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A framework for Green Industrial Policies in the Western Balkans

2024

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Acronyms

ALB	Albania
ASEAN	Association of Southeast Asian Nations
ASEAN AICO	ASEAN Industrial Cooperation Scheme
BiH	Bosnia & Herzegovina
CSO	Civil Society Organizations
ETS	Emissions Trading System
EU	European Union
EV	Electric Vehicles
FDI	Foreign Direct Investment
GIP	Green Industrial Policy
IRA	Inflation Reduction Act
KGOE	Kilograms of oil equivalent
KOS	Kosovo
MFF	(EU) Multiannual Financial Framework
MKD	North Macedonia
MNE	Montenegro
NAFTA	North American Free Trade Association
NDC	Nationally Determined Contribution
NECP	National Energy and Climate Plans
NZIA	Net-Zero Industry Act
PM	Particulate Matter
PPP	Public-Private Partnership
R&D	Research and Development
SRB	Serbia
USMCA	United States, Mexico, Canada Agreement
WB	Western Balkans

Executive Summary

Social, economic and climate challenges

Climate change is the largest economic and social challenge of our times. Doing nothing is not an option; economic and social risks stemming from climate change are enormous, damages alone are estimated to reach $1.7-$3.1 trillion per year. Many regions will become unlivable and farmland unfarmable. Many more areas will become uninsurable due to risk from climactic shocks. Many of the world's most productive and innovative cities sit next to rising seas and significant investment will be required to protect them. Poorer people tend to be hardest hit, suffering most from air pollution, and, left unchecked, climate change could push an additional 130 million people into poverty.

Yet, combatting climate change will entail significant social and economic adjustments. It will require adjustments to well established energy sources throughout almost all industries including power generation, manufacturing, transportation, and home heating and cooling. It will require increased investment in developing and deploying new technologies. Some sectors and widely used products will no longer be viable – such as coal mining and gas boilers. Others will require large adjustments. Workers will need new skills, requiring adapted training; resource-dependent regions will need new industries and sources of employment; the financial system will need to adapt to new rules and can no longer safely invest in previously safe assets; existing infrastructure will need to adapt, and new infrastructure built; urban areas will need to adapt to increased heat and increasing frequency of climate shocks.

The "grow now, clean up later" strategy is no longer viable. Policymakers might be inclined to adopt such a strategy, hoping to benefit from environmental solutions developed elsewhere and cost reductions through incremental improvements and economies of scale. This approach could also be seen as a way to avoid the political resistance that often accompanies immediate environmental action. However, this strategy has serious limitations:

- High risks of ecological damage and economic losses from stranded assets, by locking economies into carbon-intensive pathways, particularly since energy systems tend to have long-lasting dependencies.
- Higher costs in the future, necessitating more radical -and potentially socially harmful – restructuring measures.
- Hinder a country's ability to capitalize on market and investment opportunities presented by decarbonization, thus missing out on a first-mover advantage in strategic industries.

Countries are increasingly turning to green industrial policies to adapt to economic and climate challenges. Green industrial policies aim to support the transition away from fossil fuels and toward clean ways to power manufacturing, transport, and comfortable buildings. But they also aim to do more. Other aims include shielding economies from geopolitical shocks (such as the EU's efforts to reduce imports of Russian gas), and supply shocks (such as ships blocked in canals). In addition, they aim to secure sufficiently diversified supply chains or home-grown deployment to prevent raw materials or other inputs being used as political weapons. Fossil-fuel importing countries also see opportunities to reduce their susceptibility to large global price swings, while reducing trade deficits.

Green industrial policies also represent a real social and economic transformation that, done well, can benefit most citizens. Reduced pollution in cities will make urban environments more pleasant. It will also reduce ill health as well as lost days of work

and school that sickness from pollution causes. The poor will benefit most. Western Balkan countries have the lowest air quality in Europe, and air pollution contributes to premature deaths from heart disease, stroke, chronic obstructive pulmonary disease, lung cancer and other diseases. Cleaner industries reduce pollution and tend to generate more jobs than fossil fuel ones and they are more productive and better paid, boosting growth and living standards. Renovating homes not only makes them greener, but also makes the more comfortable and cheaper to run, benefiting most those with lowest income. Greener power and transport systems will make the region's economies less vulnerable to global fuel price shocks. And renewable power is already cheaper than fossil fuels in many cases, providing homes and businesses with a reliable and cheap power supply. Countries with abundant sustainable energy can export it. This approach offers benefits from commercial perspectives as well as contributing to energy security for the Western Balkans. Another option is to use green power to ensure existing and new industries use the green power and then export the resulting products, supporting additional employment and attracting additional investment. These approaches are not mutually exclusive. The need to protect vulnerable regions and people from negative impacts of the transition offers an opportunity to rethink social expenditures, ensure they go where they are most needed and, essentially, help people and regions take the opportunities offered by the transition.

Why green industrial policies matter for the Western Balkans

In addition, green industrial policies in Europe matter enormously for Western Balkan nations; on the one hand, they offer significant opportunities for the region's countries, while, on the other, ignoring them presents significant risks.

- **First, the opportunities:** EU policies to diversify supply chains, nearshore, and source goods from low carbon economies provide potential opportunities. Geographically close to the EU and considered friendly countries, all WB countries have potential to benefit from attracting significant amounts of FDI following nearshoring efforts. Several WB countries possess deposits of raw materials – such as lithium and hydrogen – that are highly demanded for the green transition. Several WB countries – such as Montenegro and Albania – have significant sources of renewable energy, allowing for low-carbon manufacturing. Many have historically had areas with a base of skilled manufacturing workers, who could be retrained, and a regional identity built on to encourage green manufacturing. The EU also makes significant financing available for transition efforts in the region, which can be mobilized to improve power reliability, green cities, protect the poor, and more. One newer potential source of revenues may stem from the potential for carbon credits. That is, the ability to sell certificates for carbon removed from or not emitted to the atmosphere through verified schemes. Projects that do this in the WB could be directly paid for their efforts in the future.
- **Next, the risks of failing to act.** Failing to act not only means leaving opportunities behind but also risks significant penalization. EU efforts to protect its own industries from imports from countries without sufficient climate or environmental policies include the CBAM. This will impose a fee on goods imported to the EU from such countries – something the Western Balkan region should avoid. In addition, as pre-accession countries, Western Balkan countries need to gradually align policies with those of EU countries. This includes contributing to the continent's climate targets, notably as articulated by the National Energy and Climate Plans (NECP), which all stipulate the gradual phase-out of fossil fuels to be replaced by renewable energy. Tools for achieving this could be considered as part of a green industrial plan and aligned with EU policies, including carbon pricing, relevant subsidies,

training, support for vulnerable regions.

A green industrial policy framework for the Western Balkans

Transition risks and how GIPs can help to mitigate them

The Western Balkan region is navigating significant economic and export risks as it transitions to a greener economy. These challenges arise from internal shifts in economic structures and external pressures, especially those from European Union policies like the Carbon Border Adjustment Mechanism (CBAM).

Sectoral transformations

- Key industries such as manufacturing, mining, and fossil fuel power generation face major transformations or potential decline. Regions and those who work in those sectors are at risk without policies that support alternative sources of economic activity and job creation.
- Countries like Bosnia and Herzegovina (BiH), Montenegro, and Serbia, with strong industrial and mining sectors, will need to adapt significantly. For instance, BiH's industrial sector is vital, contributing nearly 25% to its GDP in 2022. Mining remains a critical part of the economy and employment in Serbia and North Macedonia, but a decline in this sector could have significant regional impacts.
- The reliance on fossil fuels for electricity generation is high. In 2020, coal provided about 90% of Kosovo's electricity, two-thirds of BiH's and 60% of Serbia's.
- Transitioning away from these energy sources is essential but will be challenging, requiring substantial changes in infrastructure and energy policies.

Impact of CBAM

- The EU CBAM will cover cement, iron and steel, aluminum, fertilizers, electricity and hydrogen imports into the EU.[1] Without action, the CBAM will impose additional costs on exports from the WB to the EU beginning in 2026. The CBAM will equalize the cost of carbon between the exporter and the EU ETS (assuming the latter is higher).[2] The World Bank estimates that up to 10% of BiH's exports and close to 5% of North Macedonia's and Serbia's could be impacted.[3] Indeed, BiH is in the top-5 countries whose exports are most likely to be impacted by CBAM. Key export sectors like metals and cement in these countries are highly vulnerable. In Serbia, around 18% of EU-bound exports, including iron, steel, and fertilizers, would face CBAM impacts without action, potentially leading to substantial economic losses. Initial forecasts suggest a decline in exports from the impacted industries of BiH ranging from 11% to 25%, depending on the carbon price level, resulting in a loss of about 1.1% to 2.5% of the GDP. In Serbia, estimated losses due to the initial implementation of the CBAM are 0.2% to 0.4% of GDP annually by 2035 and around 3% of jobs are at risk.[4]
- Electricity markets have specific condition. Countries whose electricity grid is coupled with that of the EU, electricity is exempted if there is no technical solution for implementing CBAM.[5] Coupling means not only a physical connection but also connections to European electricity markets. It is possible

1 Carbon Border Adjustment Mechanism – European Commission (europa.eu)
2 Carbon Border Adjustment Mechanism (europa.eu)
3 Open Knowledge Repository (worldbank.org)
4 The World Bank. 2022. Supporting Serbia's Transition to Greener and More Resilient Growth. Policy and Institutional Reforms: Supporting Serbia's Transition to Greener and More Resilient Growth | Country Environmental Analysis (worldbank.org)
5 CBAM readiness – Energy Community Homepage (energy-community.org)

that some WB countries – such as Serbia – may achieve coupling by 2026 while others will not.[6]

- The region is beginning to prepare for CBAM requirements. While final agreement has not yet been reached, Energy Community countries of the WB will need to begin to implement carbon pricing, and – while it can begin lower than EU levels – they should reach EU ETS levels by 2030.[7] Countries like BiH, Kosovo and Serbia are beginning to develop frameworks for emissions trading and carbon pricing, while Montenegro already has a basic scheme in place. Montenegro's existing emissions trading system faces liquidity challenges and is not yet fully aligned with EU standards. The World Bank estimates that the economic impact would be significantly reduced if regulations and economies adjust appropriately.[8]

How GIPs can help realize economic opportunities

The green transition presents significant economic opportunities for the Western Balkan countries, positioning them for sustainable growth, increased competitiveness, and resilience. Embracing renewable energy and new technologies can transform the region's economy, create jobs, and attract investments.

Job creation and economic growth

- Transitioning to greener sectors can create high-productivity and well-paid jobs, particularly in green energy and technology sectors.
- The adoption of new technologies and innovations is expected to foster the growth of Small and Medium-sized Enterprises (SMEs), which can drive job creation and economic diversity.

Renewable energy potential and raw materials

- WB countries have substantial potential for solar and wind energy. Even better, different areas of the region have different, complementary potential for wind and solar power.[9] For example, mountainous regions of BiH, Montenegro and Serbia have significant onshore wind potential, while coastal areas of Albania, Montenegro and some part of North Macedonia have good sun potential. This allows countries – and, indeed, areas within countries, to produce power from different sources and share that power to reduce intermittency and increase security. Progress has already been made, although there remains a long journey to travel. For instance, North Macedonia has rapidly increased its solar capacity, while Albania and Montenegro have identified significant opportunities in wind and solar energy.
- Investment in renewable energy can reduce dependency on fossil fuels, lower energy costs, and enhance energy security. This also supports economic competitiveness by making energy cheaper and more reliable for businesses. This approach would be enhanced through improved coordination within the region to take advantage of different renewable potential and share power that is generated at different times of the day and year – for example, wind and solar potential are highly complementary, helping to reduce regional intermittency. In addition, the use of hydropower as a balancing power source will be helpful. While development has been put on hold in some countries, Albania and BiH both have significant existing hydropower capacity.
- The region is rich in critical raw materials needed for green technologies.

6 Western Balkans face tight electricity market coupling deadlines (balkangreenenergynews.com)
7 The ETS is a market mechanism so it is not possible to perfectly predict 2030 levels. Commentators tend to use a price of around €100 per tonne in 2030. The World Bank's CBAM Exposure Index uses a price of $100/tonne: Relative CBAM Exposure Index (worldbank.org)
8 Open Knowledge Repository (worldbank.org)
9 See Global Solar Atlas and Global Wind Atlas

Countries like Serbia and Albania have significant deposits of lithium, copper, and nickel, which are vital for batteries and other green technologies.
- As global demand for these materials is expected to surge, WB countries can benefit from increased extraction and processing, aligning with EU efforts to diversify and secure supply chains.

Investment

- The combination of available raw materials, renewable energy, and strategic geographical location makes the region attractive for FDI, especially in manufacturing and technology sectors.
- Companies looking to near-shore their operations closer to the EU markets can find the WB region appealing due to its resources and growing infrastructure.

Infrastructure and connectivity

- Improved electricity infrastructure will help to integrate renewable and reduce power losses. Distribution losses are above 10% and old infrastructure means high maintenance costs, increasing prices (or subsidies). New grid technologies will be needed to cope with an increase in electric vehicles and prosumers, as well as the intermittency associated with renewable power generation.[10]
- While there already exist electricity grid interconnections between WB countries and between the WB and EU, further projects should be realized. Pipeline projects include those between Italy, Albania, Croatia as well as Albania, North Macedonia and Greece. Improving electricity grid interconnections within the region and with the EU can enhance power reliability, facilitate renewable energy integration, and create opportunities for exporting clean energy.
- Examples include Montenegro's plans for a second underwater cable to Italy and the operationalized Albanian Power Exchange (ALPEX) between Kosovo and Albania, which are enhancing regional energy cooperation.

Economic resilience

- Diversifying into renewable energy sources can increase the region's resilience against economic and energy shocks, such as those experienced from fluctuating fossil fuel markets.
- The move away from fossil fuels, particularly unsustainable coal mining, can alleviate financial burdens and foster more economically viable energy production methods.

Enhanced competitiveness

- Investing in clean energy and energy efficiency will reduce long-term operational costs for businesses, making them more competitive globally.
- Current energy inefficiencies in the region, such as Serbia's high energy consumption per unit of output, highlight the need for improvements that can be achieved through greener practices.

GIPs for a just transition

The concept of a just transition centers on ensuring that the move towards a greener economy not only mitigates environmental impacts but also promotes social equity and fairness. Key elements of a just transition include protecting people and regions adversely affected by the transition and ensuring that the opportunities arising from this shift are accessible to all.

10 CEVES-Study.pdf (smartbalkansproject.org)

Better Training for Better Jobs

- The transition to a green economy will inevitably lead to the loss of jobs in sectors reliant on fossil fuels. For example, significant numbers of jobs are at risk in North Macedonia, Serbia, and the Pljevlja region of Montenegro due to their reliance on mining and energy sectors.
- However, the transition also presents the opportunity to create more and better jobs. Green jobs tend to be more productive and higher-paid compared to their fossil-fuel counterparts. Studies suggest that, with adequate support for clean energy and green industries, the number of new jobs created can significantly outnumber those lost. For instance, while Romania is projected to lose 33 000 jobs due to coal industry shutdowns, an estimated 100 000 new jobs could be created through green energy initiatives. In addition, the growth of "prosumers" (see below) means that generation capacity – and the ability to earn income from it – could be widespread. This means that a new, green economy has the potential to be more decentralized with gains widely spread across regions as well as households.
- To capitalize on these opportunities, robust policies are needed to ensure workers are adequately trained for new roles in the green economy. New skills should be aligned with the opportunities present in each country and, indeed, within specific regions of a country. Examples may include training to work in new battery factories, install PV panels or heat pumps. Some of these may include cross-border efforts – or efforts to design the same curriculum in the whole region together with relevant industry organizations – along the lines of the European Battery Alliance's Academy[11] or the certification offered by the European Heat Pump Association.[12] Whatever the training needs, it will be important to identify current and future skill gaps and develop training programs in collaboration with public and private sectors. Efforts should focus on regions negatively impacted by the transition, providing pathways for workers in declining sectors to acquire skills for emerging green jobs. Local education and training systems must align with the skills needed in these new industries.
- Smart Specialization Strategies, which link innovation and job creation, can also support the transition. These strategies could foster environments conducive to young tech entrepreneurs and other innovative sectors, creating high-quality job opportunities.

A social welfare system that protects and empowers

- While renewable power tends to be cheaper than fossil fuels, any price increase due to reduced subsidies will hit some WB households hard as they spend more on electricity as a share of their income than their EU counterparts. For example, 16% of EU households with income below 60% of the median level had utility bill arrears in 2020. But this was between 44% and 59% for Serbia, Albania and North Macedonia.[13] It will be important to ensure these households are provided adequate compensating support in the event of significant price increases.
- The green transition is a chance to revamp social welfare systems to ensure no individual or region is left behind. Currently, many households in the Western Balkans struggle to meet basic needs, with significant portions unable to afford adequate heating or facing utility bill arrears.
- Existing social welfare systems can be adapted to provide better support. For example, North Macedonia and Kosovo have implemented measures to

11 Launching the European Battery Academy to reskill thousands of industry workers | EIT (europa.eu)
12 EUCERT – European Heat Pump Association (ehpa.org)
13 CEVES-Study.pdf (smartbalkansproject.org)

subsidize energy costs for vulnerable households. However, the transition will also impact entire communities reliant on fossil fuel industries. Social welfare policies need to address these regional needs, focusing on infrastructure investments and skills programs to support these areas in moving towards cleaner industries.

- Empowering local communities through renewable energy initiatives can also provide economic benefits. For instance, encouraging households to become "prosumers" (both producing and consuming energy, like through rooftop solar panels) can reduce energy costs and provide additional income. Such initiatives are planned or in place in North Macedonia, Serbia, and Kosovo. The 2021 Serbian Law on Renewable Energy allowed for prosumers (and pays feed-in tariffs for energy sold to the grid). By the end of 2023, installed capacity reached 15MW of PV in Serbia. Prosumer capacity and growth has been faster in Albania and North Macedonia, reaching 119 MW in Albania and 129 MW in North Macedonia by the first half of 2023.[14] As the prosumer capacity expands, it will be important to monitor uptake is in line with grid and storage infrastructure and adjust incentives in line with uptake or ensure sufficient upgrades. EU Energy Communities[15] is a current EU initiative that aims to both generate bottom-up ideas for clean energy expansion and use, and to ensure the benefits are widespread. They cover renewable energy, energy efficiency and more, and are citizen-led. This concept could be developed in the WB though GIPs or accompanying efforts.
- Promoting energy efficiency is another key aspect of reducing energy poverty and improving living standards. Enhanced energy efficiency reduces costs and pollution, offering a dual benefit. This is a significant focus of EU policies and has been integrated into strategies in Kosovo, Serbia, and North Macedonia.

Clean Air for All

- The Western Balkans suffer from severe air pollution due to coal-powered plants, outdated vehicles, industrial activities, and waste management issues. This pollution has significant health and economic impacts, with high rates of premature deaths and respiratory illnesses linked to poor air quality. For example, in 2022 an estimated 16 000 died prematurely in Serbia due to air pollution, 10 200 in BiH, and between 2 500 and 4 300 in each of the other WB countries.[16]
- Addressing air pollution would greatly benefit poorer communities, who are disproportionately affected due to their proximity to industrial areas and major transport routes, and their higher likelihood of engaging in outdoor labor. Improving air quality would enhance health outcomes, reduce absenteeism from work and school, and improve overall quality of life for these communities.

Working together

Significant opportunities for cooperation among WB countries exist and can be implemented or supported through green industrial policies. Among others, opportunities to consider include:

- Joint development of curricula for training new skills – together with relevant industries – where similar skills deficits have been identified. Some joint training activities could also be held in person or online. Trainers/experts from existing programmes such as those developed by European industry organizations could be invited to participate.

14 CEVES-Study.pdf (smartbalkansproject.org)
15 Energy communities (europa.eu)
16 Health impacts of air pollution in Europe, 2022 Table 2. — European Environment Agency (europa.eu)

- Integration into the EU ETC in a coordinated fashion. This would help to raise revenues for climate and social initiative, reduce emissions, encourage energy efficiency, and ensure compliance with CBAM. An alternative could be a regional approach that slowly integrates with the EU ETS over time. For example, a regional market could be developed to ensure countries do not compete with each other, and present a unified negotiating platform with the EU. A revenue sharing mechanism would need to be implemented if it is implemented regionally.
- Coordination of renewable power – both technologies and location – would help to ensure clean power is more readily available in the region. For example, wind power in one location can combine with solar in another location to increase the number of hours clean power is available in both locations.
- A regional power trading market may also facilitate alignment with the EU and ease trade of renewable power.
- Pooling limited research and development resources – for example by establishing joint research programs, or even shared facilities in border regions.
- Integration of regional supply chains. This is particularly relevant for technologies such as electric vehicles and batteries, but a thorough study may reveal more opportunities. Different countries in the region have different resources and different strengths allowing for the development of more regional supply chains.
- Joint certification of sustainable products or manufacturing facilities, while ensuring full alignment with EU standards. This would also allow regional supply chains to source from each other while being certain that inputs meet EU requirements.

Communication and engagement

Effective communication and engagement are critical in managing the economic and social transitions under green industrial policies. These transitions often involve complex changes that can create winners and losers, generating unease and confusion, particularly with new technologies or shifts from entrenched identities, such as in mining communities. One example is the challenge of reforming fossil fuel subsidies, which are both economically costly and environmentally damaging. In 2022, global fossil fuel subsidies, including unaccounted social costs, amounted to $7 trillion—over 7% of global GDP. These subsidies disproportionately benefit wealthier groups, with the richest quintile receiving 45% of the benefits, while the poorest quintile receives only 7%. Moreover, the environmental and health impacts of these subsidies often hit the poorest hardest.

Despite the clear advantages of reducing fossil fuel subsidies—such as environmental protection, budget reallocation for social goods, and investment in renewables—reforms frequently encounter significant resistance. Studies show that a majority of subsidy reforms are weakened or reversed within a few years due to political pressures and insufficient communication, as evidenced by global cases like Ecuador and France.

To counteract such opposition and ensure successful transitions, policies must be well-designed and inclusive. This includes:

- Broadly Shared Benefits: Ensuring improvements in public services, infrastructure, and opportunities for all regions and demographics.
- Effective Communication: Utilizing community meetings, social media, and stakeholder forums to inform and engage the public.

- Continuous Adaptation: Regularly updating communication strategies and policy measures in response to feedback and changing circumstances.

A well-crafted and well-implemented engagement and communication strategy is essential. This should include clear objectives, key messages emphasizing the benefits of the green transition, and practical implementation plans. It should also establish monitoring and evaluation processes to adjust strategies as needed and build trust through transparency and responsiveness.

