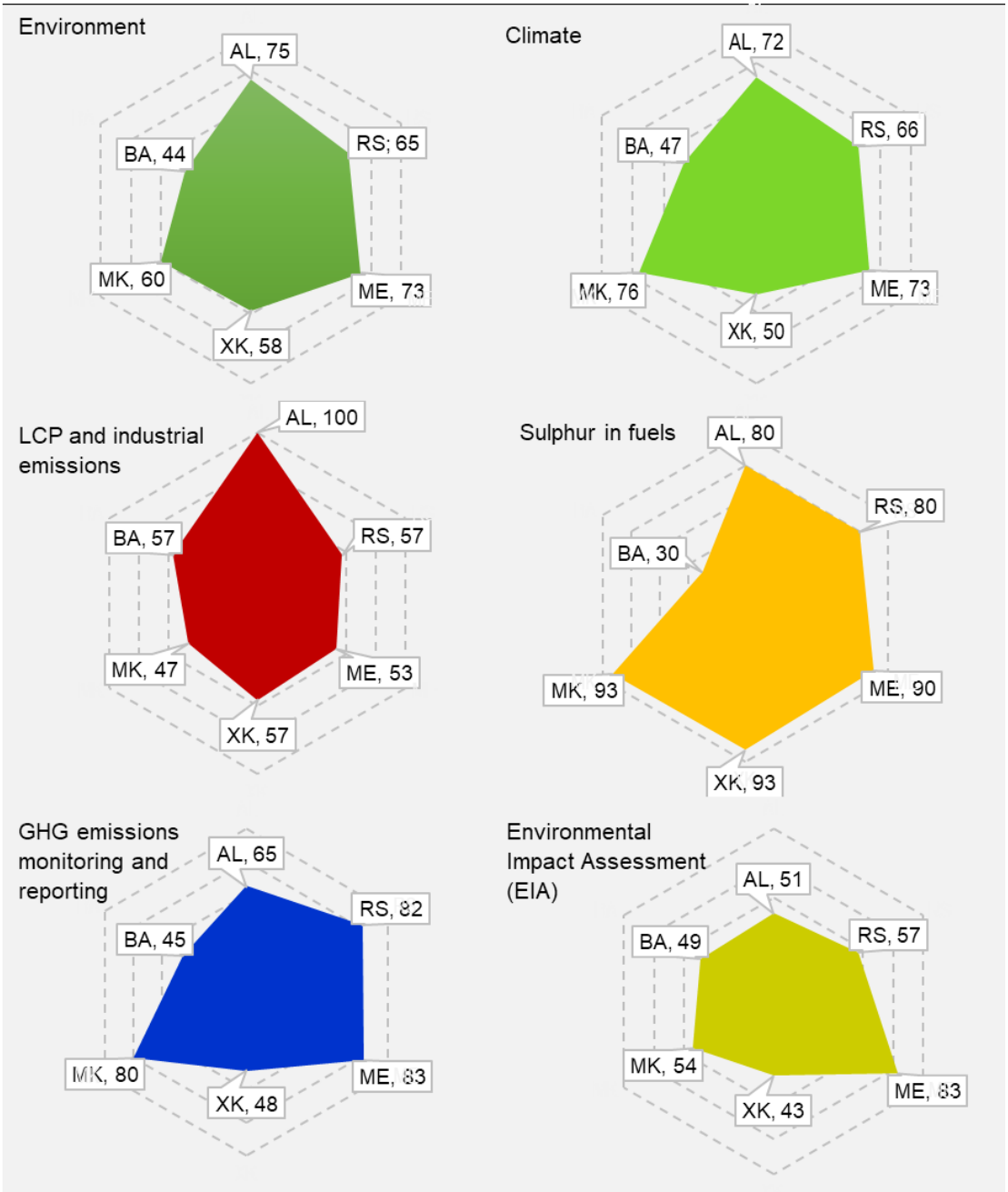
This would entail that most areas of the region will move from a Mediterranean climate to a sub-tropical, i.e. such as the one in present-day Middle East and North Africa. This type of climate is characterized by hot summers and mild drier winters. Extreme weather types, such as: 1) increase of heat waves, dry days, and extreme precipitation; 2) more pronounced rotation of severe drought and heavy rains, with appearance of extreme storms in summer that most likely cause flash floods; and 3) severe high winds and hail damage, are also expected to become more frequent.

The Western Balkans are particularly vulnerable to climate change due to a relatively high percentage of the population employed in weather and climate-related sectors, such as agriculture, forestry, and tourism, compared to Western and North Europe. The EU integration process is currently the main political driver of change in the region, also in the environment sector. The EU enlargement process provides opportunities for improving the environment in different ways but also entails a great challenge for the candidates and potential candidate countries.

3.2.6 Alignment with the EU environment and climate acquis in the Western Balkans

The level of alignment is expressed as a percentage of the target legislation according to the Energy Community methodology. The overall environmental performance in the WB ranges between 44% and 75%, indicating considerable progress in climate legislation alignment. In 2019, the advancement in this sector was 21% - 31%, while the latest values are in the range of 47% - 76% (Belis et al., 2022).

Figure 14. Alignment with the EU environment and climate acquis in WB (%), updated on 11/2021 (EnCS, 2021)

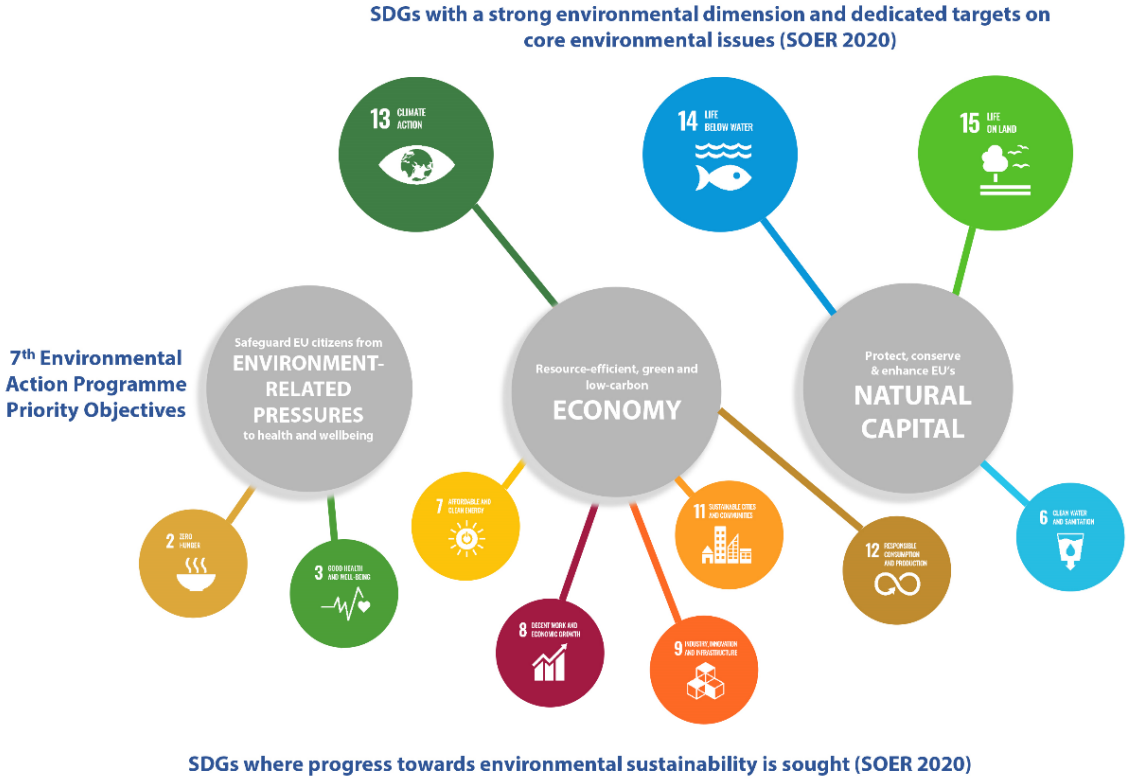


Source: EnCS, 2021.

3.2.7 Western Balkans and SDGs

The 2030 Agenda for Sustainable Development includes 17 global Sustainable Development Goals (SDGs) and 169 targets. This agenda aims to eradicate poverty, leave no one behind, and shift the world onto a sustainable and resilient path (European Environment Agency, 2020).

Figure 15. SDGs with an environmental dimension



Source: EEA compilation based on SOER 2020 (SOER 2020, p.58, 2019).

The report on SDGs and the environment in Europe by the EEA made up-to-date cross-country analysis into the focus and prioritisation of environmental action across Europe. It shows both the convergences and divergences towards environmental sustainability in Europe. The geographical scope of this publication includes 33 EEA member countries and 6 cooperating economies. It is useful for non-EU countries to compare their SDG processes against those of EU Member States as well for the EC to gain insights into environmental actions across Europe.

Accession to the EU is **Albania's** overarching priority and its most important strategic ambition is to moved towards achieving the SDGs. Albania's baseline report (published in 2018) underscores that the national strategic policy framework is most harmonised with the SDG targets in SDG 3 (good health and well-being); SDG 7 (affordable and clean energy); SDG 8 (good jobs and economic growth); and SDG 9 (industry, innovation, and infrastructure), while the least harmonisation is with SDG 14 (life below water). Albania submitted a VNR (Voluntary National Report) to the UN in 2018.

Bosnia and Herzegovina's SDG action is based on the elaboration and adoption of its SDG Framework. Under the auspices of the SDG Framework in B&H sub-group, which comprises representatives from relevant B&H institutions, at the entity and Brčko District level, extensive work has been carried out to design the SDG Framework. Bosnia and Herzegovina clusters its SDG implementation into the '5ps': people, prosperity, planet, peace, partnership. Under the 'planet' cluster, it aims to achieve protection from degradation, changes in consumption and production patterns, the sustainable management of natural resources and urgent action on climate change through implementation of SDGs 6 protection and sustainable use of water resources to ensure that drinking water is accessible, SDG 12 better use of environmental principles in business operations and respect for the principle of energy efficiency, SDG 13 combat the impacts of climate change on the country, SDG 14 ballast waters from maritime transport and SDG 15 sustainable management of forests, combatting desertification, halting and reversing land degradation and halting biodiversity loss. Bosnia and Herzegovina submitted a VNR to the UN in 2019.

As **Kosovo** is not a member of the UN, SDG actions are done mainly through the process of European integrations. Nevertheless, the UN Kosovo Team (UNKT) has set up the management structures in Kosovar institutions that will facilitate SDG integration into a key strategic planning process guided by the UN Common Development Plan (CDP). Key challenges regarding SDG actions with an environmental dimension in Kosovo are the lack of specific strategies and programmes as well as a lack of finance and institutional capacities.

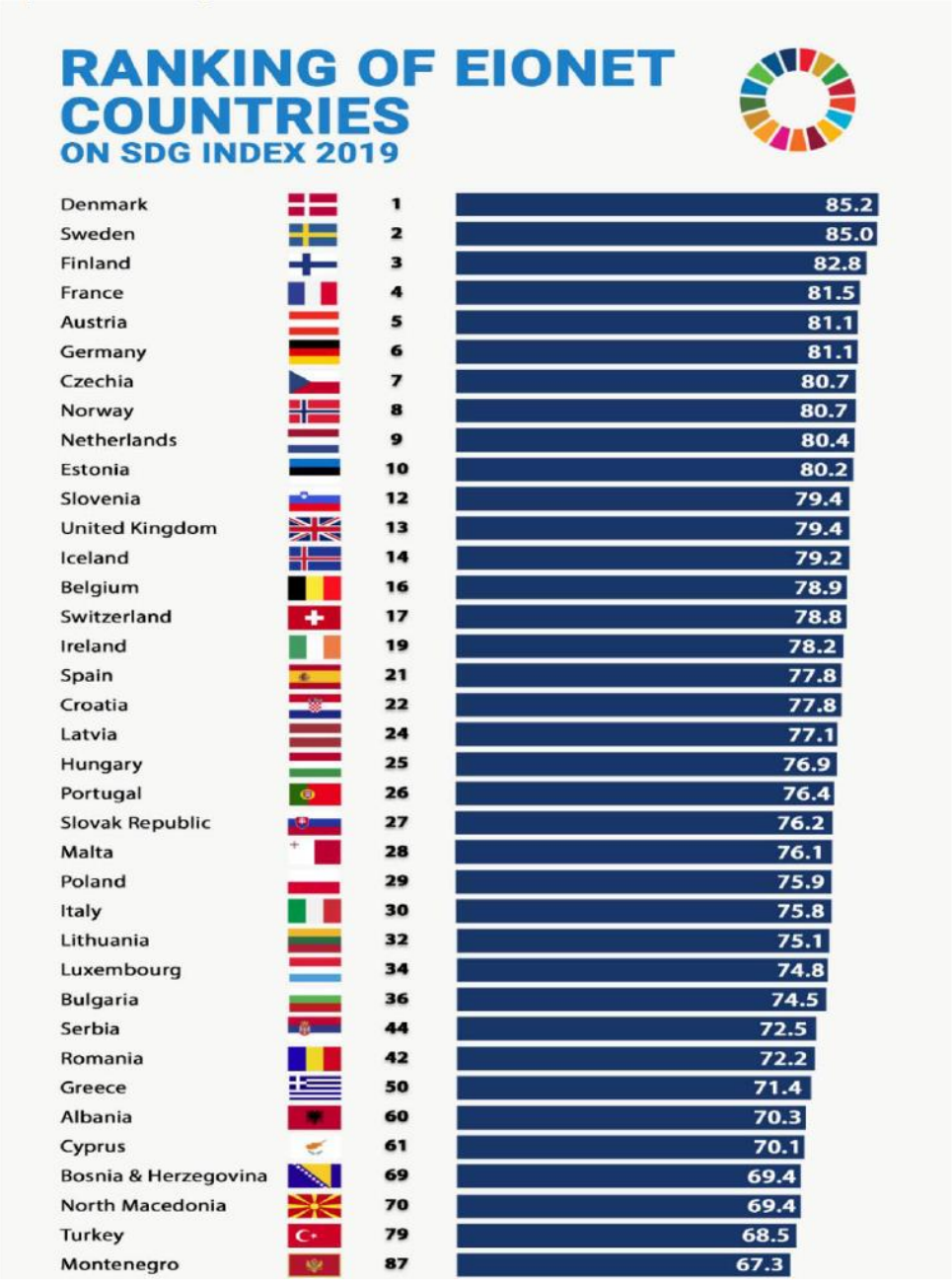
Based on the assessment of the state of national resources in the four-dimensional concept (human, social, natural and economic resources), as well as analysis of key unsustainable trends and the need for sustainable development by 2030, **Montenegro** adopted a 'DPSIR' approach (i.e. driver, pressure, state, impact, response) and identified priority areas and strategic goals to advance SDG action. By participating in international dialogue on the SDGs and Agenda 2030, Montenegro expressed its full commitment to the priority issues of sustainable development, such as: the introduction of a green economy, strengthening the efficiency of use of natural resources (SDGs 2, 3, 6, 7); climate change (SDG 13); conservation of sensitive ecosystems and coastal areas (SDGs 14, 15); and sustainable production and consumption (SDG 12). In addition to the SDG indicators developed by the UN, Montenegro's NSSD 2030 includes selected national indicators, indicators of relevant international organisations and cumulative indicators from the programme activities of the UN Development Programme in Montenegro. Montenegro submitted a VNR to the UN in 2016.

North Macedonia's Partnership for Sustainable Development UN Strategy positions environmental sustainability as one of four priority areas. The strategy sets out that, by 2020, individuals, the private sector and state institutions will base their actions on the principles of sustainable development, and communities will be more resilient to disasters and environmental risks. Under the partnership, this prioritisation will involve nine SDGs (SDGs 2, 3, 6, 7, 11, 12, 13, 14 and 15), reflecting the importance of environmental protection and resilience as per the 2030 Agenda (UN, 2016). All resident UN agencies, together with the UNECE, will support North Macedonia to adapt the SDGs to local conditions and to establish a system for tracking progress. Similarly, all UN agencies will support its alignment with EU standards and legislation, including through peer-to-peer exchanges with EU Member States.

Serbia has long been striving to integrate environmental protection and conservation objectives into several sectoral policies. The overall goal of all these activities is to support sustainable growth in Serbia, which will encourage innovation and competitiveness, protect the environment and health while ensuring that no one is left behind. Achieving the SDGs in Serbia is indivisible from the process of its accession to the EU. Set out in the National Plan for Adoption of the EU Acquis from 2018 to 2021, special attention is paid to harmonisation with the EU acquis, international standards, and implementation of agreements on six priority areas, including agriculture, environmental protection, and climate change as well as energy and industry. In discussions and the overall prioritisation process of the EU Instrument for Pre-accession Assistance (IPA) 2019 and 2020 programming, the key areas identified for support in the coming years are environmental protection and climate change. Furthermore, there is a special focus on continuing investments in infrastructure for processing waste as well as those in the reconstruction and modernisation of public facilities as part of efforts to improve energy efficiency (SDGs 2, 6, 7, 9, 12 and 13). In addition, Serbia considers the preservation of biodiversity (SDG 15) as the most important SDGs with an environmental dimension as it poses an obligation towards both the present and future generations. The country also recognises that the circular economy plays a major role in supporting SDG action, particularly on SDGs 9, 11, 12 and 13. Serbia submitted a VNR to the UN in 2019.

To providing country-level ranking and information for all 39 countries, the SDSN SDG Index for all UN member states is used as a reference as it provides the broadest country coverage. Based on this index, the top 10 countries in terms of progress to achieve the SDGs are all Eionet countries. In addition, Eionet countries represent 20 of the top 25 globally.

Figure 16. Ranking of Eionet countries on SDG Index 2019 with an environmental dimension



Source: EEA compilation based on 2019 SDG Index from SDSN and the Bertelsmann Stiftung Foundation.

3.3 Enlargement policy

Enlargement is the process whereby states join the European Union, after they have fulfilled a set of political and economic conditions. The EU is committed to the European perspective of the Western Balkans, has close links with the Western Balkans partners and cooperates with them in several important areas. [13] The EU also provides substantial assistance and financial support to the region.

At the EU-Western Balkans Summit held in 2003 in Thessaloniki, the EU reaffirmed that the future of the Western Balkans is within the EU. The Council (under the General Affairs Council configuration) establishes and supervises the EU enlargement process and the accession negotiations. The Council's latest conclusions on enlargement were approved on 13 December 2022. In line with the general framework of the Copenhagen political criteria,

[13] https://www.consilium.europa.eu/en/policies/enlargement/#Balkans

the Council stressed the need - in accordance with the 2006 renewed consensus on enlargement – for fair and rigorous conditionality and the principle of own merits.

3.3.1 Membership status of the Western Balkan economies

The Western Balkan economies are in different stages of the EU accession process. Most of them have the EU candidate status, while two are potential EU candidates. This section reviews the status of each of them.

- Albania

In 2009, Albania submitted its formal application for the EU membership. In October 2012, the European Commission recommended that Albania be granted the EU candidate status, which was awarded to the country in June 2014. In its June 2018 Conclusions, the EU Council outlined the path towards initiating accession negotiations in June 2019. The Commission reaffirmed the recommendation to commence accession talks in the Enlargement Package adopted in May 2019. In July 2022, the Intergovernmental Conference on accession negotiations was held with Albania. The Commission initiated the screening process.

The latest Progress Report, from 2022, indicates that Albania has made significant strides in meeting economic criteria, demonstrating good progress and moderate preparedness for developing a functioning market economy. However, inflation exceeded the target. Increased digitalization of public services, improved financial inclusion, and strengthened labor inspections have positively impacted the business environment and formalization of the economy. Despite these advancements, the informal economy remains substantial. Albania has made some progress and is moderately prepared to address competitive pressure and market forces within the EU.

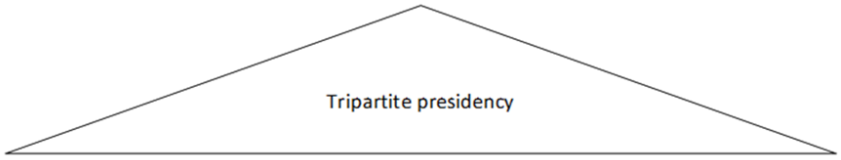
Advancements in energy and transport infrastructure, digitalisation and education have been noted, but there is still a deficiency in entrepreneurial and technological know-how. Investment needs persist in human and physical capital, skills development, and education, with low research and development spending.

Albania has achieved a moderate level of preparation in various areas related to competitiveness and inclusive growth, including digital transformation, media, taxation, economic and monetary policy, enterprise and industrial policy, as well as education and culture. While there is some level of preparation in social policy and employment, research and innovation, and progress in education, the adoption of the new National Strategy for Education and Action Plan 2021-2026, progress has been limited in the realm of economic and monetary policy.

- Bosnia and Herzegovina

Bosnia and Herzegovina – along with other Western Balkans economies – was identified as a potential candidate for the EU membership in June 2003. The Stabilisation and Association Agreement (SAA) has been ratified and entered into force on 1 June 2015. Bosnia and Herzegovina applied for the EU membership in February 2016, while in June 2022 the European Council expressed its readiness to grant the status of a candidate country to Bosnia and Herzegovina.

Figure 17. Administrative structure of Bosnia and Herzegovina



Federation of Bosnia and Herzegovina	Brcko District	Republika Srpska
Cantons (10)		
Municipalities (74)		Municipalities (63)

Source: Galic and Hollanders (2022).

Regarding economic criteria, Bosnia and Herzegovina is in the early stages of establishing a functioning market economy. Cooperation and coordination of economic policymaking at the state level and among the entities have further deteriorated, leading to a fragmented internal market. The country's Economic Reform Programme lacks sufficient credible, nationwide measures to address major structural economic challenges, including the

business environment, the informal economy, public enterprises, the green and digital transitions, and unemployment. Overall, the country's economic performance remains below its potential due to political stalemate, an overly short-term orientation, and a lack of focus on policy measures to foster growth.

Bosnia and Herzegovina is still in the early stages in terms of its capacity to cope with competitive pressure and market forces in the EU, with no significant progress made in this area. The quality of education remains low, and insufficient action has been taken to improve transport and energy infrastructure.

Bosnia and Herzegovina is at an early stage or has some level of preparation in its ability to fulfill the obligations of EU membership. The country needs to significantly enhance alignment with the EU acquis, implement and enforce necessary legislation, and make progress on various EU acquis chapters. Limited to no progress was made on different EU acquis chapters during the reporting period.

The country needs to implement additional protocols to the Central European Free Trade Agreement (CEFTA) on trade facilitation and trade in services and swiftly adopt the additional protocol on dispute settlement. Bosnia and Herzegovina continues to actively participate in regional cooperation and maintain good neighborly relations.

- Montenegro

In 2008, Montenegro applied for the EU membership. In December 2011, the EU Council launched the accession process with a view to opening negotiations in June 2012. After eight years of negotiations, all 33 screened chapters have been opened, with three provisionally closed.

On the economic criteria, Montenegro has made good progress and is moderately prepared to develop a functioning market economy. Following a sharp recession in 2020, the economy rebounded strongly in 2021 and maintained steady growth in the first half of 2022. Inflation increased significantly due to surging global commodity prices. The government adopted the 'Europe Now' fiscal reform program to support post-pandemic recovery and provided stimulus measures to ease the burden on households from rising energy and food prices.

Montenegro has made some progress and is moderately prepared to cope with competitive pressure and market forces within the EU. Efforts to improve innovation capacities and initiate a green and digital transition have been made in the last two governments. However, the education system still faces challenges due to a chronic shortage of science, technology, engineering, and mathematics (STEM) graduates.

On good neighborly relations and regional cooperation, Montenegro generally maintains good bilateral relations with other enlargement economies and neighboring EU Member States. The country actively participates in regional cooperation.