Policy options

The framework does not identify specific policies for the whole region but, rather, identifies policies and policy areas that each country should consider when drafting green industrial policies. These include:

- **Get the price right.** Without removing fossil fuel subsidies and implementing carbon pricing, all other reforms will be fighting against the tide. The right price means more resources to invest in a greener environment and a fairer society. Failure to get the price right means a lack of access to the European market and job losses. The first step in this process is clear legally prescribed climate neutrality commitment. In addition, under an emissions trading scheme it is important that there is sufficient liquidity. Integration into the EU ETS would provide this; national schemes would not yield liquid markets.
- **Leave no one and no region behind.** The transition provides an opportunity to build a fairer society by providing opportunities for better paid and more productive jobs for many groups. It also means finding ways to support regions during the transition away from old, polluting industries and towards new opportunities. Ongoing training and reskilling is essential for this. Access to cheaper ways to keep homes warm, including increase of energy efficiency of buildings, will help to tackle both energy poverty reduction and job creation. New job and entrepreneurship opportunities will help empower citizens – including youth – and can stimulate growth in regions that have, until now, been left behind.
- **Clean the environment.** The region suffers from some of Europe's worst air quality, and poorer people are hit hardest by it. A cleaner environment will improve quality of life – and length of life – for many, especially poorer groups. It will help attract investors who want to live in pleasant spaces and greener cities are more productive.
- **Work together and with EU.** All countries are in the process of EU accession and must therefore adhere to EU acquis. Many of these align with the need to transition away from fossil fuels and towards renewables, to protect poorer groups, to clean the environment, to reskill and provide job opportunities for all. Working together is also essential to attract investment to the region and to take full advantage of intermittent renewable power.
- **Seize the opportunities. And the financing.** Industrial revolutions don't happen every day. This transition offers opportunities to reshare economies and societies by making them greener and fairer as well as more productive. Moreover, significant funds are available to help the region transition. Efforts to use these funds productively should be made. In addition, investments and subsidizing of activities that are not aligned with the greening of industry shall be avoided ensuring these resources as investment in green industry.
- **Communicate and engage. Always.** It can be difficult to communicate even good well-designed policies. All GIPs should be accompanied with communication and engagement strategies, plans or protocols, and these should be taken seriously and implemented to ensure views, fears, impacts on citizens, firms and regions are considered and addressed.

1. Introduction. Green industrial policies: the why and the what

Climate change is the largest economic and social challenge of our times. Doing nothing is not an option; economic and social risks stemming from climate change are enormous, damages alone are estimated to reach $1.7-$3.1 trillion per year.[17] Many regions will become unlivable and farmland unfarmable. Many more areas will become uninsurable due to risk from climactic shocks.[18] Many of the world's most productive and innovative cities sit next to rising seas and significant investment will be required to protect them. Poorer people tend to be hardest hit, suffering most from air pollution,[19] and, left unchecked, climate change could push an additional 130 million people into poverty.[20]

Yet, combatting climate change will entail significant social and economic adjustments. It will require adjustments to well established energy sources throughout almost all industries including power generation, manufacturing, transportation, and home heating and cooling. It will require increased investment in developing and deploying new technologies. Some sectors and widely used products will no longer be viable – such as coal mining and gas boilers. Others will require large adjustments. Workers will need new skills, requiring adapted training; resource-dependent regions will need new industries and sources of employment; the financial system will need to adapt to new rules and can no longer safely invest in previously safe assets; existing infrastructure will need to adapt and new infrastructure built; urban areas will need to adapt to increased heat.

The "grow now, clean up later" strategy is no longer viable. Policymakers might be inclined to adopt such a strategy, hoping to benefit from environmental solutions developed elsewhere and cost reductions through incremental improvements and economies of scale. This approach could also be seen as a way to avoid the political resistance that often accompanies immediate environmental action. However, this strategy has serious limitations:

- High risks of ecological damage and economic losses from stranded assets, by locking economies into carbon-intensive pathways, particularly since energy systems tend to have long-lasting dependencies.
- Higher costs in the future, necessitating more radical restructuring measures.
- Hinder a country's ability to capitalize on market and investment opportunities presented by decarbonization, thus missing out on a first-mover advantage in strategic industries.

Green technologies increasingly have a geopolitical dimension. Many of the inputs for green technologies currently come from a very limited number of suppliers, including raw materials such as critical and rare earth metals as well as the most advanced semi-conductors. This leaves countries open to geopolitical disputes as well as supply chain bottlenecks.[21] In addition, green technologies offer countries to reduce dependency on third countries – for example by switching away from imported oil or gas and toward solar or wind power – providing both economic and political advantages. Finally, since green

17 https://www.weforum.org/agenda/2023/10/climate-loss-and-damage-cost-16-million-per-hour/
18 https://www.economist.com/united-states/2023/09/21/parts-of-america-are-becoming-uninsurable
19 https://www.nature.com/articles/s41467-023-39797-4
20 https://www.weforum.org/agenda/2023/01/climate-crisis-poor-davos2023/.
21 Such as occurred during COVID.

technologies are the technologies of the future, no country wishes to be "left behind", spurring competition to generate homegrown green industries. This has the potential to reduce development gaps between regions and countries.

Countries are increasingly turning to green industrial policies to adapt to these challenges. Green industrial policies aim to support the transition away from fossil fuels and toward clean ways to power manufacturing, transport, and comfortable buildings. But they also aim to do more. Other aims include shielding economies from geopolitical shocks (such as the EU's efforts to reduce imports of Russian gas), and supply shocks (such as ships blocked in canals). They also aim to secure sufficiently diversified supply chains or home-grown deployment to prevent raw materials or other inputs being used as political weapons. Fossil-fuel importing countries also see opportunities to reduce their susceptibility to large global price swings, while reducing trade deficits.

In addition, green industrial policies have social aims, in particular aiming to ensure a just transition. This means moderating the impact of the transition on people, firms and regions that are dependent on fossil fuels for their livelihoods. In addition, it can mean significant social opportunities. For example:

- Workers in clean technology sectors tend to be more productive and better paid than their counterparts in dirtier sectors, so retraining workers would raise living standards.
- More jobs will be generated by the transition than will be lost, providing an opportunity for good employment for more people.
- The transition entails cleaner environments, reducing air pollution that primarily harms poorer people through ill-health, lost working or schooling days and lower life expectancy.
- More pleasant urban spaces, which will need to be greener to combat heatwaves, and where it is easier to access services without travelling long distances.[22]
- Energy poverty can be tackled by refitting homes to reduce energy waste and consumption to make them more comfortable and cheaper to run.
- Transport poverty can be tackled by boosting access to low emission transport for all groups.

Two major examples of green industrial policy are the Inflation Reduction Act (IRA)[23] in the United States and the European Green Industrial Plan (GIP),[24] with accompanying policies. They provide tax incentives, subsidies, or regulatory support for sectors like renewable energy, electric vehicles, and critical mineral extraction for green tech inputs. In addition, the GIP aims to ensure better training for workers both to fill skills gaps and to ensure benefits are widespread among the population. The GIP is also accompanied by specific efforts to support people, businesses and regions that risk being left behind through the just transition platform and the social climate fund. Both the IRA and GIP incorporate efforts to protect domestic markets and manufacturers, attract investors in parts of the value chain, diversify supply chains or ensure increased domestic production in industries related to the green transition.

22 Concepts such as the ten or fifteen minute city aim to ensure all residents have access to basic public services as well as essentials such as grocery stores within a 10–15 minute walking distance.
23 Inflation Reduction Act Guidebook | Clean Energy | The White House
24 Communication: A Green Deal Industrial Plan for the Net-Zero Age | European Commission (europa.eu)

2. Why a GIP in the WB?

2.1 Why it matters

Green industrial policies represent a real social and economic transformation that, done well, can benefit most citizens. Reduced pollution in cities will make urban environments more pleasant. It will also reduce ill health as well as lost days of work and school that sickness from pollution causes. The poor will benefit most. Western Balkan countries have the lowest air quality in Europe, and air pollution contributes to premature deaths from heart disease, stroke, chronic obstructive pulmonary disease, lung cancer and other diseases. Cleaner industries reduce pollutions and tend to generate more jobs than fossil fuel ones and they are more productive and better paid, boosting growth and living standards. Renovating homes not only makes them greener, but also makes the more comfortable and cheaper to run, benefiting most those with lowest income. Greener power and transport systems will make the region's economies less vulnerable to global fuel price shocks. And renewable power is already cheaper than fossil fuels in many cases, providing homes and businesses with a reliable and cheap power supply. Countries with abundant sustainable energy can export it. The need to protect vulnerable regions and people from negative impacts of the transition offers an opportunity to rethink social expenditures, ensure they go where they are most needed and, essentially, help people and regions take the opportunities offered by the transition.

They will help – and indeed are essential – for meeting climate commitments. All Western Balkan[25] countries have set emission reduction targets through their Nationally Determined Contributions (NDCs) as well as other international and domestic commitments. These represent both contributions to international climate efforts and commitments to the global community. While general technological advancements combined with rapidly declining renewable energy prices will be important, they will not get WB countries all the way. Additional efforts will be needed, both to achieve environmental targets and to ensure the benefits of the transformation are broad.

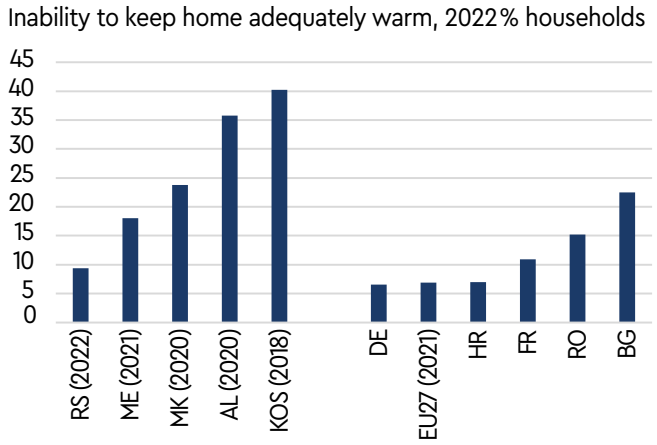
And all this comes with fiscal and financial benefits. Two policies that are essential for a successful transition, and are aligned with EU policies, are the need to cut energy subsidies and introduce carbon pricing. Energy subsidies use scarce public resources, encourage wasteful burning of fossil fuels, and almost always benefit wealthier groups more than poorer ones. There are better ways to support poorer households and regions and help them take advantage of social and economic opportunities provided by the transition. Carbon pricing is essential to ensure that the polluter pays, can raise significant sources of public revenue to finance anything from tax cuts that encourage entrepreneurship, work and innovation, to training, to infrastructure, to education, to healthcare. The EU Social Climate Fund is financed through the recently expanded EU ETS and provides €65 billion to countries to protect the vulnerable, help renovate homes and improve access to clean transport. Western Balkan countries have access to significant amounts of finance to support the transition. For example, €6 billion was also recently announced from the EU for this purpose under the

25 Except Kosovo. Not being a signatory to the Paris Agreement, Kosovo voluntarily determined the contributions. Yet, being a contracting party to the Energy Community Treaty, it has the obligation to implement the energy acquis in force, and thus respect the Energy Community Ministerial Council Decision No 2022/02/MC-EnC, which defines the contracting parties' 2030 targets on energy and climate change (see table below). These targets have been incorporated in the national energy and climate change plan (NECP) and the energy strategy (ES). In 2023, the Nationally Determined Contribution have been regulated by the Law No. 08/L-250 on Climate Change.

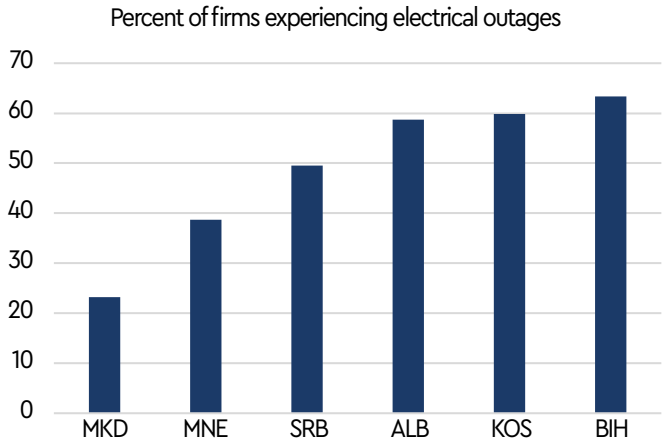
New Growth Plan for the Western Balkans.[26] The state and companies can often finance green transformations cheaper than alternatives through in-demand green (or blue) bonds. Finally, a green transition helps ensures citizens – and their pensions – are invested in growth sectors, rather than those that are not sustainable in the long-term, due to the risk of stranded assets.

Figure 2.1 **Well-considered green industrial policies offer transformative social and business opportunities**

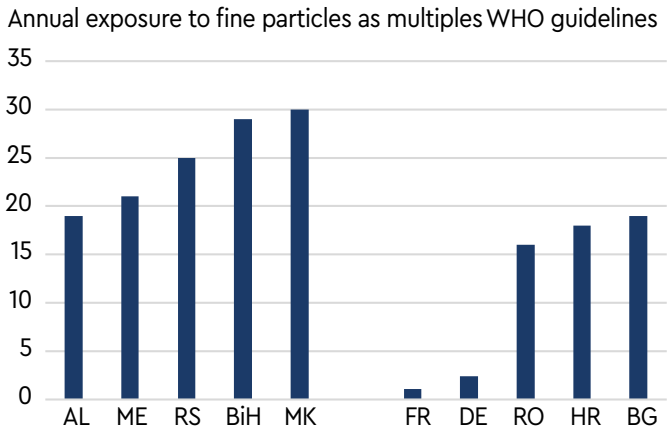
GIPs offer an opportunity to reduce energy poverty...



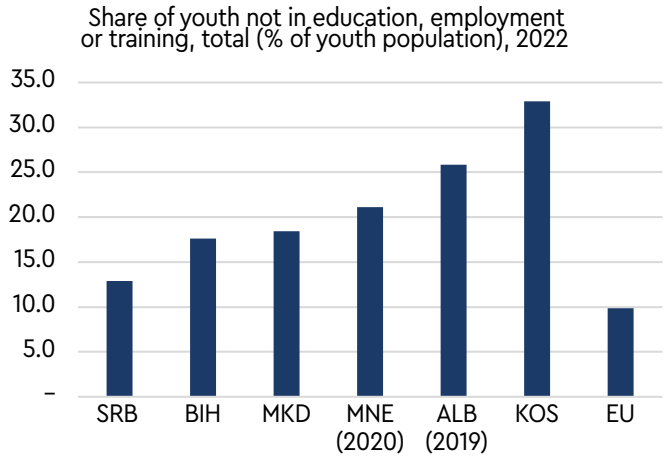
... and make sure firms benefit from more reliable electricity supply.



Cleaner energy will make for healthier urban environments for citizens...



... and the transformation can offer opportunities for better training and better jobs.



Sources : National indicators – European Commission (europa.eu) ; Air Pollution Note – Data you need to know (unep.org)

In addition, green industrial policies in Europe matter enormously for Western Balkan countries; on the one hand, they offer significant opportunities for the region's economies and societies, while, on the other, ignoring them presents significant risks.

First, the opportunities: EU policies to diversify supply chains, nearshore, and source goods from low carbon economies provide potential opportunities. Geographically close to the EU and considered friendly countries, all WB countries have potential to benefit from attracting significant amounts of FDI

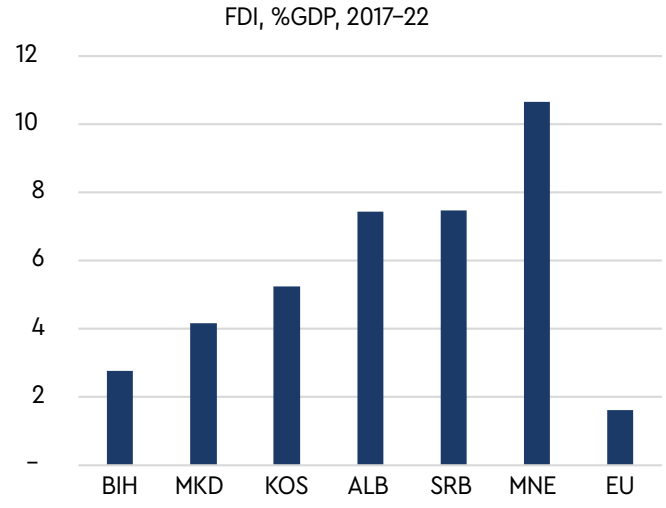
26 Six milliards d'euros pour les pays des Balkans, qui attendent patiemment une adhésion à l'Union européenne – RTBF Actus New
Growth Plan for the Western Balkans – European Commission (europa.eu)

following nearshoring efforts. Several WB countries possess deposits of raw materials – such as lithium and hydrogen – that are highly demanded for the green transition. Several WB countries – such as Montenegro and Albania – have significant sources of renewable energy, allowing for low-carbon manufacturing. Many have historically had areas with a base of skilled manufacturing workers, who could be retrained, and a regional identity built on to encourage green manufacturing. The EU also makes significant financing available for transition efforts in the region, which can be mobilized to improve power reliability, green cities, protect the poor, and more. One newer potential source of revenues may stem from the potential for carbon credits.[27] That is, the ability to sell certificates for carbon removed from the atmosphere through verified schemes. Projects that do this in the WB could be directly paid for their efforts in the future.

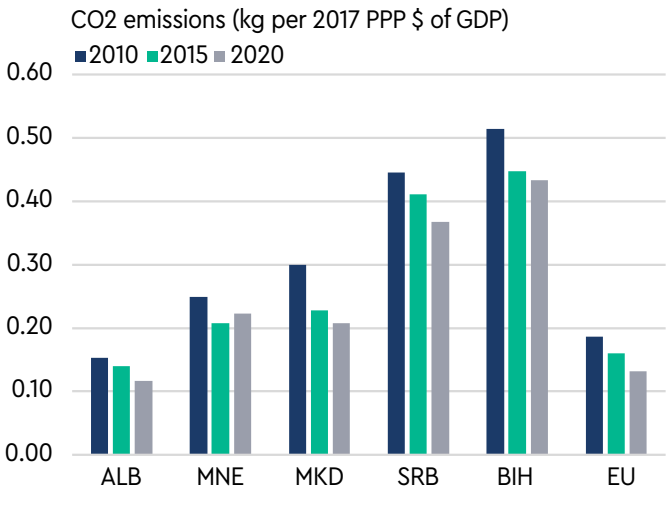
Next, the risks of failing to act. Failing to act not only means leaving opportunities behind but also risks significant penalization. EU efforts to protect its own industries from imports from countries without sufficient climate or environmental policies include the CBAM. This will impose a tax on goods imported to the EU from such countries – something the Western Balkan region should avoid. In addition, as pre-accession countries, Western Balkan countries need to gradually align policies with those of EU countries. This includes contributing to the continent's climate targets, notably as articulated by the National Energy and Climate Plans (NECP), which all stipulate the gradual phase-out of fossil fuels to be replaced by renewable energy. Tools for achieving this could be considered as part of a green industrial plan and all align with EU policies, including carbon pricing, relevant subsidies, training, support for vulnerable regions.

Figure 2.2 GIPs can help transform the environment and business practices

GIPs offer the opportunity to boost FDI, especially in clean technology supply chains...

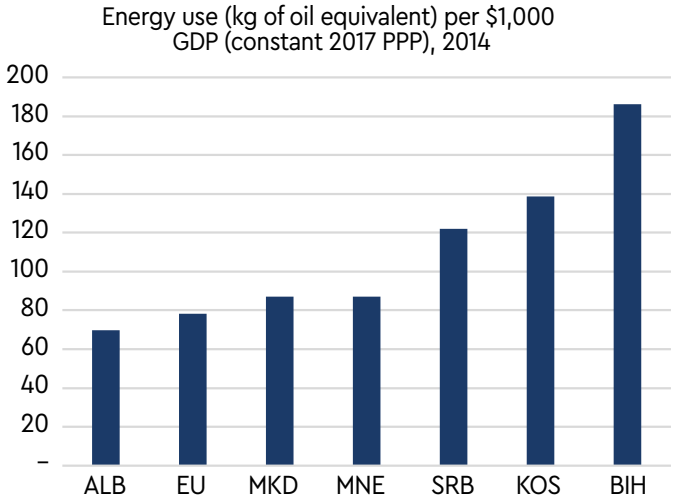


... and reduce emissions, helping to meet climate commitments,...

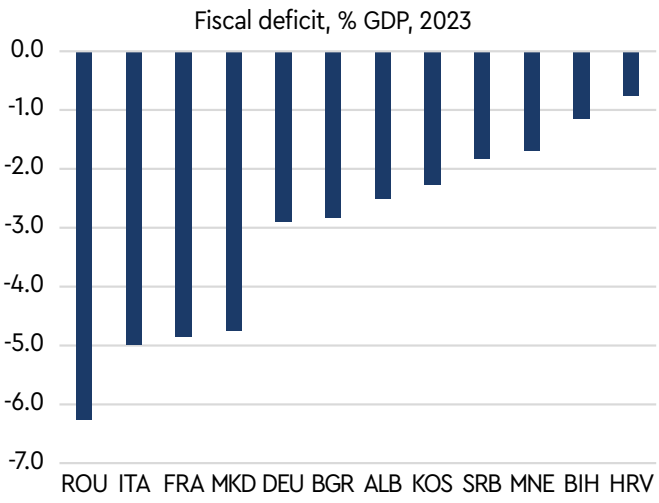


27 EU considers bringing emissions removal credits into carbon market | Reuters

...while becoming more energy efficiency, boosting competitivity, ...



...and raising fiscal resources for tackling social, economic and climate challenges.



Sources: World Economic Outlook Database (imf.org); DataBank | The World Bank

2.2 Meeting domestic and international commitments

2.2.1 Energy and pollution commitments

All WB countries have made international commitments to cutting emissions including in their Nationally Determined Contributions (NDCs). Most regional NDCs committed to absolute emission reductions compared to a baseline year and these range from a 13% to 51% cut by 2030 compared to 1990 levels (see Table 21). NDCs provide indications on which sectors will need to contribute most. For example, Serbia's includes commitments to reduce emissions from industrial process and product use. North Macedonia's includes specific increases in renewable energy for electricity generation, heating and cooling and transport. The Serbian NDCs also refer to losses and damages associated with extreme weather events and indicates the need to adapt to climate change. While Kosovo is not a signatory to the Paris Agreement, in 2021 it initiated discussions on a "voluntary NDC" and committed to an emissions reduction of 16% by 2030 compared to 2016 levels. [28]

Table 2.1 NDC Commitments

Country	Mitigation Type	Mitigation Target (excl. LULUCEF)	Baseline Year	Target Year
ALB	Relative emission reduction	20.9%	BAU	2030
BiH	Absolute emission reduction	12.8% by 2030 and 50% by 2050 (unconditional), 17.5% by 2030 and 55% by 2050 (conditional)	2014	2030, 2050

28 Kosovo | Climate Promise (undp.org)

Country	Mitigation Type	Mitigation Target (excl. LULUCEF)	Baseline Year	Target Year
KOS (voluntary NDC)	Absolute emission reduction	16.3%	2016	2030
MNE	Absolute emission reduction	35%	1990	2030
MKD	Absolute emission reduction	51%	1990	2030
SRB	Absolute emission reduction	13.2%, 33.3%	2010, 1990	2030

Source: IGES NDC Database

All countries in the region signed the Green Agenda for the Western Balkans in 2020, which highlights both carbon neutrality by 2050 and the importance of addressing energy poverty.[29] The implementation plan for the Green Agenda is based on five pillars: (i) climate action, including decarbonization, energy and mobility; (ii) circular economy, addressing waste, recycling, sustainable production and efficient use of resources; (iii) biodiversity; (iv) fighting air, water and soil pollution; and (v) sustainable food systems and rural areas. In addition to emissions reductions, the Green Agenda highlighted energy poverty as a key social dimension that must be addressed to ensure social buy-in for the transition.

As part of adopting EU acquis and obligations under the Energy Community Treaty, WB countries have drafted National Energy and Climate Plans (NECP).[30] These include commitments to reduce emissions and increase the share of renewable energy and energy efficiency (see Table 22). Under the NECP, all countries have committed to net neutrality by 2050. Targets for 2030 differ depending upon context and national needs. BiH committed to a 41% reduction in emissions compared to 1990 levels and a 44% share of renewable energy in total gross final energy consumption. Serbia committed to a 40% reduction in emissions compared to 1990 levels and a 33.6% share of renewables.

NECPs also outlined plans to achieve targets. These include the introduction of ETS (BiH, Kosovo, North Macedonia, Serbia – Montenegro already operates a small domestic one) as well as specific plans. For example, BiH committed to decommissioning of 410 MW of thermal power plants, no new fossil fuel power plants, over 2,000 MW of renewable sources, and an increase in photovoltaic power plants of over 1,500 MW. The North Macedonian and Kosovo[31] NECP elaborates on all five dimensions of the Energy Union i.e. decarbonization (greenhouse gas emissions and renewable energy sources), energy efficiency, security of energy supply, internal energy market, and research, innovation and competitiveness. Kosovo includes specific energy efficiency savings targets in buildings as well as energy audits for large companies. Estimated investment needs are also included. The BiH NECP estimated investment needed for the implementation of the NECP is between €7 to 8.2 billion by 2030. In Kosovo, there is large funding gap between needs and identified financing: funding needs are estimated at €328 million and the low GoK investments of only €138 million during 2020–2021. Preparation of the Montenegro NECP is ongoing and

29 56db6af6-92c2-4ff7-a1ba-7e8893d8e7a8_en (europa.eu)
30 Energy Community acquis – Energy Community Homepage (energy-community.org)
31 The Kosovo NECP is in draft at the time of drafting.

early announcements from responsible Ministry suggest they may increase the level of ambition to reduce emission to 55% by 2030 compared to 1990 levels. The plan may also include a phase-out of the Pljevlja thermal power plant, which represents 45% of the country's total electricity generation – significant investment in renewables will be required to compensate. In some cases, WB countries' NECPs improve on their NDC. For example, in Serbia, the NECP commits to -40.3% of the GHG reduction and 40.7% of 2030 share of renewables in total energy consumption.

Table 2.2 NECP and Energy Community Committments

Country	2030 reduction target compared to 1990 levels	2030 share of renewables in total energy consumption	2050 target
ALB	18.7%	54.4%	Net carbon neutrality
BiH	41%	44%	Net carbon neutrality
KOS	16.3% wrt 2016	30%	Net carbon neutrality
MNE	55% (energy community excl. LULUCF)	73% (energy community)	Net carbon neutrality
MKD	81%	38%	Net carbon neutrality
SRB	40%	41%	Net carbon neutrality

In addition, all countries have domestic commitments and aim to align these with international commitments. For example, North Macedonia has laws on energy efficiency and air quality. They also have an Energy Strategy, which outlines how to achieve energy targets. The North Macedonian Energy Development Strategy envisions a phase-out of coal by 2027. Kosovo's Energy Strategy incorporates targets under the NDC. Serbia's Energy Sector Development Strategy includes principles for energy efficiency, while its Low-Carbon Development Strategy (LCDS)[32] envisions a carbon-neutral society by 2050, with a competitive and resource-efficient economy which provides citizens new, green jobs and a quality life in a climate-resilient society. Serbia's Law on Use of Renewable Energy Sources[33] and amended law on Energy[34] envision the development of a new incentive system for electricity generation from renewable sources in the form of market premiums and limited feed-in-tariffs.[35] The Serbian Law on climate change introduces the EU ETS MRV obligations. Investment in renewables will be essential in Montenegro, which will eventually lose its main (coal-powered) electricity generator. Plans include a new hydro-power plant and the renovation of existing hydro-power plants (helping also to mitigate intermittency from solar and wind), as well as the construction of new solar and wind generation. However, there is no legally prescribed net carbon neutrality commitment in any of the WB countries, as it is a case in the EU Climate Law.

Gaps remain in institutional planning to meet commitments and a GIP can help to address these. As part of the Energy Community and EU candidate countries, WB countries need to make progress integrating energy legislation. The 2023 Energy Community Implementation Report[36] tracks members' reforms,

32 Low-Carbon Development Strategy for the period 2023–2030, with projections up to 2050 ("Official Gazeta of the RS", No. 46/2023)
33 Official Gazette of RS, no. 40/21
34 Official Gazette of RS, no. 40/21
35 for projects with installed capacities under 3 MW solar wind and under 0.5 MW for power plants using other RES
36 https://www.energy-community.org/dam/jcr:3da7c4f8-ea23-4169-b1e9-66b0ed05fcb7/EnC_IR2023.pdf

while the CBAM readiness tracker tracks the Energy Community's readiness for CBAM implementation.[37] Serbia is considered most advanced with 63% of required reforms across five dimensions[38] implemented, while BiH is furthest behind, with just 35% of required reforms implemented. Yet, even in best-performing Serbia, significant gaps remain. For example, Serbia's Employment Strategy does not consider the importance of green jobs and opportunities, despite the fact that they may generate significant numbers of jobs. Similarly, the 2022 European Commission Report on Serbia notes that there is not yet a policy or legal document(s) that explore and design carbon price instruments, internalize the costs of emissions and ensure compliance with CBAM, nor have sufficient considerations yet been given to a fair and just transition aspects into development goals. BiH's NECP does not provide enough analysis to be sure that the proposed policies and plans will indeed lead to successfully reaching targets.

2.2.2 Environmental commitments

International and domestic commitments go well beyond energy to include also circular economy, biodiversity and environmental protection. While targets exist, these tend to be less well defined at the EU level but nonetheless matter for a clean, healthy living environment, overall environmental sustainability and resource efficiency.

Circular economy and waste management: This includes the need to transform both industry/manufacturing and consumption away from linear use and discard processes to a more circular process. Challenges identified include recycling facilities, knowledge among the industrial sector of how to use waste products (e.g. in construction). In 2022, Montenegro put in place a National Circular Transition Strategy for the period until 2030. Currently in Montenegro less than 5% of waste is recycled but 46% comes from industry suggesting that a comparatively few points generate a large proportion of waste. Kosovo launched its Circular Economy Roadmap in 2023 prioritizing the creative sector as the key force in the transition to a circular economy. Other priority sectors include food systems, forest systems, retail, built environment, and manufacturing. Around 4.4% of waste in Kosovo is recycled – up from below 1% in 2019. In North Macedonia already a third of all waste is recycled, while municipality waste recycling rates are around 15% in Serbia. In 2019, BiH's per capita natural resource consumption was documented at 11.5 tons, which is less than the EU average of 14.5 tons per capita. However, BiH lags in terms of resource productivity, a measure of the GDP to domestic material consumption ratio, with a figure of 0.9 compared to the EU average of 2.2. Additionally, a mere 2.2% of BiH's waste undergoes recycling. Serbia's Circular Economy Action Plan[39] includes the promotion of the circular economy and the education of companies; encouraging investments in circular and low-carbon economy solutions as growth generators; and encouraging more efficient use of material resources and energy efficiency in industrial processes. Private companies are also implementing circular economy actions in the region. For example, Kosovo's leading water producer, Ujë Rugove, is using an EBRD loan to improve plant efficiency, reduce resource use and increase use of recycled materials (see Box 3 on use of EU funds for details).

37 Secretariat to track CBAM readiness of the Energy Community – Energy Community Homepage (energy-community.org)
38 The five dimensions are: markets and integration; ensuring energy security; decarbonizing the energy sector; improving the environment; and performance of authorities.
39 Official Gazette, No. 37/21

The circular economy can offer some opportunities related to GIP. Of particular note is a connection to reducing risk of availability of rare earth and other metals required for the transition while reducing toxic waste by significantly increasing electronics recycling. Waste can also be used to generate electricity and heat. One area where improvements are challenging but there are potential rewards in terms of lower costs is in construction. It is important that laws do not treat all construction material as hazardous. Processing construction waste can also require support from local authorities to aggregate across multiple areas to ensure sufficient economies of scale for processing. The potential for improvement in resource management and waste recycling in BiH in line with the circular economy pillar of the Green Agenda for the Western Balkans. Other efforts can include making it easier for households and firms to recycle and improve incentives to recycle. A focus should be on other the sectors that use most resources and where the potential for circularity is high such as buildings, food, water and nutrients.

Biodiversity and environmental protection: Biodiversity can be considered a complementary effort to green industrial policies. For example, biodiversity can improve urban living environment, reduce risks from natural disasters such as landslides and floods. In addition, biodiversity can generate economic opportunities such as in tourism and sustainable forestry. Most WB countries have significant forest cover including Montenegro, Serbia and BiH. As progress is made toward carbon removal certificates in the EU, there may also be an opportunity to generate financing for green projects in the region.

2.3 Western Balkan countries are better off coordinating GIPs

Collaboration on green industrial policy among Western Balkan countries offers multiple benefits that can catalyze sustainable development and economic growth across the region. First, such collaboration can foster technological innovation and knowledge transfer, facilitating the adoption of renewable energy sources, energy-efficient technologies, and eco-friendly manufacturing processes. By pooling resources and expertise, WB countries can accelerate the transition towards a low-carbon economy, reducing dependency on fossil fuels and mitigating the adverse effects of climate change. Coordination is essential to reap the full benefits of renewable energy – different weather patterns across and within countries, mean they can ensure more reliable power supply through better inter-connections, while reaping export potential from the sector.

Moreover, a shared approach to green industrial policy can enhance the region's competitiveness in global markets. By aligning regulatory frameworks and standards, Western Balkan countries can create a conducive environment for green investments, attracting foreign capital and stimulating job creation in environmentally friendly sectors. This can not only diversify the economies but also prevent a "race to the bottom" in attracting green investments in the region. Such a race has already been evident as the EU and US compete for investments, competing to provide large subsidies to attract or retain manufacturing capacity.[40] Importantly each country is a pre-accession country needing to align its own laws with those of the EU and European industrial policy is explicitly aimed at improving sustainability.[41]

40 EU Unveils a Green Investment Plan to Compete With US and China – Bloomberg

41 "The EU's industrial policy aims to strengthen the competitiveness of EU industry and to promote a more sustainable, resilient and digitalized economy that creates jobs." EU industrial policy – Consilium (europa.eu)

A shared approach to green industrial policy can reduce the risk of wasted public resources. Cautionary tales have emerged to reinforce the message that aims need to be clear and scarce public funds spent efficiently. In Germany, €902 million of state aid to Northvolt to build a battery plant is in response to the US inflation reduction act (IRA)[42], creating concerns about a "race to the bottom". Also in Germany, subsidies to chip manufacturers are proving costly – €6.8 billion, later increased to nearly €10 billion – to Intel may contribute toward increasing chip manufacturing in the EU but would come at a cost of €1 million per job (including temporary construction workers).[43] The legality of these subsidies is now being questioned under German law adding uncertainty to the business environment.[44] Germany is also pursuing an investment from TSMC at a cost of €5 billion in subsidies.[45]

Opportunities for collaboration countries could consider include:

- Joint development of curricula for training new skills – together with relevant industries – where similar skills deficits have been identified. Some joint training activities could also be held in person or online. Trainers/experts from existing programmes such as those developed by European industry organizations could be invited to participate.
- Coordination of development of carbon pricing mechanisms. For example, a regional market could be developed to ensure countries do not compete with each other, and present a unified negotiating platform with the EU. A revenue sharing mechanism would need to be implemented if it is implemented regionally.
- Coordination of renewable power – both technologies and location – would help to ensure clean power is more readily available in the region. For example, wind power in one location can combine with solar in another location to increase the number of hours clean power is available in both locations.
- A regional power trading market may also facilitate alignment with the EU and ease trade of renewable power.
- Pooling limited research and development resources – for example by establishing joint research programs, or even shared facilities in border regions.
- Integration of regional supply chains. This is particularly relevant for technologies such as electric vehicles and batteries, but a thorough study may reveal more opportunities. Different countries in the region have different resources and different strengths allowing for the development of more regional supply chains.
- Joint certification of sustainable products or manufacturing facilities, while ensuring full alignment with EU standards. This would also allow regional supply chains to source from each other while being certain that inputs meet EU requirements.

42 Margrethe Vestager on X: "This is a 1st case of matching aid. We approved 902M€ #StateAid for @northvolt to build a new plant of green #batteries in DE. Without it, @northvolt would set the plant in US, where they were offered support under the #IRA Now investments & jobs will be in EU https://t.co/gKzioLEz3i" / X (twitter.com)
43 It is make or break for Intel's giant bet on Germany (economist.com)
44 German court ruling could cost Intel billions of euros in subsidies – state minister | Reuters
45 German region chief defends massive subsidies to lure chip producer – Euractiv

2.4 What the framework provides

Each country must tailor its green industrial policy to its own needs and circumstances. In particular, starting points differ significantly from one nation to another – renewable energy capacity and infrastructure in place differ, public resources differ, strengths and weaknesses of investment climates differ, although all must improve to attract needed investment. Nonetheless, WB countries have much in common and a generalized and coordinated approach to formulating GIPs can be helpful.

This document therefore presents not a green industrial policy but a framework to approach their development. Ultimately, the aim will be a clean and prosperous economy based in a social transformation that ensures opportunities for all people and regions. Yet not all challenges can be addressed with GIP. This framework contains:

- A "menu" of potential challenges that each country could consider using GIP to address.
- Potential broad solutions to address each challenge.
- Preliminary learnings from global GIP experience.
- Lessons on communicating climate-related transformations.

Some important caveats are in order drawing from global experience. First, global experience will need to be adapted to country-specific contexts. Second, green industrial policies are new and while some lessons may be drawn from general industrial policies, the comparison is far from perfect. Therefore, the ultimate impact of GIPs is not yet fully known – rather, it is possible to draw already some preliminary directional successes or failures for WB governments to consider.

3. Global green industrial policy experience & their relevant for the Western Balkans

3.1 Introduction: Context and Objectives

The pathways to economic development are changing, due to significant new market conditions driven by climate change and the global decarbonization agenda. Development is about opening pathways to prosperity, rather than locking in unsustainable growth, which is why early greening through green industrial policy is of paramount importance. The exports of carbon-intensive products will face increasing constraints, while considerable market opportunities arise for low-carbon technologies and environmental goods.

In many ways, given the emerging global investment and trade trends, the economic future of the Western Balkans is linked to European trade dynamics but also by the sub-region's ability to capture some of the industrial benefits that arise from the global decarbonization agenda.

In that sense, given their relatively small domestic markets, regional integration is of tremendous importance to building a resilient and competitive industrial ecosystem in the economies of the Western Balkans, and a multilateral coordination of industrial policies can help achieving this goal.

This annex therefore explains the rationale for industrial policy in the context of green economic transformation and analyzes different global experiences in terms of multilateral approaches to industrial policy that may be of relevance to the Western Balkans.

3.2 Global decarbonization: vulnerabilities and windows of opportunity for green industrialization

3.2.1 Changing market conditions and regulatory landscapes

The pathways to economic development are evolving due to significant new market conditions driven by climate change and global efforts to combat it. This also means that for regions such as the Western Balkans, the "grow now, clean up later" strategy is no longer viable. Policymakers might be inclined to adopt such a strategy, hoping to benefit from environmental solutions developed elsewhere and cost reductions through incremental improvements and economies of scale. This approach could also be seen as a way to avoid the political resistance that often accompanies immediate environmental action (Pegels and Altenburg, 2020). However, this strategy has serious limitations:

- High risks of ecological damage and economic losses from stranded assets, by locking economies into carbon-intensive pathways, particularly since energy systems tend to have long-lasting dependencies (Fouquet, 2016; Aghion et al., 2019).
- Higher costs in the future, necessitating more radical restructuring measures (Acemoglu, et al. 2012; Stern, 2007).
- Hinder a country's ability to capitalize on market and investment opportunities presented by decarbonization, thus missing out on a first-mover advantage in strategic industries (Lebdioui, 2022).

- Loss of competitiveness and access to large consumer markets due to new sustainability trade measures and regulations adopted by key players. The EU's recent Carbon Border Adjustment Mechanism exemplifies this shift and has particular relevance for the Western Balkans.

Development is about opening pathways to prosperity, rather than locking in unsustainable growth, which is why early greening through green industrial policy is of paramount importance. The exports of carbon-intensive products will face increasing constraints, while considerable market opportunities arise for low-carbon technologies and environmental goods. The synergies between economic development and sustainability are explained below, with a specific focus on the green reconfiguration of industrialization.

3.2.2 A new type of industrialization aligned with the sustainability agenda

The role that industrialization can play in the context of ecological sustainability is often misunderstood. Industrialization as we know it has to change as industrialization has had harmful pernicious ecological impact on our planet (industry currently accounts for 30% of GHG emissions globally). A climate-compatible industrialization model is possible but needs to be based on new principles of sustainability, resource efficiency and durability. Below, are three main drivers that align industrialization strategies with those new principles:

Table 3.1 Summary of three drivers of green industrialization

Drivers	Green window of opportunity for manufacturing	Requisites of the 4th industrial revolution	Environmental upgrading
Benefits	Large-scale deployment of low-carbon technologies opens a new wave of opportunity for industrialization, which hold considerable potential for jobs creation and technological innovation Opportunities exist to industrialize not only by integrating key segments of low-carbon technology supply chains (e.g. the manufacturing of electric batteries) but also by taking advantage of abundant clean energy generation as feedstock to develop competitive energy-intensive services and manufacturing activities.	Energy transitions are a backbone pillar to sustain the 4th industrial revolution (4IR), which is defined as the advent of "cyber-physical systems, which are highly-energy intensive and can consequently generate a high carbon footprint Existing calls by the international community to reduce the environmental impact of artificial intelligence systems and data infrastructures	Value creation by adopting environmental measures in value chains, meaning that firms can move into more profitable and/or technologically sophisticated economic niches by becoming "greener". Environmental upgrading can help increase production efficiency either through better organization of internal processes or the use of superior technology, but also increase the competitiveness and value of products by increasing their durability and/or lowering their environmental impact.

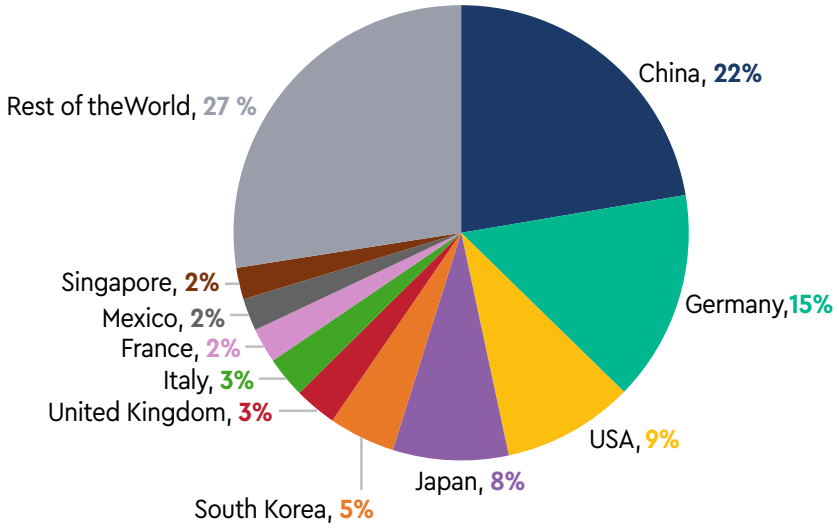
Drivers	Green window of opportunity for manufacturing	Requisites of the 4th industrial revolution	Environmental upgrading
Challenges	Parts of those value chains are becoming increasing consolidated and marked by intense competition Requires access to cheap, reliable and clear energy sources.	Failure to ensure access to cheap, reliable, and clean energy sources in some nations may hinder their ability to uptake a state-of-the-art industrialization strategy	Requires careful cost-benefit analysis and market studies to identify the sustainability premium Possible tensions between product durability and revenues for industrial models based on volumes and renewed consumption from the same customer base
Examples	Wind turbine manufacturing in Brazil Solar cell production in Malaysia	Investments in integrated solar farms and clouding services in Chile Costa Rica's "plug and play" strategy (see Box 2)	Firms that capture market premiums through product differentiation for goods whose eco-friendliness lies in their production (e.g. Adidas shoes made out of recycled material) or their consumption (e.g., electricity-saving gadgets)
Literature for further details	Perez, 2016; Lema, Fu and Rabellotti, 2020; Newfarmer et al. 2019; Lebdioui, 2022	Mazibuko-Makena and Kraemer-Mbula 2021; UNESCO, 2022	De Marchi, Di Maria, and Micelli 2013; Ponte 2019

For all the above-mentioned reasons, we must go beyond an unproductive confrontation between the sustainability and the industrialization agenda. However, not all countries are equally well positioned to benefit from green industrialization opportunities, and some have already taken a head start. For economies such as in the Western Balkans, proactive policy interventions will be needed to catch up and join the green industrialization race.

3.2.3 The situation of latecomers: is there still time to join the green industrialization race?

Some countries have taken a significant head start in terms of green industrialization. Figure 6.1 shows that only 3 countries (namely China, Germany, and the USA) account for half of global exports of low carbon technology products. China's performance has been spectacular in that regard. Since 2000, China has increased its low-carbon technology exports tenfold and positioned itself as the uncontested exporter of low-carbon technologies (see Box 3).