Regarding Montenegro's ability to assume EU membership obligations, the country continues to work on alignment with the EU acquis in many areas, but overall progress is limited.

- North Macedonia

In 2003, North Macedonia was identified as a potential candidate for EU membership. Its Stabilization and Association Agreement, the first in the region, has been in force since 2004. The country applied for the EU membership in March 2004. In July 2022, the Intergovernmental Conference on accession negotiations was held with North Macedonia, and the screening process began. On July 19, 2022, the first Intergovernmental Conference on accession negotiations took place following the approval of the Negotiating Framework by the Council.

On the economic criteria, North Macedonia has made some progress and has achieved a good level of preparation for developing a functioning market economy. The government implemented fiscal measures in early 2022 to counter the negative impact of rising food and energy prices, although there is room for improvement in targeting these measures.

There was further progress in improving vocational education and training, but significant skills shortages persist. Gaps in transport and energy infrastructure, low investment and innovation spending, and the need for a broader offering of public e-services are hindering the country's growth potential.

In terms of competitiveness and inclusive growth, North Macedonia is moderately prepared in most areas but needs additional efforts, particularly in digital transformation and media, as well as education and culture.

On the Green Agenda and sustainable connectivity, North Macedonia has achieved a good level of preparation in trans-European networks, with some progress in environment and climate change. Substantial efforts are needed in energy, transport policy, and trans-European networks, urging accelerated implementation of the Economic and Investment Plan and the Green Agenda for the Western Balkans.

- Kosovo

Kosovo is the potential EU candidate. In 2008, the EU expressed its willingness to assist Kosovo's economic and political development through a clear European perspective. The EU contributes to stability in Kosovo through the EULEX rule of law mission and a Special Representative.

Kosovo has made some progress on economic criteria and is at an early stage in developing a functioning market economy. Limited progress has been made in coping with competitive pressure and market forces in the EU. Challenges include improving the quality of education, addressing skill gaps in the labor market, and addressing concerns about the coal-based, outdated, and unreliable energy supply.

Kosovo has made some progress in competitiveness and inclusive growth, with additional efforts needed in areas such as digital transformation and media, as well as education and culture. Limited progress has been made in research.

On the Green Agenda for the Western Balkans and sustainable connectivity, Kosovo has made some progress in transport and limited progress in energy, environment, and climate change. In resources and agriculture, Kosovo has made some progress in food safety, veterinary policy, and phytosanitary policy but limited progress in agriculture.

Overall, Kosovo needs to improve administrative capacity and coordination across all sectors for effective implementation of the EU acquis.

- Serbia

Serbia is the EU candidate country. In 2008, a European partnership for Serbia was adopted, outlining priorities for the country's EU membership application, and in 2009, Serbia formally applied. On January 21, 2014, the 1st Intergovernmental Conference took place, signaling the formal start of Serbia's accession negotiations. So far, 22 out of 35 chapters have been opened, including all chapters under cluster 1 on the fundamentals of the process and cluster 4 on the Green agenda and sustainable connectivity, with two provisionally closed.

On the economic criteria, Serbia is between a good and moderate level of preparation and has made some progress in developing a functioning market economy.

Regarding Serbia's ability to assume EU membership obligations, the country continues work on alignment with the EU acquis in many areas, particularly in company law, intellectual property rights, research and innovation, and financial control.

The competitiveness and inclusive growth cluster is closely linked to Serbia's Economic Reform Programme, with progress made in several areas. Efforts include steps towards establishing the Youth Guarantee scheme, improvements in the budget process, action plans for the strategy on state ownership and management of business entities, development of the startup ecosystem, and steps towards compliance of the quality assurance system in higher education with ENQA recommendations.

3.4 Green Agenda for the Western Balkans

The European Green Deal, approved in 2020, set the new path that also needed to involve the six Western Balkan economies. By signing the Sofia Declaration on the Green Agenda for the Western Balkans in October 2020, leaders from the WB region recognised the importance of the European Green Deal (EGD), which is the EU's new growth strategy towards a modern, climate neutral, resource-efficient, and competitive economy. For this acknowledgement to materialise in practice, the leaders of the Western Balkans economies also agreed to incorporate elements of the EGD into all interrelated sectors and policies, based on the European Commission's Guidelines, with the common goal of developing carbon-neutral and sustainable economies in the region.

The European Commission working document[14] outlines in more detail the actions related to the Green Agenda for the Western Balkans (GAWB) included in the Communication on an Economic and Investment Plan for the Western Balkans adopted by the European Commission. It further details the five pillars of the Green Agenda:

1. climate action, including decarbonisation, energy, and mobility,
2. circular economy, addressing waste, recycling, sustainable production, and efficient use of resources,
3. biodiversity, aiming to protect and restore the natural wealth of the region,
4. fighting pollution of air, water, and soil, and
5. sustainable food systems and rural areas.

Digitalisation will be a key enabler for the above five pillars in line with the concept of the dual green and digital transition.

One of the important elements in the Sofia Declaration relates to the Economic and Investment Plan, designed for long-term support toward green and sustainable economy that would bring the region closer to the European market. With the population of almost 18 million, the Western Balkan region is an important market for the EU and a transit area for European and international goods, with qualified workforce and economy ready for investments. For these reasons the Western Balkan economies have a key role in the global value chains supplying the EU.

The Green Agenda includes important objectives that are clearly inter-related, representing an ambitious and complex agenda for the Western Balkan governments.

The legislative framework regarding the most important issues has been prepared and adopted, but most economies have not yet implemented the necessary reforms. According to prevalent assessments (e.g., by the European Commission, the Energy Community Secretariat, the European Bank for Reconstruction and Development, the OECD and the World Bank), the Western Balkans are today at *the very beginning of their green transition*. Although governments have adopted specific laws that provide the legal and regulatory frameworks regarding energy and climate, these frame works are incomplete, while some of the legislation is outdated (Table 7). Moreover, many of these laws have not yet been implemented and enforced (Aspen Institute, 2023).

[14] COM(2020) 641

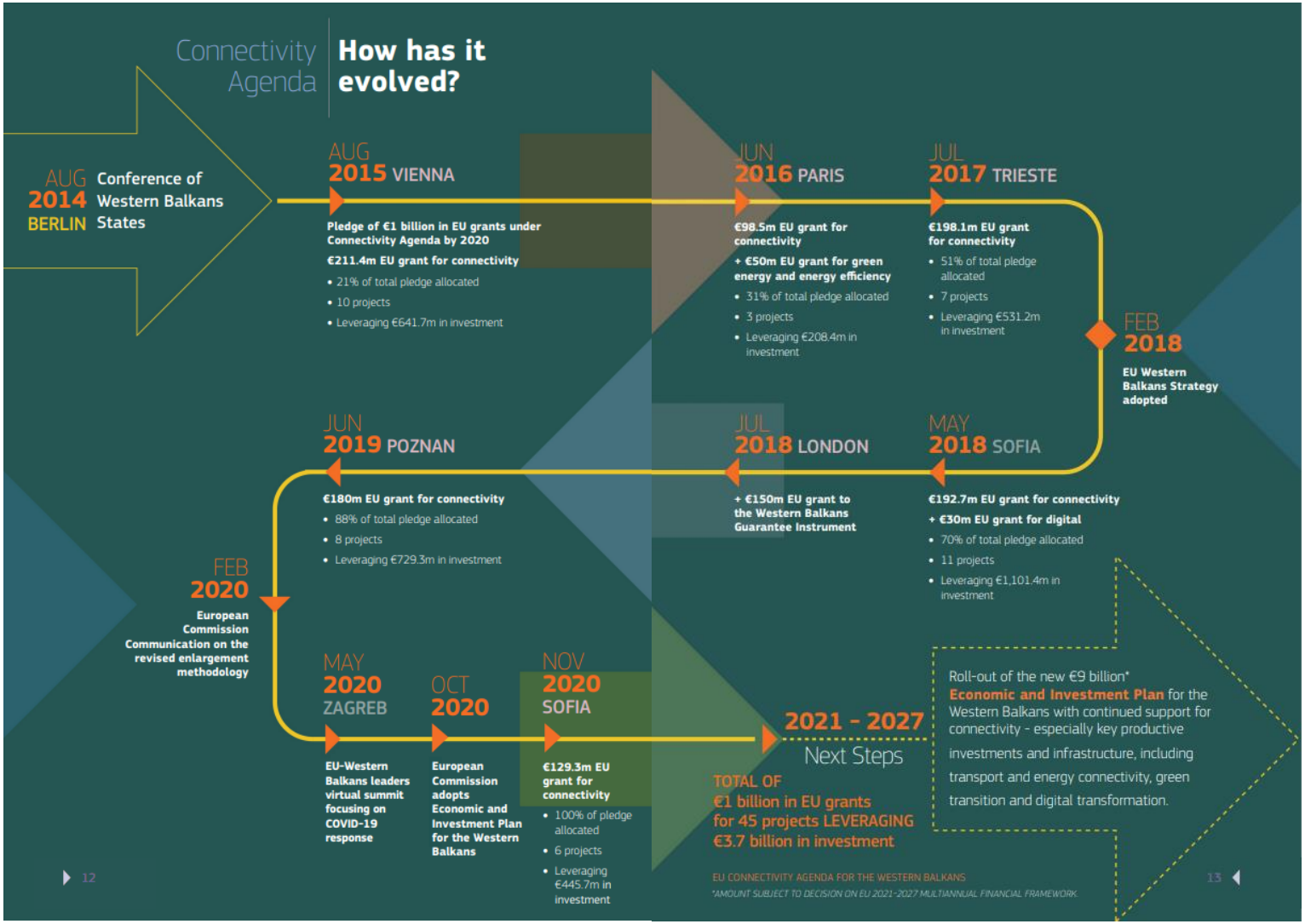
Table 7. Western Balkans' strategic and legislative frameworks on energy and climate

	Energy Strategy	Low-carbon Development Strategy	Climate-change Law	Energy Efficiency Strategy	Renewables Development Strategy
Albania	National Energy Strategy 2018-2030	National Climate Change Strategy (endorsed in 2019)	Law on Climate Change (adopted in December 2020)	National Energy Efficiency Action Plan expired in 2020	National Action Plan for Renewable Energy Resources in Albania 2019-2021
Bosnia and Herzegovina	Framework Energy Strategy 2035	Climate Change Adaptation and Low Emissions Growth Strategy 2025	–	Action Plan for Energy Efficiency of Bosnia and Herzegovina 2019-2021 (NEEAP BiH) (final draft)	National Renewable Energy Action Plan 2020
Kosovo	Energy Strategy 2017-2028	Climate Change Strategy 2019-2028 and Action Plan on Climate Change 2019-2021 (approved)	–	National Energy Efficiency Action Plan (NEEAP) 2019-2021 (draft)	National Renewable Energy Action Plan (NREAP 2011-2020)
North Macedonia	Energy Development Strategy 2030	Long-term Strategy on Climate Action and National Action Plan on Climate Change (drafts)	Law on Climate Action (draft)	Fourth National Energy Efficiency Action Plan (NEEAP) (adopted)	Renewable Energy Action Plan Until 2025
Serbia	Energy Sector Development Strategy for the Period until 2025; Energy Development Strategy 2040 (draft ongoing)	Draft low-carbon development strategy	Law on Climate Change (adopted in 2021)	Fourth National Energy Efficiency Action Plan (NEEAP) (until 2021) (adopted)	National Renewable Energy Action Plan 2020 (adopted in 2013)

Note: green colour denotes approved and valid document, black – valid document that requires revision, blue – draft document, not yet approved, red – expired document.
Source: Adapted from OECD, Multi-dimensional review of the Western Balkans. From analysis to action, April 2021, section 14.2.

The figure below shows how the process has evolved from its inception in 2014 in Berlin (i.e. the Berlin Process):

Figure 18. Process for implementation green deal in the Western Balkans



Source: European Union, 2021.

The European Commission with the Economic and Investment Plan proposes the mobilization of 9 billion euros, funds through the IPA III programme for the 2021-2027 period to support the economic convergence with the EU by increasing national competition, inclusive growth and green and digital transition. In addition to these grants, the plan also creates a guarantee facility for the Western Balkans that could support investments of up to 20 billion euros in total. The Economic and Investment Plan for the Western Balkans focuses on investment in 6 (six) key areas:

1. Sustainable transport;
2. Production of energy;
3. Environment and climate ;
4. Digital transformationa;
5. Private sector;
6. Human capital.

The implementation plan for the Western Balkan economies is focused on five pillars[15]:

1. Decarbonization: Climate, energy and mobility, commitment to achieve together with the EU a carbon neutral continent by 2050 through the adoption of strict climate policies and reforms in the energy and transportation sector. This flagship will particularly focus on:
    - Harmonisation of national legislation on climate change with the EU regulations and development of integrated national energy and climate plans.
    - Decoupling of economic growth and resource consumption that would lead to greater resistance of economy to climate change and would decrease the risk of disasters.
    - Preparations to introduce the Emission Trading Scheme (ETS) and carbon pricing, which means that the polluters who surpass the permitted quantities of CO2 emissions will have to pay.
    - Reviewing and revising, where necessary, all relevant legislation to support progressive decarbonisation of the energy sector.
    - Preparing an assessment of the socio-economic impact of decarbonisation at the individual economy and regional level.
    - Giving advantage to energy efficiency and improving it in all sectors, with a particular focus on energy renovation of buildings.
    - Increasing the percentage of renewable energy sources and reducing energy poverty.
    - Increasing the share of renewable energy sources and provide the necessary investment conditions.
    - Any increase of biomass combustion must be done with due consideration to air pollution impacts.
    - Decreasing and gradually phasing out coal subsidies, strictly respecting state aid rules.
    - Ensuring participation in the Coal Regions in Transition initiative for the Western Balkans.
    - Developing programmes for addressing energy poverty and financing schemes for household renovation and providing basic standards of living.
    - Supporting smart infrastructure, digitalisation of all types of transport, defining new corridors in rail transport and introducing new alternative fuels (hydrogen).
    - Supporting development of smart transport infrastructure, promoting fostering of innovative technologies (such as paperless transport, artificial intelligence, multimodal passengers ticketing, mobility as a service, border/boundary crossing applications).
    - Increasing regional cooperation in the area of alternative fuels infrastructure development.
2. Circular economy, that is to say moving from linear consumption of resources, to their recycling and reuse and creating minimum or zero waste. The actions should focus on:
    - Improving sustainability of primary production of raw materials.
    - Applying an industrial ecosystem approach to attain environmentally sustainable balanced economic recovery.
    - Developing circular economy strategies looking at the entire lifecycle of products.
    - Making further progress in the construction and maintenance of waste management infrastructure for cities and regions.

[15]Regional cooperation council ; Action Plan For The Implementation Of The Sofia Declaration On The Green Agenda For The Western Balkans 2021-2030, Sarajevo, 04th October 2021

- Designing and implementing consumer-targeted initiatives to raise awareness of citizens on waste prevention, separate collection and sustainable consumption.
- Concluding and implementing a regional agreement on the prevention of plastic pollution, including specifically addressing the priority issue of marine litter.
- Further implementing Smart Specialisation Strategies, place-based, innovation-led transformation agendas for sustainability.
- Within this pillar, each country should develop a strategy for circular economy that would cover the entire life cycle of a product. This means that waste production should be prevented and if there is waste, technologically advanced waste management should be used, it should be recycled, reused and remanufactured.

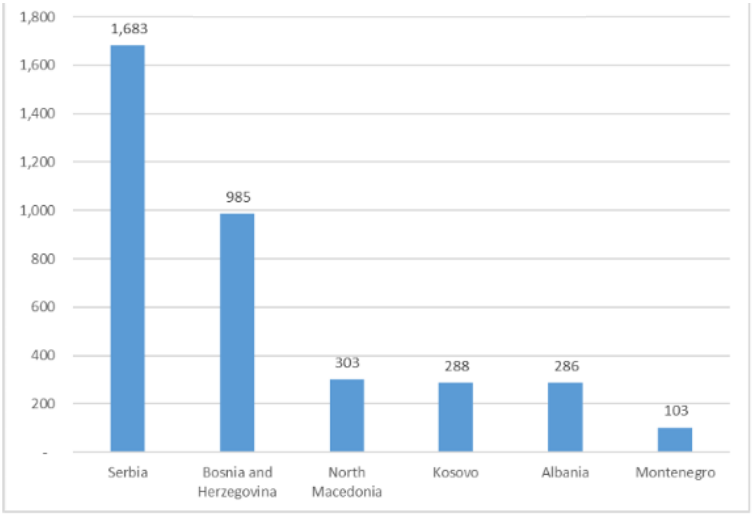
Figure 19. The circular economy model[16]

Source: European Parliament Research Service.

3. Reducing pollution of air, water and soil will be one of the flagships that all WB economies will have to achieve. As one of the most polluted regions in Europe, the expenses of the healthcare system are far greater than those in the EU and this requires work. The figure below shows the cost of pollution impact on health.

[16] https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits

Figure 20. Cost of pollution impact on health in the Western Balkans in 2016 (in millions EUR)



Source: Regional Cooperation Council

As per the Action Plan for Implementation of the Green Agenda, it will be necessary in all WB economies to:

- Finalise the process of ratification of the Convention on long-range transboundary air pollution.
- Support modelling to establish economy-wide emission reduction commitments for the five main pollutants covered by the NEC Directive and the Gothenburg Protocol under the Convention on Long-range Transboundary Air Pollution.
- Develop and implement a Strategy on air quality and use the best available technologies in line with the Industrial Emissions Directive.
- Establish a system for monitoring air quality.
- Construct the necessary infrastructure for waste water treatment.
- Implement relevant EU water-related acquis (Water Framework Directive, Urban Waste Water Treatment Directive and Nitrates Directive).
- Integrate soil protection in other laws and regulations as well establish a regional soil partnership.

4. Sustainable food production and farming is the fourth important pillar that the EU believes requires serious improvement in the Western Balkan economies, having in mind that this sector contributes around 10% of the gross domestic product (GDP), while in some economies the percentage of workforce in this sector is up to 20%. Even though this region is rich in resources, there are major structural problems in farming so the following activities are envisaged:

   - Harmonisation of the farming sector and food production with EU standards on food protection and safety, animal health and prevention of diseases.
   - Strengthening of sanitation controls in the whole food chain and improve the traceability and labelling of food products.
   - Promotion of environmentally-friendly (zero pollution) and organic farming and reduction of synthetic chemical products used in food production.
   - Cooperation with scientific, education, business and agricultural holdings to facilitate transfer to innovative and environmentally friendly technologies and farming methods.
   - Raising awareness about sustainable food production and promote organic production.
   - Reducing use of chemical products in food production such as pesticides, veterinary drugs and fertilizers.
   - Reducing waste along roads and rivers and modernising the sector.

5. Biodiversity – protection and restoration of ecosystems in the Western Balkan economies should also be harmonised with the EU legislation. Having in mind that the region is rich in endemic species of animals and environments, it must be preserved and restored with the following activities:

- Supporting the region to develop and implement a plan for biodiversity until 2030 for the Western Balkans. Developing and implementing the Western Balkans 2030 Biodiversity Strategic Plan.
- Developing the Western Balkans Biodiversity Report.
- Supporting the development and implementation of a plan for forest restoration.
- Strengthening the mechanisms for regional cooperation for biodiversity conservation and preservation and inclusion of the United Nations Rio Convention.
- Setting up the Western Balkans Biodiversity Information Hub to improve knowledge exchange and availability of information.
- Putting in place the Biodiversity Monitoring and Evaluation Framework.
- Developing Green Infrastructures and ecosystem connectivity.

The implementation of the Agenda will be challenging for Western Balkan policy makers, given that the Western Balkans stands far behind the EU in terms of environmental progress. The policies needed to achieve the Agenda and the main points of the Agenda itself are summarised in the Table below. As can be seen, most of the policies relate to the agricultural sector, although some relate to energy, transport, sewerage and manufacturing.

Table 8. Policies related to fulfilling the Green Agenda in the Western Balkans

Five pillars	Policies related to				
	Energy	**Transport**	**Agriculture**	**Sewerage**	**Manufacturing**
Decarbonisation	Carbon pricing; energy investment and infrastructure; clean energy transition	Revitalisation of the rail network; employing intelligent transport system; improving transport logistics			
Circular economy	Alignment with the EU industrial supply-chain policy				
Depollution			Wastewater treatment; reuse of water in agriculture	Urban wastewater collection and treatment	
Sustainable food systems and rural areas			Agri-food and primary production alignment with EU standards; organic farming, sustainable food consumption		Food processing
Biodiversity			Preventing deforestation and illegal logging		

Source: Jovanovic and Vujanovic (2023)

The implementation of all activities envisaged with the Green Agenda and the Action Plan will require excellent financial management, good communication with financial institutions and donors, as well as impeccable transparency in spending for greater mutual trust among all stakeholders.

3.4.1 Decarbonisation and energy transition

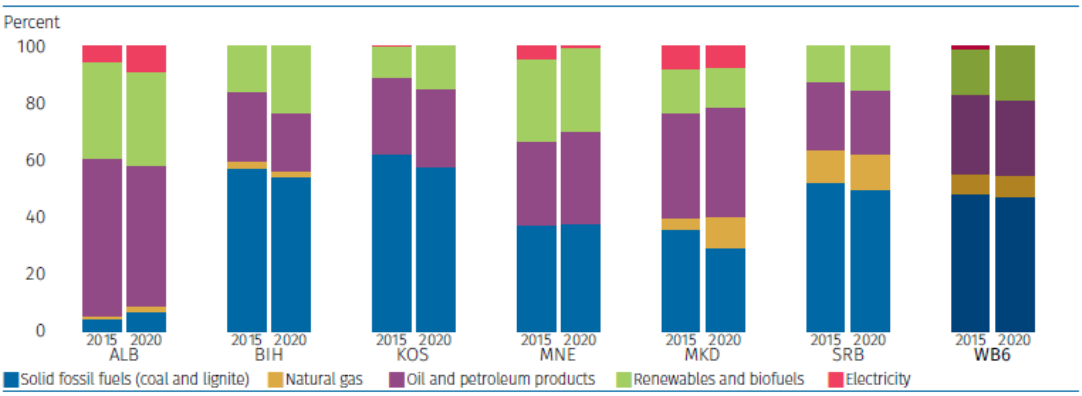
According to the International Energy Agency, the transition toward a low-carbon, environmentally sustainable economy has begun in the Western Balkan economies, but progress has been slow and not without setbacks.

Despite recent progress green energy transition based on wind and solar capacity additions, as well as the increased availability of renewable energy finance, the primary source of energy in the Western Balkans – except for Albania – is still domestic lignite and coal (64 percent of electricity in the Western Balkans was produced from lignite and coal in 2020 and 47 percent of gross available energy in 2020, down from 49 percent in 2015). The Western Balkans' coal-heavy energy mix, coupled with low levels of energy efficiency, results in high levels of air pollution.

A quadruple energy crisis has hit the Western Balkan economies hard in the past year, stalling progress and investment in key strategic areas but also highlighting the need for more diversified energy sources and strengthened cross-border interconnections. In addition to high prices of electricity imports, quadruple energy crisis refers also to the parallel occurrence of a series of technical problems at coal power plants and mines (primarily in Kosovo, North Macedonia, and Serbia), unfavorable conditions for hydropower production (impacting all Western Balkan economies but mostly Albania), and an increase in biomass prices in all economies.

The negative consequences of high fossil fuel dependency, high energy intensity and outdated technology use in the Western Balkan are clearly visible beyond the direct economic impacts.

Figure 21. Western Balkans' energy mix: Gross available energy by product, 2015 and 2020



Note: Gross available energy is defined as the overall supply of energy for all activities on the territory of the country. Note that for derived products (electricity), the chart shows only stock changes and international trade, as the original primary form of supply is accounted for in the form of the respective primary product.