Figure 3.1 Export market shares of low-carbon technology products (average 2019–2021)



Source: Author's elaboration based on data provided by the IMF climate dataset

For latecomers, this also means that there is increasing competition to seize market opportunities to manufacture low-carbon technologies. However, rather than accepting the existing comparative advantages as a given, it is worth questions what are the factors that enables countries such as China, Germany, Denmark or Japan to take a lead in the production of low carbon technologies. Interestingly, many of the factors that are critical to those successes are not natural, but policy-induced. The role of the state goes beyond that of a referee that sets the regulations and norms and can be also responsible for shaping productive transformation away from 'low-quality activities' towards 'high-quality activities' that are characterized by economies of scale, technological upgrading, high productivity and wages (Chang, 2011; Mazzucato, 2016; Perez, 2010, 2016).

This has considerable implications for "latecomers" such as the nations of the Western Balkans, where the rationale for industrial policies is also even stronger in the case of substantial market imperfections that hinder industrial activities, technology transfer, adoption, innovation, and learning-by-doing. Rather than implying that those conditions make industrial policies too risky (which is the common critique of industrial policy in developing countries), they justify why government interventions are needed in the first place to efficiently reorient scarce capital towards priority areas with high spillover effects. This, of course, requires appropriate governance mechanisms and institutional structures to avoid inefficiencies, distortions, elite capture, and corruption. It is through such an approach that the rest of this policy note addresses the rationale for industrial policy to stimulate green economic transformation.

3.3 The rationale for industrial policy in the context of green economic transformation

This section addresses the rationale for industrial policy, but also outlines the factors of success and the different ecological dimensions of industrialization, before highlighting various country experiences of potential relevance to the Western Balkans.

3.3.1 The case for industrial policy

An industrial policy can be defined as the strategic effort by the state to encourage the structural transformation of an economy, to enhance efficiency, productivity growth, and competitiveness (Chang, 2011). More specifically, it refers to "any type of selective government intervention or policy that attempts to alter the structure of production in favor of sectors (or activities) that are expected to offer better prospects for economic growth in a way that would not occur in the absence of such intervention in the market equilibrium" (Pack and Saggi, 2006). Industrial policy can also be used to balance regional growth and assist workers to retrain or relocate, and consequently "defuse the resistance to economic change likely to come from those who would be the hardest hit" (Reich, 1982), which holds particular relevance in the context of low carbon transition and possible job losses in carbon-intensive activities (Lebdioui, 2022).

From the 1980s until the early 2020s, industrial policy lost popularity due to the dominance of free market economics, a selective interpretation of failures in various regions, and the implementation of structural adjustment programs, which led to the minimization of the role of the state. But industrial policy has witnessed a revival in popularity around the world, based on an acknowledgment that they have been necessary ingredients of the acquisition of new comparative advantages in the past and also essential in seizing the so-called 'green windows of opportunities'.

There are many different instruments in the Green Industrial Policy toolbox, both on the demand-side and supply-side. Those include fiscal incentives, public investment and procurement, environmental regulations, import constraints, and subsidized credits for productive activities (see table below).

Table 3.1 The Green Industrial Policy toolbox

Demand-side	Supply-side
• Fiscal incentives for low carbon technology consumption	• Fiscal incentives for low-carbon technology production
• Public procurement	• Subsidized credit to firms (often through national development banks)
• Environmental regulation and penalties	• Public financing for R&D support
• Local content requirements (only effective in specific conditions)	• Public investment in related infrastructure
• Import constraints	• Green skills development program
• Price control mechanisms	• Public provision of a clean electricity matrix to firms

3.3.2 Coordinating cross-ministerial bodies for green industrial policy

Green industrial policy is often hindered by inconsistencies of objectives across various policy realms, as shown by a large body of literature on the importance of "policy mixes", that is the coherence, combination, and complementarity of various policy instruments to stimulate low carbon transitions (e.g. Palage et al. 2019; Rogge et al. 2017).

Green Industrial Policies are more likely to be effective if they are part of a joined-up policy approach and careful coordination with energy, environmental, skills, labor market, and fiscal policies. In contrast to conventional industrial policy, which has been historically led by a ministry of international trade and industry (MITI) in several countries, green industrial policy requires coordination across a much larger variety of actors. The new set of institutional capabilities required for green economic transformation can include a coordinating body between the relevant ministries (finance, industry, trade, energy, environment, science & technology, education) as well as other entities, so that policies do not work at cross-purposes but instead amplify synergies.

The coordination between related policies for green economic transformation has taken various forms in different countries. For instance, in Malaysia, green industrial policy is coordinated by the Economic Planning Unit, which sits under the Prime Minister's office. In China, to allow for cross-ministerial energy planning coherence, the Ministry of Energy was disbanded (five years after its creation in 1988) precisely because the portfolio of that ministry overlapped with other ministries. Instead, China's energy sector and green industrial policies are regulated by multiple government bodies and agencies.

3.4 Multilateral approaches to industrial policy

3.4.1 Overview: the regional dimension of industrial policy

Most successful instances of green industrial policy are found in countries with very large populations size (such as China, the USA, Brazil, India), who could rely on demand-side policies to generate economies of scale but also impose local content requirements. But not all countries can achieve green industrialization through demand-led growth. Countries with smaller domestic market sizes face different constraints, and therefore replicating the same green industrial policy tools that work somewhere else might not be advisable. For instance, in the Western Balkans, where national market demand is often not large enough to reach economies of scale, green economic transformation requires access another region's larger market demand (e.g. the EU) and/or multilateral coordination towards regional supply chain development.

Besides leveraging a larger and/or more prosperous neighbor's market demand (see section 4.2), small economies can indeed achieve economic transformation through coordinating their industrial policies at the regional level.

At the most basic level, such coordination takes the form of a trade liberalization approach and the adoption of free trade areas, while establishing joint norms, quality certifications, and smoothening dialogue between different stakeholders (such as industry associations). However, besides building a larger common market, the potential of a regional block is more than the sum of their parts. This is why, 'green' regional developmentalism is also based on the idea that neighboring countries leverage their complementary assets (whether it is critical

minerals abundance, manufacturing capacity, renewable energy potential, as well as proximity to important trade route) to develop an efficient regional industrial ecosystem around climate-related technologies (Davies, 1996; Ismail, 2018; Lebdioui 2022). Indeed, one of those is that regional integration is not just about trade, but about increased social and economic development (Stiglitz, 2016).

Therefore, at the most ambitious level, to unlock the full benefits that regional cooperation can bring for green economic transformation, it is essentially to go beyond basic approaches to trade integration and emphasize multi-sectoral program embracing production, infrastructure, and trade, notably to build regional value chains that can foster industrial transformation (Davies, 1996; Ismail, 2018).[46]

Such an approach can take the form of various policy initiatives, including:

- Regional and sub-regional strategies for specific low-carbon industries (electric batteries, EVs) to help align demand-side policies to create larger and more stable regional market demand.
- Knowledge sharing platforms to share information and improve human capital. For instance, fostering partnerships among universities and educational networks holds potential for advancing regional innovation, as well as supporting partnerships across business and industry associations.
- Region-wide certification for low-carbon products, to enable access to other country's market demand and streamline administrative processes.
- Cross-border infrastructure, especially for energy systems and electricity grids, to enable a stability of the transmission network and leverage complementary resources and intermittent energy sources (such as Nord Pool, a pan-European power exchange).
- Joint financing solutions through a coordination of development banks, or the creation of a sub-regional development bank tasked with funding transnational projects (a well-managed larger sub-regional development banks may have a higher impact that a group of smaller development banks that are more difficult to administrate).
- Pooling limited R&D resources for joint innovation to shared challenges. Science and technology play a key role for green economic transformation, but requires substantial public funding. In nations with limited budgets, pooling resources among countries offers a pragmatic solution, which has been a key element of the EU's support for R&D.

In practice, achieving such a regional coordination of green industrial policy remains paved with challenges, not only in the Western Balkans but everywhere. Political and ideological differences, external influences, and gaps in physical infrastructure connectivity, as well as disparities in economic development levels among neighboring countries, can generate resistance to regional integration (Lebdioui, 2023). Nevertheless, surmounting such challenges is necessary given the significant development opportunities and challenges that arise in the 21st century for the Western Balkans and other regions. Furthermore, many regions around the world have successfully pursued various levels of integration (such as the European Union, ASEAN, and the African Union, among others), which can serve as the basis for useful lessons for the Western Balkans.

46 For instance, in the African context, Ismail (2022) outlines how the African Continental Free Trade Area can be implemented in a manner that supports the transformative industrialization of Africa and facilitates a "climate-resilient developmental regionalism".

3.4.2 The "market piggybacking" model (Poland, Mexico, Vietnam) and relevance for the Western Balkans in the present

The idea of "piggy-backing" on a larger and/or more economically prosperous neighboring country's demand as an industrial development strategy is not new: Vietnam, Poland, and Mexico have provided useful cases over the past few decades.

Vietnam's proximity to China has allowed it to tap into the Chinese supply chain and cater to its immense market demand, especially as labor costs in China have risen. The integration of Vietnamese firms into Chinese supply chains has been critical for economic growth. Many companies have moved their production to Vietnam, attracted by its lower labor costs and improving infrastructure, thereby allowing Vietnam to export intermediate goods (especially in industries such as electronics, textiles, and machinery) back to China and other global markets.

Similarly to Vietnam with China, Poland's economic strategy also exemplifies the "market piggybacking" model, leveraging the market demand and industrial dynamics of its neighbor, Germany. Poland has integrated into the German supply chain, benefiting from Germany's industrial demand, technology and increase labor costs, which led several German companies to move production to Poland, attracted by both lower labor costs and a skilled workforce. This shift has enabled Poland to develop industrial capabilities in the automotive, electronics, and machinery sectors.

It is also in that perspective that Mexico has industrialized, by leveraging its preferential access to the US market allowed by NAFTA (and the subsequent entry into force of the USMCA), the presence of low-wage skilled labor as well as domestic capabilities to attract investments in low carbon technology supply chains (especially in the automotive sector). In fact, when it comes to green industrialization, Mexico also stands to benefit from the recent low-carbon technology market push in the United States, which have already led to new investments in Mexico.

The experience of Mexico, Poland and Vietnam reveal that the ability to tap into another country's market is conditioned by several factors (including signed trade agreements, domestic capabilities, geographic proximity, and transportation costs), but also that in the long term, a country's success in seizing opportunities stemming from other country's market demand also hinges on the use of industrial policies. Those policies are particularly helpful to improve supply-side industrial capabilities, such as the development of a skilled local workforce capable of engaging in high-value-added industries to move beyond the mere assembly and processing activities and implementing improvements in logistics and infrastructure (both digital and physical) that are essential to attracting investments in high value-added industries.

Those experiences are particularly relevant to the Western Balkans, given their proximity to the EU market, but also to other key markets (e.g. Turkey). However, it is worth noting that this strategy is not without its risks. Heavy dependence on a single market can expose a country to economic vulnerabilities if there is a downturn or radical policy change in the larger country. Market diversification and strategic planning are essential to mitigate these risks. It is also crucial to ensure that this strategy aligns with the long-term domestic developmental goals, rather than locking countries in unsustainable development routes, or to a race to the bottom in terms of labor costs. Furthermore, not all nations have access to large neighboring markets to bolster their green economic

transformation, and countries surrounded by smaller economies therefore face a collective demand-side challenge. In regions such as the Western Balkans, besides relying on external demand, regional integration can be very helpful to ensure the coordination and perennity of demand-side and supply-side policies.

3.4.3 The ASEAN model and relevance for the Western Balkans in the present

In Southeast Asia, the model of regional integration and coordination of industrial policies is characterized by a collaborative approach among its member states through the ASEAN (Association of Southeast Asian Nations) economic community and its coordinating council. Launched in 2015, the ASEAN economic community aims to create a single market and production base, characterized by free movement of goods, services, investment, skilled labor, and freer flow of capital. This initiative seeks to enhance the region's global competitiveness by reducing trade barriers, harmonizing standards, and simplifying customs procedures. By creating a more integrated economic space, ASEAN member states aim to attract more foreign direct investment and foster intra-regional trade.

Interestingly, besides promoting intra-regional trade, such institution also enables countries such as Indonesia, Malaysia, the Philippines, Singapore, Thailand, and others, to coordinate their national policies, establish regional targets and objectives, and support the development of regional supply chains. Industrial policy coordination within ASEAN is indeed further supported by initiatives such as the ASEAN Industrial Cooperation Scheme (AICO), aims to promote joint manufacturing industrial activities between ASEAN-based companies. The focus of the regional coordination of industrial policy in the region has been sectors where ASEAN already has competitive advantages, (such as electronics, automotive, and agro-based industries), and where collaboration approach allows member states to leverage their individual strengths while benefiting from regional synergies.

In that sense, efforts to coordinate industrial policies around the EV industry are particularly interesting. Efforts to develop EVs supply chains in ASEAN face several challenges. On the one hand, the region benefits from the presence of several major automotive manufacturing countries (such as Thailand, Malaysia, Indonesia, and Vietnam). On the other hand, the ASEAN automotive industry remains heavily dependent on foreign technology, operating mainly in the assembly segment, while the countries of the region rely on vary different policies (attracting FDI for some, and developing national champions in others). The development of a regional EV supply chain also hinges on the development of an extensive network of charging infrastructure, and managing legacy investments in internal combustion engine (ICE) productive capacity. As such, the recent ASEAN Leaders' Declaration On Developing Regional Electric Vehicle Ecosystem (2023) aim to address those coordination issues by committing to encourage the harmonization of regional standards for the electric vehicle ecosystem as well as training and certification based on international standards, to enhance trade facilitation, ensure interoperability and seamless cross-border mobility, as well as improving infrastructures and charging stations; optimizing the production and use of sustainable materials and resources to achieve higher value creation of the electric vehicle supply chain in the region; and collaborating on research and development activities and human capital development; and gradual phasing-out conventional internal combustion engine into Zero Emission Vehicle including Electric Vehicle, amongst other initiatives.

In contrast to a supranational body (such as the EU), the ASEAN coordination of industrial policy aims to facilitate dialogue between governments directly and leaves much greater autonomy for sovereign member states to design their own policies and emphasize policy harmonization and consensus on implementation of regional initiatives. However, the ASEAN model also present challenges. ASEAN initiatives lack a mandate to directly influence national industrial policies, and are instead designed to complement them. Limited funding and ASEAN's flexible structure, while responsible for its survival and adaptability, restrict its ability to promote coordinated change and avoid contradictory efforts among member states.

Nevertheless, overall, the ASEAN model of regional integration and industrial policy coordination can offer valuable lessons for the Western Balkans, as both sub-regions face challenges of economic fragmentation and the need to enhance competitiveness. By adopting a similar approach to ASEAN, the Western Balkans could work towards creating a regional industrial strategy that is not only aimed at boosting free trade but also i attract more foreign investment, promoting capacity-building and economic upgrading. Given its flexibility, the institutional mechanisms underpinning ASEAN regional integration are also suitable for regions aiming to promote regular dialogue and policy coordination while respect national sovereignty and without having to create new supranational institutions from scratch. For the Western Balkans, the ASEAN model also shows how adopting a flexible, complementary approach to regional integration and industrial policy could help manage diverse national interests while promoting economic collaboration and development.

3.4.4 The EU model and relevance for the Western Balkans in the future

The European Union represents a unique model of regional integration, driven by a very peculiar historical post-war context, and represents both successes and limitations for green industrial policy.

One of the great successes of European industrial policy coordination lies in the case of Airbus. The creation of Airbus in the 1970s shows how collaboration among four European countries led to significant industrial advancements and the emergence of a globally competitive aerospace company. Similarly to today's green industrialization race, the creation of Airbus was motivated by a shared vision of European governments to create a competitor to the dominant American aerospace companies like Boeing and McDonnell Douglas, which justified pooling resources and expertise from multiple countries. Indeed, European governments provided substantial funding and subsidies to Airbus, which enabled the company to survive as an infant industry and gradually benefit from productivity gains through learning by doing, but also enabled to share financial risks across various countries. That said, rather than exemplifying a case of regional industrial policy coordination, Airbus is a case of multilateral coordination of industrial policy between four countries.

By the late 1980s, a shift to neoliberalism emphasized horizontal policies, regional cohesion, and R&D funding provision, adapting the integration process to changing economic ideologies. But more recently, the EU's has prioritized sectors like battery and semiconductor production, responding to strategic interests and the rise of industrial policies and trade protection measures in the USA and China.

Nowadays, the European Union industrial policy is designed in a way where the EU commission sets up on long-term targets while member states decide on the implementation and strategy to achieve those goals. However, this model has had limitations. The EU has been far less successful at develop a regional green industrial policy, partly due to the resistance of some of the large member-states, such as Germany, that seek to move faster on their own.

Furthermore, while the EU is often portrayed as a success story, it is essential to consider who has benefited from this integration. Historically, cooperation between France and Germany, avoiding direct competition, further stabilized the European integration process. However, inequality persist within Europe, with some sub-regions lagging behind. In response to the rise of green industrial policy in China and the USA, the EU faces concerns about lagging in industrial competitiveness.

For the Western Balkans, the EU model highlights the importance of a shared vision, robust institutional frameworks, and substantial economic cooperation for successful regional integration. Adopting aspects of the EU's integration strategy, such as collaborative R&D initiatives and cohesive policy frameworks, could support their regional development and integration efforts while navigating current economic constraints. However, future industrial policy coordination in the Western Balkans might be constrained by EU supranational targets and strategy.

3.5 Conclusion

The pathways to economic development are undergoing significant transformation. Regions like the Western Balkans must adapt to these changes by embracing early greening through proactive industrial policies. This approach not only mitigates the risks associated with carbon-intensive pathways but also unlocks considerable market opportunities for low-carbon technologies and environmental goods.

The rationale for industrial policy in the context of green economic transformation is compelling. Successful industrial policies must integrate green dimensions, ensuring sustainability and ecological integrity. Different country experiences highlight diverse approaches to green industrialization, each offering valuable lessons for the Western Balkans. Brazil's use of national development banks, China's comprehensive green industrial policy and coordination of demand-side and supply side policies, and Costa Rica's leverage of renewable energy for green manufacturing and services exemplify strategies that balance economic growth with environmental stewardship.

Nevertheless, for small nations, there is a limit to what can be achieved without regional coordination. In that sense. multilateral approaches to industrial policy further underscore the importance of regional cooperation. The ASEAN model, despite its limitations, demonstrates how regional integration can complement national policies and foster economic collaboration. For the Western Balkans, adopting a similar flexible and complementary approach could enhance regional competitiveness and resilience.

The European Union's integration experience provides another critical reference point. The EU's historical context, robust institutional frameworks, and focus on R&D and innovation showcase the benefits of a shared vision and coordinated efforts. For the Western Balkans, emulating aspects of the EU's strategy, such

as collaborative R&D initiatives and cohesive policy frameworks, could support their regional development and future integration ambitions.

In conclusion, the Western Balkans face a pivotal opportunity to align their economic development with global sustainability goals. By learning from global examples and leveraging regional cooperation, they can build a resilient and competitive industrial ecosystem. Early and proactive green industrial policies will be essential in navigating the challenges and seizing the opportunities presented by the evolving global economic landscape.

Nevertheless, many critical questions remain for rethinking structural transformation in the Western Balkans. For instance, which sectors and activities offer the best prospects of regional complementarity and value addition? What are the main institutional and regulatory hurdles for the regional coordination of national industrial policies? What role can CSOs and business councils play in this process, beyond relying on government-level dialogue? How will green industrial policies in the Western Balkans facilitate future membership to the EU, and will policies have to be dismantled after EU accession? Answering those questions will be key to unlocking new development models in the region and pave the way to creatively structure a sustainable and inclusive green economic transformation strategy that works for all the countries of the Western Balkans.

4. A green industrial policy framework for the Western Balkans

What the industrial policy framework describes. This chapter does not purport to develop a single green industrial policy for the Western Balkans. Rather, it describes some of the challenges that countries in the region face, and which a green industrial policy framework can contribute toward solving (Table 41). It focuses on the major challenges in the region which have a connection to greening the economy and societies, and which – while not all applicable for every country – have relevance in multiple countries. In addition, it also considers themes or challenges where cooperation will be most important with Europe in general and between Western Balkan countries. Given WB needs to broadly align with the EU as part of the accession process, this chapter considers the main areas of the EU Green Industrial Plan and accompanying efforts, as described above.

Table 4.1 Approach to GIPs in the Western Balkans

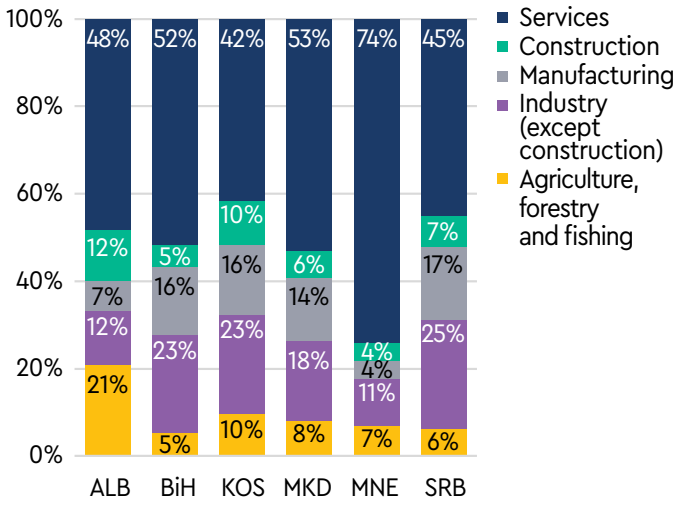
What this chapter does not do	What this chapter does do
Provide a single GIP for the whole region.	It provides a "menu" of themes, challenges or opportunities that a GIP may contribute toward solving.
Describe every social and economic challenge in the region.	It focuses on challenges which are connected to greening economies and societies, and where GIPs are highly relevant.
Identify every greening challenge in each country.	It focuses on challenges that occur in several countries, and are related to the green transition.
	Considers themes or challenges that may be most relevant for cooperation with Europe as a whole and between Western Balkan countries.
Discuss communication and public relations	The importance of communication strategies and examples are discussed in the following chapter.

4.1 Economic challenges & the transition

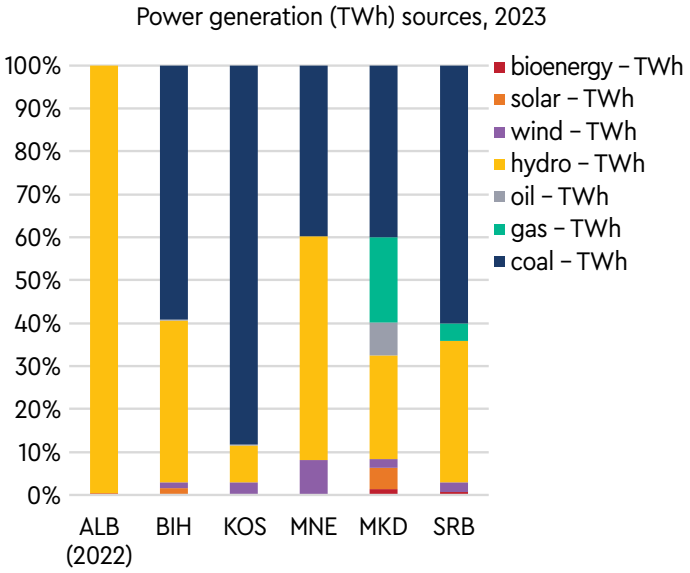
WB countries are all embarked on a similar greening journey but have different starting points. Each country is embarked on a mission to reduce emissions and reach net zero, while modernizing their economies and improving their social and work environments. All are EU pre-accession countries, implying common climate and energy commitments (see section 3.2). In addition, all could benefit from more resilient economies and societies. Yet, each has its own starting point, with differences in terms of economic structure – that is, which industries dominate – and the sources of power for the economy and for homes being particularly prevalent. For example, Albania benefits from almost entirely renewable energy for electricity generation (hydropower), while coal contributes over half of power generation in Kosovo, Serbia and BiH (Figure 41). Yet, to some extent, all countries require new, clean power to reduce pollution, remain competitive, and meet climate targets; and all countries still have industries that need to green in order to retain access to the EU markets and meet domestic and international climate commitments. Green industrial policies can help.

Figure 4.1 There are key differences in economic structures and fuels for power generation

Economic structures differ between WB countries...



... and countries face very different power generation challenges.



Sources: Statistics | Eurostat (europa.eu); Electricity Mix – Our World in Data

4.1.1 Economic transition risks

The Western Balkan region faces significant economic challenges as it navigates the green transition. Each country in the region must contend with the repercussions of shifting economic structures, driven by both internal and external factors. Internally, nations will need to manage the transformation or decline of key sectors such as manufacturing, mining, and fossil fuel power plants, including thermal energy. Externally, European Union policies, particularly the CBAM, pose risks to manufacturing exports from the region. These changes threaten economic output and employment, and will require technological adaptation, highlighting the multifaceted challenges of transitioning to a greener economy.

Several countries in the region have a strong historical manufacturing base, which will need to adapt or see decline. For example, BiH's industrial sector accounted for close to a quarter of GDP in 2022, with manufacturing alone adding close to 14%. The metal processing sector is the most valuable segment of the mining industry, and the mineral industry is the largest source of goods by value. In some countries, the industrial sector is comparatively small, accounting for around 8.5% of GDP and 8.4% of employment in Montenegro, for example. However, Montenegro is home to an aluminum processing plant – a difficult to decarbonize industry – which was an important exporter for the country until 2023.

Mining is an important contributor to employment and economic output in several countries. For example, Serbia has a long tradition of coal mining. Over 30 000 people were employed in mining sector. The impact of declining mining for employment and economic output has not been one of assumptions in the draft NECP in Serbia or other national development documents. There are over 100 active mines in North Macedonia. While the sector employs less than 1% of the workforce, these can be geographically concentrated so efforts will need to be made to ensure no region is left behind.

Many countries rely on fossil fuels for electricity generation, powering industry and heating homes, and its phase out will present a challenge. For example, coal accounted for close to 90% of power produced in Kosovo, and two thirds of the electricity generation mix in BiH in 2020. In Montenegro, the Pljevlja thermal power plant generates 45% of the country's total electricity. In Serbia coal power plants accounted over 60% of the total electricity generation.

4.1.2 Export risks

EU green transition policies – and notably CBAM – will require action if they are not to impact business and employment in the region. The EU CBAM will cover cement, iron and steel, aluminum, fertilizers, electricity and hydrogen imports into the EU.[47] Without action, the CBAM will impose additional costs on exports from the WB to the EU beginning in 2026. The CBAM will equalize the cost of carbon between the exporter and the EU ETS (assuming the latter is higher).[48] Electricity markets have specific conditions. For countries whose electricity grid is coupled with that of the EU, electricity is exempted from the CBAM if there is no technical solution for implementing CBAM.[49] Coupling means not only a physical connection but also connections to European electricity markets. It is possible that some WB countries – such as Serbia – may achieve coupling by 2026 while others will not.[50]

Exports risk being hit without action. For example, BiH ranks among the top five countries[51] with thehighest share of exports to the EU being subject to the CBAM. Electricity, cement, iron and steel, aluminum, and artificial fertilizers together constitute nearly 44% of BiH's exports and all could be subject to CBAM. The EU accounted for 54% of total Serbian external trade in 2022 and has grown by more than five time over the last two decades.[52] Manufacturing accounted for 85% of the country's goods exports in 2022.[53] Exports to the EU subject to the CBAM include iron and steel, fertilizers, aluminum, cement, and electricity were worth 18% of total export to the EU in 2022.[54] Aluminum comprised Montenegro's main goods export until 2023, while mining output (notably chromium, copper and nickel) is one of Albania's main exports. The Kosovo Government has identified priority industrial sectors including areas that risk being subject to CBAM regulations in the future, such as the manufacture of rubber and plastics, which is already an important contributor to Kosovo's industry.

This represents a considerable risk for employment and output for these industries if they fail to adapt. Impacted industries' exports to the EU accounted for approximately 10% of the BiH GDP in 2022. Initial forecasts suggest a decline in exports from the impacted industries of BiH ranging from 11% to 25%, depending on the carbon price level, resulting in a loss of about 1.1% to 2.5% of the GDP. In Serbia, estimated losses due to the initial implementation of the CBAM are 0.2% to 0.4% of GDP annually by 2035 and around 3% of jobs are at risk.[55] Moreover, indirect impacts will be felt by suppliers of inputs for the production

47 Carbon Border Adjustment Mechanism – European Commission (europa.eu)
48 Carbon Border Adjustment Mechanism (europa.eu)
49 CBAM readiness – Energy Community Homepage (energy-community.org)
50 Western Balkans face tight electricity market coupling deadlines (balkangreenenergynews.com)
51 Along with UAE, Ukraine, Belarus, and Iran
52 From around €3.2 billion in 2009 to around €18 billion in 2022: https://www.stat.gov.rs/en-us/vesti/20230717-spoljnotrgovinska-robna-razmena-konacni-podaci-2022/
53 Trade, EU in Serbia, https://europa.rs/trade/?lang=en
54 Serbia country diagnostic 2023, EBRD
55 The World Bank. 2022. Supporting Serbia's Transition to Greener and More Resilient Growth. Policy and Institutional Reforms: Supporting Serbia's Transition to Greener and More Resilient Growth | Country Environmental Analysis (worldbank.org)

of the CBAM-affected products and inclusion of additional sectors in the scope defined after 2025.

The region is beginning to prepare for CBAM requirements. While final agreement has not yet been reached, Energy Community countries of the WB will need to begin to implement carbon pricing, and – while it can begin lower than EU levels – they should reach EU ETS levels by 2030.[56] BiH has prepared a roadmap for emissions trading and has established a framework for monitoring, reporting, and verifying (MRV) emissions. However, the process of assessing the options and planning the implementation of various elements of the trading system and corresponding legislation needs to be faster to determine the prices and scope to provide certainty for businesses and investors. Similarly, Serbia does not yet have a policy or legal document(s) that explores and design carbon price instruments, internalize the costs of emissions and ensure compliance with CBAM, although there is legislation that introduces MRV commitment to the installations covered by the EU ETS. Montenegro's Law on the Protection against Adverse Impacts of Climate Change sets, among other things, the legal basis for a national ETS for the industry and power sectors. While a national ETS has been running in Montenegro for close to 3 years it has limited liquidity due to the small number of participants, creating challenges for the effective functioning of the scheme. Its price is not aligned with the EU ETS, with an initial price of €24 compared to an EU ETS price of around €65 in June 2024.[57]

4.1.3 Policy options

Green industrial policies can help to moderate the risks associated with the green transition. Below we present policy options for governments to explore. Not all will be applicable in each country and specific implementation modalities will differ by context. Therefore, these should be regarded as a "menu" of policy areas that could be included in a GIP or accompanying efforts to support ensuring a country can moderate economic risks posed by the transition.

- **Continue the process of establishing and aligning carbon pricing with the EU ETS.** This is especially important given the importance of the EU market and impact of the CBAM. Energy Community countries are committed to introducing carbon pricing and aligning prices with the EU ETS by 2030. It is also essential to get prices right in order not to undermine other policies that contribute to the transition. It is also essential to cut explicit fuel subsidies. In addition, it provides an essential source of revenue that can be used to help finance the transition.
- **Where domestic ETS exist, ensure interoperability with the EU ETS.** This can help to address liquidity challenges and a common price with the EU ETS.
- **Identify industries that can replace fossil fuel related sectors and support regions' efforts to diversify.** This will require economic studies to assess the assets each region has in terms of raw materials, skills, culture and the natural environment. Gaps that could be filled such as skills upgrades or new infrastructure will need to be identified. Regions will need to be supported in the transition to new sectors.

56 The ETS is a market mechanism so it is not possible to perfectly predict 2030 levels. Commentators tend to use a price of around €100 per tonne in 2030. The World Bank's CBAM Exposure Index uses a price of $100/tonne: Relative CBAM Exposure Index (worldbank.org)

57 Carbon Price Tracker | Ember (ember-climate.org)

4.2 Economic opportunities & the transition

The green transition presents numerous economic opportunities for Western Balkan countries. Embracing new, greener sectors can lead to the creation of higher productivity and better-paid jobs. The shift towards green energy offers increased mining opportunities and the potential for transforming raw materials in an environmentally sustainable manner. By harnessing green energy, these countries can capture a larger share of the EU manufacturing market, becoming more competitive due to improved energy efficiency and lower energy costs. Together clean energy and raw material transformation could promote FDI as companies increasingly near-shore, with the aim of being closer to large markets, raw materials and clean, reliable energy. This transformation not only fosters economic growth but also positions the Western Balkans as a leader in the sustainable economy of the future.

Adoption of new technologies and innovation, required by the greener and more resilient growth, could lead to an increase in the creation of new SME businesses, creating new jobs in forthcoming years. More investment to higher-value-added sectors of the economy will ensure competitiveness of the WB economy in the long run. These require the educational system to adapt to the new opportunities, identify innovative possibilities of the economy and ensure an appropriate investment environment and, when needed, incentives for investors and companies with more complex products. In Serbia, investment in research remains low at 1% of GDP with only one third of this amount coming from the private sector. Also, there is absence of early-stage research funding schemes. Montenegro is the first non-EU country that, in collaboration with DG JRC, adopted Smart Specialization Strategy – S3 (in 2019) and it is about to start development of the new one which is perceived as a good opportunity to absorb EU Structural funds in the area of innovations and application of new green technologies.

There are ample opportunities to benefit from near-shoring and friend-shoring in goods and materials related to the transition. The International Energy Agency predicts a 400% increase in global demand for these raw materials prevalent in the region by 2030. Demand for lithium is especially predicted to grow as much as 40 times by the end of the decade. Currently, the global supply of critical materials is concentrated in a few countries, namely China with 66% of the total share, followed by South Africa with 9% and Congo with 5% each in the global supply of critical materials. There are significant European efforts to diversify and derisk supply of these materials, providing opportunities for WB countries. This was concretized in the recently adopted EU Growth Plan for Western Balkans, which offers the region integration into EU industrial chains through the development of strategic industrial projects on raw materials and batteries, covering all material flow phases from research, extraction, processing/production, to use and recycling. The plan provides an opportunity for companies and organizations from the region to join both EU Raw Materials and Battery Alliances.

Regional supply chains and the "piggybacking" model of industrial policy provide significant economic opportunities. "Piggybacking" experiences are particularly relevant to the Western Balkans, given their proximity to the EU market, but also to other key markets (e.g. Turkey). The idea of "piggy-backing" on a larger and/or more economically prosperous neighboring country's demand as an industrial development strategy is not new: Vietnam, Poland, and Mexico have provided useful cases over the past few decades. Vietnam's proximity to China has allowed it to tap into the Chinese supply chain and

cater to its immense market demand, especially as labor costs in China have risen. The integration of Vietnamese firms into Chinese supply chains has been critical for economic growth. Many companies have moved their production to Vietnam, attracted by its lower labor costs and improving infrastructure, thereby allowing Vietnam to export intermediate goods (especially in industries such as electronics, textiles, and machinery) back to China and other global markets. Similarly to Vietnam with China, Poland's economic strategy also exemplifies the "market piggybacking" model, leveraging the market demand and industrial dynamics of its neighbor, Germany. Poland has integrated into the German supply chain, benefiting from Germany's industrial demand, technology and increase labor costs, which led several German companies to move production to Poland, attracted by both lower labor costs and a skilled workforce. This shift has enabled Poland to develop industrial capabilities in the automotive, electronics, and machinery sectors. The experience of Mexico, Poland and Vietnam reveal that the ability to tap into another country's market is conditioned by several factors (including signed trade agreements, domestic capabilities, geographic proximity, and transportation costs), but also that in the long term, a country's success in seizing opportunities stemming from other country's market demand also hinges on the use of industrial policies. Those policies are particularly helpful to improve supply-side industrial capabilities, such as the development of a skilled local workforce capable of engaging in high-value-added industries to move beyond the mere assembly and processing activities and implementing improvements in logistics and infrastructure (both digital and physical) that are essential to attracting investments in high value-added industries.

Western Balkan countries have a wealth of raw materials required for green technologies. For example, BiH has deposits of magnesite, chromite, chrysotile asbestos, and others are found throughout the country, with 143 locations of strategic raw materials as defined by the EU Raw Material Act.[58] Serbia has significant mineral resources, including precious, base and industrial metals, and hydrocarbons. These include the high-grade copper-gold mineralization at Cukaru Peki/Timok south of Bor and the presence of substantial lithium-borate deposits in Jadar (see Box 4 in chapter 5 on communication lessons). Albania has significant deposits of copper, nickel, and chromium. It also has significant deposits of naturally regenerating hydrogen, which could become a significant energy source to power transport and difficult-to-decarbonize sectors. This could attract difficult-to-decarbonize sectors, such as steel, and industries that rely on them. In addition, it can be a source of clean power for industry in general.

Western Balkan countries have renewable energy potential. Several areas of BiH, Montenegro and North Macedonia have solar potential equivalent to parts of Italy[59] ,while mountainous regions of BiH, Montenegro and Albania as well as large parts of northern and eastern Serbia have high wind potential.[60] Combining wind and solar has a particular advantage because they tend to generate power at different times of day and in different seasons, helping to ensure reliable supply. Some countries in the region already benefit from considerable renewable power including Albania and BiH. Others, have identified renewable power as a potential new sector to generate power, replace imports and generate jobs and exports. For example, 267 new renewable power plants (254 of which were solar) were constructed in North Macedonia in 2022, boosting capacity by 18%.[61]

58 EU RESEERVE Project: RESEERVE – Mineral potential of the ESEE region
59 https://globalsolaratlas.info/
60 Global Wind Atlas
61 SWD_2023_693 North Macedonia report.pdf (europa.eu)

By the end of 2022, they represented 41.5% of installed generation capacity and produced 29% of power in the country and construction has continued apace since then. A recent study revealed 2 500 MW of additional wind capacity and 2 000 MW of additional solar capacity in Albania, which will require significant investment to realize. In June 2024, the Kosovo Government signed three agreements for a solar power plant of 100 MW. Adding this capacity to the existing renewable electricity production will increases the share of renewables to approximately 23%. Also in June 2024, North Macedonia announced investment for a 400 MW wind farm with construction to begin in 2025.[62] Kosovo has halted new hydropower projects due to their adverse environmental impacts. Montenegro already uses 39% of hydro potential and is planning to construct new hydro-power plants. An international assessment on renewable potential in the country, in which Montenegro participated jointly with Albania, Italy and Croatia, revealed significant potential for offshore wind farms.

The green transition offers the opportunity to build a more resilient economy. While home-produced coal should shield the power sector and economy from shocks, this has not proven to be the case. For example, in Serbia in December 2021 the largest thermal power plant broke down, leading to an urgent ramp-up of electricity imports. Gas imports increased in parallel, driven by inadequate storage levels and insufficient storage capacity. Diversifying renewable supply will also boost the resilience of the energy supply for businesses and for homes. Current renewable generation capacity is mainly hydropower. Yet, increasing climate impacts on water supply makes this supply less reliable. For example, 2022 droughts hit hydropower generation in North Macedonia and the country saw thermal power generation increase by 17% in that year as a result. North Macedonia also relies on imported natural gas for around 7% of its primary energy consumption. Following Russia's invasion of Ukraine, natural gas prices have been prone to geopolitical shocks.

Regional electricity interconnections will improve power reliability, offer export opportunities and make renewables more viable. Each country is subject to different potential shocks that hit power generation. For example, weather patterns differ, technical power outages differ, geopolitics can differ. Significant micro-differences within and between WB countries' solar[63] and wind[64] generation potential means that better interconnectivity can help smooth generation and overcome the challenge of renewable intermittency for the whole region. Ensuring clean and reliable power for business and homes depends partially on connecting power transmission grids between places to help to reduce the impact of shocks on each other. Improved grid connectivity both between Western Balkan states and with the EU has therefore been important under recent and ongoing EU financing for the region.[65] Examples of new inter-regional connections exist. For example, Montenegro already has existing interconnections with BiH, Italy, Serbia and Kosovo and plans a second under-water sea cable to Italy. This integration aims at enhancing market liquidity, promoting efficient electricity trading, and strengthening regional energy cooperation. Kosovo and Albania have operationalized the Albanian Power Exchange (ALPEX) to conduct a coupled and organized Day-Ahead Market and Intra-Day Ahead Market and to operate as the nominated electricity market operator (NEMO) for Albania and Kosovo. Kosovo plans to integrate ALPEX (Kosovo's electricity market) with the upcoming North Macedonian day-ahead market, as well as with Greece. Improved power grid

62 Alcazar Energy Partners launches 400 MW wind power project in North Macedonia (balkangreenenergynews.com)
63 https://globalsolaratlas.info/
64 Global Wind Atlas
65 action document template (country) empty (europa.eu)

interconnections not only make renewable power more feasible but also offer opportunities to export clean electricity for Western Balkan countries, boosting economic activity and good employment opportunities for citizens.

Renewable energy can reduce costs for businesses, supporting competitiveness. The region is stuck in an energy price dilemma. The current dirty energy mix in many countries is often underpriced, and requires subsidies. While this underpricing reduces costs for businesses in the short-term, it also disincentives investment in even more competitive clean energy, and investment in energy efficiency, both of which would support longer-term competitiveness. It also swallows limited public resources, which could be used more productively, harming long-term economic opportunities. As a result, many countries in the region are very energy inefficient. For example, Serbia's economy uses four times more energy to produce a unit of output than the EU27 average. Investment in clean energy and energy efficiency would reduce costs and boost business competitiveness in the long term.

Together, clean power and raw materials can promote investment in the region. Several countries in the region have the potential to attract Foreign Direct Investment by building on the combination of raw materials, clean power and historical industrial expertise. For example, Serbia has significant deposits of lithium and existing car manufacturing capacity. The right investment framework combined with the right skills could attract additional investment in battery production as well as an expansion into electrical vehicle manufacturing, generating good well-paid jobs. Recent discovery of hydrogen in Albania[66] could encourage investment in hard-to-abate industries such as steel, some of which can switch from fossil fuels to hydrogen.[67] Clean energy and access to the large EU market by ensuring full compliance with EU standards (including in carbon pricing) can encourage investment in manufacturing within the region. This is particularly the case given current "near-shoring" and "friend-shoring" trends.

The green transition offers the opportunity to transition away from value-destroying fossil fuels. For example, coal mining has not been financially sustainable in BiH. They recorded a total loss of about €122 million from 2019 to 2021 and have accumulated arrears of €257 million.[68] This implies future costs as either debts are written off or a public bail-out needed.

Box 1. A GIP can contribute to improving the investment environment

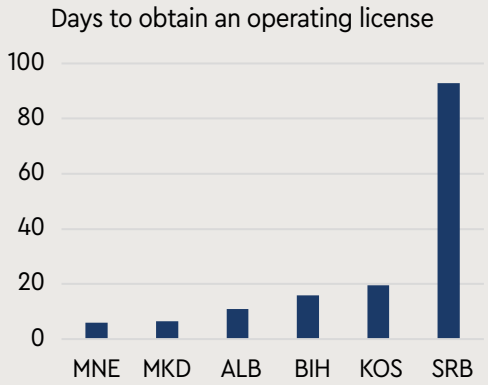
While developing the Green Industrial Plan, the European Commission noted that there was a need for a **more proactive public sector** in some areas, while in others, there was a need for the **public sector to step out of the way**. One notable challenge was over-regulation of permits and licenses for developing renewable energy. Bureaucratic processes are a major constraint to the green transformation and the benefits it brings. State interventions could be streamlined, simplified and speeded up with minimal negative impact.

Similarly, Western Balkan countries can review their own investment environment as part of their own GIPs, with the aim of attracting FDI, generating jobs, encouraging entrepreneurship, reducing corruption, and spurring the transformation. Business surveys point to some areas that should be reviewed to encourage investment and entrepreneurship in clean sectors.

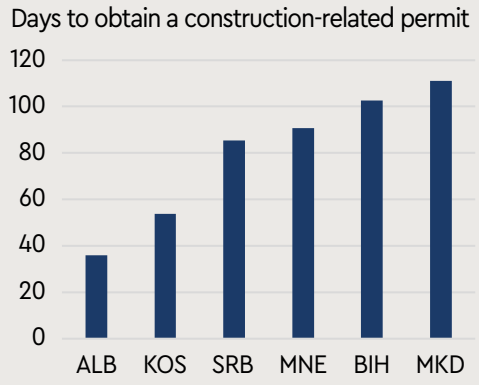
66 This Albanian mine could help unlock the hydrogen economy (nationalgeographic.com)
67 The potential of hydrogen for decarbonising steel production (europa.eu)
68 The World Bank, BOSNIA AND HERZEGOVINA Country Economic Memorandum

Figure 4.1 **Business surveys point to areas to review to stimulate investment in the region.**

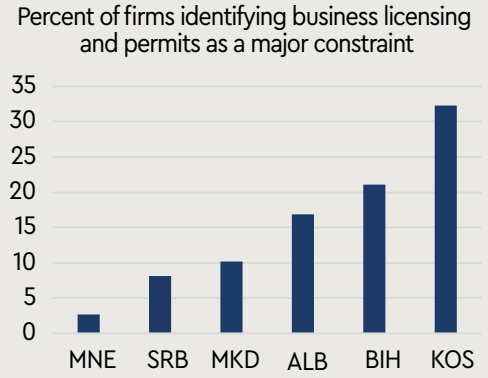
Getting a business license takes a long time...