Source: Eurostat.

On the supply side, aging coal power plants and the use of biomass cause significant air pollution. Similarly, on the demand side, poor energy efficiency in buildings and heating also contributes to poor air quality. All Western Balkan economies have failed to comply with air pollution limits set in their National Emission Reduction Plans (NERPs) where applicable, also due to a lack of enforcement of pollution limits outlined in those plans. A majority of the Western Balkan economies' power fleet is over 40 years old, with few plants scheduled for decommissioning and new plants in the pipeline. Specifically, legal limit values for sulfur dioxide (SO2) from coal power plants are frequently breached. Coal combustion is the second-largest source of PM 2.5 emissions in the region22. In 2019, annual mortality rates due to PM2.523 air pollution in the Western Balkans were more than double the EU-27 average, with mortality rates in Bosnia and Herzegovina 140 percent above those in the EU-27 average.

This includes phasing out coal subsidies, market-based renewables support, and Just Transition work for coal regions in the Western Balkans.[17] The Sofia Declaration also specifically calls for "continued alignment with the EU Emissions Trading Scheme," as well as working toward "introducing other carbon pricing instruments to promote decarbonization in the region." Through the Energy Community, the Western Balkan economies have furthermore committed to reforming electricity and gas markets, providing common rules for an internal power market, as well as cross-border cooperation. They also committed to diversifying their energy sources with renewables and energy efficiency targets, as well as working on more open and fairer retail markets.

In Western Balkan economies, energy production via renewable sources is close to or even higher than the EU average. However, Serbia, North Macedonia, and Kosovo rely heavily on coal, and hence they will face greater challenges to reach the decarbonization goal. In the wake of the energy crisis stemming from the cut of the supply of Russian gas to Europe, the energy transition is gaining importance. In view of all these factors, the decarbonization goal in the Western Balkans can be achieved only by strong public investment in renewable energy, as well as government support for private initiatives in the same direction, through appropriate industrial policy measures.

[17] https://balkangreenenergynews.com/heres-what-western-balkans-committed-to-in-sofia-declaration-on-green-agenda/

3.4.1.1 Just transition

Coal is the backbone of the energy systems in the region. Kosovo, Serbia, and Bosnia and Herzegovina are among the world's top ten economies in terms of the share of coal in their electricity production, at 95 percent, 67 percent, and 65 percent, respectively. North Macedonia (51 percent) and Montenegro (41 percent) have relatively more balanced energy mixes, while Albania uses no coal in its domestic electricity generation (see Figure 21). In 2017, the 18 gigawatts of installed electrical capacity in the region were almost evenly divided between coal-fired TPPs and hydropower plants. At present, however, coal accounts for 70 percent of the electricity produced in the Western Balkans.[18]

To address the challenges local societies face because of the transition away from fossil fuels, the EU introduced the Just Transition Mechanism, aimed at mobilizing more than EUR 100 billion in the 2021 to 2027 budget period. It consists of three pillars: a Public Loan Facility (via the European Investment Bank), the Invest EU instrument to support investments of the private sector, and the Just Transition Fund (JTF). [19]

Furthermore, the transition is even harder for the Western Balkan economies than for the EU Member States because of their weaker financial situation and the very high dependence of most economies in the Western Balkans on coal, as well as more pronounced coal-related air pollution levels, which significantly exceed legal limits. According to the latest reports, all the Western Balkan economies that use coal have failed either to comply with the air pollution limits set by their National Emission Reduction Plans (NERPs), emitting much higher quantities of pollutants, or, in the case of Montenegro, to close the country's only coal plant after the expiration of its limited lifetime derogation. In fact, it was found that in 2020, the 18 coal power plants in the Western Balkan economies emitted 2.5 times higher quantities of SO2 than the 221 coal power plants in the EU combined. This, in turn, causes thousands of air-pollution-related deaths in the Western Balkans economies as well as in many other countries in the EU.

According to the European Commission, a total of 138,000 jobs are linked to coal in the six Western Balkan economies and Ukraine: 89,500 in the mining industry and 48,500 in coal-based TPPs. Phasing out coal in line with EU policies could lead to the loss of 0.4 percent of all jobs in Montenegro, 0.5 percent in North Macedonia, 0.6 percent in Serbia, 1.3 percent in Bosnia and Herzegovina, and 1.4 percent in Kosovo. In the latter two cases, coal accounts for a higher percentage of employment than in coal-dependent Poland, where the share stands at 0.7 percent.

Job losses because of decarbonization call for national just transition plans. A just transition incorporates the "leave no one behind" principle of the agenda 2030, and is one of the preconditions to achieve the clean energy and decarbonization objectives of the GAWB in a sustainable and socially fair manner. Just transition is integrated into the Paris Agreement which points to "the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities." It should provide new employment and decent work as well as social safety nets for affected workers, communities, and regions (Aspen Institute, 2021).

In 2021, the EU Commission launched the Secretariat of a new initiative for coal regions in transition in the Western Balkans and Ukraine.[20] The Secretariat of a new initiative to help coal regions in the Western Balkans and Ukraine transition away from coal towards a carbon-neutral economy has been launched by the EC. Mirroring the successful EU Initiative for coal regions in transition, the newly established secretariat will deliver support to coal regions in Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia and Ukraine. Seventeen regions with significant coal mining activities and coal-based energy production will be the key beneficiaries. The initiative's secretariat will provide direct support for its implementation and ensure collaboration across the diversity of institutions and actors that the initiative will engage.

The new initiative builds on the experiences of the initiative for coal regions in the EU, which has connected stakeholders, provided technical assistance, and developed support materials for affected regions since 2017. These activities focus on the EU's just transition efforts, which aim to alleviate socioeconomic consequences of

[18] https://carnegieeurope.eu/2023/10/09/green-transition-and-western-balkans-pub-90730

[19] The Green Tank and CEE Bankwatch Network (2021), A Just Transition Fund for the Western Balkan countries. Copyright © The Green Tank, 2021 https://thegreentank.gr/

[20] https://commission.europa.eu/news/commission-launches-secretariat-new-initiative-coal-regions-transition-western-balkans-and-ukraine-2021-02-15_en

transition, while promoting the development of new, future-oriented economic activities. The two initiatives will benefit from manifold synergies and support each other's implementation.

An initial screening has identified at least 17 regions with significant coal mining activities and coal-based energy production that are eligible to participate in the initiative. Their participation in the activities of the initiative is voluntary, and while 17 regions have been identified, it will remain at their discretion to actively engage.

Moreover, the initiative is open to any region with coal mining activities and possibly coal use for energy purposes in the WB six economies covered by the initiative. Regions with no ongoing coal mining activities but with a significant reliance on coal for energy production (like electricity, heat) would also be considered eligible for this initiative on a case-by-case basis.

Table 9. Coal Regions in the Western Balkans

REGION	**ECONOMY**
Tuzla canton, Srednjobosanski canton, Zeničko-Dobojski canton, Ugljevik region, Gacko region	Bosnia and Herzegovina
Prishtina	Kosovo
Pljevlja Region	Montenegro
Bitola region, Kičevo region	North Macedonia
Kostolac region, Kolubara region, Obrenovac region, Pomoravlje region	Serbia

The initiative will provide an open platform allowing region-wide, multi-stakeholder dialogue. It will create a space for sharing experiences, knowledge and best practices on transition-related issues and encourage ties between coal regions in the Western Balkans and Ukraine and their EU counterparts through coal region-to-region exchanges.

A just transition should be based on social dialogue at all levels to make sure that the energy transition and decarbonization burden is shared in a fair way. Carrying out a just transition is complex, involving, among others, energy, economic, social, environmental, and education policies and requires cross-sectoral cooperation and long-term planning on the national and regional level.

Box 8. Just transition

To successfully implement the Green Agenda for the Western Balkans (GAWB) and achieve the goals of decarbonization, fostering broad societal consensus becomes imperative. The active involvement of diverse stakeholders is the initial prerequisite for ensuring a fair and comprehensive transition. Key participants encompass various entities such as line ministries responsible for energy, climate, environment, employment, education, social policies, finance, and economic development. Additionally, engagement from local governments, trade unions, energy companies, the business sector, civil society, academia, and local communities is crucial.

This collaborative approach is particularly pivotal when addressing the decarbonization component of the GAWB. The decarbonization objective necessitates profound structural changes across all sectors of the economy, ranging from energy and agriculture to transport, construction, urban planning, and virtually every facet in between.

Furthermore, it is essential to underscore the significance of active participation from these stakeholders in order to create a harmonious and inclusive process. Their input and collaboration will not only contribute to the successful implementation of the GAWB but also help navigate the complex challenges associated with the required transformations. This collaborative effort ensures that the transition is not only effective but also considers the diverse perspectives, needs, and concerns of all parties involved.

3.4.1.2 CBAM

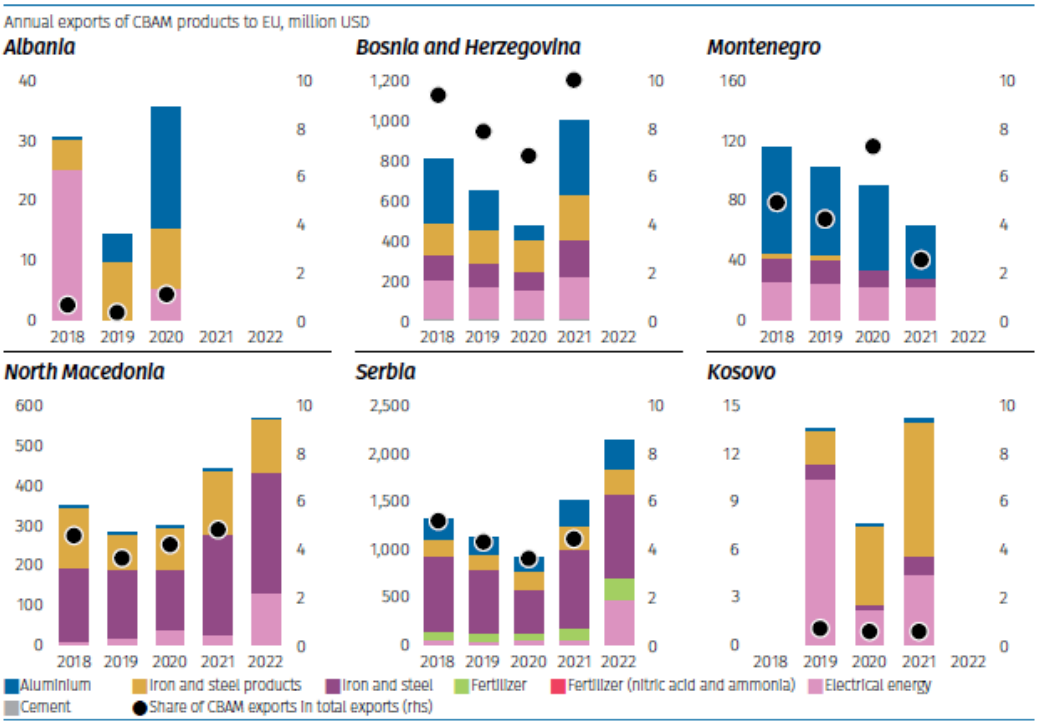
The Carbon Border Adjustment Mechanism (CBAM) is a carbon tariff on carbon intensive products, such as cement and some electricity, imported by the European Union. Legislated as part of the European Green Deal (EU Regulation 2023/956), it takes effect in 2026, with reporting starting in 2023.

The CBAM proposal from December 2022 encouraged third countries to introduce carbon pricing, as the amount of CBAM certificates to be surrendered for a given product would be corrected for any carbon price paid in the country of origin (Article 9). Full CBAM exemptions would apply to countries linking to the EU ETS, while partial CBAM exemptions could apply to third countries that integrate with the EU through electricity market coupling – a process that the Western Balkan economies are going through with the support of the Energy Community.

The CBAM's impact on third countries that do not qualify for exemption or join the EU by the time CBAM becomes effective depends on their exposure and ability to adapt. Exposure can be measured as share of GDP from trade in CBAM goods with the EU and carbon intensity. Ability to adapt depends on characteristics such as export diversity, pace of decarbonization, and capacities for Measurement, Reporting and Verification, among other aspects.

This gradual implementation provides time and opportunity for the Western Balkan economies to adapt and prepare for the CBAM. The CBAM aims to incentivize coordinated climate action in trading partner countries, including the Western Balkan economies.

Figure 22. Share of exports exposed to CBAM by sector and economy, 2018-2022



Note: Kosovo data only includes EX1 exports. Total exposure is therefore underestimated in the chart.
Source: COMTRADE, WDI and Kosovo Agency of Statistics.

Given that the EU is the main trading partner of the Western Balkan economies, and the carbon-intensive modes of production in the region, the CBAM represents a tangible transition risk for these economies.

Despite the Western Balkan economies' high vulnerability and exposure to the CBAM compared to other countries, the expected aggregate macroeconomic impact for these economies is small as economies are expected to adjust quickly by reallocating production capacities to other products. While the CBAM may drive some emissions reductions in exposed countries, domestic policies are needed to drive transformative decarbonization and keep up with the EU acquis**.**

The CBAM incentivizes regional efforts for completing electricity market integration and coupling with the European electricity market. Western Balkans' transmission networks are strongly interconnected and removing barriers to leverage these connections can be a next step. In addition, most Western Balkan economies are working on activities to fulfil the preconditions for market coupling.

The European Commission's Guidance for the implementation of the Carbon Border Adjustment Mechanism (CBAM) for operators outside the EU, including the Western Balkans (EC, 2023), was formulated in August 2023. Although not legally binding, this document specifically outlines the requirements for operators managing installations that produce CBAM goods outside of the EU. This guidance is particularly relevant during the transitional period, spanning from October 1, 2023, to December 31, 2025. Throughout this period, CBAM is applied without imposing a financial obligation on importers; instead, it serves solely for the purpose of data collection.

In tandem with the global shift towards a more sustainable future, the Western Balkans 6 Chamber Investment Forum (WB6 CIF) has played a crucial role in assisting businesses in navigating the intricacies of the Carbon Border Adjustment Mechanism (CBAM). The WB6 CIF, a collaborative initiative involving chambers of commerce and industry from Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, and Serbia, has taken significant strides in this direction.

On September 6, 2023, the WB6 CIF, in collaboration with the European Commission (specifically, the Directorate-General for Neighbourhood and Enlargement Negotiations (DG NEAR) and the Directorate-General for Taxation and Customs Union (DG TAXUD)), hosted an online event. The event, titled "Carbon Border Adjustment Mechanism: What Changes for Western Balkans Companies?," served as a platform for disseminating valuable insights and information regarding the implications of CBAM for businesses in the Western Balkans. This collaborative effort underscores the commitment to ensuring a smooth transition and effective understanding of CBAM-related changes among companies in the region.

3.4.1.3 Carbon pricing

There is a widespread consensus that the adoption of carbon pricing mechanisms will yield numerous advantages for the Western Balkan economies as they undergo a transition towards greener and more resilient growth. Carbon pricing assumes a pivotal role in facilitating a sustainable shift and can effectively address energy security risks. By enabling swift, cost-effective emissions reductions, it not only fosters environmental responsibility but also generates government revenue. This revenue can be strategically allocated to policies that enhance productivity or alleviate distortionary taxes. Moreover, embracing carbon pricing diminishes exposure to the Carbon Border Adjustment Mechanism (CBAM) and underscores preparedness for EU accession.

Substantial strides have been taken in establishing robust Monitoring, Reporting, and Verification (MRV) frameworks for carbon pricing systems, facilitated through national legislation and Energy Community proposals. Notably, Albania, Bosnia and Herzegovina, Montenegro, and Serbia have enacted MRV legislation specifically targeting greenhouse gas (GHG) emissions. Across all Western Balkan economies, there is a commitment to reporting electricity production emissions and CO2 intensity through the Energy Community.

In a significant development, the Ministerial Council of the Energy Community, in December 2022, adopted the MRV regulation. Member states are mandated to transpose this regulation, along with the requisite institutional framework, by the end of 2023, with full implementation anticipated by 2026. This collective effort is indicative of the region's commitment to aligning with international standards and embracing effective measures to address climate challenges.

The following acts within the Energy Community Decarbonization Roadmap 2021, were originally foreseen for adoption in 2022[21]:

- MRR regulation (Commission Implementing Regulation (EU) 2018/2066 on the monitoring and reporting of greenhouse gas emissions amended by Commission Implementing Regulation (EU) 2020/2085);
- AVR regulation (Regulation (EU) 2018/2067 on the verification of data and on the accreditation of verifiers amended by Commission Implementing Regulation (EU) 2020/2084);

[21] see https://www.energy-community.org/

- Accreditation Regulation (Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products).

To date, half of the Western Balkan economies are actively contemplating the implementation of carbon pricing systems, and Montenegro has taken a proactive step by introducing an Emission Trading System (ETS). Montenegro stands out as the most advanced, having implemented an ETS since 2020 that covers both the power and industrial sectors. The auctioned allowances within this system adhere to a minimum price of EUR 24, and the generated revenues are channeled into the "Eco Fund," dedicated to supporting environmental protection initiatives. Bosnia and Herzegovina is currently exploring various design options for a national carbon pricing system, while Serbia and North Macedonia have initiated their first impact assessments.

While carbon pricing can elevate the costs associated with emissions-intensive generation, fostering a shift away from coal, it is essential to recognize that additional policies are imperative to incentivize the widespread adoption of renewables in the region. Furthermore, the potential acceleration of coal-phase-out through carbon pricing could have repercussions on vulnerable communities. Initiatives such as the "Initiative for Coal Regions in Transition in the Western Balkans and Ukraine" have commenced work to address employment and social challenges stemming from the shift away from coal, historically the primary employment sector in the Western Balkan region.

Collaboration at the regional level on carbon pricing through the Energy Community holds promise for expediting the adoption of carbon pricing mechanisms in the Western Balkan economies and achieving efficiency gains.

The introduction of the Carbon Border Adjustment Mechanism (CBAM) serves as an incentive for regional efforts to complete electricity market integration and strengthen ties with the European electricity market. Given the robust interconnectedness of Western Balkans' transmission networks, removing barriers to leverage these connections stands out as a crucial next step. Moreover, most economies in the Western Balkans are actively engaged in fulfilling the prerequisites for market coupling.

3.4.2 Circular economy

Five pillars stand central to any successful circular economy[22]:

1. Reuse, reduce, recycle;
2. Energy efficiency;
3. Closed circle;
4. System thinking;
5. Social inclusiveness.

A common objective includes keeping products, equipment, and infrastructure in use for as long as possible, which improves the overall productivity of these resources. According to the Ellen MacArthur Foundation[23], all ‘waste’ should become a ‘source’ for another process: either a by-product or recovered resource for another industrial process or as regenerative resources for nature (e.g., compost).

In the Western Balkans, the progress of aligning with the waste management legislation, including recycling, plastics, chemicals, eco-design and other circular economy (CE) related provisions is rather slow and limited, while full enforcement of existing legal and policy frameworks represents an even bigger challenge (RCC, 2021).

While societies and economies across the world have been adopting structural changes to reduce their environmental impact and prevent the catastrophic consequences of accelerated resource consumption, in the WB, CE is frequently confused with waste management and recycling – which is only the final stage of a product’s life cycle. The prevention of pollution and waste throughout all stages of a product’s life cycle are still out of focus for many regional actors.

The concept of a circular economy (CE) remains relatively new to the Western Balkan region, making it still somewhat abstract for many citizens and business owners in the area. Unlocking the region's potential for transitioning towards a circular economy requires a strategic approach that involves mainstreaming CE

[22] Circular economy in the Western Balkan Region, Balkan Forum, 2021, www.thebalkanforum.org.
[23] https://www.ellenmacarthurfoundation.org/.

objectives into various policy areas and integrating CE practices across all sectors and levels. Simultaneously, there is a crucial need to raise general awareness about the concept and the multitude of benefits it can bring.

Circular economy, by combining linear economic benefits with sustainable concepts, stands out for its eco-effectiveness in the production of goods. The key elements facilitating the shift from a linear to a circular economy encompass enhanced waste prevention, management, and recycling, investments in renewable energy sources, biodiversity protection, sustainable water resource extraction and cycling, responsible consumption, and the extension of product utility within environmental ecosystems.

Despite the potential, the Western Balkan economies currently exhibit a low level of resource productivity, measured at EUR 0.35/kg, which is six times lower than the EU average (Jovanovic and Vujanovic, 2023). Recycling rates are notably low, with only 3% of waste being recycled, in stark contrast to the EU's 44%. Even within this figure, Albania contributes significantly, with an 18% recycling rate, while other economies practically lack recycling infrastructure (refer to Figure 15). This underscores the necessity for government intervention through targeted industrial policies that support recycling companies, particularly those employing innovative technologies.

Another challenge is the lack of valid data in local languages pertaining to the circular economy in the Western Balkan economies. This not only complicates information dissemination but also suggests that circular economy initiatives and projects in the region may not align with EU-defined standards. Waste mismanagement further impedes the adoption of a circular economy model, with insufficient and inadequate infrastructure in the waste sector posing a significant challenge.

In conclusion, while the circular economy concept is recognized in the Western Balkans, its full integration and development for citizens, consumers, companies, producers, and reproducers is still an ongoing process that requires concerted efforts.

A set of financial and non-financial incentives should be implemented to facilitate the transition to a CE (Aspen Institute, 2023):

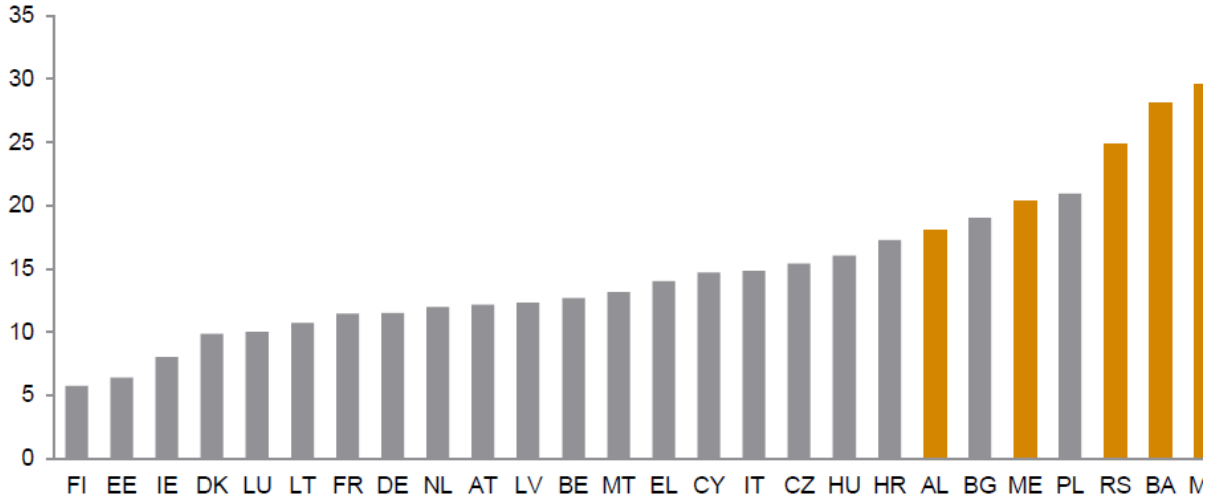
- Support the creation of new value;
- Mitigate investment risks;
- Enhance the competitiveness of CE supply chains.

3.4.3 Depollution

Depollution, which is one of the biggest issues in the Western Balkans where air pollution is among the highest in Europe, owing to emissions from older coal plants inherited from the communist era, as well as heavy reliance on private transportation.