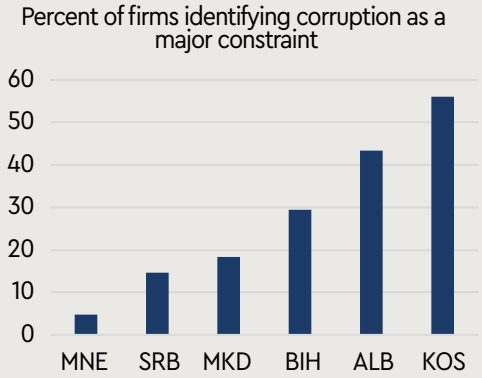
... and construction permits are burdensome to obtain



Permits and licensing are burdensome in many countries...



... and so is corruption, often connected to bureaucratic opportunities for corruption.



Sources: Enterprise Surveys Indicators Data – World Bank Group

4.2.1 Policy options

Green industrial policies can help to realize economic opportunities associated with the green transition. Below we present policy options for governments to explore. Not all will be applicable in each country and specific implementation modalities will differ by context. Therefore, these should be regarded as a "menu" of policy areas that could be included in a GIP or accompanying efforts to support ensuring a country can take full advantage of economic opportunities offered by the transition.

- **Provide a clear commitment to the transition.** Where feasible, commitments should have buy-in across the political spectrum to ensure policy continuity. This makes it clear to companies and consumers that policies will change and will not be reversed. It reduces policy uncertainty and ensures companies and households know their investments will pay off in the longer-term. This is applicable for carbon neutrality, carbon pricing, fuel subsidy removal as well as the importance of meeting targets. Targets should be enshrined in law but a credible commitment also requires policies that demonstrate how the targets will be achieved.
- **Establish and align carbon pricing with the EU ETS.** This is especially

important given the importance of the EU market and expected impacts of the CBAM. It is also essential to get prices right in order not to undermine other policies that contribute to the transition. It is also essential to cut explicit fuel subsidies. In addition, it provides an essential source of revenue that can be used to help finance the transition.

- **Create an enabling environment for renewable energy investments**. While adequate environmental evaluations need to be undertaken, the time taken to realize investments could be reduced. This could be achieved through ensuring sufficient staffing and expertise in the administrative process, designating renewable energy development zones that require "lite" processes, and – especially – simplifying investment in brownfield sites (supporting business and job generation to replace old polluting industries). Renewable energy investments could also be made more attractive through ensuring priority grid access, relevant tax incentives or other financial incentives financed through donor funds (see 4.5).
- **Boost prosumer options.** This not only provides additional renewable power, but also helps to reduce energy bills and can provide a source of income for households. A combination of awareness campaigns, incentives such as feed-in tariffs and/or cheap battery installation options would help encourage this option. The costs can be financed through reduced fuel subsidies and carbon pricing.
- **Simplify the investment climate more broadly.** The transition offers ample opportunities to attract domestic and foreign investment. This should be supported through a clear, transparent investment environment and simple, clear processes. SMEs and start-ups should, in particular, be considered in order to encourage local domestic dynamism and provide opportunities for local populations to benefit from the transition. In addition, investment in research should be increased and an early-stage research funding schemes for private sector should be established. An option is promotion of and support to cooperation with the EU companies in the field of innovation. In addition, timely preparation of the educational system for the new opportunities is precondition.
- **Evaluate market failures in other environmental areas such as circular economy and take appropriate action.** For example, there may be first mover challenges to opening specific types of business, such as recycling building material, where there is not yet a market. Costs of disposal need to be integrated into purchase prices, and recycling facilities provided.
- **Develop balanced and clear sustainable mining rules for green transition raw materials.** This can encourage investment in the sector, contribute to global emissions reductions and generate employment, while ensuring environmental sustainability. In addition, it can encourage investment in sectors that use the materials such as batteries.
- **Promote entrepreneurship.** This includes not only a welcoming investment environment but also efforts to facilitate networking, skills development, connections between universities and the private sector and more.
- **Integrate power networks better.** This makes renewable energy more feasible and reliable, while reducing power risk.

4.3 A just transition

Green Industrial Policies offer the opportunity to build fairer societies. This is both essential to ensure a successful transition with strong public support and an opportunity for social and economic transformation. The key elements of a just transition include:

- Protecting people and regions that suffer from the transition
- Ensuring opportunities provided by the transition are broadly accessible

Putting people at the center of the transition means ensuring they can benefit from the ample opportunities offered by the transition – for example, by providing training opportunities and ensuring an investment climate that generates new jobs, as well as by cushioning people and regions from negative impacts of the transition.

4.3.1 Better training for better jobs

Jobs will be lost during the transition. The decline of jobs in sectors that will be phased out will be significant. For example, an estimated 66 000 workers in North Macedonia will be at the most risk of losing jobs and will need to change their occupations. In Serbia, over 30 000 people were employed in mining sector alone.[69] In the Pljevlja region of Montenegro around 17% of employed people work in mining and energy. With the transition away from fossil fuel both the mining and power plant jobs, as well as those connected to them are at risk.

But more and better jobs can be created than are lost, providing significant opportunities for many. Ample studies demonstrate that green jobs require a higher level of skill than their dirtier counterparts and are more productive, resulting in higher wages. In addition, the green transition will generate more jobs than are lost.[70] For example, in Romania, where large-scale shutdowns of coal mines and coal power plants is occurring, an estimated 33 000 jobs will be lost. Without support for clean energy the economy will not naturally replace all of these jobs. Yet, through support for green energy deployment and other sectors in impacted regions – including, but not limited to, training, an estimated 100 000 jobs can be created.[71] In Serbia, it is estimated that decarbonization of the energy sector will lead to decreasing trend of energy poverty up to 2050 and a small net job loss (-2% in 2050). This net job loss is mainly due to the reduction of jobs in the sectors related to fossil fuels, mainly in the iron and steel, and, to a certain extent, in agriculture. However, these losses could be compensated by job gains in sectors related to renewable energy sources, energy efficiency, construction, in the forestry and forestry related sectors.[72]

Thus, the transition both requires better-trained workers and offers the opportunity for better-paid and more productive jobs. The right policies are needed to ensure the training is provided and to ensure that everyone has the opportunity to benefit. This means efforts to identify the needed skills and skill gaps – both now and in the future. It means development of training courses, often through public-private collaboration, and implementing the training programs. Ensuring that everyone has the opportunity to benefit while cushioning the

69 Statistical Office, 2022

70 See, for example: Jobs for the green transition – CEPS ; The green transition and jobs: what do we know? | Job Creation and Local Economic Development 2023 : Bridging the Great Green Divide | OECD iLibrary (oecd-ilibrary.org) ; The Just Ecological Transition: An ILO solution for creating 100 million jobs by 2030 | International Labour Organization

71 Supporting the preparation of Territorial Just Transition Plans for Romania and the Czech Republic – Cambridge Econometrics (camecon.com)

72 Low Carbon Development Strategy of the Republic of Serbia

impact of the transition on those that work in dying sectors is important. It will mean efforts to focus training opportunities on regions with negative impacts from the transition (see 4.3.2), and developing a pathway from jobs in, for example, coal, to training in skills required in the growing green economy. Of course, this cannot happen alone – economic policies need to support the investment that generates sustainable jobs (section 4.2). Required local skills should be supplied through adequate education and training locally.

A more innovative economy provides opportunities for good jobs. Smart Specialization Strategies offer an opportunity to connect innovation and job creation. This can also include providing a supporting environment for young entrepreneurs in tech sectors, and several Western Balkan countries already have small clusters of tech entrepreneurs.

Reskilling has been identified as an important part of the just transition process in the region. For example, the North Macedonia Just Transition Roadmap considers skills development to be one of its four critical components, and includes continual vocational training, active labor market policies, work-based learning, youth-specific initiatives, among others. The UNDP recently included reskilling as a critical component of its recommendations for a just transition in Serbia.[73] The Kosovo government has outlined ten priority policy areas as part of its industrial policy. Two relate directly to skills and job creation including workplace internships wage subsidies, while on work-based training, and a skills credit scheme to support companies' efforts to train staff. A recent UNDP publication called for retraining of the workforce in Pljevlja, Montenegro, as part of its transition.[74]

4.3.2 A social welfare system that protects & empowers

The transition provides a real opportunity to update social welfare policies and ensure no one and no region is left behind. In some cases, this may mean using existing systems better and in others it may be a rethink of what social welfare means. While renewable power tends to be cheaper than fossil fuels, any price increase due to reduced subsidies will hit some WB households hard as they spend more on electricity as a share of their income than their EU counterparts. For example, 16% of EU households with income below 60% of the median had utility bill arrears in 2020. But this was between 44% and 59% for Serbia, Albania and North Macedonia. It will be important to ensure these households are provided adequate compensating support in the event of significant price increases.

The current system isn't working as well as it could. Across the region around half of households report only just being able to "make ends meet" or need to take on debt/use savings to meet basic needs.[75] While the regional poverty rate fell by around a third between 2016 and 2019 to 19.3%, the pace of decline appears to have considerably slowed since the pandemic. In the region, between 10% and 40% of households are unable to keep their house sufficiently warm in winter in WB countries and between 22% and 49% of households have utility bill areas (see box 2). Even in Serbia – the best performing country in the region in terms of energy poverty indicators – some 77 000 households are considered vulnerable energy consumers.[76] **Examples of adapting existing systems exist.** For example, in 2022 North

73 08-03-2021_Report-on-a-Roadmap-for-Just-Transition-for-Serbia.pdf (klimatskepromene.rs)
74 Just transition – Between Myth and Reality | United Nations Development Programme (undp.org)
75 Western Balkans Regular Economic Report (worldbank.org)
76 https://www.energy-community.org%2Fdam%2Fjcr%3Af201fefd-3281-4a1f-94f9-23c3fce4bbf0%2FDOOREIHP_poverty_122021.pdf&usg=AOvVaw0Oai_wjCqBSg5JVKqmvHb9&opi=89978449

Macedonia increased support for vulnerable energy customers by topping up the guaranteed minimum assistance for beneficiaries, received by 35 000 households.[77] In 2023, the Kosovo Government approved the Program for the Protection of Vulnerable Consumers, which subsidizes electricity bills of families with an average monthly income of less than €150 monthly income per family member.

Rethinking social welfare to include regional as well as household needs is important. Whereas social welfare tends to be targeted toward individuals or households, the transition will impact whole communities, cities or regions that rely on fossil fuel. These include Tuzla, Srednjobosanski, Zeničko-Dobojski, Ugljevik, Gacko (BiH), Pristina (Kosovo), Pljevlja (Montenegro), Bitola, Kičevo (North Macedonia), Kostolac, Kolubara, Obrenovac, and Pomoravlje (Serbia).[78]Social welfare systems need to adapt accordingly. Considering how best to moderate the impact on those communities, while helping whole regions to transition to cleaner industries will be important. This may require investment focused on new infrastructure, skills programs (see above) targeted for specific regions. In addition, specific efforts to repurpose existing brownfield sites and attract investment (e.g. in renewable energy) to those sites will likely be warranted.

Making clean energy pay for local communities and households. In addition to providing well-paying jobs and reducing pollution, local communities may benefit from reduced energy tariffs. This can help to reduce energy poverty, while achieving local buy-in for renewable energy projects. In addition, the installation of renewable energy in homes will reduce energy bills and can provide households with an additional source of income. In its Just Transition Roadmap, North Macedonia plans to promote such prosumers (those that both consume energy and produce it – e.g. from rooftop solar), with a focus on vulnerable consumers. This can help to boost renewable power supply – as has been highly successful in Poland – and, through the use of feed-in tariffs, provide an income to prosumer households. Serbia also has limited feed-in tariffs for small renewable installations, while Kosovo has also highlighted feed-in tariffs in its NECP. It is important to note that relevant grid and storage upgrades may be required if such schemes become popular.

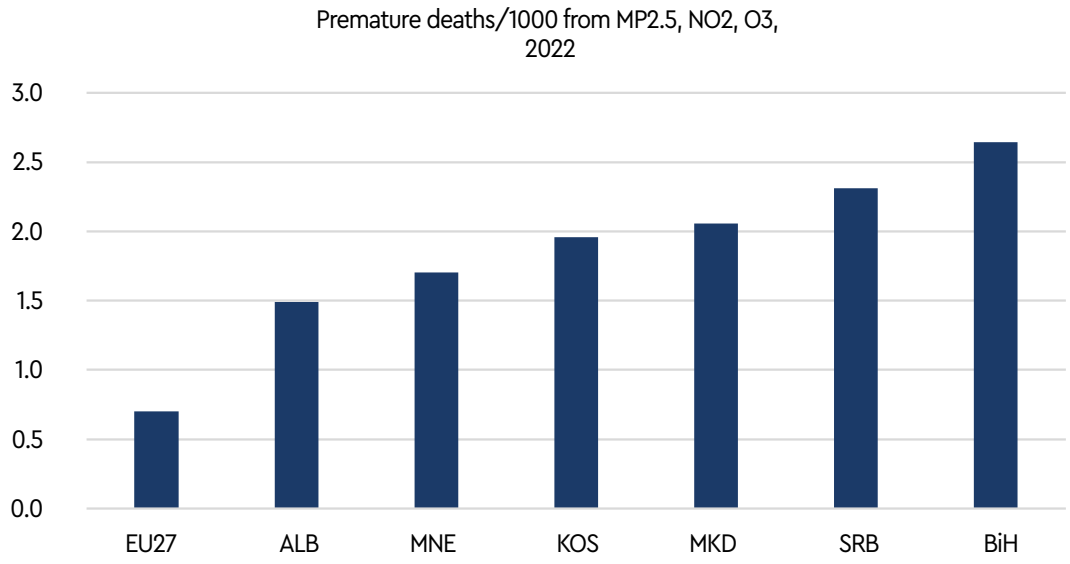
Energy efficiency can contribute to reduced energy poverty and better living standards. WB countries tend to be highly energy intensive. Kosovo is the most energy intensive economy (467 KGOE per €1 000); followed by BiH (459) and Serbia (425). [79] This compares with an EU average of 116 KGOE per €1 000. In general, WB countries have highly energy inefficient economies, which increases costs for businesses and households. This stems partly from the region's reliance on coal but also poor quality power plants and grids and a lack of investment in energy efficiency. Yet, improved energy efficiency offers many benefits through lower energy costs and reduced pollution. Using the welfare system to promote energy efficiency is therefore a win-win. For this reason, it is a major component of the EU's social climate fund.[80] In the WB, Kosovo and Serbia have established energy efficiency funds, while it is an important component of North Macedonia's Just Transition Roadmap. It is also considered an important component of the Western Balkans Investment Framework.[81]

77 Recent social policy developments in Albania, Czechia, Italy, North Macedonia, Malta, Sweden and Lithuania – Employment, Social Affairs & Inclusion – European Commission (europa.eu)
78 Initiative for coal regions in transition in the Western Balkans and Ukraine – European Commission (europa.eu)
79 GAP-Study.pdf (smartbalkansproject.org)
80 Social Climate Fund – European Commission (europa.eu)
81 Energy Efficiency (wbif.eu)

4.3.3 Clean air to breath for all

The Western Balkan region suffers from some of the dirtiest air in Europe. A combination of coal-powered thermal power-plant emissions, a transport sector dominated by out-of-date vehicles, waste dump sites and poorly regulated industrial activity cause air, water and soil pollution far exceeding values prescribed by the World Health Organization.[82] The annual economic cost of air pollution is conservatively estimated by the World Bank to range from 3.6% to 8.2% of GDP of BiH, Kosovo and North Macedonia in 2020.[83] As a result, three quarters of individuals in the WB viewed pollution as either a "serious" or "somewhat serious" issue in a 2022 OECD survey, up from 64% in 2019.[84] In 2022 an estimated 16 000 died prematurely in Serbia due to air pollution, 10 200 in BiH, and between 2 500 and 4 300 in each of the other WB countries.[85] Furthermore, there are estimates that show that over 1 000 people in Serbia suffer from chronic bronchitis as a direct result of outdoor air pollution, while 600 are hospitalized as a consequence of respiratory or cardiovascular symptoms.[86] Air pollution is a significant issue in BiH, particularly in urban areas such as Sarajevo and Tuzla. In Sarajevo, the primary pollutants are residential heating, traffic, and industrial plants, while Tuzla, an industrial city, recorded PM2.5 values at 22µg/m³, making it one of the most polluted cities in Europe. Industrial pollution is substantial, especially in the Zenica area, where Kakanj's thermal power plant and ArcelorMittal steel plant emit an annual 90 000 tons of SO2, accounting for over 20% of the total SO2 emissions in BiH.[87] In BiH, an estimated 3 300 people die prematurely from exposure to air pollution, and thousands more live with increased respiratory and cardiovascular conditions.

Figure 4.1 Premature deaths from air pollution are far above the EU average



Source: Health impacts of air pollution in Europe, 2022 Table 2. — European Environment Agency (europa.eu)

Poorer communities have the most to benefit from cleaner air.[88] Multiple studies reveal that poorer communities suffer most from pollution.[89] They tend

82 Pollution-Balkans-EN2.pdf (zoinet.org)
83 World Bank Document: "This estimated cost is conservative and does not include the costs associated with hospital stays, cost of illness, and loss of work days"
84 14. A green recovery in the Western Balkans | Multi-dimensional Review of the Western Balkans : From Analysis to Action | OECD iLibrary (oecd-ilibrary.org)
85 Health impacts of air pollution in Europe, 2022 Table 2. — European Environment Agency (europa.eu)
86 Health and Environment Alliance (HEAL). "Air Pollution & Health in Serbia". HEAL website, December, 2014.
87 Amika.org
88 The social impact of air pollution in the Western Balkans – Österreichische Gesellschaft für Europapolitik (oegfe.at)
89 Income-related environmental inequalities associated with air pollution in Europe | European Environment Agency's home page (europa.eu)

to live in more industrial areas and those closer to large transport corridors. They are also more likely to have manual jobs with physical outdoor labor that exposes them to outdoor pollution.[90] Improved air quality will therefore have a significant positive impact on quality of life and life expectancy for less affluent communities and families by improving health, reducing lost days of work and therefore income, and reducing educational absence.

Box 2. A GIP can contribute to alleviating energy poverty and a cleaner environment

Increasingly, it is cheaper to generate power from renewables than old technologies. Between 2009 and 2019 global average costs of producing electricity using coal declined from $111 to $102 per megawatt hour (MWh) in Levelized Cost of Energy (LCOE) or over the lifetime of the power plant. The cost of producing a MWh of electricity using gas – a much cleaner alternative to coal – declined from $83 to $53/MWh. Yet, costs fell even more for renewables – from $135 to $41/MWh for onshore wind and from $359 TO $40/MWh for solar PV. It is now cheaper – on average – to produce power from renewables than it is from old technologies.

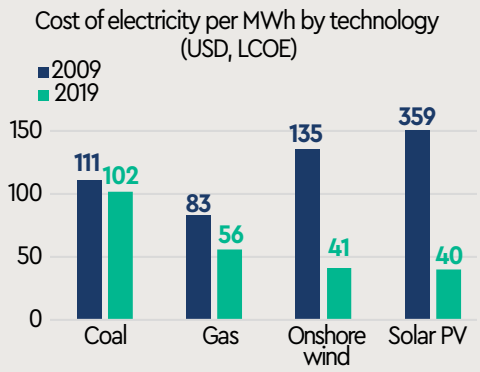
The current system does not provide affordable power to households. Energy poverty is already high in the region, with between 9% (Serbia) and 40% (Kosovo) reporting being unable to keep their homes sufficiently warm in winter. Between 22% (Serbia) and 49% (Kosovo) have arrears in utility payments.

And it forces people to live in polluted environments. The WB have some of the most polluted air in Europe. People lose days of work and school to ill-health as a result of pollution and suffer from higher health costs, helping to embed low income. Around 6 500 people are estimated to die prematurely as a result of air pollution in Serbia and 3 300 do so in BiH. The annual economic cost of air pollution is conservatively estimated by the World Bank to range from 3.6% to 8.2% of GDP of BiH, Kosovo and North Macedonia in 2020. A growing number of studies demonstrate that poorer and more vulnerable groups suffer most from pollution.

Clean energy supply offers the chance to significantly reduce energy poverty in the region. Clean energy will improve air quality, reducing lost days of school and work, and reducing ill-health impacts and costs for families and society. This will benefit most poorer groups. In addition, clean power now rivals fossil fuel for cost and if fossil fuel subsidies were removed, clean power would be clearly cheaper, helping to reduce energy poverty. In addition, the energy transition can provide more and more productive (and therefore better paid) jobs for workers.

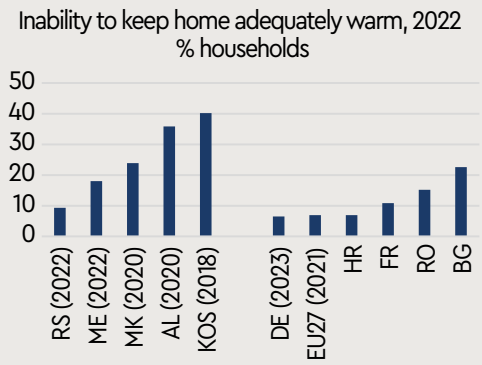
Figure 4.2 Cleaner, cheaper energy that supports poverty reduction

New, cleaner technologies are now cheaper than polluting alternatives...



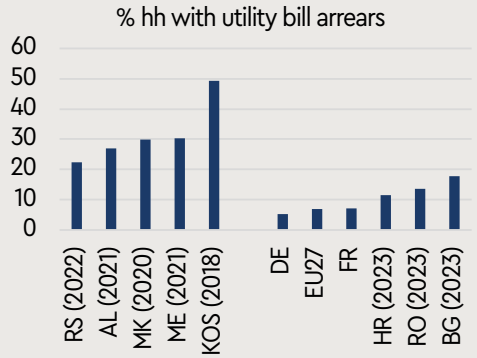
... and help more households pay their bills....