The figure 23 shows that Western Balkan economies are far more polluted than the EU-27 member states. Only Poland and Bulgaria have levels of air pollution close to those of some less polluted Western Balkan economies, such as Montenegro and Albania. Pollution is particularly problematic for Serbia, Bosnia and Herzegovina, and North Macedonia, which have average concentrations of PM2.5 particles twice as high as the level in Austria, for example. Although Montenegro is defined as an ecological state in its constitution, it also has a very high level of air pollution.

Figure 23. Air pollution as measured by concentration of fine particulate matter (PM2.5), mean annual exposure (micrograms per cubic metre), 2016

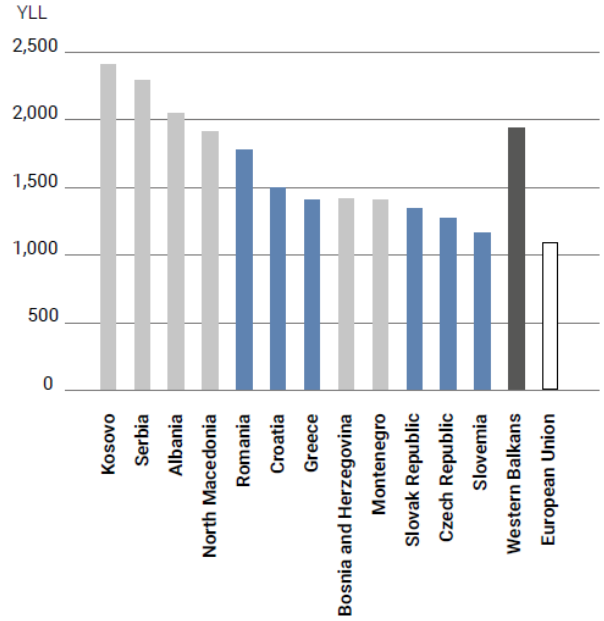


Note: The data show concentrations of fine particulate matter (PM2.5). The higher the values, the greater the level of pollution. The last pillar to the right represents North Macedonia (MK). Data for Kosovo are not available.
Source: World Health Organization.

River pollution has also been a significant issue in the Western Balkans, owing to inadequate sewerage and wastewater treatment systems. Finally, soil degradation is a serious environmental issue, especially in Serbia and Montenegro, where around 20% of soil is at risk.

These issues related to depollution clearly call for industrial policies aimed at a transformation of the energy sectors in the Western Balkan economies, improvement of public transportation systems, enhancement of waste management, investment in wastewater treatment plants for the reuse of water in agriculture and urban wastewater collection, and support for sustainable agricultural and food production.

Figure 24. Years of life lost per 100,000 inhabitants attributable to exposure to pollution in 2016



Source: European Environment Agency, 2020.

The predominant use of coal in most Western Balkan economies, coupled with low energy efficiency, have a negative impact on the environment, pollution, and climate change. There is abundant evidence that the levels of pollution in the Western Balkans are alarming.

3.4.4 Sustainable food systems

The fourth pillar of the Green Agenda places a spotlight on sustainable food systems and rural areas, urging the implementation of agricultural-related policies to align food-processing establishments with EU standards. The proposed measures aim to enhance sanitary controls, encourage environmentally friendly and organic farming, deploy eco-friendly technologies, and reduce waste in rural areas. Achieving these goals necessitates industrial policy measures tailored to the agriculture and food sectors, building upon the strategies outlined earlier in this note.

Agriculture holds significant importance in the entire Western Balkan region, contributing approximately 10% to the GDP (Zupanic et al, 2021). In the Republic of Serbia, the total gross value of agricultural production reached 5.5 billion USD in 2019. In Albania, agriculture serves as the foundation for social well-being and unemployment protection. Meanwhile, in Bosnia and Herzegovina, one-fifth of the population is employed in the agricultural sector. Montenegro boasts a noteworthy 8% share of the agriculture sector in its GDP, and in the Republic of North Macedonia, agriculture accounts for 13% of the GDP. Almost half of the Western Balkans' territory is dedicated to agriculture, with 19% designated as pasture, 29% as arable land, and 18–58% of the workforce connected to this sector.

Organisations from the Western Balkans have actively engaged in international collaborations in the agri-food sector, both within the region and with EU Member States. The University of Belgrade, University of Novi Sad, University of Niš, University of Kragujevac, and Ss. Cyril and Methodius University of Skopje stand out as the top five organisations in terms of publications and R&D activities in the agri-food domain (Radovanovic et al, 2024). A notable illustration of the region's potential is the Biosens Institute from the University of Novi Sad, focusing on sustainable solutions in agriculture. Biosens coordinates various projects addressing biosystem and environmental challenges, contributing to the digitalization of the agricultural and food sector – for instance, the Antares project financed by the EU Horizon Europe programme[24]).

Despite the abundance of natural resources, agri-food systems in all Western Balkan economies encounter numerous challenges. The agricultural sector, a pivotal player in food production and safety, simultaneously

[24] https://antaresproject.eu/

shoulders responsibilities for environmental protection, climate change mitigation, and gas emissions. Additionally, agriculture faces threats from various factors linked to climate change, such as storms, erosion, and landslides stemming from climate variability and extreme weather events. Given the significance of forestry alongside agriculture, Western Balkan economies are categorized as being of medium to high sensitivity to climate change.

3.4.5 Protection and restoration of ecosystems

The entire Balkan Peninsula stands out as a biodiversity hotspot, characterized by its unique climate, landscapes, and habitats of European significance. The region boasts extensive forest cover, numerous free-flowing rivers, and encompasses three biogeographic regions: Continental, Alpine, and Mediterranean, fostering a diverse array of habitats.

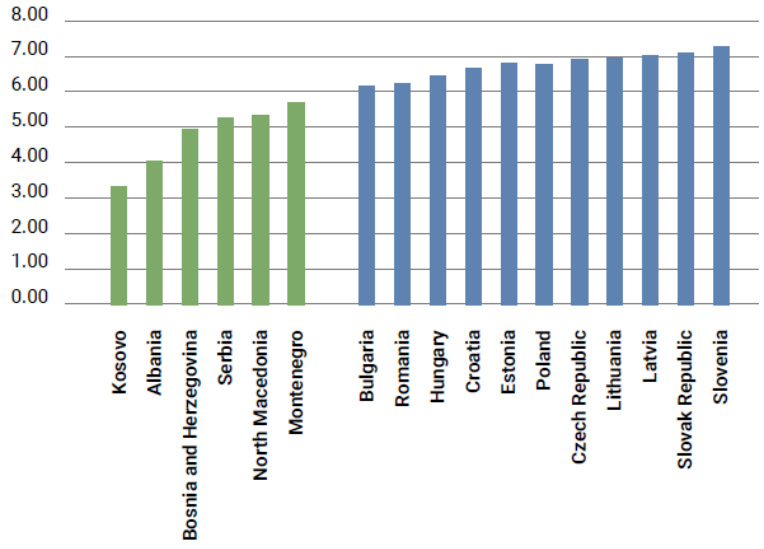
In accordance with the UN Convention on Biological Diversity and its Aichi targets, a minimum of 17% of terrestrial and inland water, and 10% of coastal and marine areas were expected to be protected by 2020. The European Commission has formally embraced the 30x30 target, aiming to safeguard 30% of its territory by 2030, as part of the EU Biodiversity Strategy to 2030. Additionally, one-third of these protected areas should be designated as "strictly protected." However, the Western Balkan region lags behind in achieving these goals, with percentages of protected areas hardly approaching the 20% mark. Some economies, such as Bosnia and Herzegovina, have less than 5% of their territory under protection (Aspen Institute, 2021). The current percentages of protected areas in the Western Balkan economies are as follows: Albania 18.59%, Bosnia and Herzegovina 3.63%, Kosovo* 11.5%, Montenegro 14%, North Macedonia 8.96%, and Serbia 7.74%.

Addressing this pillar necessitates comprehensive action plans, including efforts to enhance knowledge on biodiversity, engage in forest landscape restoration, strengthen regional cooperation, and foster closer collaboration with international organisations and the EU. While these aspects may initially appear beyond the scope of industrial policy, they are poised to benefit from measures designed to ensure sustainable agricultural production, promote responsible tourism, and encourage renewable energy production.

3.4.6 Green transition of Western Balkan economies

Available indicators on various aspects of the green transition are not very encouraging.

Figure 25. EBRD scores on green quality of a sustainable market economy, 2021



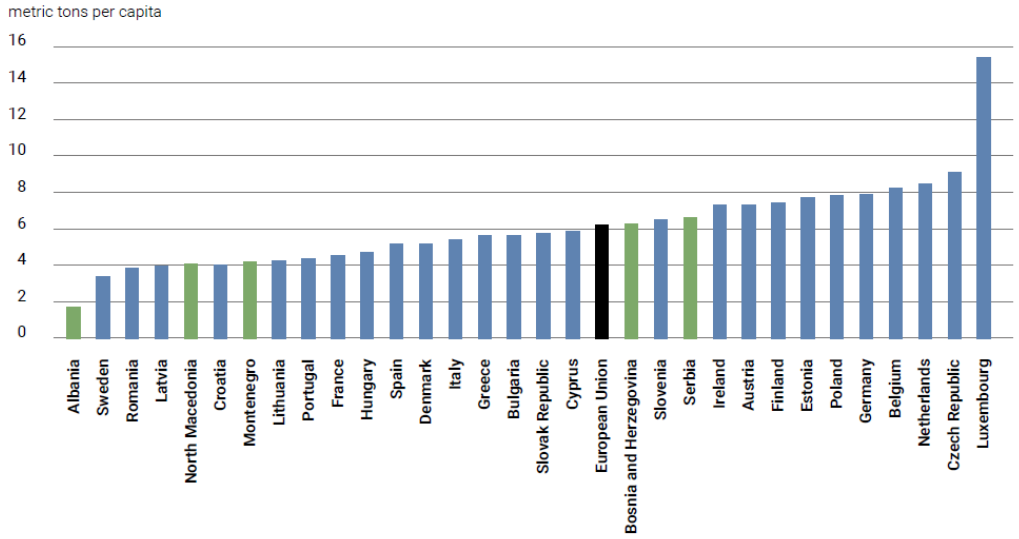
Note: Scores range from 1 to 10, where 10 represents a synthetic frontier corresponding to the standards of a sustainable market economy.
Source: Aspen Institute, 2023, based on the EBRD data.

A synthetic indicator, developed by the European Bank for Reconstruction and Development (EBRD), gauges the green quality of a sustainable market economy using a range of quantitative and qualitative indicators. This indicator reveals that the Western Balkan economies currently trail the eleven EU member states in Central Eastern Europe in terms of the green quality of a sustainable market economy (see Figure 25).

The situation becomes even more concerning when considering the carbon intensity of GDP (CO2 emissions per unit of GDP). In this aspect, most Western Balkan economies exhibit ratios several times higher than the EU average. Once again, Albania stands out as an exception, thanks to its reliance on hydropower. Additionally, the carbon intensity of electricity production in the Western Balkans surpassed more than three times that of the EU-27 average in 2020. While the Western Balkan economies are not part of the EU Emissions Trading System (EU ETS), initial steps in this direction have been initiated.

Examining carbon dioxide emissions (in metric tons) per capita, only Bosnia and Herzegovina and Serbia had slightly higher emissions in 2019 than the European Union average. In contrast, Montenegro, North Macedonia, and particularly Albania boasted among the lowest emissions, reflecting lower levels of industrial activity per capita (refer to Figure 26). World Bank data on the sectoral structure of carbon dioxide emissions underscores that in the Western Balkans, emissions are predominantly generated in the electricity and heating sector, a relatively higher proportion compared to most EU member states. The sole exception is Albania, where the transport sector is the primary contributor to emissions.

Figure 26. Carbon Dioxide Emissions (metric tons per capita), 2019



Note: No data for Kosovo available.
Source: Aspen Institute, 2023, based on the World Bank data.

3.4.6.1 Indicators and progress towards GAWB

The Action Plan is organised to mirror the seven components of the Sofia Declaration (Climate Action, Energy, Transport, Circular Economy, Pollution, Sustainable Agriculture, and Nature and Biodiversity Protection), grouped into five pillars. It encompasses measures to fulfill the 58 commitments (objectives) outlined in the Sofia Declaration, providing an overview of the primary regional coordinators and other relevant organisations contributing to specific objectives. For each measure, an indicative timeframe for implementation is defined through consultations with regional coordinators and Western Balkan authorities.

Ensuring the smooth implementation of the Sofia Declaration requires continuous monitoring of key parameters. This monitoring will occur in regular cycles based on predefined indicators (provided below), enabling the tracking of progress, level of achievements, or the identification of impediments and delays. These indicators serve as valuable tools for identifying and analyzing reasons for any slowdown or stagnation in the implementation process.

The monitoring system will also facilitate the design of corrective actions to overcome challenges and ensure the uninterrupted continuation of activities. Both qualitative and quantitative indicators within the monitoring system are selected based on their relevance to the Sofia Declaration's implementation and the availability of data through annual monitoring cycles. In collaboration with regional organisations and the European Commission, the Regional Cooperation Council intends to establish a reporting mechanism comprising an annual narrative report and an annual indicators overview.

The narrative report will be collaboratively developed with all partners responsible for relevant policy areas and other stakeholders engaged in implementing the Sofia Declaration. Therefore, the narrative section will offer a comprehensive overview of progress in all seven components of the Sofia Declaration. It will be supplemented with additional chapters, including perspectives from NGOs, local self-government, donors, the business community, and youth. The report will be concise yet substantive, providing a succinct overview of activities and results compared against the established objectives.

Table 10. GAWB indicators

	No.	Indicator	Data source
Climate action	1.	Total GHG emissions (tonnes of CO_2 eq)	GHG inventories / Environmental Protection Agencies / Statistical Offices
	2.	The GHG emission intensity of power generation (tonnes of CO_2 eq)	EnC reports / Environmental Protection Agencies / Statistical Offices
	3.	The number of sectoral policies that include climate change adaptation	EC Progress Report / Communication on EU Enlargement Policy
	4.	Level of climate financing	EC Progress Report / Communication on EU Enlargement Policy
Energy	1.	Implementation ratio electricity	EnC Implementation Report
	2.	Implementation ratio renewable energy	EnC Implementation Report
	3.	Implementation ratio gas	EnC Implementation Report
Transport	1.	Relevant directives/regulations/standards/specifications transposed	TCT Action plan progress report / Technical Committee reports
	2.	Western Balkan Strategies updated with sustainable and smart elements	Sustainable and Smart Mobility progress reports / Ad hoc group meetings
	3.	Infrastructure developed according to TEN-T (related to green elements)	TEN-T Annual Plans
Circular Economy	1.	Domestic material consumption per capita	http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=t2020_rl110&lang=en Statistical Offices
	2.	Domestic material consumption	http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=t2020_rl110&lang=en Statistical Offices
	3.	Resource productivity	https://ec.europa.eu/eurostat/databrowser/view/env_ac_rp/default/table?lang=en Statistical Offices
	4.	Generation of waste - Total	https://ec.europa.eu/eurostat/databrowser/view/env_wasgen/default/table?lang=en / Environmental Protection Agencies
Depollution	1.	Annual ambient concentrations of PMs, SO_2 and NOx	Annual air quality reports for Western Balkan economies / Environmental Protection Agencies
	2.	Annual emissions of PM_{total}, PM_{10}, SO_2 and NOx from large combustion plants	EnC annual implementation reports Energy Community Homepage (energy-community.org) Environmental Protection Agencies LRTAP Convention NFR tables

	3.	Annual emissions of NH_3 and NMVOC	Environmental Protection Agencies LRTAP Convention NFR tables
	4.	Population connected to public water supply (%) and Population connected to wastewater treatment plants (%)	Statistical Offices of Western Balkan economies, Eurostat
	5.	Artificial land cover per capita by type	Statistical Offices of Western Balkan economies, Eurostat / Environmental Protection Agencies (Corine Land Cover)
	6.	Nitrate in groundwater	Statistical Offices of Western Balkan economies, Eurostat / Environmental Protection Agencies
Sustainable Agriculture	1.	Share of the area under organic farming in the total utilised agriculture area	Environmental Protection Agencies State of the Environment Reports
	2.	Share of land under management requiring reduction in chemical input	
	3.	Mean organic carbon content in agricultural land	Environmental Protection Agencies State of the Environment Reports
	4.	Production of renewable energy from agriculture	
	5.	GHG emissions from agriculture (tonnes of CO_2 eq)	Environmental Protection Agencies State of the Environment Reports
	6.	Number of farms and food processing enterprises receiving (IPARD) support to align with hygiene and animal welfare standards	
Nature and Biodiversity protection	1.	Designated terrestrial and marine protected and conserved areas including OECMs	UNEP-WCMC World Database on Protected Areas (WDPA) https://www.protectedplanet.net/en/thematic-areas/wdpa?tab=WDPA, World Database on Other Effective Areas-based Conservation Measures (WDOECM) https://www.protectedplanet.net/en/thematic-areas/oecms?tab=OECMs
	2.	Potential Natura 2000 sites and economy-wide ecological networks	European Natura 2000 database, datasets on ecological networks https://www.eea.europa.eu/data-and-maps/data/natura-2000-eunis-database
	3.	Species Protection Index	Western Balkan economies' and regional Red Lists https://www.iucnredlist.org/
	4.	Protected areas management effectiveness	Global Database on Protected Areas Management Effectiveness (GD-PAME) https://www.protectedplanet.net/en/thematic-areas/protected-areas-management-effectiveness-pame?tab=Results

	5.	Species recovery programmes	Regional and economy-wide species action plans
	6.	Area of restored forest landscapes	Bonn Challenge Barometer https://infoflr.org/bonn-challenge-barometer
	7.	Phenology of selected plant and animal species	Indicators and sources of verification to be agreed upon based on the regional biodiversity strategic plan
	8.	Biodiversity Strategy and Action Plans for Western Balkan economies (BSAPs)	The reporting system as defined by the Secretariat of the Convention on Biological Diversity in the Global post-2020 Biodiversity Framework https://www.cbd.int/conferences/post2020

Source: RCC, 2021.

As regards Green Agenda and sustainable connectivity, **Albania**[25] is moderately prepared on energy, environment, and climate change. Limited progress was made in further aligning the EU acquis on water management, chemicals, and environmental crime. The impact of strategic investments on biodiversity and nature protection requires attention. This cluster and the reforms concerned have significant links to Albania's Economic Reform Programme, the Commission's Economic and Investment Plan and the Green Agenda for the Western Balkans endorsed by Albania in December 2020. Albania has some level of preparation in most areas linked to resources, agriculture, and cohesion, namely agriculture and rural development, food safety, and financial and budgetary provisions. It is moderately prepared as regards regional policy and coordination of structural instruments. Albania has made some progress in agriculture and rural development.

Bosnia and Herzegovina[26] made some or limited progress in the green agenda and sustainable connectivity cluster, where the country is at an early stage on energy, environment, and climate change. The country has a certain level of preparation in the areas of transport and of trans-European networks. However, Bosnia and Herzegovina made no progress in the areas of resources, agriculture, and cohesion (agriculture and rural development, food safety etc.), where preparation is mostly at an early stage. The country must step up its efforts to prepare and adopt a post-2021 countrywide strategy for rural development, align its legislation on food safety, veterinary and phytosanitary policy and strengthen its administrative capacities.

The green agenda and sustainable connectivity cluster is at the heart of the Green Agenda for the Western Balkans and closely linked to **Montenegro's**[27] economic reform programme and the Commission's Economic and Investment Plan. All four related chapters of the country's EU accession process are open, with closing benchmarks that remain to be fulfilled in each chapter. Some progress was achieved on creating a functioning day-ahead energy market and on preparing for membership of the Paris Memorandum of Understanding on Port State Control. There was limited progress on the review and implementation of the transport development strategy; on water management and by improved climate change reporting.

Concerning the cluster 4 on the Green Agenda and sustainable connectivity, **North Macedonia**[28] has achieved a good level of preparation in trans-European networks. Some progress was made in the areas of environment and climate change. Substantial efforts are needed in the areas where limited progress was made such as in energy, transport policy and trans-European networks. The country needs to accelerate the implementation of the Economic and Investment Plan and of the Green Agenda for the Western Balkans over the upcoming period.

Kosovo[29] is at an early stage of preparation on environment and climate change topics. Kosovo made limited progress, notably on environmental reporting and air quality monitoring. Kosovo needs to increase its political commitment to address environmental degradation and climate change challenges and substantially improve the implementation of its legislation, to align it with the Green Agenda for the Western Balkans' goals. Most of the recommendations from the previous report are still pending. As regards horizontal issues, Kosovo needs to adopt revised strategies, action plans and legislation to ensure their coherence with the Green Agenda objectives and ensure their implementation. The adoption of the Strategy for Environmental Protection and Sustainable Development 2022-2030 is delayed. The implementation of the current strategic framework is

[25] COM SWD(2022) 332 final - Albania 2022 Report
[26] COM SWD(2022) 336 final – Bosnia and Herzegovina 2022 Report
[27] COM SWD(2022) 335 final – Montenegro 2022 Report
[28] COM SWD(2022) 337 final – North Macedonia 2022 Report
[29] COM SWD(2022) 334 final – Kosovo* 2022 Report

challenged by the lack of funding and administrative capacity, and heavy reliance on international donors. Kosovo still needs to align its environmental protection with the environmental liability directive. Even though the environmental inspections legislation has been redrafted, it is not yet adopted and the enforcement capacity is still missing. Kosovo also needs to amend and implement the laws on environmental and strategic impact assessment. Inter-institutional coordination and civil society involvement needs to be enhanced. Kosovo needs to take over raising awareness responsibilities from the international community and civil society organisations.

The Green agenda and sustainable connectivity cluster is closely linked to **Serbia's**[30] Economic Reform Programme and the Commission's Economic and Investment Plan. The cluster and all related chapters were opened in December 2021, after Serbia had fulfilled the remaining requirements, namely the adoption of action plans on oil stocks and on gas unbundling. Limited progress was achieved overall with the exception of Trans-European networks, where Serbia advanced on upgrading its infrastructure, with works starting on the Serbia-Bulgaria gas interconnector, a strategically highly important project for Serbia and Europe.

3.4.6.2 Skills aspects for green transition in the Western Balkan economies

According to the definitions by the United Nations Environment Programme (UNEP) and the International Labour Organisation (ILO), "green jobs" are characterized by their environmental sustainability and social fairness. These jobs play a crucial role in driving the economy towards decarbonization, efficient resource and energy use, and biodiversity protection. Additionally, they ensure safe work environments, social protection, and equitable income, aligning with the Sustainable Development Goals.

The necessity of specific skills for green jobs is paramount. Green skills encompass technical knowledge and abilities essential for effectively applying green technologies and processes in a professional setting. These skills, integrating various knowledge, values, and attitudes, support environmentally sustainable decision-making both at work and in daily life. They are particularly significant for the younger generation, who have the potential to influence ecological transitions over a longer term.

Research highlights the need for new skills at every level and across the spectrum for the green transition. This includes education from a young age to advanced professional levels. Training in areas such as Green Public Procurement (GPP) is also vital for public authorities. Equally important is the reskilling of workers vulnerable to job losses due to decarbonization efforts, ensuring their transition to new roles in the evolving green economy.

Addressing the employment challenges associated with the decarbonization of the energy sector is a critical aspect in the Western Balkans, where phasing out coal and fossil fuel subsidies is expected to result in job losses and social challenges (OECD, 2022a). In five of the six Western Balkan economies (excluding Albania which does not have coal production), the coal industry employs over 30,000 people. A majority of these workers, over two-thirds, are employed in open-pit coal mining, with the remainder in power plants. Although representing a small fraction of the total 14.5 million people living in these economies, mining and thermal power plants (TPPs) have long been dominant employment sources in regions reliant on coal. The ripple effect also extends to many small companies in these areas that are directly dependent on these industries, such as through supply chain links to coalmines and TPPs. A significant portion of coal-related employment, almost half, is in Serbia's Kolubara and Kostolac regions, with about 16,500 workers, followed by Bosnia and Herzegovina.