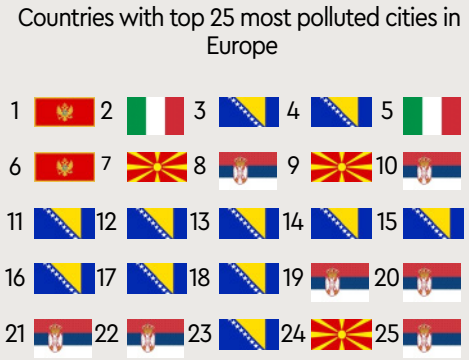
... so the transition can reduce the high energy poverty...



... while providing cleaner cities to live in.

90 Air pollution exposure disparities across US population and income groups | Nature ; Air pollution hurts the poorest most (unep.org)





Sources: https://ourworldindata.org/cheap-renewables-growth ; https://energy-poverty.ec.europa.eu/observing-energy-poverty/national-indicators_en ; https://www.iqair.com/world-most-polluted-cities

4.3.4 Policy options

Green industrial policies should be accompanied by Just Transition policies that support real economic and social change. Below we present policy options for governments to explore. Not all will be applicable in each country and specific implementation modalities will differ by context. Therefore, these should be regarded as a "menu" of policy areas that could be included in a GIP or accompanying efforts to support ensuring a country can take full advantage of economic opportunities offered by the transition.

- **Identify skills gaps and design training programs.** This should be done together with the private sector. Programs could be rolled out especially in transitional areas to ensure job losses are replaced by new jobs. They can also be targeted toward at-risk groups or those who are under-represented in the labor market, such as youth. This upskilling will also have the benefit of attracting investment and boosting productivity and wages.
- **Implement work-based training options.** This could include vocational training subsidies for relevant skills.
- **Ensure relevant skills and knowledge is incorporated into school curricula when appropriate.** This will help to ensure that children gain useful skills and knowledge early on and can benefit from the green transition.
- **Consider social aspects when phasing-out fossil fuels.** For example, more dynamic economic regions could see coal plants closed first, while efforts to regenerate less dynamic regions are made.
- **Improve the quality of the built lived-environment.** This may include providing green spaces and safe bike lanes in urban areas, to encourage investment and improve quality of life. It also improves health and productivity.
- **Consider regional support as part of welfare provision.** Since the transition impacts whole communities, cities or regions it is important to consider how best to support and revitalize regions and not only households.
- **Encourage local generation of renewable power while creating jobs and income.** This may include options such as feed-in tariffs for rooftop solar, regeneration of brownfield sites as social or clean industrial spaces (e.g. for renewable energy or clean manufacturing). This will bring jobs and income to just transition regions.
- **Ensure a supportive environment for innovation and for tech entrepreneurship.** In some cases, this may involve state support – e.g. to find sites for tech hubs. In other cases, it may involve the state resisting

the urge to meddle and allowing young entrepreneurs the opportunity to innovate.

4.4 Considering environmental trade-offs

The transition is not without trade-offs, which need to be identified and managed. Trade-offs in the region as well as elsewhere include those related to pollution from mining and its use of water, the impact of dams for hydropower on wildlife and ecosystems, as well as the impact of windmills on birds.

Many parts of the WB already suffer from excessive pollution, but the transition can be used to clean existing pollution and ensure new technologies do not significantly contribute towards it worsening. For example, water pollution is already a significant environmental issue in BiH. Two of the longest rivers in the country, Bosna and Neretva, are already polluted. The main land degradation drivers identified for BiH included floods, erosion, drought, bare land and unsuccessful afforestation, a sizable percentage of mining contamination on 2.3% of the country's territory, and over-use of pesticides and mineral fertilizers. In Serbia, mining pollution has sometimes been significant. For example, with its large copper mine and smelting, Bor is one of the most polluted places in Serbia. Air quality tests in Bor have found traces of sulphur dioxide, arsenic, iron, nickel and cadmium, which all have a severe impact on air quality and the health. One sample from the Pek river showed levels of copper 17 times higher than those prescribed in the regulations as well as high concentrations of arsenic, copper and lead in river sediment.[91]

It will be important to ensure that the transition does not make matters worse and, where feasible contribute towards clean-up of existing polluted areas to improve environmental sustainability and quality of life. This means ensuring practical, clear and simple standards that are well enforced and practical.

4.5 Financing the transition

This section considers potential sources of financing for the transition; it does not intend to be exhaustive but, rather, point to the types of options available. It is important to note that making funds available does not automatically result in implementation of relevant policies or projects. Several factors are important, and this section supports only the first:

- Knowledge of availability of financing by relevant actors
- Knowledge of fund application processes and needs by relevant actors
- Ability to identify relevant projects, form teams and implement projects

91 RERI, 2021

4.5.1 Potential EU financing

The table below presents a (non-exhaustive) list of potential EU financing sources for WB countries.

Table 4.1 Potential EU financing sources

Financiers	Title	Themes	Coverage	Notes	Links
EU	Instrument for Pre-accession Assistance (IPA) III	IPA III will support beneficiaries in adopting and implementing the political, institutional, legal, administrative, social and economic reforms required to comply with EU values and to progressively align with EU rules, standards, policies and practices, with a view to future EU membership, thereby contributing to mutual stability, security, peace and prosperity.	All EU accession countries	€14.8 bn during 2021-27	https://commission.europa.eu/strategy-and-policy/eu-budget/performance-and-reporting/programme-performance-statements/instrument-pre-accession-assistance-ipa-iii-performance_en
EU (+multiple multilateral and bilateral contributors)	Western Balkans Investment Framework	The Economic and Investment Plan for the Western Balkans invests €9 billion in six priority areas: Sustainable transport, Clean energy, Environment and climate, Digital future, Private sector and Human capital.	6 WB countries	€9 bn from IPA III, €20 bn leveraged investments through Western Balkans Guarantee Facility	https://www.wbif.eu/
EU	ConnecTA	(TA under IPF III) Technical assistance project with the overall objective to assist in the development and completion of the Core transport and energy networks in the Western Balkans region and to support the Digital Agenda for the Western Balkans	6 WB countries		https://www.wbif.eu/news-details/new-connecta-website-online
EU	Western Balkans Enterprise Development & Innovation Facility (WB EDIF)	(Part of IPF III) Aims at improving access to finance for small and medium-sized enterprises (SMEs) in the Western Balkans. By supporting SMEs and the infrastructure surrounding them, WB EDIF contributes to the overall growth and development of the Western Balkans economies themselves.	6 WB countries		http://www.wbedif.eu/

Financiers	Title	Themes	Coverage	Notes	Links
EU	IPARD III	Support for rural development programs, including agri-food sectors.	Albania, Montenegro, North Macedonia, Serbia	€990 mil during 2021-27 (including Turkey)	https://agriculture.ec.europa.eu/international/international-cooperation/enlargement/pre-accession-assistance/overview_en
EU	EU Territorial Cooperation Programmes (INTERREG)	"Interreg Europe is an interregional cooperation program, co-funded by the European Union. The European Union strives to reduce disparities in the levels of development, growth and quality of life in and across Europe's regions. Our program contributes to this objective and runs from 2021 to 2027."	Albania, BiH, Montenegro, North Macedonia, Serbia	€394 during 2021–27 for a total of 36 countries	https://www.interregeurope.eu/
EU	LIFE	Finances environment and climate action	North Macedonia	€5.4 bn during 2021–27	https://cinea.ec.europa.eu/programmes/life_en
EU	Horizon Europe	Research and innovation funding program	6 WB countries	€95.5 bn during 2021-27 for all participating countries (total of 48 participating and associate countries globally + 117 eligible low and middle income countries)	https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en
EU	Growth Plan for WB	The aim is to bring some of the benefits of membership to the region in advance of accession, boost economic growth and accelerate much needed socio-economic convergence.	6 WB countries	€6 bn	https://neighbourhood-enlargement.ec.europa.eu/news/commission-presents-new-growth-plan-western-balkans-including-eu6-billion-grants-and-loans-2023-11-08_en

Financiers	Title	Themes	Coverage	Notes	Links
EU, EBRD, KfW	Regional Energy Efficiency Program (REEP)	Multi-year regional energy efficiency support program REEP was established in 2012 through WBIF.	6 WB countries	€600 mil combined with WBIF grants	
EU+Others	Green for Growth Fund	The Green for Growth Fund is the first specialized fund to advance energy efficiency and renewable energy in Southeast Europe, including Turkey, as well as in the nearby Neighbourhood region and in the Middle East and North Africa. Initiated by the European Investment Bank and KfW Development Bank, GGF is an innovative public-private partnership established to reduce energy consumption and...	19 different countries incl all 6 in WB	€20 mil EU+€60 mil others=total €80 mil	https://www.ggf.lu/
KfW, EU, DE, CH, AU	European Fund for Southeast Europe	The European Fund for Southeast Europe provides sustainable funding to micro and small enterprises, helping them to grow, generate additional income, and create employment, as well as to low-income families, assisting them in the improvement of their housing conditions. Special focus is also placed on financing for agricultural businesses. EFSE was established in 2005 by German development bank KfW with...	Balkans (incl. HR, RO, BG)+ Caucuses+ Accession countries +Belarus		https://www.efse.lu/
EU, US, Bilaterals	Regional Housing Programme	The Regional Housing Programme is a joint initiative of four countries - Serbia, Bosnia and Herzegovina, Croatia and Montenegro – which aims to provide permanent housing solutions for 27 000 most vulnerable refugee families (about 74 000 people) in the region. These countries were most affected by the conflicts of the 1990s and, on this basis, they have a significant...	SRB, BiH, MNE, HR	€274 since 2012	https://regionalhousingprogramme.org/

Financiers	Title	Themes	Coverage	Notes	Links
EU implemented by UNDP	EU for Green Agenda in Serbia	The project "EU for Green Agenda in Serbia", with the technical and financial support of the European Union and in partnership with the Ministry of Environmental Protection, is implemented by UNDP in cooperation with the Embassy of Sweden and the European Investment Bank (EIB), with additional funding from the Governments of Sweden, Switzerland and Serbia.	Serbia		https://www.undp.org/serbia/projects/eu-green-agenda-serbia

Box 3. Examples of use of EU funds

Example 1: For 2021–2023, the IPA III funding for national programmes amounts to €571 million for Serbia. This includes the dedicated €165 million from the 2023 Energy Support Package. Launched in 2020, the Economic and Investment Plan (EIP) for the Western Balkans aims to mobilize up to €30 billion in cooperation with international financial institutions until 2027. Under the EIP for Serbia, the EU has already mobilized €5.7 billion in investments, out of which €1.1 billion in grants. The EIP flagship projects in public sector for Serbia, endorsed between 2020 and 2023, support sustainable transport, clean energy, environment and climate, digital infrastructure and human capital.

Example 2: Following the adoption of the Energy Support Package for the Western Balkans, in December 2022 Montenegro received €30 million of budget support from the EC to reduce the immediate socio-economic impact of the energy crisis on vulnerable social groups, as well as for the improvement of the regulatory framework and business climate for RES investments. As part of the package, Montenegro's Parliament adopted the National Energy Action Plan in January 2023. The Plan consists of 13 measures, covering a range of targets, including the preparation of a strategic framework (NECP) and implementation of the EC's recommendations on energy included in the Annual Report by January 2024. The adoption of the Energy Support Package incentivized Montenegrin authorities to strengthen the interinstitutional coordination and a multi-stakeholders dialogue. Nevertheless, administrative capacity in this area still needs to be strengthened.

Example 3: To enhance its competitiveness and expand operations, Kosovo's leading water producer, Ujë Rugove, became the first company to receive financial support from the European Bank for Reconstruction and Development (EBRD) and the Enterprise Expansion Fund II Western Balkans (ENEF II, part of the Western Balkans Investment Framework)) for the introduction of green technologies. This support will enable the company to diversify its product range and strengthen its position in both the Kosovan and export markets. The loan will be utilized to acquire a new facility and install high-capacity production lines, facilitating the introduction of new product categories with sustainable packaging. Specifically, Ujë Rugove will implement Clean-In-Place (CIP) technology for system cleaning, use air compressors, reduce the plastic and glass weight per bottle, and incorporate at least 50% recycled polyethylene in the stretch film and labels for its packaging. Additionally, the company will start using recyclable cans for bottling. These initiatives aim to reduce water losses and packaging waste during production, incorporate recycled materials into packaging, and reduce CO_2 emissions. As part of the loan agreement, Ujë Rugove will adopt the environmental, social, and governance (ESG) reporting framework.

This commitment will enhance the company's responsibility and accountability for maintaining high environmental, health, and safety standards. Beyond its production facilities, Ujë Rugove is also spearheading green initiatives. In its commitment to higher environmental, health, and safety standards and long-term industry sustainability, the company, alongside other water and beverage producers in Kosovo, is working on establishing a recycling system for plastic and glass. This project, currently in its inception phase, envisions the creation of an NGO to manage the recycling process. However, the establishment and completion of the relevant legal framework are essential for its success. Despite these advancements, Ujë Rugove faces challenges in finding workers with the necessary industry-specific skills and know-how.

4.5.2 Potential donor/bank financing sources

Bilateral and multilateral financing are often more ad hoc financing availability than the EU programs, which often run during longer than a single EU Multiannual Financial Framework (the latest being 2021–27). Multilaterals often have country engagement papers that last 3–5 years and the emphasis and themes financed can differ within this timeframe, as well as with government priorities. Nonetheless, significant financial – as well as technical – support is often available. In addition, they often provide financing at a significantly cheaper rate than the public sector is able to borrow at. The table below presents a non-exhaustive list of potential options.

Table 4.1 Potential donor financing sources

Financiers	Description
World Bank	Provides budget support (Development Policy Financing) directly to Ministries of Finance (and sometimes sub-nationals). This requires policy reform and countries can often benefit from technical assistance. Project-specific lending (Investment Policy Financing) connected to specific projects. Financial support through specific funds established in a country (e.g. energy efficiency funds) or through commercial banks for specific purposes. The International Finance Corporation (IFC) provides equity investments in specific companies or projects.
European Bank for Reconstruction and Development (EBRD)	Project financing – including for the private sector; equity financing; guarantees. Operate in agribusiness, infrastructure, transport and all forms of climate finance.
European Investment Bank (EIB)	The lending arm of the EU. Almost half of EIB lending now goes to cohesion regions.
Global Environment Facility	Provide lending for environmental purposes, including blended financing in areas such as nature, climate, biodiversity, land degradation, climate technologies, etc. Administered by the World Bank.
Green Climate Fund	Provides financing for the public and private sector with the aim to balance climate adaptation and mitigation projects. Includes financing for climate technologies and new business models and practices. Also provides financing to derisk climate investment.

Financiers	Description
Bilaterals – e.g. KFW (German Development Bank); FCDO (UK) AfD (France)	Specific country programs.
Millenium Challenge Corporation (e.g. Kosovo Compact)	A grant of $202 million, focusing on delivering modern, clean energy solutions to improve the reliability of electricity in Kosovo.

4.5.3 Potential domestic resources

There is ample scope to raise funds domestically to support the transition and elements included in GIPs. Some examples are presented in the table below.

Table 4.1 Potential domestic financing sources

Source	Description
Cut fossil fuel subsidies	An Energy Community Study in December 2020 reported that the region continues to subsidize coal. During 2018–19 subsidies amounted to €88.8 mil in Serbia; €42.9 in BiH; €12.7 mil in Kosovo; €3.8 in North Macedonia and €1.1 mil in Montenegro.[92] These resources could be better used.
Emissions Trading Scheme	Implementing the ETS would raise significant additional resources to finance GIP priorities (in addition to eliminating CBAM-related concerns). In compliance with the EU ETS, least 50% of the revenues generated from the auctioning of allowances should be used for financing policies and measures such as: • develop renewable energies • improve energy efficiency, district heating systems and insulation, or to provide financial support in order to address social aspects in lower- and middle-income households • encourage a shift to low-emission and public forms of transportation • promote skill formation and reallocation of labor in order to contribute to the fairness of the effort to reduce emission across the economy and the society, in particular in regions most affected by the transition, in close coordination with the social partners
Polluter Pays Principle	The EU polluter pays principle indicates that the entity that initially polluted should pay for the clean-up. For example, the clean-up of a former coal site should be paid by those that now own the coal company. One estimate suggests that this could generate more than €25 bn during 2022–50 in Serbia alone.[93] However, changes of ownership (e.g. from state to private) means this may be difficult to fully apply.

92 Parliamentary question | Fossil fuel subsidies in the Western Balkans | E-001575/2021 | European Parliament (europa.eu)
93 Low Carbon Development Strategy of the Republic of Serbia

Green/Blue Bonds	Green bonds can be issued by the public sector or private companies and the financing raised should be used for green reforms. They can attract lower interest rates than traditional borrowing. Serbia issued a €1 billion green bond in 2021[94] under its Green Bond Framework and used the resources to finance rail transport and sustainable water management.[95]
Public-Private Partnerships	Mobilizing private funds to finance climate and transition projects will be essential. One way to do this is through Climate-Smart Public-Private Partnerships (PPPs).[96] These could be implemented with technical assistance from multilateral organizations.
Topic specific funds	Examples may include establishing funds for energy efficiency or skills development. These funds may seek contributions from donors or EU projects. They could also be established using resources from ETS or cuts to fossil fuel subsidies.
Carbon removal certificates	With its ample forestry as well as green power potential, the region could benefit from revenue earned through future EU carbon removal certificates,[97] although details are yet to be defined.

94 Serbia issued a Sovereign Green Bond | Green Finance Platform
95 Serbia spends most of green bond proceeds in transport, water, wastewater sectors (balkangreenenergynews.com)
96 Preparing, Procuring and Implementing Climate-Smart PPPs Public Private Partnership (worldbank.org)
97 Certification of permanent carbon removals, carbon farming and carbon storage in products – European Commission (europa.eu)

5. The importance of communication and engagement

5.1 Communication is challenging, even for good policies

Economic and social transitions are a communication challenge. There are both winners and losers, particularly in the short-term. The voyage into the unknown can create unease among citizens and businesses about the risks involved. New and evolving technologies can create confusion. Longstanding identities – such as those in mining towns – can be hard to adapt. In this backdrop it is easy for voices from short-term political interests or those from economic sectors that fail to adapt or seize new opportunities can sow seeds of discontent and confusion.

Take, for example, the case of costly fossil fuel subsidies, which are socially and environmentally harmful. Explicit fossil fuel subsidies – where cash or tax breaks are provided directly to support the production or consumption of fossil fuels – are estimated to have cost governments $700 billion in 2021[98] and at least $1 trillion in 2022.[99] Including implicit subsidies – not charging the full social cost of burning fossil fuels – is estimated to raise total global fossil fuel subsidies to $7 trillion in 2022.[100] That amounts to over 7% of global GDP – more than governments spend on education and two thirds of what they spend on healthcare.

These subsidies not only encourage the burning of fossil fuels by making them cheaper but also overwhelmingly benefit the rich. Wealthier groups consume more fuel, both directly – for example through travel or heating/cooling homes – and indirectly, by consuming more goods that use fossil fuels in the fabrication and transport process. Therefore, these subsidies are overwhelmingly regressive in nature. Indeed, globally an estimated 45% of the benefits go to the richest quintile, while just 7% go to the poorest quintile.[101] In addition, the poor overwhelmingly suffer from the air pollution resulting from the over-use of subsidized fossil fuel burning.[102] Transitioning away from fossil fuel subsidies and explicitly pricing carbon emissions to incorporate the negative social costs into the price would reduce environmental damage, encourage investment in renewables, reduce air pollution, and unlock budgetary resources that can be used more productively.[103] ***This pro-poor transition[104] is a "no-brainer"***.

Yet, many such reforms are later watered down and sometimes reversed. A recent study of fuel subsidy reforms found that within a year 62% had been weakened or reversed and after 5 years, 87% were.[105] Examples of political pressure to reverse such policies are global including in Ecuador, Iran, Nigeria, and France's *gilets jaunes*.

98 Selection of 51 major countries only: Cross-national analysis of attitudes towards fossil fuel subsidy removal | Nature Climate Change
99 Fossil Fuels Consumption Subsidies 2022 – Analysis – IEA
100 Fossil Fuel Subsidies Surged to Record $7 Trillion (imf.org)
101 The Unequal Benefits of Fuel Subsidies Revisited: Evidence for Developing Countries; by David Coady, Valentina Flamini, and Louis Sears; IMF Working Paper WP/15/250; November 2015
102 Global air pollution exposure and poverty | Nature Communications / Air pollution kills – Evidence from a global analysis of exposure and poverty (worldbank.org)
103 Fossil Fuel Subsidy Reform and the Just Transition: Integrating approaches for complementary outcomes | International Institute for Sustainable Development (iisd.org)
104 World Bank: Transforming Trillions: Repurposing Subsidies for Climate Action and Economic Health
105 Political leadership has limited impact on fossil fuel taxes and subsidies – PMC (nih.gov)

Insufficient communication and engagement resulted in opposition even from those who stood to gain most. Protests against reforms often include those from poorer groups who stand to benefit most from reduced fuel subsidies through improved social benefits, better public services such as health and education, reduced taxes, and reduced pollution. In addition, the job-creation power of greener sectors provides more opportunities for better and better-paying jobs. Polluted regions can – though good management – benefit from building on their industrial past to thrive with cleaner industries and better jobs. Protests can be reinforced by loud voices that may benefit from the status quo.

Countering opposition to the transition requires both good policy and good communication. Among others, good policy needs to include ensuring the benefits of the transition are shared broadly among different households and regions. As discussed above, this can include:

- Ensuring the transition includes better public services such as health, education and infrastructure for a broad range of people and regions.
- Improving the power supply for all.
- Improving the social welfare system.
- Reducing pollution in all neighborhoods.
- Ensuring all groups of workers can benefit from new training and opportunities for better and better-paid jobs.

Standard engagement protocols can help. It is necessary to conduct consultations between the local community and the investors, with the active participation and support of the state administration, in the earliest phase of project implementation. In particular, this engagement is important before decisions are made whose implementation and effects may have an impact on the environment, human health and sustainable development of the local community. Such consultations could be ensured through standard engagement protocols (perhaps as part of an engagement and communication strategy) to follow between business entities and local communities, including CSOs. The protocol should consider themes such as investment, production and business activities for which the implementation of the environmental impact assessment procedure is prescribed.

Box 4. Communication challenges in the region

Jadar lithium mine in Serbia

Jadar has the potential to supply around 10% of global lithium demand, thereby making a significant contribution to reducing global emissions and pollution. It is estimated that over the expected 40-year life of the mine, it will produce 2.3m tonnes of battery-grade lithium carbonate, a mineral critical for large-scale batteries for electric vehicles and storing renewable energy, and 160,000 tonnes of boric acid annually, necessary for the renewable energy equipment such as solar panels and wind turbines.