The coal and traditional power sectors are already experiencing a decline in jobs. For example, in Serbia, the Kolubara mining basin saw a reduction of more than 3,000 jobs between 2017 and 2019; in the Kostolac mining area, job numbers decreased from 2,000 in 2009 to around 1,500 in 2019, despite the opening of new mines and increased production capacity. In Montenegro, the number of mineworkers has almost halved, from 1,200 in 2010 to 670 in 2019.

Combining re-skilling programs with financial compensation for coal workers has proven effective in other countries dealing with similar transitions. These programs often yield better long-term results than simple financial payments. Potential job and training categories that correspond to the skills of former miners and workers include thermal retrofitting in the buildings sector, as well as other relevant jobs in construction and manufacturing.

The transition to renewable energy and energy efficiency offers new employment opportunities. Investments in these sectors are generally more labor-intensive compared to the oil and gas sector and are usually located closer to consumers. This presents an opportunity to create new jobs in current mining regions. The "Just

[30] COM SWD(2022) 338 final – Serbia 2022 Report

Transition Plans" developed by WWF's Regions Beyond Coal initiative for countries like Greece, Poland, and Bulgaria, which include roadmaps for transforming coal regions and creating new, sustainable employment opportunities, could serve as a model for the Western Balkan economies.

The "Initiative for Coal Regions in Transition in the Western Balkans and Ukraine," launched in December 2020, is designed to support these economies in managing the social challenges and job losses resulting from coal phase-out and mine closures. This initiative aims to provide technical and financial support to coal regions in EU neighboring economies, facilitating an open platform for region-wide dialogue and sharing best practices on transition-related issues.

Education is a key component in this transition, affecting behaviors towards the environment from an early age and reskilling workers from transition industries. The curricula need to include competences and skills essential for the green economy. For successful implementation, the Green Agenda for the Western Balkans must be reflected in education system reforms, ensuring people are prepared for tomorrow's labor market and society. With proper information and education, the youth can significantly contribute to the Green Agenda's implementation. The European Green Deal should also be integrated into various components of the Erasmus+ program, available in the region.

The green transition requires significant changes in mentality and behavior, in addition to new technological solutions, to stimulate both demand and supply. Raising public awareness and involvement is crucial for achieving a credible vision for the low-carbon transition in the Western Balkans. Economy-wide and local communication campaigns targeting specific groups on issues like the benefits of heat pumps over fuel wood are necessary. Key target groups include low-income households, youth, and women. Additionally, energy, climate, and environment issues should be more present in the media. Informing citizens and organisations about the specific costs of pollution and benefits of clean energy transitions is vital. For instance, educating parents and caregivers about the impacts of air pollution on children's health and development is important, as is informing public officials about the necessity and benefits of biodiversity and healthy ecosystems. Cities and municipalities should be made aware of the economic costs of not adapting to climate change.

Improving teacher training on energy, climate, and environmental education and incorporating these topics into school curricula are essential steps. Continuous and regular training for teachers is necessary to keep them informed about the latest technological and scientific developments. At present, continuous professional development (CPD) for teachers is limited in many Western Balkan economies.

The Western Balkans need more human capital with skills and expertise required for investment in renewables. To build such capacity, appropriate curricula on renewable energy at technical, vocational, and tertiary institutions are needed. There is a shortage of skilled workers for the installation, maintenance, and quality assurance of solar panels and wind power.

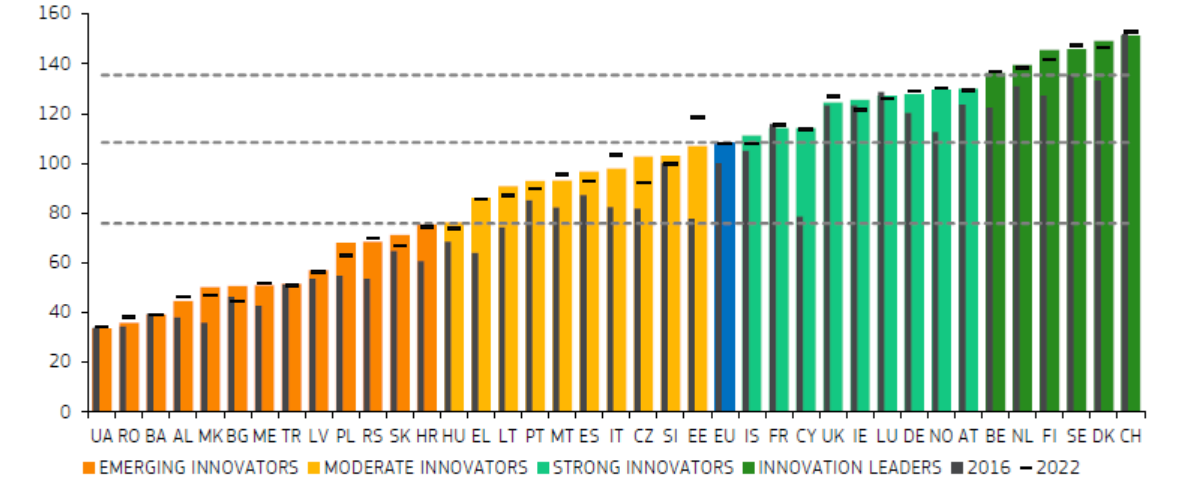
Enhancing energy efficiency in Western Balkan economies requires effective strategies for energy efficiency improvements, the mobilization of sufficient financial resources, and the development of less carbon-intensive heating systems. Comprehensive and widely accepted strategies for energy efficiency improvements, especially in the building sector, are needed. Additionally, there is a need for better incentives and frameworks to mobilize financing for energy efficiency improvements in buildings, including energy efficiency funds endowed with sufficient financial resources. The expansion of modernized district heating systems could replace inefficient heating devices. Improving energy efficiency standards and skills in the Western Balkan economies is also necessary.

Energy efficiency standards for equipment and buildings can enhance energy efficiency. Up-to-date energy efficiency standards for heating and cooling systems could prevent the proliferation of inefficient devices in the Western Balkans. However, standards can only be implemented where the necessary expertise is available. Policy and training options must focus on overcoming shortages in technical expertise related to energy efficiency improvements and skilled professionals, such as energy auditors and managers. While some progress has been made in capacity-building programs for energy auditors and managers, these need to be broadened and carried out in a sustained manner. For further reading on the related development of new skills, Baldassarre and Saveyn (2023) is a recommended source.

3.5 Overview of the Western Balkans research and innovation performance in the EU programmes and initiatives

The innovation performance of 11 European countries, which are not EU Member States (including WB economies), has been assessed using the same methodology and presented in the European Innovation Scoreboard 2023. The performance groups for all European countries are shown on a map in Figure 27.

Figure 27. Performance groups: innovation performance per dimension



All performance scores are relative to that of the EU in 2016. Coloured columns show countries' performance in 2023, using the most recent data for 32 indicators The horizontal hyphens show performance in 2022, using the next most recent data. Grey columns show countries' performance in 2016. The dashed lines show the threshold values between the performance groups, where the threshold values of 70%, 100%, and 125%, when using the latest 2023 data, have been adjusted upwarc by multiplying with 1.085 to reflect the performance increase of the EU between 2016 and 2023 as the graph shows performance scores relative to the EU in 2016.

Source: European Innovation Scoreboard, 2023.

Albania (AL), Bosnia and Herzegovina (BA), Montenegro (ME), North Macedonia (MK), Serbia (RS), Türkiye (TR), and Ukraine (UA) are classified as Emerging Innovators. Among these, three countries demonstrate the highest performance across all economies in at least one indicator: Albania excels in Sales of Innovative Products and Environment-Related Technologies, Bosnia and Herzegovina in Environment-Related Technologies, and Serbia in Non-R&D Innovation Expenditures.

Since 2016, the performance of three countries - North Macedonia, Norway, and Serbia - has improved faster than the EU average (8.5 percentage points). Meanwhile, for five countries (Montenegro, Albania, Iceland, the United Kingdom, and Türkiye), performance has increased significantly, albeit at a rate below the EU average. In contrast, Bosnia and Herzegovina, Switzerland, and Ukraine have seen a decrease in performance. Between 2022 and 2023, almost all 11 countries experienced a decline in key indicators such as Population with Tertiary Education, SMEs with Business Process Innovations, Employment in Innovative Enterprises, Sales of Innovative Products, and Resource Productivity.

Research and Innovation (R&I) funding comes from various sources, including national funding, EU Framework Programmes like Horizon 2020 and Horizon Europe, and Pre-accession IPA funds. The latter two, being substantial support from the European Commission (EC), aim to develop standards in the enlargement region comparable to those enjoyed by EU citizens. However, national funding programs for research and innovation are beyond the scope of this document.

The full association of the Western Balkans (WB) with the EU Framework Programmes for Research and Innovation has been a successful driver of systematic changes in the WB, stimulating progress in developing new mechanisms, infrastructures, and legislation to improve resource use efficiency. Association with the Framework Programmes involves 49 European Partnerships in the first Horizon Europe Strategic Plan and 37 Partnerships Biennial Monitoring Report (Damjanovic and Windischbaur, 2023).

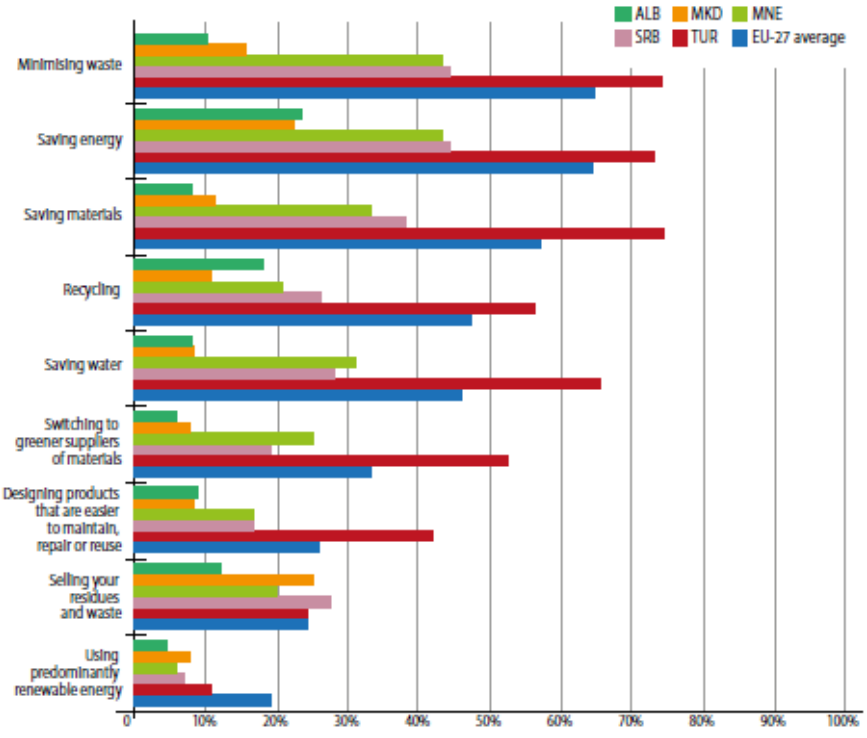
3.6 Innovation policy for SMEs

Globalisation, technological development, and expanding markets have been significant catalysts for firm innovation over the past decade. Increasingly, SMEs are recognised for their pivotal role in shaping innovation- and knowledge-based economies. There's also a clear connection between firm innovation and economic output; innovative practices and activities enable firms to grow and enhance productivity, even if only a small fraction reach the global technological frontier.

SMEs are crucial in achieving the net-zero goal for greenhouse gas emissions (GHG), accounting for 50% of global emissions and 63% in the EU. Environmental concerns are particularly relevant for SMEs, which face the impacts of environmental degradation and are subject to the volatility and uncertainty of energy prices, posing distinct challenges for their survival and growth. Crucially, SMEs can be instrumental in innovating and developing technologies to tackle these challenges. New green markets, such as those arising from the circular economy, also offer fresh business opportunities for SMEs.

In recent years, the greening of SMEs has gained momentum in the region (OECD, 2022b). A growing number of SMEs in the Western Balkans and Turkey are offering green products or services. For instance, 36% of North Macedonia's SMEs provide such products or services, surpassing the proportion in the EU. Additionally, many SMEs have adopted at least one measure to enhance resource efficiency, such as minimizing waste, or conserving energy or water. While Western Balkan economies generally lag behind the EU average in this respect, Turkish SMEs excel in saving materials, water, and energy, and in waste reduction, reflecting the government's commitment to SME greening. Most SMEs in these regions have implemented at least one strategy to become more resource-efficient.

Figure 28. Resource efficiency measures undertaken by SMEs (2021)



Note: Data for Bosnia and Herzegovina and Kosovo are not available.
Source: European Commission (2022), Eurobarometer: SMEs, Resource Efficiency and Green Markets.

3.7 Smart Specialisation in the Western Balkans

Smart Specialisation is the EU answer to the need of such place-based territorial innovation policies. This policy approach is implemented in all EU Member States, and is gaining increasing worldwide appreciation. It

advocates focusing public investment in research, development, and innovation activities on a few, carefully chosen country-specific priority domains, where the impact can be the greatest. Close to 200 regions in EU have so far developed their Smart Specialisation strategies (RIS3). Recent study by Gianelle et al. (2020) showed that Smart Specialisation are implemented in a variety of ways, with some common characteristics which were used to develop a framework for the design of RIS3 in the EU Enlargement and Neighbourhood region aiming at supporting national policy makers in developing a strategy that would meet the standards of EU innovation policies. By 2018, all Western Balkan economies launched their respective Smart Specialisation processes.

During the EU Western-Balkan Summit on October 6, 2021, the European Union and the six economies of the Western Balkan region have agreed to strengthen their cooperation on several areas including research, innovation, and education, also to emphasize the intention of these economies of a long-term goal of EU membership. The agreement aims at promoting scientific excellence and education reform in the Western Balkan economies also helping to prevent "brain drain" of researchers out of this region (Radovanovic et al, 2023).

Smart Specialisation is one of the flagship initiatives of the Western Balkan Agenda on Research, Innovation, Education, Culture, Youth and Sport (European Commission, 2021). It is also included in other EU policy documents regarding the region, such as the 2021 Communication on EU Enlargement Policy and the Economic and Investment Plan for the Western Balkans.

Having in mind all characteristics of the S3 concept, it is fair to conclude that the concept provides a new policy approach to the six Western Balkan economies. As such, S3 holds considerable potential to help them enhance the innovative potential of their private sectors and to do so in a collective way built on public-private cooperation (Radovanovic and Benner, 2019).

In addition to the support provided to EU regions for the design and implementation of Smart Specialisation strategies over the last years, the JRC of the European Commission has been providing guidance and assistance to the EU Enlargement and Neighbourhood countries for the development of Smart Specialisation strategies since 2013, through its Smart Specialisation Platform (S3P). Since 2019, this support was strenghtened through a project targeted on providing direct support to the EU Enlargement and Neighbourhood Region, jointly managed by the JRC and DG NEAR. All six Western Balkan economies are currently in the process of preparing, adopting or implementing RIS3 with the support of the JRC. While Montenegro was the first Western Balkan economy to adopt its RIS3 in June 2019, the S3 process is also finalised in Serbia in 2020. Other economies are deeply engaged in process of S3 development. Based on available documents, the tables 10 and 11 below summarise the current strategic framework and emerging S3 priorities in the Western Balkan economies.

1. <u>Albania</u>

Albania joined the JRC Smart Specialisation Platform in 2017 and has since been developing the strategy for Smart Specialisation with the support of the European Commission (EC) and following the JRC's methodological framework for Smart Specialisation in the EU Enlargement and Neighbourhood Region. The quantitative analysis was completed in 2021 and it was followed by a qualitative analysis which refined the quantitative mapping's results, leading to the identification of five preliminary priority domains for the Smart Specialisation Strategy (Fabbri et al, 2022): Agriculture, Fisheries, and Aquaculture; Manufacturing; Energy, Accommodation, and Support Service Activities; Information and Communication; Administrative and Support Service Activities.

Based on EDP findings, three vertical priorities are being identified and the country is currently focussing on:

- Renewable Energy and Natural Resources;
- Healthy and Sustainable Food Chain;
- Sustainable and Diversified Tourism

The draft of the Smart Specialisation strategy of Albania is currently being prepared according to these priorities.

- **<u>Bosnia and Herzegovina</u>**

The initial effort to prepare a Smart Specialisation (S3) strategy in Bosnia and Herzegovina (BiH) commenced in 2020, initiated by the Council of Ministers. This followed the formation of a working group and the appointment of the Directorate for Economic Planning (DEP) as the coordinator for the S3 process. By drafting the Smart Specialisation Strategy Map, BiH has aligned with the EU's initiative that emphasizes a new approach to overall

economic development at both regional and national levels. The S3 of BiH considers the country's governance structure, encompassing the state level, the two entities of the Federation of Bosnia and Herzegovina (FBiH) with its ten cantons, Republika Srpska (RS), and the Brcko District. The study (Galic and Hollanders, 2022) was conducted to identify potential priority domains for smart specialisation in BiH, based on an analysis of economic, innovation, scientific, and technological data, and adhering to the methodology developed by the Joint Research Centre (JRC) of the European Commission (EC).

A list of potential priority areas investigated through quantitative mapping and in the qualitative analysis phase (Fabbri, Pucar and Galic, 2024) includes:

- ICT;
- Metal and Electrical Industry;
- Production and Processing of Plastics;
- Production and Processing of Food and Beverages / Food industry;
- Wood Industry;
- Tourism Industry.

After the completion of the mapping phase, Bosnia and Herzegovina will launch of its EDP exercise currently under preparation.

- **Kosovo**

The Smart Specialisation process in Kosovo started in 2018 when it registered in the Smart Specialisation Platform. The Smart Specialisation team was established in 2020 and the process is coordinated by the Office for Strategic Planning under the Prime Minister's Office. Since then, Kosovo has been implementing a roadmap for the definition of a National Strategy for Smart Specialisation, with the assistance of the EC and according to the JRC methodological framework for Smart Specialisation in the EU Enlargement and Neighbourhood region. The quantitative mapping, coordinated by the national authorities and supported by the JRC started in October 2020 and was finalized in August 2021. The qualitative mapping started in November 2021 and was finalised in May 2022 (Hollanders and Rexhebeqaj, 2023).

The qualitative analysis confirmed five areas with the greatest potential:

- Wood processing;
- Food processing;
- Green energy;
- ICT;
- Creative industries.

The report emphasised the importance of the automation of processes, digitalisation, new digital frontiers (artificial intelligence, IoT sensors, and machine learning), and energy transition (use of renewable sources). Kosovo finalised its EDP phase in 2023. The draft of the Smart Specialisation strategy of Kosovo is currently being prepared.

- **Montenegro**

Montenegro launched its Smart Specialisation process in 2017 and formed a team to oversee the process and coordinate the tasks for the strategy development. Montenegro adopted its Smart Specialisation strategy in 2019 and received conditionally positive assessment by the European Commission services. Implementation of the S3 of Montenegro is under the Council for Innovation and Smart Specialisation, which was established in August 2019.

Pursuant to the strategic development vision of Montenegro, through the application of S3 methodology and conducting of the EDP, four priority areas have been defined. By investments, as well as through development of innovative and research potential in the selected priority areas, new opportunities will be created for entrepreneurial activities and development of a knowledge-based economy.

The identified priorities are the following:

- Energy and sustainable environment;
- Sustainable agriculture and food value chain;
- Sustainable and health tourism;

- ICT.

The priority area of ICT is also seen as a horizontal priority providing business and technological support to other priority areas.

- **North Macedonia**

The Smart Specialisation (S3) process in North Macedonia started in March 2018, when the letter of commitment from the country's government on starting the development of the National Research and Innovation Strategy for Smart Specialisation reached the Joint Research Centre. The process is led by the Smart Specialisation team of North Macedonia and jointly coordinated by the Ministry of Economy and Ministry of Science and Education. The quantitative analysis within the mapping of the economic, innovation and scientific potential was conducted in 2019 and revealed several sectors with strong potential. The following priority areas were confirmed after the qualitative analysis (Radovanovic et al, 2022) and the EDP which was completed in 2022:

- Smart Agriculture and Food with Higher Added-Value;
- Information and Communication Technologies (ICT) Sector;
- Electro-Mechanical Industry - Industry 4.0;
- Sustainable Materials and Smart Buildings.

The work on the finalisation on the strategy was intense ever since and the Smart Specialisation strategy of North Macedonia was adopted late in 2023. It is currently pending the assessment by the European Commission services.

- **Serbia**

Serbia registered on the Smart Specialisation (S3) platform in 2015. The Smart Specialisation process in Serbia started in 2017, with the Ministry of Education, Science and Technological Development taking charge of the coordination of the process by establishing an Inter-ministerial working group for the development of the Research and Innovation Strategy for Smart Specialisation (RIS3). Under the guidance and support by the JRC and by following the JRC methodological framework for smart specialisation in the EU enlargement and neighbourhood countries, Serbia identified the following priority areas in the mapping stage (Radovanovic et al, 2021), which were later confirmed during the stakeholder dialogue within the EDP:

- Food for future;
- ICT,
- Future machines and manufacturing systems;
- Creative industries.

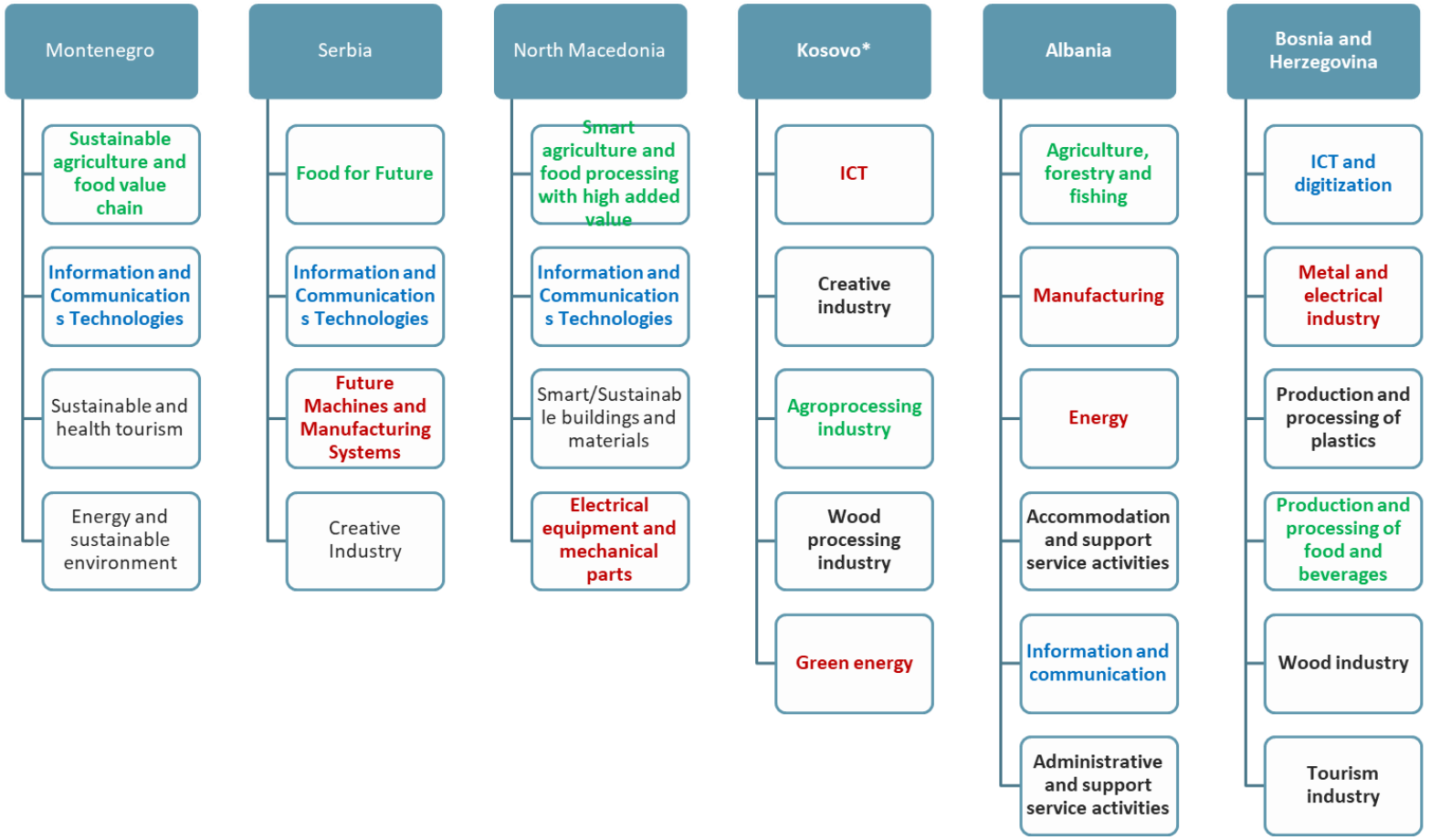
Serbia finalised the adoption process of its Smart Specialisation framework documents including the action plan in April 2021. The action plan was revised in 2023 and the documentation is currently being assessed by the European Commission services.

Table 11. Policy documents for innovation in the Western Balkans relevant to Smart Specialisation

Albania	Bosnia nad Herzegovina	Kosovo	Montenegro	North Macedonia	Serbia
National Strategy on Development and Integration II (2015-2020) National Strategy for Science, Technology and Innovation (2017-2022) Strategy on the Development of Business and Investments (2014-2020) Cross-Sectoral Strategy on Rural and Agriculture Development (2014-2020) Cross-Sectoral Strategy on the "Digital Agenda of Albania" (2015-2020) National Fisheries Strategy (2016-2021) National Health Strategy (2016-2020) National Strategy on the Sustainable Development of Tourism (2018-2022) Cross-Sectoral Strategy on Decentralisation and Local Governance (2015-2020)	Strategy of Science Development in Bosnia and Herzegovina (2017-2022 Sectoral Policy for Electronic Communications in Bosnia and Herzegovina (2017-2021) Policy for the Development if the Information Society in Bosnia and Herzegovina (2017-2021) Action Plan for the Development and Implementation of the Qualifications Framework in Bosnia and Herzegovina (2014-2020) Priorities for Higher Education Development in Bosnia and Herzegovina (2016-2026) Strategy of Scientific and Technological Development of the Republic of Srpska "Knowledge for Development" (2017-2021)	National Development Strategy (2016-2021) Strategy for Innovation and Entrepreneurship (2019-2023) Kosovo Education Strategic Plan (2017-2021) Kosovo Information Technology Strategy (2014-2020) Kosovo Digital Agenda (2012-2020) Energy Strategy of the Republic of Kosovo (2017-2016) National Research Programme of Kosovo (2010-2015)	Industrial Policy of Montenegro (by 2020) The National Renewable Energy Action plan for use of Renewable Energy Sources (by 2020) Fisheries Strategy of Montenegro (2015-2020) Master Plan of the Development of Health System of Montenegro (2015-2020) Strategy for the Development of Agriculture and Rural Areas (2015-2020) Strategy of Innovation Activity (2016-2020) National Roadmap for European Research Area (2016) Montenegro Development Directions (2015-2018) Energy Policy of Montenegro (by 2030)	Industrial Strategy of the Republic of North Macedonia 2018-2027 Competitiveness Strategy (2016-2020) National Small and Medium-Sized Enterprises Strategy (2018-2023) Economic Reform Programme (2019-2021) The Economic Growth Plan Fiscal Strategy of the Republic of North Macedonia (2019-2021) National Strategy of Innovation (2012-2020) and eight regional strategies for innovation Entrepreneurial Learning Strategy of the Republic of North Macedonia 2014-2020 National Strategy for Sustainable Development (from 2008)	Strategy and Policy of the Industrial Development of the Republic of Serbia (2011-2020) Strategy of Development of ICT Industry (2017-2020) Strategy for the Development of SMEs, Entrepreneurship and Competitiveness (2015-2020) Strategy of Science and Technological Development of Serbia "Research for Innovation" (2016-2020) Strategy for the Development of Education in Serbia (until 2020) National Employment Strategy (2011-2020) Fiscal Strategy (for 2017 with projections for 2018 and 2019 Economic Reform Programme (2017-2019)

Source: Radovanovic and Benner (2019).

Table 12. Smart Specisalisation priorities identified/under investigation in the Western Balkans



Note: For ME, Mk and RS – proirities coming from adopted S3; for XK – priorities coming from EDP; for AL – proirities coming from mapping; for BA – priorities coming from quantitative analysis. Colours in text indicate identical or similar (potential) priority areas across the Western Balkan economies (same colour for identical/similar priority areas).

Source: Authors.

The Western Balkan economies are carrying out the Smart Specialisation process by following the Smart Specialisation framework for the EU Enlargement and Neighbourhood Region, with the support of the Joint Research Centre. One of the crucial stages of the process is to identify priority areas for intervention, where the policy instruments and measures for Smart Specialisation should be targeted at.

Box 9. Mutual S3 priorities across the Western Balkan region

Even in different stages of S3 development, it has been observed that some of the priority areas identified in their respective Smart Specialisation efforts are mutual to the entire region (see table 11). The priorities areas are identified as follows:

- All WB economies - sustainable agriculture (food processing) and ICT;
- Montenegro, Albania, Kosovo - energy;
- Serbia, Kosovo, North Macedonia, Albania - manufacturing, metal processing industry;
- Montenegro, Bosnia and Hercegovina – tourism.

It is foreseen that the identification of such priority areas revealed that not only common priority areas are being identified, but also particular strengths and challenges that the economies are facing for using their full potential are likely to be similar (Radovanovic et al, 2023). As these Smart Specialisation processes were coordinated at the national level, it was important to share such strengths and challenges, as well as main characteristics and drivers of the identified priority areas for the benefit of the entire region. Due to the continuity of the Smart Specialisation exercise, monitoring and evaluation are of utmost importance (for relevant information, see chapter 2.3.1).

3.8 Regional cooperation

In the last period, the Western Balkan region demonstrated increased efforts for regional cooperation in domains of economic and innovation potential. There have been several initiatives to augment the cooperation efforts aiming at broader development of regional competitiveness and increasing the opportunities for better economic integration of the entire region into the EU common market.

- Economic and Investment Plan for the Western Balkans[31]

The Economic and Investment Plan for the Western Balkans focuses on progression and collaboration in the region. This ambitious plan includes ten investment flagships, each designed to support the region by sustained economic recovery, ecological and digital advancement, and strengthened regional bonds within the Western Balkans and with the European Union. Central to this transformative vision is a series of infrastructure projects. These projects, earmarked for immediate funding, should bring new investments across the region. The effects of these developments are manifold: enhanced trade routes, bolstered connectivity, and a revitalized economic landscape. Such comprehensive infrastructure development not only paves the way for individual nation growth but brings the Western Balkan countries closer. By intertwining infrastructure development, digital transformation, environmental sustainability, private sector enhancement, human capital development, and sustainable transport, the plan lays a foundation for a Western Balkans that is not only economically resilient and competitive but also interconnected and unified in its path to growth and EU integration.

Among the important elements of this plan are digitalisation, the formation of the Common Regional Market, and the emphasis on clean energy and environmental sustainability. Integration of the EU's digital strategy with the Western Balkan region will provide technological upgrade, but also enable the region to align itself with the global digital evolution and open new possibilities for regional collaboration in technological innovation and digital infrastructure development. Concerning the efforts in the area of clean energy and environmental sustainability, the shift from fossil fuels and antiquated infrastructure to greener, efficient systems do not only stand as an environmental imperative but also provide opportunities for regional cooperation. Collective efforts in this direction align with the broader European Green Deal, underscoring the region's commitment to a shared vision of a greener future.

The plan recognises the vital role of the private sector in regional economic integration and socio-economic development, as well as the importance of the human capital development. Enhancing access to financing and

[31] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1811

business support, coupled with initiatives to strengthen public-private partnerships, is poised to enhance regional economies. Emphasizing inclusivity and fairness, it aims to ensure that the benefits of recovery and growth are shared equitably. Strengthening the labor market, enhancing workforce training, and promoting sectors like education, health, and culture represent not just individual objectives for the economies but also opportunities for regional collaboration and shared growth.

- Common Regional Market (CRM)

The Common Regional Market (CRM) Action Plan for 2021-2024 represents a significant initiative aimed at bolstering economic integration and cooperation among the Western Balkan economies. This plan is envisaged as a catalyst for deeper regional economic integration, serving as a stepping stone towards the integration of these economies into the European Union (EU) Single Market.[32] The CRM initiative focuses on four key areas:

1. Regional Trade Area: This involves the free movement of goods, services, capital, and people. It includes measures like Green Lanes for faster goods movement, mutual recognition of standards and qualifications, and liberalization of trade in services. The aim is to align rules and regulations with the core principles governing the EU Internal Market, thereby promoting growth and employment opportunities in the region.
2. Regional Investment Area: This area is focused on aligning investment policies with EU standards and promoting the region to foreign investors. Efforts will be made to increase the attractiveness of the region for Foreign Direct Investment (FDI), leveraging the market size and regional production networks.
3. Regional Digital Area: Integration into the pan-European digital market is a key goal, emphasizing the importance of broadband internet access, reduction of roaming charges, and development of digital skills. This initiative seeks to harness the potential of the digital economy, facilitating trade and making the market more accessible and competitive.
4. Regional Industrial and Innovation Area: This area targets the transformation of the industrial sector and shaping value chains. It involves supporting start-ups, fostering green and women entrepreneurship, and integrating the regional supply chains into European and global networks. The focus is on driving economic growth and job creation through a productivity-based, export-oriented growth model.

Additionally, the plan emphasizes the importance of governance coordination and monitoring for the successful implementation of the CRM Action Plan. By closely aligning with EU standards and fostering areas such as trade, investment, digital economy, and industrial innovation, the WB6 economies aspire to strengthen their economic base, increase regional resilience, and accelerate integration into the European market. The successful implementation of this plan is expected to have a transformative effect on the region, contributing to sustainable growth and development.

- New Growth Plan for the Western Balkans

The New Growth Plan for the Western Balkans, an initiative unveiled in November 2023, marks a pivotal step in the region's journey towards socio-economic convergence with the European Union (EU) and an acceleration of EU reforms. This comprehensive plan, enriched with a €6 billion Reform and Growth Facility, is a testament to the EU's commitment to the Western Balkans, fostering deeper integration and supporting fundamental reforms.

Central to the plan is the vision of enhancing the Western Balkans' economic integration with the EU's Single Market. This ambitious goal aims to bring the region closer to the EU, offering tangible benefits to its citizens even before formal accession. This integration covers a wide array of sectors, ranging from the free movement of goods and services to energy market integration, thereby facilitating a smoother transition for the Western Balkans into the EU economic landscape.

Another critical aspect of the plan is the development of the mentioned Common Regional Market within the Western Balkans itself. By nurturing this unified market, the plan sets in motion a series of collaborative efforts, encouraging these nations to harmonise their economic policies and standards. This harmonisation is not an end in itself but a means to a more integrated and prosperous regional economy, attracting investments and

[32] https://www.wb6cif.eu/2020/11/11/summit-in-sofia-declarations-on-common-regional-market-and-green-agenda/

fostering trade within the Western Balkans. The implementation of this market is expected to significantly boost the regional GDP, adding an estimated 10% over time.

The plan also places a strong emphasis on accelerating fundamental reforms across the Western Balkans. Each partner in the region is tasked with preparing a detailed Reform Agenda, outlining priority reforms segmented into specific milestones. The Western Balkan economies' efforts in adopting EU regulations and practices should bring the economies closer, fostering a spirit of cooperation and mutual growth. The fulfillment of these reforms, deemed "payment conditions," is key to unlocking financial support from the new Growth Plan. These reforms are pivotal not only in enhancing economic growth and attracting foreign investment but also in reinforcing regional stability and moving the Western Balkans closer to EU membership. Financial support underpins the entire Growth Plan, with the EU proposing a new financing instrument - a mix of €2 billion in grants and €4 billion in concessional loans. A significant portion of this funding is allocated to investments through the Western Balkans Investment Framework (WBIF), with the rest tied to the successful implementation of the Reform Agendas by the Western Balkan governments. The spirit of collaboration is further bolstered by investments through the Western Balkans Investment Framework, which supports projects of regional significance. This approach encourages countries within the Western Balkans to engage in projects that benefit the region as a whole, promoting cooperation on critical issues like infrastructure, energy, and environmental protection.

- Regional collaboration events and initiatives by the Joint Research Centre

Within its support to the Western Balkan economies in pursuing their Smart Specialisation strategies, the JRC launched an initiative of promoting regional collaboration through a series of actions. It organised several regional conferences with the objective of sharing the experiences from the advancements in Smart Specialisation and discussing how to overcome different challenges that the economies were facing. Such conferences were organised both in the EU Member States (i.e. Sofia in 2018 and Bucharest in 2019) and in regional economies (Podgorica in 2019, Belgrade in 2019 and Skopje in 2022). These events brought together a wide array of stakeholders and policy-makers from both EU and the Western Balkans, including well-renowned experts in the field of innovation and innovation policy. The findings from these conferences, as judged by the Western Balkan economies themselves, provided very important solutions for process of developing Smart Specialisation strategies in the region.

In 2021, the JRC also launched a series of targeted thematic workshops on common priority areas in the Western Balkans. The first such workshop was held in 2021 on the topic of agri-food, where the stakeholders from the entire region discussed the achievements in identifying strengths of this priority area and challenges that the implementation of this domain might face. The second workshop from this series was organised in 2022 on the topic of ICT and with the same objective – to discuss the opportunities for further advancing policy actions in this common domain and share the experiences. However, the main goal was to assess the opportunities for regional collaboration in these domains by revealing the strenghts in respective value chains, niches in which the economies excel, main players in economies in the domains and bringing them together to discuss the potential for collaboration. This initiative proved to be very successful, producing reports with the conclusions and recommendations for the economies how to advance their own as well as regional competitiveness in these common Smart Specialisation priority domains.

In addition to these reports, the JRC published several 'horizontal' studies with the aim of helping the Western Balkan economies to identify potential challenges and evidence-based strengths within their economic landscapes. It is worth noting the 'Analysis of value chains in the Western Balkans' from 2022 and the upcoming 'Smart Specialisation in the Western Balkans: potential for knowledge-based cooperation', among others. Also, in late 2023, the JRC launched an interactive web platform that reveals main stakeholders in the priority areas in the entire EU Enlargement and Neighbourhood Region, including the Western Balkans, focusing on their activities on patenting, publishing scientific papers and project involvement, highlighting collaborations in these actions. All these products and services of the JRC are available at the web platform "Knowledge Hub for Smart Specialisation in the EU Enlargement and Neighbourhood" hosted by the JRC.[33]

- Activities of the Regional Cooperation Council

The Regional Cooperation Council[34] serves regional cooperation and European and Euro-Atlantic integration of South East Europe to spark development in the region. RCC is an all-inclusive, regionally owned and led

[33] https://s3platform.jrc.ec.europa.eu/knowlegde-hub
[34] https://www.rcc.int/

cooperation framework. Within the framework of the general political guidelines set by the South-East European Cooperation Process (SEECP), the RCC works to develop and maintain a political climate of dialogue, reconciliation, tolerance, and openness towards cooperation, with a view to enabling the implementation of regional programmes aimed at economic and social development to the benefit of the people in the region.

The RCC has been working towards the integration of South East European (SEE) economies, with a focus on enhancing regional cooperation for the benefit of its citizens. The Annual Report for 2022-2023 not only highlights the challenges faced in the past year but also delineates the notable achievements and outlines our objectives for the forthcoming period. The RCC's efforts have been multifaceted, encompassing support for investment policy reforms, fostering innovation, promoting economic inclusion, empowering women, and advancing the digital agenda to implement the Common Regional Market, among other initiatives.

Given that the Western Balkan region trails behind the European Union in terms of employment rates, innovation and entrepreneurship have been earmarked as top priorities. In this regard, the Western Balkans Innovation & Research Platform has been operationalized, rapidly emerging as a pivotal regional coordination mechanism for innovators and researchers.

The events of the past twelve months have underscored the pressing need for increased energy security. A viable pathway to this objective is through the diversification of energy sources and substantial investment in renewable energy. Hence, the RCC is intensifying its efforts to coordinate the implementation of the Green Agenda for the Western Balkans (GAWB).

- Balkan barometer[35]

Balkan Barometer is an annual survey of public opinion and business sentiments in six Western Balkans economies, commissioned by the Regional Cooperation Council (RCC). It is examining aspirations and expectations on life and work, prevalent socio-economic and political trends & regional and European integration. Balkan Barometer is conducted each year by an independent agency among more than 6,000 citizens and 1,200 companies throughout the region. Some interesting results of research (relevant to this study) conducted in 2023[36] are as follows:

- 76% of people believe regional cooperation is good for their economy;
- Drop of the EU support in the region: 59% (or 3% less than in 2021);
- 69% of people agree that what brings the Western Balkans citizens together is more important than what separates them;
- 1 in 5 of Western Balkans citizens associate the Balkans with hope or cooperation;
- depopulation: 44% of people are considering living abroad (5% more that in 2022);
- 71% young people are considering leaving their home country;
- 27% of Western Balkan citizens say corruption is the biggest problem;
- 27% of Western Balkan citizens do not trust political parties;
- 71% of Western Balkan businesses see EU membership as a good thing;
- 74% of Western Balkan businesses perceive regional cooperation important for their business;
- 13% of Western Balkan businesses predominantly use renewable energy, while 37% did not take any steps to reduce the environmental impact their businesses make;
- 70% of businesses in the region do not see climate change as a problem.

3.9 Smart Specialisation priorities and Green Agenda for the Western Balkans

The Green Agenda for the Western Balkans can greatly benefit from Smart Specialisation Strategies, which are conceived as place-based, innovation-led transformation agendas for sustainability. S3 create the opportunity to engage regions and cities in transformation contributing to the green transition, focusing on identify innovation investments.

The S3 already adopted in Montenegro and Serbia can serve as example to the other Western Balkan economies. The Smart Specialisation Strategy of Montenegro, adopted in 2019, addresses environmental and sustainability in two priority domains: first, sustainable agriculture and food value chain; and second, energy and sustainable

[35] https://www.rcc.int/balkanbarometer/
[36] BALKAN BAROMETER INFOGRAPHIC 2023.

environment[37]. The S3 of Serbia address also on production on food for future and future machines and manufacturing systems, strongly connected with sustainable goals and environmental issues. Both S3 has priority connected to information and communication technologies while digitalisation will be a key enabler for five pillars of GAWB in line with the concept of the dual green and digital transition.

Very important are conclusions from the lasts Conference "Policy Dialogue on Aligning Priorities in the Western Balkans" Green Agenda for the Western Balkans –the way forward", held in Sarajevo sept 2023[38] ;

- Decentralize the implementation of the Green Agenda by incorporating local municipalities and encouraging more private sector involvement.
- Strengthen local governance capacities to conduct proper GAWB implementation.
- Strengthen regional cooperation to ease the green transition by lowering costs and avoiding inefficient parallel structures in implementing the Green Agenda.
- Raise awareness about the importance of clean energy and environmental protection both among the population and at the policy level, including by sensitizing youth to the severity of the issue and the potential for the future of the energy transition through education.
- Strengthening GAWB coordination, monitoring, and reporting systems at the regional level.
- Ensure that energy transition strategies are coordinated and multidisciplinary, involving social, legal, economic, technical, and educational considerations.
- Seek out expert-informed recommendations during the policy-making process
- Use the energy crisis as a catalyst for a green transition.
- Improve university curricula and enhance regional cooperation to promote research
- Promote the exchange of knowledge and resources on a regional level.
- Counteract the public misconception of CE as a form of waste management with awareness and education campaigns that explain the complexity of the issue
- Increase furthered EU support for the long-term implementation of the Green Agenda.
- Make clear that energy security questions in the Western Balkans need to be tackled together with the EU instead of leaving the Western Balkans to create a unique and isolated solution.
- Seek a wider exchange between politics, business, and non-governmental organisations to find compromises and partnerships in securing energy and raw materials as well as protecting employment.
- Increase efforts to raise understanding and incentives for the implementation of the Green Agenda, both at the civil society as well as at the policy-making level.

[37] Brussels, 6.10.2020 SWD(2020) 223 final COMMISSION STAFF WORKING DOCUMENT Guidelines for the Implementation of the Green Agenda for the Western Balkans

[38] https://wbc-rti.info/object/news/24487

Table 13. Priorities as defined in Green Agenda for Western Balkan and Smart Specialisation Strategy for WB economies

GAWB priorities	Smart Specialisation priorities					
Main areas	**MONTENEGRO**	**SERBIA**	**NORTH MACEDONIA**	**KOSOVO***	**ALBANIA**	**BOSNIA AND HERCEGOVINA**
Decarbonisation: climate, energy, mobility	Sustainable agriculture and food value chain	Food for future	Agriculture and food processing with high added value	ICT	Agriculture , forestry and fishing	ICT and digitalisation
Circular economy	Information and Communication Technologies	Information and Communication Technologies	Information and Communication Technologies	Creative industry	Manufacturing	Metal and electrical industry
Depollution: air, water & soil	Sustainable and health tourism	Future Machines and Manufacturing Systems	Smart/sustainable buildings and materials	Agroprocessing industry	Energy	Production and processing of plastics
Sustainable food systems & rural areas	Energy and sustainable environment	Creative industry	Electrical equipment and mechanical parts	Wood processing industry	Accommodation and support service activities	Production and processing of food and beverage
Biodiversity: protection & restoration of ecosystems				Green energy	Information and communication	Wood industry
Note : followed by Dual green and digital transition						Tourism industry

Note: As of December 2023, the priority areas for ME, MK, RS were either part of adopted strategies or in the case of AL and XK being furhter invstignated , while for BA they were considered as potential, since the mapping phase is not offically concluded. Same colours mark direct links between the GAWB and S3 priorities.

Source: Authors.

* *This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.*

The Green Agenda for Western Balkan[39] is the new growth strategy for the Western Balkan economies. The Communication introducing the Green Agenda also admits that this transformation will 'require a strong policy response at all levels' and significant investment efforts.

Both the Green Agenda for the WB and Smart Specialisation represent transformation policy frameworks. While Smart Specialisation is a place-based innovation policy approach, the Green Agenda can benefit from place-based dynamics; therefore, such combination enables and supports transformation. The policy framework of the Green Agenda needs to take Smart Specialisation explicitly on board. The correlation between GAWB and S3 is presented in the Table 13, while the summary of correlation is presented in the Table 14.

Table 14. Relation between GAWB and priorities in S3 per Western Balkan economies

MAIN AREAS RELATED TO THE GAWB	**S3 PRIORITIES IN 2023**
Decarbonisation: climate, energy, mobility	Montenegro, Kosovo, Albania
Circular economy	Indirectly: North Macedonia, Kosovo, B&H
Depollution: air, water & soil	Serbia, North Macedonia, Kosovo, Albania, B&H
Sustainable food systems & rural areas	*All economies*
Biodiversity: protection & restoration of ecosystems	Montenegro , B&H
Note: followed by Dual green and digital transition	*All economies*

Note: As of December 2023, the priority areas for AL, ME, MK, RS and XK were either part of adopted strategies or considered final, while for BA they were considered as preliminary.

Source: Authors.

[39] Brussels, 6.10.2020 SWD(2020) 223 final COMMISSION STAFF WORKING DOCUMENT Guidelines for the Implementation of the Green Agenda for the Western Balkans

4 Conclusions and recommendations

Based on the previous analysis, a survey was conducted aiming at receiving qualitative feedback on the main challenges on the use of Smart Specialisation results for the green transition of the region. The participants to the survey came from different economies from the Western Balkan region. The chosen consultation method used for the development of this study depended on the limited time and accessibility of potential participants in the consultations. The methodology for data collection is given in the annex.

4.1 Conclusions

The six economies of the Western Balkans are at different stages of economic transformation, striving to develop policies that maximize their potential. Environmental degradation in the Western Balkan region is notably present in soil, water, and air pollution. This degradation is attributed to various socio-economic factors such as weak or recovering economies, limited budgets for environmental protection, insufficient regulation and public participation, old industry, and restricted access to cleaner technology and environmental information.

Despite experiencing growth, the Western Balkan economies faced various challenges, including inflation surges, electricity and heating outages, and inflation pressures persisting in early 2023. However, investments in the Western Balkans have shown resilience, and employment levels, except in North Macedonia, remain above pre-crisis levels. Small and medium-sized enterprises (SMEs) significantly contribute to economic performance and sustainable development in the Western Balkan region, accounting for a substantial portion of private-sector employment and value added.

The fragmentation and small scale of the economies pose challenges to the economic growth and competitiveness of the Western Balkan economies. Additionally, the Western Balkan economies are at varying stages in the EU enlargement process and accession negotiations. The level of alignment with the Energy Community methodology differs across the region.

Smart Specialisation is recognized as a new policy approach and a tool for industrial development in the Western Balkans. It aims to concentrate resources on key priorities for economic transformation. The Smart Specialisation approach in the Western Balkan region can optimize public funds, stimulate private investment, and focus on key priorities rather than spreading investments thinly. The Western Balkan economies are committed to Sustainable Development Goals, the European Green Deal, and the Green Agenda for the Western Balkans. However, the Green Agenda's implementation lags due to incomplete legal documents and necessary reforms. Governments perceive the green transition mainly as an obligation imposed by the European Union.

Coal remains the primary energy source in the region, accounting for 70% of electricity production. The Western Balkans lack a comprehensive industrial policy, and the adoption of Smart Specialisation Strategies (S3) is a relatively recent development. Although S3 strategies have been adopted, their effects remain uncertain in Montenegro and Serbia, while other economies are at different stages of S3 development. Environmental topics are occasionally part of S3 priorities. The Western Balkans are in the initial stages of their green transition.

Policies related to fulfilling the Green Agenda in the Western Balkans are outlined in Table 8. The transition to a low-carbon, environmentally sustainable economy has started in the region, but progress has been slow with setbacks. Progress in aligning with waste management legislation and circular economy provisions is slow, presenting enforcement challenges. Air pollution in the Western Balkans remains among the highest in Europe, primarily due to emissions from older coal plants and heavy reliance on private transportation.

Agriculture's crucial role in food production, safety, environmental protection, and climate change mitigation is juxtaposed with threats from climate-induced factors. The percentage of protected areas in the Western Balkans is below the 20% mark, with some economies having less than 5% territory under protection. Available indicators on the green transition in the WB are not encouraging within a relatively short period since the development of the Green Agenda in 2019. Enhancing green skills is crucial for the ecological transition, particularly for younger generations.

SMEs are recognized as key players in developing innovation- and knowledge-based economies. Smart Specialisation is a tool for sustainable growth and innovation across the entire WB region. Improving the implementation of the Green Agenda and utilizing Smart Specialisation to mobilize innovation efforts are essential. Communication and collaboration among relevant ministries and sectors for S3 and Green Agenda implementation need improvement. Engagement between local governments and government bodies is insufficient. Government officers are more familiar with the Green Agenda than with S3.

Additional knowledge and cross-sectoral connections are needed for successful Green Agenda and S3 implementation. Upskilling and reskilling are necessary across sectors, especially in corporate settings, for a just transition. Increasing public awareness and changing mentalities are crucial for the green transition. Considering local, regional, national, and transnational dimensions concurrently is necessary. Redirecting existing budgets toward promising areas identified for the future is crucial for green transformation.

Box 10. Need for the unified transition plan in the Western Balkans

The Western Balkan economies lack a comprehensive and unified plan for the transition, considering supply and demand for different forms of energy across the region, and energy trade at both intra-regional level and with neighbouring countries (OECD, 2022a). In particular, the challenge of replacing baseload power currently generated from coal has not been resolved. To address the remaining challenges, the Western Balkan economies can advance in several interrelated areas: continue their transition away from coal towards cleaner forms of energy; strengthen their performance on energy efficiency; reform energy pricing in an equitable and strategic way that takes account of both vulnerable groups and environmental concerns; enhance regional integration in the energy sector; and mobilise financial resources for a green recovery.

4.2 Recommendations

Following the concept of a dual green and digital transition, it is crucial to implement the Green Agenda using innovative solutions that minimize costs. The interconnectedness of the five Green Agenda pillars emphasizes the importance of a holistic approach and coordinated action across all mentioned areas. Thus, integrating environmental protection into other policies and development programs should establish a green economy, conducting economic activities with low carbon emissions and efficient resource utilization. To fully realise this green transition, administrative capacity at both national and local levels needs strengthening, along with law enforcement. This transition to a green economy should coincide with public administration and judiciary reforms. Moreover, the socio-economic impact of this transition requires consideration, ensuring the Green Agenda's implementation is socially just and inclusive.

Measures taken to address the just transition can significantly impact economic sectors and the labor force within these sectors. Vulnerable or precarious employment groups might be particularly affected by mitigation measures in the just transition. Hence, monitoring and planning measures that provide alternative solutions to the affected labor force are essential. Data on vulnerable employment can identify groups with low potential for adaptation and resilience due to inadequate integration into the labor market and weak socio-economic positions. Addressing the social component, being the most sensitive and complex issue, requires careful long-term planning at the national and regional levels.

Governments in the Western Balkans perceive the green transition and decarbonization primarily as obligations imposed by the European Union. Enhancing this perception as an opportunity to strengthen economies, societies, and improve citizens' health and living conditions remains a low priority. This perception should be reinforced through research and public campaigns. The economy and its stakeholders need to adapt and actively participate in the new just transition process, as it shapes their operations in the future.

The development of the second generation of Smart Specialization Strategies in the Western Balkan economies will occur in a different context, aligned with the new Green Agenda for the Western Balkans. Policy makers and citizens will need to include societal challenges associated with green transformation across the economies.

To facilitate the implementation of the Sofia Declaration on the Green Agenda for the Western Balkans, the following actions are necessary: ensuring regional ownership and cooperation, adopting a multi-stakeholder approach, fostering cross-sectoral collaboration involving all relevant Western Balkan authorities, and strengthening cooperation at various levels.

Table 15. Summary of recommendation based on findings in Study and Green agenda Action plan[40]

TO BE ADDRESSED	DUTIES /TASKS BASED ON GREEN AGENDA	RESPONSIBILITY /WHO
Legislation, policies,	• Align with the EU Climate Law with a vision of achieving climate neutrality by 2050, adoption of strict climate	• Government.

[40] cc.int/docs/596/action-plan-for-the-implementation-of-the-sofia-declaration-on-the-green-agenda-for-the-western-balkans-2021-2030

regulations, S3 and GAWB strategies	policies and reforms in the energy and transportation sector. • Harmonisation of national legislation on climate change with the EU regulations and development of integrated national energy and climate plans in the Western Balkan economies. • Preparations to introduce the Emission Trading Scheme (ETS) and carbon pricing. • Review and revise, where necessary, all relevant legislation to support progressive decarbonisation of the energy sector. • Prepare an assessment of the socio-economic impact of decarbonisation at the individual economy and regional level. • Develop legal frame for giving advantage to energy efficiency and improving it in all sectors, with a particular focus on energy renovation of buildings. • Increase the percentage of renewable energy sources and reducing energy poverty. • Increase the share of renewable energy sources and provide the necessary investment conditions. • Decrease and gradually phase out coal subsidies, strictly respecting state aid rules. • To prevent adverse social effects of the green transition, governments should draft "just transition strategies", including social measures for different societal groups, based on an assessment of their relative vulnerability to the transition process. • Ensure participation in the Coal Regions in Transition initiative for the Western Balkans. • Develop programmes for addressing energy poverty and financing schemes for household renovation and providing basic standards of living. • Supporting smart infrastructure, digitalisation of all types of transport, defining new corridors in rail transport and introducing new alternative fuels (hydrogen). • Additionally address waste legislation in the part related to by-products and end-of-life products, as it lacks incentive measures for stimulating waste as "zero waste". • Develop circular economy strategies looking at the entire lifecycle of products. • Make further progress in the construction and maintenance of waste management infrastructure for cities and regions. • To develop methodology to incorporate environmental policy and digitalisation I all other national policies as obligatory. • It is necessary to prioritise and mainstream environmental and climate issues contained in the GAWB into all policy areas. Specific funds need to be earmarked for implementing the Green Agenda. • Incorporate municipality and corporate sector as well as other in decision making process. • WB governments need to draft long-term, visionary strategic plans (encompassing the next decades, instead of only a few years) on how to successfully implement the	• Relevant ministries (primarily for energy, environmental protection, education, finance). • Gov. bodies: agency for energy and similar. • Municipalities. • Chamber of commerce. • Regional chambers of commerce. • Sector level associations. • SMEs associations. • Power utilities. • Coal mines. • Academia. • NGOs.

	objectives of the GAWB with clear timelines and specific targets. • All relevant stakeholders, including the business community, trade unions, CSOs, think tanks, local communities, international financial institutions, etc., need to be actively engaged in the drafting and implementation of these strategic plans. Governments should also coordinate within the region when designing these plans.	
Corporative laws, strategies, policy	• Businesses in the Western Balkans need to understand the urgent need to decarbonise their activities and production processes, as they will otherwise be severely hit by EU climate policies, for instance through a CBAM. In this regard, businesses will have a hard time reducing the carbon footprints of their products and activities. • Assist in the development of plans for corporations, especially those that are exposed to the negative impact of the transition. • Organise and coordinate the establishment of SME networks for the energy transition with chamber of commerce and universities. • Create conditions for the transformation of the current utility business model into a model for "the utility of the future".	• Responsible ministries for energy, education, economy, environment, labour. • Business community. • trade unions. • CSOs. • local communities. • international financial institutions.
Academia topics, education	• Cooperate with scientific, education, business, and agricultural holdings to facilitate transfer to innovative and environmentally friendly technologies and farming methods. • Development of new curriculum in social, technical, and environmental sciences. • The perception of the transition as an opportunity for strengthening economies and societies and for improving citizens' health and living conditions remains low and should be strengthened through research and public campaigns. • Governments and public institutions in the WB lack knowledge when it comes to policy options, changes in legislation, and strategic planning in the environmental and energy sector. • In the future, environmental research should focus on maintaining and enhancing existing cooperation with university-level education institutions and scientific institutes worldwide, and on promoting the establishment of new cooperation. • Promoting the area of environmental protection can be established through primarily engaging young researchers on programmes of general interest in line with the law, such as those supporting and funding scholarships for young, gifted scientists and researchers, programmes for developing human resources in scientific and research work, programmes for funding doctoral academic studies. • Improving international bilateral and multilateral cooperation will enable sharing and transferring experiences among partners. This kind of cooperation, particularly established through the mobility of researchers and exchange of experiences and results, also increases the level of expertise and knowledge of each of the	• Responsible ministries for education and science, energy, environment. • Other responsible ministries. • Research institutions.

	partners in environmental protection and energy management.	
Smart Specialisation strategies	• Fully implement Smart Specialisation Strategies, place-based, innovation-led transformation agendas for sustainability. • Having in mind that the area of environmental protection was not in a sufficient extent identified in the process of mapping economic, scientific and innovation potential in all economies, more attention should be paid in the future to actions concerning environmental protection. • The preparation of the second generation of S3 in the Western Balkan economies will take place in a different context, in line with the new GAWB. In this respect it will be required from policy makers and other stakeholders to include the societal challenges associated with green transformation across the economies. • Support the development of smart transport infrastructure, promote fostering of innovative technologies (such as paperless transport, artificial intelligence, multimodal passengers ticketing, mobility as a service, border/boundary crossing applications). • Horizontal networking of identified companies in this area with key stakeholders in machine industry and electroindustry, as well as agriculture and food industry, will contribute to successful application of the concept of smart specialisation (e.g in Serbia). • Investments in scientific and research projects in environmental protection should be increased. • Explore possibilities for establishing a functional and dedicated government fund for just transition.	• Government. • Relevant ministries (primarily for energy, environmental protection, education, finance) • Gov. bodies: agency for energy and similar. • Municipalities. • Chamber of commerce. • Regional chambers of commerce. • Sector level associations. • SMEs associations. • Polluters. • Academia. • NGO.
Green transition	• Identify burning issues and find the best solutions for addressing them by involving all stakeholders in the chain. • Collective dialogue Important to proceed with a partnership negotiation between employers and employees in the transition process. • In the regions that are expected to be most affected, within the framework of the Regional Chambers, organise an institution (e.g. council or similar) for just transition that will assist corporations in acquiring new knowledge, but also in exchanging experiences of good practice. • Learn on examples on how to raise capacities to better address just transition. Look for best practices on the international market.	• Employers and employees connected through company work agreements. • Chamber of commerce. • Regional chambers of commerce. • Interested parties and corporations.
Depollution	• Finalise the process of ratification of Convention on Long-range Transboundary Air Pollution and its protocols; • Support modelling to establish economy-wide emission reduction commitments for the five main pollutants covered by the NEC Directive and the Gothenburg Protocol under the Convention on Long-range Transboundary Air Pollution; • Increase the uptake of Best Available Techniques in accordance with the Industrial Emissions Directive; • Establish an adequate air quality monitoring system, including through accreditation of air quality monitoring networks;	• Government. • Relevant ministries (primarily for energy, environmental protection) • Gov. bodies: agency for energy and similar. • Municipalities. • Chamber of commerce.

	• Modernise water monitoring infrastructure and Build the necessary infrastructure for wastewater treatment reach good status for all water bodies; • Integrate soil protection in other policy areas and establish a regional soil partnership to improve knowledge exchange and identify examples of best practices for soil protection from pollution and degradation;	• Polluters. • Academia. • NGOs.
Circular economy	• Establish legal basis. • Support the establishment of a digital platform to assist the economies, further inform and connect them. • Revise the urban planning laws, as they do not follow the requirements of new businesses and sectors. In the context of legislative issues, it is necessary to include corporate sector. • Improve sustainability of primary production of raw materials. • Establish a centre for training and education of SMEs, e.g., in chambers of commerce or at the regional level for education and training. • Apply an industrial ecosystem approach to attain environmentally sustainable, balanced economic recovery. • Connect as much as possible with the companies already working on the international markets in the waste sector.	• Government. • Gov. bodies: agency for waste, etc. • Municipalities. • Chambers of commerce. • Recyclers. • Waste producers. • Other potential users. • Polluters. • Academia. • NGOs. • International organisations.
Agricultural policy	• Align the agri-food and primary production sector with the EU standards on food safety, plant and animal health and welfare and environment. • Strengthen the official sanitary controls along the entire food chain and improve the traceability and labelling of food products. • Promote environmentally friendly (zero pollution) and organic farming and reduction of synthetic chemical products used in food production. • Support investments in renewable energy production and technologies as well as GHG emission reductions and adaptation to climate change measures in agriculture.	• Government. • Relevant ministries (primarily for environmental protection and agriculture) • Municipalities. • Farmers. • Association of farmers. • SMEs. • Academia. • NGOs.
Protection of nature and biodiversity	• Develop and implement the Western Balkans 2030 Biodiversity Strategic Plan. • Prepare nature protection and restoration plans including for marine areas. • Develop and implement the Western Balkans Forest Plan. • Analyse biodiversity benefits of nature-based solutions and opportunities for their integration into the development of climate, restoration and other plans. • Development of green infrastructures and ecosystem connectivity.	• Government. • Relevant ministries (primarily for environmental protection, forest, water and agriculture). • Municipalities. • Academia. • NGOs.
Public awareness	• The awareness among governments and public institutions in the WB needs to be enhanced. • Design and implement consumer-targeted initiatives to raise awareness of citizens on waste prevention, separate collection, and sustainable consumption.	• All.

Education and qualifications	• Governments and public institutions in the WB lack knowledge when it comes to policy options, changes in legislation and strategic planning in the environmental and energy sector. Capacity development and awareness-raising campaigns for public officials are needed in this regard. • Corporate sector should share its needs for different professions with the body responsible for school curricula and enable assessment of new job descriptions and education of the young in the most adequate direction. • Need for trainings and education in relation to new green jobs for those already employed and opening possibilities of informal education. • SMEs should domestically, cross-regionally, and internationally create networks to share experiences and knowledge. Thereby, the SME sector could become a competitive "laboratory" for innovations and the reduction of emissions in production processes.	• Government. • Responsible ministries for education environment and energy. • Agency responsible for school curricula. • Corporate sector.
Access to information	• Dissemination of important and relevant information to citizens, workers unions and other stakeholders, through panel meetings, workshops and similar events.	• Local governments to take active role in informing members-citizens and workers unions.
Young population	• Bearing in mind that the crucial participants in the just transition will be young people, it is necessary to pay special attention to the development of the education sector at all levels. Necessary professional profiles should be defined in cooperation with the needs of the economy, more precisely of the market itself.	• Government. • Responsible ministries for education, energy, environment, labour and employment.
Gender balance and empowerment of vulnerable groups	• Relevant ministries to prepare adequate inclusive strategies for women to decent employment, education, and health. • Initiate entrepreneurship as a possibility for more new jobs. More incentives should be offered for women, vulnerable groups, and young persons. • Consider the possibility of establishing training centers for education in the local governments that will be most affected, given that these municipalities will gain experience in the green transition process that is important to share with other municipalities and individuals (for example, for organic food production, development of sustainable tourism, protection of natural entities).	• Responsible ministries for labour, employment, family care and demography, and education. • Local governments. • NGOs.
Regional cooperation	• Companies should establish networks and build coalitions amongst themselves to jointly advocate for the implementation of the GAWB. • In this regard, business associations and chambers of commerce should take a more proactive role in promoting the implementation of the GAWB. • The business sector should also increase its cooperation with universities in this context.	• Government. • Responsible ministries for education, energy and environment. • Academia. • Corporate sector.

	• Increase regional cooperation in alternative fuels infrastructure development. • Conclude and implement a regional agreement on the prevention of plastic pollution, including specifically addressing the priority issue of marine litter. • Strengthen the mechanisms for regional cooperation and strategic planning on biodiversity conservation and implementation of the commitments under the Convention on Biological Diversity. • Regional collaboration can take many forms. Economies might share selected building blocks of pricing mechanisms including on institutional infrastructure and MRV as well as on market operation and flexibility mechanisms in the case of emissions trading schemes. • Economies also may opt for looser collaboration, in the form of pooling resources; exchanging lessons on common challenges and issues or sending an aligned political signal on carbon pricing. • Set up the Western Balkans Biodiversity Information Hub to improve knowledge exchange and availability of information. • Improving international bilateral and multilateral co-operation will enable sharing and transferring experiences among partners. This kind of cooperation, particularly established through the mobility of researchers and exchange of experiences and results, also increases the level of expertise and knowledge of each of the partners in environmental protection. Other advantages will include a comparison of established approaches and results, as well as scientific and technological comparison, that will reduce the differences among individual institutions and increase the usage of results. • It is necessary to continue with the implementation of results that are directly implementable in practice. Within this sub-area, the following potentials, requiring additional research, were identified: biomass (pellet, bio-degradable waste); efficient bacteria; leftovers from other processes – waste treatment: dry farm leftovers (cows, cattle, pigs, chickens); leftovers from meat industry – their rehabilitation and further exploitation; municipality waste treatment; geothermal energy and solar energy.	
International market - connections at different levels	• Governments need to update their industrial policies and create an inducive environment for businesses and investments by setting market incentives. This could be achieved, for instance, through granting subsidies, imposing carbon prices, or providing green bonds. Close cooperation between the public and the private sector as well as with international financial institutions is crucial in this regard. • Connect as much as possible with the companies already working on the international markets in the e.g. waste sector.	• Ministries of economy. • Chambers of commerce. • Sector-level associations.
Access to finance	• It is necessary for governments and public authorities to prioritise and mainstream environmental and climate issues contained in the GAWB into all policy areas. Specific	• Commercial banks. • IFIs. • Chambers of commerce and

	funds need to be earmarked for implementing the Green Agenda. • New green products are already available for both population and corporate sector. • For the corporations and interested parties, it is crucial to learn how to prepare projects and access funding. • Access to IFI's and Banks finance capital projects under newly set out conditions for green projects. Acquire information on potential financing options from relevant ministries, organisations and e.g. chambers of commerce. • Clear and full cooperation with the banking sector is expected. • SMEs lack financial resources, capacities, and know-how concerning the green transition. Governments should provide special loans, subsidies, and trainings for SMEs to help them manage the green transition.	regional chambers of commerce. • Responsible ministries of finance, environment and energy.
NGO sector	• CSOs should be strongly supported in their task of educating and informing citizens, but also politicians, about the implications of the green transition and about the goals and commitments contained in the Green Agenda for the Western Balkans. • Specialized online portals and media outlets should be created, to generate public interest in the topics of the Green Agenda. • As there is only a small number of CSOs and think tanks working on environmental/climate change topics in the WB region, they should form cross-regional and cross-sectoral alliances of supporters of the Green Agenda for the Western Balkans to strengthen their advocacy efforts.	• Relevant ministries. • Academia. • NGOs.
EU level	• International partners play a key role in holding incumbent governments accountable for their commitments and the timeframes to which they have committed. • The EU needs to take into consideration the starting point of the Western Balkans economies when it comes to decarbonization and grant feasible transition periods when introducing climate policies that affect external trading partners (such as, for instance, CBAM). • The EU should provide special financial support (on the scale of structural funding) to the economies of the WB in their decarbonization efforts. • Transparency in the allocation and use of funds dedicated to implementing the Green Agenda should be ensured with a strong focus on monitoring compliance to allocation requirements. • International donors should streamline and coordinate their efforts in the form of a donor coordination platform to avoid overlapping of measures targeted at implementing the GAWB.	

Source: Authors.

Box 11. General recommendations

As part of the modern trends in creating scientific and innovation policies, effort in WB should be invested in strengthening co-operation among decision makers, the scientific community, academia and the business sector and civil society – with the aim to increase the competitiveness of the economy, economic growth, and societal progress, by interlinking research, industrial and innovation strengths, and resources.

It is necessary to direct resources and research to several priority areas, especially those exhibiting issues with potentially significant effects on the society and enable more efficient use of domestic but also international potentials for better positioning in global, international institutions, relevant to the area.

By developing innovation, science, and technologies in environmental protection, conditions are met for the preservation of our living space and the protection of health of the environment and the bio fund. This will help preserve the health of people and provide potentials for a healthy future of our children and generations yet to come.

Annexes

Annex 1: Methodology for data collection

The methodology conducted for purpose of the study included analysis of the following:

- available EU policy documents concerning Green Deal, Green agenda for the Western Balkans and Smart Specialisation, strategic, legal and policy framework in relevant areas, case studies and examples of good practice;
- available literature concerning the Smart Specialisation in the Western Balkans, as well as concerning the green transition of the Western Balkan economies.
- relevant national legislation, including the EU accession documentation for all Western Balkan economies and national policies for green transition and innovation related areas, as well as other national strategic documents of concern.

The methodology also included:

- identification of key stakeholders relevant for the Smart specialisation and Green agenda for Western Balkan;
- development of questionnaire and conducting a survey concerning the main challenges regarding role of stakeholders and the topic of this study.

Based on the work, the report aimed at providing relevant conclusions and recommendations on the possible uses of the Smart Specialisation process and outcomes for supporting the green transition of the Western Balkan region, including proposals for national and regional collaborative activities.

Research on EU policy

General desk research for Smart specialisation and Green deal was conducted on:

- International and European policy for Smart Specialisation and Green deal;
- EU Legal and institutional framework;
- International studies;
- Good learning practices in other countries in Europe;
- Guidelines;
- Literature review also included consulting web-based resources.

Research on Smart Specialisation and green transition in the Western Balkans

Desk research on the Smart Specialisation and green transition in the Western Balkan consulted the following:

- International sources on the WB economies;
- National strategic documents and data basis for WB economies concerning S3 and GAWB;
- National documents, national statistics, data basis concerning economy, innovation, research, environmental protection, employment, and other topics of concern like, but not limited to (if available) national integrated energy and climate plan, climate strategies and action plan, S3, low carbon development strategies;
- Regulations and relevant legislature on environmental protection, energy management;
- Relevant instructions from the ministries responsible for energy, environmental protection, labour, education, science, economy, finance;
- Web sites of Governments at national and local level, national institutions, ministries, academia, corporate sector, NGO;
- Overview of existing and previous practices and projects relating to S3 and GAWB in the Western Balkan economies;
- Lessons learned, good practice mapping;
- Identification of gaps;
- Conclusions and recommendations.

Identification of stakeholders

The first phase in the development of the study was to identify and collect primary data based on national and international practice all possible groups of stakeholders that should be involved in development of the study.

It must be underlined that the transition of Western Balkan economies towards green economies must be just and fair, maximizing opportunities for economic prosperity, social justice, rights and social protection for all, leaving no one behind. A green transition requires the inclusion of a ***broad and diverse range of stakeholders***, including governmental bodies, specialists from environmental, science, education, energy management, business, financial and academic spheres. It is another key element of collaborative governance at the national and local levels for the implementation of inter-sectoral dialogues and the development of cooperation.

The framework for the definition of stakeholders laid down in correlation between S3 and GAWB is given in the Table 13.

Important consultations are implemented in the process of development of this study. The purpose of the consultation process was to gather data from the stakeholders and target groups, required to implement Green Agenda for the Western Balkans and Strategy for Smart Specialisation in each economy of the Western Balkan region and to define optimum public policy measures. The goal of the stakeholder selection was to propose a comprehensive list of potential stakeholders to be involved in development of this study.

The full-scale mobilisation of available resources and capacities should lead to an extensive dialogue process aiming at achieving the participatory cooperation framework.

Criteria for the identification of stakeholders

In the process of creating a Smart Specialisation strategy, each Western Balkan economy identified 4 to 5 priorities. On the other hand, the Green agenda for the Western Balkans has 5 pillars of its priorities. The synergy of both priority lists as it is presented in the Table 13 and defines the framework for stakeholders that need to be included in the analysis.

Stakeholder involvement is about building and maintaining constructive relationships over time with all institutions, bodies and their representatives, corporate sector, academia, NGOs, who are engaged in the development not only of the Smart Specialisation strategy but also of different strategies and programs related to the requirements of Green agenda, such as strategies for circular economy, decarbonisation, mitigation with climate changes, air protection, energy, renewable energy, sustainable transport, protection of biodiversity, production of agri-food, etc.

Due to the complexity of Green transition and Smart Specialisation and their cross-relations, the ten key groups of stakeholders have been identified as priority aggregates based on their type, roles and responsibilities. Each group of actors presented below has a certain capability to impact the successful analysis in the development of the study from various perspectives and with diverse levels of knowledge and experience, gaining a potential role:

- **Ministries,** as bodies that formulate government policies and lead the decision-making processes on the national level, each responsible for its area of action. The role of ministries is essential from the point of view of the green transition and Smart Specialisation governance, as well as the organisation of the close inter-ministerial cooperation because the quality analysis requires a multi-sectoral approach. As key creators of public policies at the national level, the ministries that formulate development directions in the field of energy, environmental protection and climate change, industry and infrastructure, employment and labour market, social protection, education and science, economy, finance, trade, entrepreneurship and innovation, agriculture, forestry, and tourism are included (see Annex).
- **Governmental institutions and regulatory bodies,** as state or independent bodies specialised and responsible for various fields. Together with the ministries, they represent the backbone of leading changes and coordination, implementation, and monitoring of certain government policies. Such institutions are mainly governmental agencies such as but not only: agencies responsible for management of environmental data, energy agencies, Agencies for nature protection, etc (see Annex).
- **City administrations and local governments,** as local authorities of concerned and affected environments which should oversee organising and implementing the transition towards green economy in decentralised and transparent manner, bringing local communities and regions that are at the forefront of the energy transition into the central position of further national plans and policy-making (municipal governments from main cities included, as well as Standing conference of towns as representer of municipal interests; see Annex).
- **Corporate sector,** as the group of public and private companies, private businesses, SMEs, as well as their associations presenting major players in terms of change in the business development and

business model, also related to GAWB topics like decarbonisation of the core carbon-intensive business activities, high energy consumer and huge environmental polluters portfolio which would have wide impact on future local and national socio-economic development. Furthermore, it should also include entities that would be indirectly affected by such transformation and which should closely cooperate and coordinate with priority companies on planning and implementation (included main polluters, big energy consumers; see Annex).

- **Business and professional organisations,** as the actors that gather specialised professionals or interest groups, possessing thematic expertise and skills valuable in the green transition process (including chambers of commerce from the whole Western Balkan region, as representer; see Annex).
- **Academia and local school administrations,** as the educational institutions that present a backbone of the future labour market, carriers of knowledge and sources of a needed qualified workforce. Academia also has a specific dimension related to science in terms of research and innovation, which should strongly support the transformative process as an important component, while the role of local schools lies in their competence to lead regional reskilling and retraining activities (included all national universities; see Annex).
- **Non-governmental organisations,** as the actors of high importance for the just transition framework, which should be considered as partners able to effectively support the process from the perspective of advocating, knowledge-sharing, promotional activities, informal education, and similar sector-specific activities.
    - *Note that chambers of commerce and associations of local governments are non-profit organisations supporting activities of their members (corporations, SMEs, local governments etc). Due to survey time constraints, NGOs were not directly responding to the questionnaire, but the data from research documents from NGOs were included in the analysis (e.g., through Bankwatch, Aspen institute, EIB and other sources)*.
- **Financing institutions,** as the enablers of funding opportunities and securing sustainable resources. While international funds and banks already lead the support toward transformation and must be continuously included, the commercial banking sector operational on national level should be attracted and mobilized as well (included indirectly in the frame of ministries responsible for finance).
    - *Note: due to survey time constraints, financial institutions from the Western Balkan region were not directly responding to the questionnaire; instead, the data from the World Bank, EBRD and other sources were used for this study.*
- **Other relevant actors** with the potential ability to support just transition and have a valuable assisting roles in the implementing its certain activities.
    - *Note – the study includes data from documents originating from UNDP, OSCE, IFI as well as regional portals and news etc*. *For the full list, please see References*.

Besides grouping the stakeholders as per their category, interest and responsibilities, additional grouping should be performed based on the range of their influence, in terms of national-level or local-level. To achieve deeper analysis between the groups in examining green transition in the context of Smart Specialisation the following stakeholder groups were differentiated during the development of this study:

- Level 1 – Directly involved institutions and groups;
- Level 2 – Other project-related institutions and organisations;
- Level 3 – Other interesting parties.

Related to the level of involment, for the purpose of this study, the list of stakeholder categories is the following:

Level 1. Directly involved

- Ministries and governmental organisations and bodies, multisectoral groups covers by government/ministries: responsible for environmental protection, agriculture, Smart Specialisation, energy management, education, science, finance;
- Environmental agencies;
- Energy agencies;
- Coal energy producers;
- Coal mines;
- IPPC polluters;
- Big industrial energy consumers;
- Chambers of commerce;

- Industry and other relevant business/industry associations;
- Academia (environmental and energy, agriculture, science, education, finances).

Level 2. Other related institutions/organisations

- Other ministries/indirectly involved ministries;
- Local administration and governments of cities impacted by green transition;
- Academia (other);
- Representatives of local small and medium enterprises;
- Unions of workers;
- NGOs.

Level 3. Other interested parties

- Polluters and energy consumers;
- Renewable energy operators;
- General public;
- Other projects related to S3 and GAWB;
- Banks and other funding organisation.

Questionnaires based on stakeholder perception

Based on the findings from the analysis of policy documents, legal and institutional frame for WB economies, concerning Smart Specialisation and Green Agenda for Western Balkan, semi-structured questionnaires were prepared for 3 groups of stakeholders:

1. Governmental and related bodies;
2. Corporate sector;
3. Academia.

Communication

The process of collecting data intended to utilise various methods of engagement that will be used as part of its continuous interaction with the stakeholders. Due to the current situation (short time for performing the project, past issues caused by the COVID-19 pandemic), the format of consultation was significantly reduced and focused on online communication and direct communication with the stakeholders.

Content of questionnaires

Questionnaires needed to address topics closely related to the living conditions in the Western Balkan economies, and were to be filled in by the interested parties/stakeholders living and working in the region.

Three types of questionnaires were developed for 3 groups of stakeholders (government, corporates, and Academia) and consisted of:

- General information;
- Specific information.

Specific information was needed for each group considering their specific roles and duties in the development of S3 and the Green agenda requirements.

Conclusions from the survey

Tree types of questionnaires were developed: for governmental bodies and institutions, corporate sector, and academia and research institutes. Questionnaires were distributed by mails to 110 stakeholders from the Western Balkan economies and the response rate was 28%. The survey was enhanced also through direct communication with some stakeholders. The additional research included official documentation and publications available on the relevant websites and portals, and data from previous related studies.

Main goal in developing the questionnaires was to explore some of the key questions addressing the uncertainty on how can the green transition be implemented by using smart specialisation strategy in the Western Balkan region:

- Where will the main directives regarding green transition be coming from and how will they influence operating of government/companies/academia;

- How will the economies access financial market and will they be able to meet the new requirements in funding of green projects;
- Which kind of expertise is needed in future;
- How will the education activities be organised;
- How will the reskilling of current employees be identified and organised;
- Will the labour force have enough time to acquire education necessary for green transition, new green jobs;
- How will academia adapt to it.

References

Al-Ajlani, H., Cvijanovic, V., Es-Sadkix, N. and Muller, V. EU Eco-Innovation Index 2022, Policy brief, June 2022.

Alves Dias, P. et al., EU coal regions: opportunities and challenges ahead, EUR 29292 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-89884-6, doi:10.2760/064809, JRC112593.

Aspen Institute, Western Balkans Stakeholder Forum 2021, Esch, V. and Palm, V. (eds), December 2021.

Aspen Institute, Green Agenda for the Western Balkans – The road toward effective and sustainable implementation, 2023, ISSN 2940-4169.

Baldassarre, B. and Saveyn, H., A systematic analysis of EU publications on the circular economy, Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/36203, JRC133158.

Belis, C. A., Djatkov, D., Lettieri, T., Jones, A., Wojda, P., Banja, M., Muntean, M., Paunovic, M., Niegowska, M., Marinov, D., Poznanovic, G., Pozzoli, L., Dobricic, S., Zdruli, P., Vandyck, T., Status of environment and climate in the Western Balkans, EUR 31077 EN, Publications Office of the European Union, Luxemburg, 2022, ISBN 978-92-76-52723-7, doi:10.2760/294516, JRC129172.

Bigas, E., Bovenzi, N., Fuster Marti, E., Massucci, F.A., Hollanders, H., Matusiak, M. and Reimeris, R., Smart Specialisation in the Eastern Partnership countries, Fuster Martí, E., Matusiak, M. and Reimeris, R. (eds), EUR 31234 EN, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/520032, JRC128524.

Cahil, B. and Allen, M. M., Just Transition Concepts and Relevance for Climate Action – A preliminary Framework. Just Transition Initiative, Center for strategic and international studies (CSIS), 2020.

Damjanovic, S. and Windischbaur, B., Overview of the Western Balkans Research and Innovation Performance in EU Programmes and Initiatives, Policy Brief, Policy Answers, 2023.

Damjanovic, S., Petrusic, D., Radulovic, N., Milonjic, M., Strategija pametne specijalizacije Crne Gore 2019 – 2024, Ministarstvo nauke Crne Gore, 2019.

EBRD. The EBRD Just Transition initiative – Sharing the benefits of a green economy transition and protecting vulnerable countries, regions and people from falling behind, EBRD, 2020.

EMA, Education and research in the Western Balkan region: An assessment of countries' experiences and their performance in EU funded programmes, European Movement in Albania (EMA), 2019.

European Commission, Directorate-General, Taxation And Customs Union Guidance Document On CBAM Implementation For Installation Operators Outside The EU, Brussels, 17 August 2023, working document.

European Commission, Directorate-General for Research and Innovation, Hollanders, H., European Innovation Scoreboard 2023, Publications Office of the European Union, 2023, https://data.europa.eu/doi/10.2777/119961.

European Commission, Directorate-General for Research and Innovation, A Western Balkans agenda on innovation, research, education, culture, youth & sport, Publications Office of the European Union, 2021, https://data.europa.eu/doi/10.2777/831554.

European Committee of the Regions, Commission for the Environment, Climate Change and Energy, Gloersen, E., Mader Furtado, M., Gorny, H. et al., Implementing the European Green Deal – Handbook for local and regional governments, European Committee of the Regions, 2022, doi/10.2863/359336.

European Environment Agency, Air Quality in Europe: 2020 Report, as reported in: OECD, Multi-dimensional Review of the Western Balkans. From Analysis to Action, April 2022, 367, OECD Development Pathways, OECD Publishing, Paris, https://doi.org/10.1787/8824c5db-en (accessed December 20, 2022).

European Environment Agency, Sustainable Development Goals and the environment in Europe: a cross-country analysis and 39 country profiles, Report no. 21/2020, doi: 10.2800/780706.

European Parliament, The Economic and Investment Plan for the Western Balkans: assessing the possible economic, social and environmental impact of the proposed flagship projects, Study, May 2022.

European Union, Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism.

Eurostat, Sustainable development in the European Union: Monitoring report on progress towards the SDGs in an EU context, Luxembourg: Publications Office of the European Union, 2023, doi:10.2785/403194.

Fabbri, E., Pucar, S., and Galic, M., Smart Specialisation mapping exercise in Bosnia and Herzegovina, Publications Office of the European Union, 2024 (*forthcoming*).

Fetting, C., The European Green Deal, ESDN Report, December 2020.

Foray, D., Smart Specialisation: Opportunities and Challenges for Regional Innovation Policy, Routledge, London, 2015.

Foray, D. and Goenaga Beldarrain, X., The goals of Smart Specialisation, S3 Policy Brief Series No 01/2013, EUR 26005 EN, Publications Office of the European Union, Luxembourg, 2013, JRC82213.

Foray, D. and Rainoldi, A., Smart Specialisation programmes and implementation, JRC Working Papers JRC82224, Joint Research Centre, 2013.

Foray et al., Guide to Research and Innovation Strategies for Smart Specialisation (RIS3), European Commission, May 2012.

Foray, D., David, P. A., and Hall, B., 'Smart Specialisation: The Concept', in Knowledge for Growth: Prospects for science, technology and innovation, Report EUR 24047, European Union, 2009.

Gianelle, C., Kyriakou, D., Cohen, C. and Przeor, M. (eds), Implementing Smart Specialisation: A Handbook, Brussels: European Commission, 2016, EUR 28053 EN, doi:10.2791/5356.

Green Tank and CEE Bankwatch Network, A Just Transition Fund for the Western Balkan countries, Green Tank, 2021.

Harding R., Nauwelaers C., Cohen C. and Seigneur I., Fostering the Green Transition through Smart Specialisation Strategies, EUR 30921 EN, Publications Office of the European Union, Luxembourg, 2021, doi:10.2760/38422, JRC123169.

Hegyi, F. and Prota, F., Assessing Smart Specialisation: Monitoring and Evaluation Systems, EUR 30654 EN, Publications Office of the European Union, Luxembourg, 2021, JRC123734.

Hollanders, H. and Rexhebeqaj, V., The identification of priority domains in Kosovo. A mapping exercise, Gerussi, E. (ed), Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/234515, JRC132677.

ILO, Global Commission on the Future of Work, Work for a brighter future Geneva: ILO, 2019.

ILO, Skills for a greener future: A global view based o 32 country studies, Geneva: ILO, 2019.

ILO, Just Transition Towards Environmentally Sustainable Economies and Societies for All. Geneva: ILO, 2018.

ILO, Guidelines for a just transition towards environmentally sustainable economies and societies for all. Geneva: ILO, 2015.

ILO, Human Resources Development Recommendation, Geneva:ILO, 2004 (No. 195).

Jovanović, B. and Vujanović,N., Towards Effective Industrial Policy in the Western Balkans, The Vienna Institute for International Economic Studies, Policy Notes and Reports 66; February 2023.

Kelchtermans, S., Kardas, M. and Klincewicz, K, Implementing Smart Specialisation Strategies - Analysis of the Role of Regional Strategies in National Innovation Strategies, Publications Office of the European Union, Luxembourg, 2021, ISBN 978-92-76-40318-0, doi:10.2760/711198, JRC125959.

Kyriakou, D., Palazuelos Martinez, M., Perianez-Forte, I., and Rainoldi, A. (eds.), Governing Smart Specialisation (1st ed.), Routledge, London, 2016.

Marinelli, E. and Perianez Forte, I., Smart Specialisation at work: The entrepreneurial discovery as a continuous process, S3 Working Paper Series No. 12/2017, EUR 28838 EN, Publications Office of the European Union, Luxembourg, 2017, doi:10.2760/514714, JRC108571.

Matusiak, M., Radovanovic, N., Rakhmatullin, R., Stehrer, R., Beraha, I., Berrer, H., Boch, M., Djuricin, S., Graser, G., Jovanovic, B., Korpar, N., Ljumovic, I. and Marjanovic, D., Analysis of Value Chains in the Western Balkan Economies - Enriching the Potential for Regional Cooperation in Priority Areas; Matusiak, M., Radovanovic, N.

and Rakhmatullin, R. editor(s), EUR 31024 EN, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/47718, JRC126816.

Matusiak M., Kleibrink A. (ed.), Supporting an Innovation Agenda for the Western Balkans: Tools and Methodologies, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-81870-7, doi:10.2760/48162, JRC111430.

Miedzinski M., Coenen L., Larsen H., Matusiak M., Sarcina A., Enhancing the sustainability dimension in Smart Specialisation strategies: a framework for reflection. Step-by-step reflection framework and lessons from policy practice to align Smart Specialisation with Sustainable Development Goals, Miedzinski M., Matusiak M. editors, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/300268, JRC130497.

Nakicenovic, N., Zimm, C., Matusiak, M. and Ciampi Stancova, K., Smart Specialisation, Sustainable Development Goals and environmental commons. Conceptual framework in the context of EU policy, EUR 30882 EN, Publications Office of the European Union, Luxembourg, 2021, doi:10.2760/766406, JRC126651.

Nauwelaers C., Harding R., Perianez-Forte I., Haegeman K., H. and Arregui E., Case studies towards Green Transition in EU regions – Smart Specialisation for transformative innovation, Publications Office of the European Union, Luxembourg, 2022, doi:10.2760/382998, JRC130517.

OECD, Multi-dimensional Review of the Western Balkans: From Analysis to Action, OECD Development Pathways, OECD Publishing, Paris, 2022a, https://doi.org/10.1787/8824c5db-en.

OECD, SME Policy Index: Western Balkans and Turkey 2022: Assessing the Implementation of the Small Business Act for Europe, SME Policy Index, OECD Publishing, Paris, 2022b, https://doi.org/10.1787/b47d15f0-en.

Oqubay, A., Cramer, C., Chang, H. and Kozul-Wright, R. (eds), The Oxford Handbook of Industrial Policy, 2020.

Perianez Forte, I. and Wilson, J., Assessing Smart Specialisation: The Entrepreneurial Discovery Process, EUR 30709 EN, Publications Office of the European Union, Luxembourg, 2021, doi:10.2760/559139, JRC124405.

Radovanovic, N., Fabbri, E., Matusiak, M., Conte, A., Salotti, S., Dosso, M., Hollanders, H., Tolias, Y., Ndubuisi, G., Owusu, S., Duran, N., Fuster, E., Massucci, F. and Quinquillà, A., Smart Specialisation in the Western Balkans: potential for knowledge-based cooperation, Radovanovic, N., Fabbri, E. editor(s), Publications Office of the European Union, Luxembourg, 2024 (*forthcoming*).

Radovanovic, N. and Bole, D., Guidelines for the stakeholder dialogue in the process of designing and implementing Smart Specialisation strategies in the EU Enlargement and Neighbourhood Region, Publications Office of the European Union, Luxembourg, 2024.

Radovanovic, N. and Bole, D., Methodological guidelines for qualitative analysis of economic, innovation and scientific potential in the EU enlargement and neighbourhood, Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/171562, JRC133528.

Radovanovic, N., Gerussi, E., Reid, A. and Jevremovic, A., Unlocking the potential for regional collaboration in the ICT domain in the Western Balkans, Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/25755, JRC133944.

Radovanovic, Nikola, Benner, Maximilian, Smart Specialisation and the Wider Innovation Policy Context in the Western Balkans, EUR 29918 EN, Publications Office of the European Union, Luxembourg, 2019, doi:10.2760/380898, JRC118199.

Regional cooperation council, Digital skills needs and gaps in the Western Balkans – scope and objectives for a fully-fledged assessment, Regional Cooperation Council, 2021.

Regional cooperation council, Action Plan For The Implementation Of The Sofia Declaration On The Green Agenda For The Western Balkans 2021-2030, Sarajevo, 2021.

Stojanovic, I., Puska, A. and Selakovic, M., A Multi-Criteria Approach To The Comparative Analysis Of The Global Innovation Index On The Example Of The Western Balkan Countries Economics. Volume 10, No. 2, 2022.

UNEP, Using Indicators for Green Economy Policymaking, 2014.

UNFCCC, Just Transition of the Workforce and the Creation of Decent Work and Quality Jobs - Technical Paper, UNFCCC, 2016.

Vukovic, A. and Vujadinović Mandić, M., Study on climate change in the Western Balkans region, Regional cooperation council, 2018.

Woolford, J. and Boden, M., Higher Education for Smart Specialisation: A Handbook (Version 2.0) EUR 30733 EN, Publications Office of the European Union, Luxembourg, 2021, doi:10.2760/118876, JRC125293.

World Bank, Testing Resilience, Western Balkans Regular Economic Report 23, World Bank Group, 2023.

World Bank, Western Balkans Regular Economic Report No. 20 - Greening the Recovery, Fall 2021.

Zupanic, F.Z., Radic, D. and Podbregar, I., Climate change and agriculture management: Western Balkan region analysis. Energ Sustain Soc 11, 51 (2021).

List of abbreviations and definitions

CBAM	Carbon Border Adjustment Mechanism
CPD	continuous professional development
EU	European Union
FDI	Foreign Direct Investment
GAWB	Green Agenda for the Western Balkans
GDP	Gross Domestic Product
GHG	Greenhouse gas emissions
GPP	Green Public Procurement
GVC	Global Value Chains
ICT	Information and Communication Technology
ILO	International Labour Organisation
IOT	Internet of Things
IPR	Intellectual Property Rights
ITE	Initial teacher education
KET	Key Enabling Technologies
R&D	Research and development
SEE	South East Europe
SEECP	South-East European Cooperation Process
SME	Small and medium enterprise
S3	Smart Specialisation Strategy
STP	Science and Technology Park
TTO	Technology Transfer Office
UNEP	United Nations' Environment Programme
WB	Western Balkans

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