The mine would have significant economic benefits for the country and the local community. It would contribute some $1.5 billion per year to the national economy, directly employ 1170 workers and support and additional 3950 jobs in related sectors. The expected tax revenues for the state and local government are estimated at $133 million per year. It also offered future economy opportunities such as processing, encouraging investment in battery and EV manufacturing to be close to the source of lithium.

The mining developer made significant efforts to inform local communities about the project. Two info centers were opened by Rio Tinto (the developer of the project) in Loznica in 2016 and in Brezjak in 2019, aiming to provide the local community with up-to-date information about the Jadar Project.

Engagement with communities has also included public presentations, open day events focusing on particular aspects of the project, consultations and regular community meetings, both in person and online. In 2019, the Local Road Committee was established for evaluating the condition of local roads used by the Rio Tinto company. Members of the Committee are representatives of the company and the local community. The Committee has and will continue to provide technical recommendations for repairs to maintain the quality and safety of local roads, providing benefits for the local community.

Despite efforts, there was strong position that residents that will be affected by the project, as initial communication efforts waned over time. Residents from the village of Loznica and the municipality of Krupanj feel they were not properly informed about the project by the government or Rio Tinto. They learned from secondary sources that a larger project was being prepared than it was initially presented. Additional villages in Krupanj learned they would also be affected but reported that they were not informed about or invited to consultation meetings regarding strategic plan for the development of a lithium mine and mineral processing plant in the Jadar River valley nor they were invited to participate in a detailed feasibility assessment process. According to a number of citizens, Rio Tinto has told owners of the land if they do not sell the land at the offered price, they will be expropriated. Moreover, Rio Tinto and the government of Serbia did not conduct any socioeconomic studies about development scenarios without the mine, nor studies about how much potential agricultural production will be lost and the risks of toxins entering the water, food, air and soil of this region. The lack of information appears to have boosted opposition and fears around the project leading to large protests.

The protests led to the cancellation of the project despite its benefits. The government was unable to present to the public concrete assurances that the project would lead to the creation of more than a small number of relatively low-skill mining jobs. As a result, there was a widespread sentiment among the Serbian public that the main beneficiaries of the Jadar Project would be European carmakers and consumers, who would benefit from Serbia's cheaper labor costs at the expense of the Serbian environment. As result the Jadar project was formally cancelled, after the Government of Serbia passed the Decree on the Termination of the Spatial Plan of the Special Purpose Area for this project. Hence, all administrative acts for the Rio Tinto project were annulled – all permits, resolutions and decisions, including Decision on determining the scope and content of the Environmental Impact Assessment study. In spite of that, the Ministry of Mining and Energy has not stopped the procedure for issuing the permit for lithium exploitation and extended the deadline for the company to complete the documentation 11 times. The Rio Tinto company has been trying, for more than two years, to obtain approval for an exploitation field, a document that allows it to start mining lithium in Serbia.

The Jadar project was cancelled because it lost its "societal approval license" rather than documented risks. Although the Jadar project was cancelled over concerns regarding the potential of environmental damage, it is important to note that Rio Tinto had complied with all applicable local laws. In addition, the project was cancelled prior to the completion of a final environmental impact assessment, as mandated by Serbian law, meaning the public position on the potential environmental damage was not supported by a comprehensive scientific assessment. The failure of the Jadar project is therefore an important example of a mining project being cancelled owing to reaching a critical level of opposition from the public, also referred to as a loss of the "societal license" to operate that may not have existed in the first place.

5.2 An engagement and communication strategy

An engagement and communication strategy should, ideally, accompany national green industrial policies – or, indeed, any other green transition plans. While there may be no "one size fits all", several broad areas could be considered to help communicate the benefits, understand what measures should be taken to mitigate negative impacts and communicate these, pro-actively identify and combat mis-information.

The engagement and communication strategy should be adapted to the context and highly practical. That is, it should be a document that can be referred to in order to understand next steps. In addition, the document should be reviewed and updated from time to time. Finally, the process implemented should be considered a "living process", providing regular feedback to those who work in communication on how to adapt communication as the environment evolves, and to policy-makers and implementers to indicate when adjustments in policy may be required.

While no correct outline exists, elements or chapters to include in the engagement and communication strategy may broadly follow the below outline:

1. **Introduction:**
- Brief overview of the green industrial transition policies.
- Importance of inclusive communication and engagement in addressing concerns and maximizing benefits.
2. **Audience analysis:**
- Identification of key stakeholders impacted by the green industrial transition (households, firms, regions).
- Potential concerns, priorities, and needs of each stakeholder group.
- Assessment of existing perceptions and knowledge about the transition policies.
3. **Objectives of engagement and communication strategy:**
- Listening: Learning concerns and risks faced by stakeholders; learning about potential opportunities from the transition; understanding what policies could mitigate risks and promote opportunities.
- Communicating: Increase awareness of the benefits of the transition policies; address concerns and mitigate negative impacts through effective communication and policy development; facilitate dialogue and collaboration between stakeholders and policymakers.
4. **Key messages to be communicated:**
- Emphasize the benefits of the green industrial transition, such as job creation, economic growth, and environmental sustainability.
- Communicate specific policy measures aimed at mitigating negative impacts on households, firms, and regions.
- Highlight the importance of listening to and addressing concerns raised by stakeholders.
5. **Communication channels:**
- Community meetings, focus groups, interviews and town halls.
- Local authorities.
- Social media platforms for broader outreach and engagement.
- Workshops and webinars for detailed information sharing.
- Dedicated websites or portals for resources and updates.
- Surveys.
- Establish advisory panels or stakeholder forums to facilitate ongoing dialogue.
6. **Content Creation:**
- Develop informative and engaging content tailored to different audience segments.
- Use storytelling and case studies to illustrate the benefits and success stories of the green industrial transition.
- Provide clear explanations of policy measures and their intended impacts, as well as clear explanations of measures and obligations of institutions/

governments to ensure transparent processes and procedures.

7. **Practical implementation plan:**
- Define a timeline for communication and engagement activities.
- Assign responsibilities to team members for content creation, event coordination, and stakeholder outreach.
- Allocate resources for materials, personnel, and technology.

8. **Monitoring and Evaluation:**
- Track engagement metrics such as participation rates, feedback received.
- Regularly assess the effectiveness of communication efforts in addressing concerns and promoting understanding.
- Adjust strategies based on feedback and evaluation results.
- Inform policy-makers "live" of potential need to adjust policies.

9. **Risk Management:**
- Identify potential misconceptions or resistance to the transition policies and develop strategies to address them proactively.
- Prepare for unforeseen challenges by establishing crisis communication protocols.
- Maintain transparency and honesty in communication to build trust with stakeholders.

10. **Adaptation and Continuous Improvement:**
- Stay responsive to evolving stakeholder needs and feedback.
- Periodically review and update communication strategies to reflect changing circumstances and emerging opportunities.
- Foster a culture of continuous learning and improvement within the communication team.

An example of a good engagement and communication process can be found in the implementation of the British Columbia carbon tax.[106] This transformative climate policy had the potential to attract significant opposition; it increased fuel costs for companies and households, including poorer families. It taxed an historically important sector for the province, including for jobs and exports. In addition, fuel is a major input for many businesses, increasing costs and hitting competitivity. ***Yet, the policy gained political and public acceptance. Why?***

Policy design:

- Tax was revenue neutral – revenues were "returned" through other tax cuts and welfare payments, moderating impact on those that were hit and ensuring benefits were shared.
- Introduced steadily but very predictably – allowed time for firms and households to adjust.
- Predictable but responsive – tax increased over time in predictable way but adjusted with a "pause" to allow businesses/households a chance to catch up.
- Simplicity – policy did not add administrative burden for the vast majority of households or firms (as the tax was designed to be paid "upstream" and through existing tax mechanisms).

Communication

- Steadfast political commitment – clear communication from the regional authorities.

106 Scaling up ambition: Lessons from British Columbia's carbon tax | NDC Partnership

- Clear communication of benefits – policy design (as above) but also other benefits of the policy, such as opportunity to become a clean tech center.
- Stakeholder engagement – households, businesses, NGOs – paid attention to concerns and adapted policy and communication to address them.
- Transparent redistribution of revenues – it was clear how the benefits of the policy were shared.
- Ongoing communication – allowed communication and policy changes to be made as the context and concerns changed.

Luck/use favorable moment to introduce reform

- Recent weather shocks had raised awareness of climate risks.

Box 5. Communication successes in the region

The Tirana River Rehabilitation Project (2013-ongoing)

The Tirana River Rehabilitation Project stands out as a successful example of effective communication and community engagement. Aimed at revitalizing the Tirana River area, which had suffered from neglect and pollution, the project's leaders prioritized transparent and frequent communication with the citizens of Tirana. Through public consultations, workshops, and regular updates via various media, the municipality kept the public informed and involved.

The success of this approach was evident in the community's positive reception and active participation in the project, which not only aimed to clean and protect the river but also to create recreational spaces and improve urban living conditions. The project's communication strategy effectively conveyed the long-term benefits of the rehabilitation, generating public support and enthusiasm that contributed to its ongoing success.

6. Conclusions and summary of policy options

This framework for green industrial policies has identified challenges faced by Western Balkan countries that green industrial policies can contribute to addressing. While each country has a different starting point and faces different needs, the countries have many similar challenges and can adapt solutions to their individual context. More details are included in each chapter, and summaries provided below. The key commonalities include the need to:

Get the price right. Without removing fossil fuel subsidies and implementing carbon pricing, all other reforms will be fighting against the tide. The right price means more resources to invest in a greener environment and a fairer society. Failure to get the price right means a lack of access to the European market and job losses. The first step in this process is clear legally prescribed climate neutrality commitment. In addition, under an emissions trading scheme it is important that there is sufficient liquidity. Integration into the EU ETS would provide this; national schemes would not yield liquid markets.

Leave no one and no region behind. The transition provides an opportunity to build a fairer society by providing opportunities for better paid and more productive jobs for many groups. It also means finding ways to support regions during the transition away from old, polluting industries and towards new opportunities. Ongoing training and reskilling is essential for this. Access to cheaper ways to keep homes warm, including increase of energy efficiency of buildings, will help to tackle both energy poverty reduction and job creation. New job and entrepreneurship opportunities will help empower citizens – including youth – and can stimulate growth in regions that have, until now, been left behind.

Clean the environment. The region suffers from some of Europe's worst air quality, and poorer people are hit hardest by it. A cleaner environment will improve quality of life – and length of life – for many, especially poorer groups. It will help attract investors who want to live in pleasant spaces and greener cities are more productive.

Work together and with EU. All countries are in the process of EU accession and must therefore adhere to EU acquis. Many of these align with the need to transition away from fossil fuels and towards renewables, to protect poorer groups, to clean the environment, to reskill and provide job opportunities for all. Working together is also essential to attract investment to the region and to take full advantage of intermittent renewable power. Multiple practical ways to work together for mutual benefit of each country in this report – these should be considered as a starting point.

Seize the opportunities. And the financing. Industrial revolutions don't happen every day. This transition offers opportunities to reshare economies and societies by making them greener and fairer as well as more productive. Moreover, significant funds are available to help the region transition. Efforts to use these funds productively should be made. In addition, investments and subsidizing of activities that are not aligned with the greening of industry shall be avoided ensuring these resources as investment in green industry.

Communicate and engage. Always. It can be difficult to communicate even good well-designed policies. All GIPs should be accompanied with communication and engagement strategies, plans or protocols, and these should be taken seriously and implemented to ensure views, fears, impacts on citizens, firms and regions are considered and addressed.

7. Annex I – International experience

7.1 Summary of case studies of relevance to the Western Balkans

Box 6. Brazil: Key role of national development banking

Brazil, where over 1.2 million renewable energy jobs have been created, offers an important experience of green industrial policy, and shows the critical role that national development banks can play in the process of green industrialization. The Brazilian Development Bank (BNDES) has played a crucial role in financing the wind turbine manufacturing industry, providing loans and credit lines (at rates well below market levels) to incentivize value addition around renewable energy projects, especially for local wind turbine manufacturing, while imposing local content requirements (Hochstetler & Keck, 2018). The various local content requirements slowed the actual introduction of wind power until after 2009 but eventually contributed to a substantial national industry. Brazil's experience also shows the considerable path dependence that exist between manufacturing capabilities and low-carbon technologies, as Brazil's pre-existing aerospace sector helped to develop a wind turbine industry (Hochstetler 2020).

Brazil's R&D efforts in the biofuels sector are also worth noting, as the country also established itself as a global leader in biofuel production, notably thanks to proactive R&D support and coordinated demand-side policies (Szklo et al., 2005). The first Brazilian patent on biodiesel was obtained in 1983, shortly after the launch of the National Renewable Energy Alternatives from Vegetable Sources Program and the resulting R&D with pure esters and blends with 30% ester from soybean oil, due to the greater availability of this feedstock. In 2006, Petrobras Biocombustível, a subsidiary of Petrobras, Brazil's state-owned oil company, was created to support the production and R&D around biofuels. To promote technological development around biofuels, Petrobras Biocombustível led several R&D initiatives which mobilized 19 public agricultural research centers. Those initiatives started with the launch of pilot plants for the production of biodiesels in 2006 and included the establishment of an oilseeds research network in 2010, which provides funding and technical support to public agricultural research centers.

Nowadays, biofuels represent about 25% of the Brazilian road transport fuel demand. The development of biofuels in Brazil has also led to considerable socio-economic benefits, such as jobs creation. For instance, ethanol production generates approximately 32 times more jobs per unit of energy produced compared to the petroleum sector. Despite increasing mechanization, the sector also generated over 500,000 direct jobs, most of which are formal jobs. Indeed, while around 40% of Brazilian agricultural workers are formally employed, in sugarcane production, 81.4% of employees are formally hired, and have access to employment benefits.

Biofuels are part of the EU's greening strategy but, to avoid deforestation risks and the risks of displacement of food crops for biofuel crops, the term "sustainable biofuels" has been created. To be considered sustainable, biofuels must contribute neither to negative environmental impacts nor displace food crops.

Box 7. Costa Rica: The "plug-and-play strategy"

By leveraging its renewable energy capacity, Costa Rica has successfully attracted investment in green manufacturing activities and technology services, creating a model for sustainable economic development that other countries can easily emulate. Costa Rica generates over 98% of its electricity from renewable sources, including hydropower, wind, geothermal, and solar energy. This composition of the country's electricity matrix has not only reduced the country's carbon footprint but also made it an attractive destination for green manufacturing, as companies looking to minimize their environmental impact are drawn to Costa Rica's reliable and sustainable energy infrastructure. This strategy has notably Costa Rica position itself as a hub for environmentally responsible production

Costa Rica has also pursued other green economy strategies. In 2020, the government of Costa Rica has launched a "bioeconomy strategy" that seeks to address the challenge of COVID-19 via promotion of a green knowledge economy. It also proposes the application of the principles of a circular bioeconomy and the decarbonization of production and consumption processes. This strategy provides a framework for the orientation of investments, the development of incentives, and synergies between production and the environment. The strategy, which aims to position Costa Rica as a knowledge-based economy with sustainable production of high added value and the fair and equitable use of its biodiversity, builds on the country's previous commitments to decarbonization.

However, Costa Rica's experience also shows that economic transformations can at times exacerbate inequalities, as the country's export sophistication led to an increase in the wage premium for skilled workers in the industrial clusters located in the center of the country, whereas unskilled workers and those living in coastal areas have not been able to benefit as much from the emerging high-tech manufacturing sectors, and therefore remain dependent on commodities and tourism as means of livelihoods. Such an experience forms the basis of valuable policy lessons for countries aiming to promote socially inclusive green industrialization, especially regarding the need to recognize that green industrial opportunities are not neutral regarding domestic winners and losers, and the need to coordinate industrial policies with social, skills development and labor market policies to tackle skills gaps and mismatches[107] that hinder marginalized groups.

Box 8. China's green industrial policy and peculiar institutional configurations

China features one of the most remarkable cases of successful green industrial policy, enabling it to become the world's largest exporter of low-carbon technologies, which include solar cells, electric batteries, and wind energy equipment. Green industrial policy in China has comprised a comprehensive set of tools (including R&D support, the establishment of national-level innovation centers focused on clean technologies and local content requirements) with effective coordination of demand-side and supply-side policies (Lema and Ruby 2006). Indeed, China only represents 17% of the global population but will be responsible for 60% of new renewable capacity expected to become operational globally by 2028 (IEA, 2024). The country's political has strategically prioritized moving away from labor-intensive, resource-based, and energy-intensive industries to circumvent the middle-income trap. It is in that context that green industrialization has been promoted and integrated in the nation's industrial and energy policy strategy since the 2000s, including through the government's five-year plans.

107 Skills mismatches can lead to considerable wage penalties, and especially for overqualification that eventually affect both job and life satisfaction. People that are unable to find a job that corresponds to their skill level are not employed at their full productivity potential (see ILO 2020).

China's approach to green industrial policy offers valuable insights into the importance of balancing centralized long-term vision with localized short-term implementation. Most explanations of why China has been able to outcompete others in green industries emphasize its distinctive state-led model, involving active intervention by the central government regulators to create and protect market (Shen and Xie, 2017). However, other analytical works reflect a more nuanced reality in the ground and a mixture of authoritarian and liberal features, with elements of decentralization and space for local governments to act as representatives of local interests, rather than as mere agents of the central government (see Li, 2010, Lieberthal, 1992). The failure of the central government to control local governments and local enterprises in several instances also allows a high degree of local industrial and energy policy space and flexibility despite the overt authoritarian rule (Lo, 2015).

Several lessons can be drawn from China's experience, though they may not be easily replicated in other institutional and political context. The key takeaway from China's experience is the balance between the central government's provision of long-term policy direction ('where to go'), and the flexibility of local governments to design policies to deliver identified objectives ('how to get there'). In some ways, China's approach bears some resemblance to policymaking in federal systems (such as Malaysia) but also the European Union, where a supranational body legislates on long-term targets while member states decide on the implementation strategies. Such a balance can be crucial in aligning immediate actions with the much-needed long-term vision in green industrial policy.

7.2 European green industrial plan and accompanying reforms

1. **Context and aim**

As EU candidate countries and Energy Community members, Western Balkan (WB) countries will need to align policies with European industrial, greening and social policies. This appendix therefore explains in some detail the green deal industrial plan and accompanying reforms. This includes the challenges that each element of these policies aims to address and how they are addressed. While the scale and the available resources may differ, every challenge faced in the EU is also relevant for WB countries to some extent.

The **aims of this report** are to:

- Provide an overview of the EU Green Industrial Plan and related efforts, for those who need a global picture of policy and actions in this area, including national experts.
- Provide a significant number of resources through links and references for those who need to explore specific areas in more detail. These are mainly to official sources but also news sources, press releases and studies or reports when relevant.
- Serve as a basis for the concise section on the EU GIP provided above in the Western Balkan GIP report.

Box 9. What is industrial policy and why is this different?

What is industrial policy? Economists tend to think of industrial policy as policies that select particular industries because those sectors could lead to future economic growth and employment. For the IMF, "industrial policy refers to government efforts to shape the economy by targeting specific industries, firms, or economic activities."[108]

For the EU, "The EU's industrial policy aims to strengthen the competitiveness of EU industry and to promote a more sustainable, resilient and digitalized economy that creates jobs."[109]

Theoretical underpinnings for industrial policy. Industrial policy can be justified by the observation that countries can be "stuck" in a disadvantageous equilibrium – producing products low down the value chain with little value-added resulting is low profit and low wages. The economy is unable to jump to higher value-added sectors or industries because of market failures such as:

- Economies of scale combined with small domestic market;
- High entry costs combined lack of financing;
- Poor infrastructure or skills pushing up costs

Using industrial policy governments can provide boosts that help overcome these market failures and allow an economy to produce higher value-added goods.

How can it be implemented? Industrial policy can be implemented by providing subsidies or tax breaks to a particular sector, or introducing trade barriers to give "home firms" preferential access to their home market. It can also be implemented in a more subtle way – for example by fast-tracking infrastructure or skills/training that are required by a particular sector or, in some cases, by offering favorable exchange rates for state-owned (or other) companies. Often the aim is to move up the value chain or to develop national champions.

Why are some people skeptical about it? While politicians have had some success in "picking winners", industrial policy is also prone to abuse and failure. Politicians pick winners for political or emotional reasons; domestic industry that is protected from global competition becomes inefficient and lagging global standards; public funds are wasted on expensive job creation, or finance investment that would have occurred without subsidies. They can also create a 'race to the bottom' with countries competing to subsidies their own companies, reducing resources available for other essential public services, and encourage bosses to chase political favor rather than efficiency and innovation.

But this is not your standard industrial policy. If industrial policy is so risky, why use it in this case? Because the highest aim of the industrial policy today is not creating national champions by picking winners or rolling the dice on future potential growth sectors. Rather, it is to meet climate goals and bring along a sometimes-skeptical public to ensure the aims are achievable. This includes changing incentives, increasing knowledge and reducing risks – essentially changing laws and regulations, changing pricing incentives by incorporating negative externalities from emissions into prices, reducing risks from investment in research by (co-)financing it or guaranteeing/ signaling future markets, increasing knowledge about investment opportunities in green sectors or declining regions, or reducing risks of those investments through cheap financing or other instruments, reducing social and economic risks for people and regions impacted. In doing so, it aims to reshape the economy and have beneficial social and environmental (as well as climate) impacts. The GDIP and accompanying efforts aim to put in place the building blocks to achieve this transformation.

108 Industrial Policy and the Growth Strategy Trilemma (imf.org)
109 EU industrial policy – Consilium (europa.eu)

2. Background of EU's green industrial policy

The Paris Agreement is a legally binding international treaty on climate change adopted by 196 parties – including the EU – at the 2015 United Nations Climate Change Conference (COP21).[110] It set long-term climate goals – in particular the parties agreed to "substantially reduce global greenhouse gas emissions to hold global temperature increase to well below 2°C above pre-industrial levels and pursue efforts to limit it to 1.5°C above pre-industrial levels".[111] Under the agreement, each country submitted its own Nationally Determined Contribution (NDC), outlining its own commitments to the world to curtail emissions.[112] For developing and emerging countries the commitments are often (partly) dependent on sufficient financial and technical support. Each country is expected to update its NDC every five years. The EU committed to become a climate neutral continent by 2050.[113]

The European Green Deal (EGD) was adopted by parliament in June 2021.[114] Its headline aim is to make the EU climate neutral by 2050 starting with reducing emissions by 55% by 2030 compared to 1990 levels (known as the "Fit for 55" package).[115] The legislative package and subsequent amendments and plans cover most sectors of the European economy. Some of the most important targets include:

- Improve energy efficiency by 11.7% by 2030 (annual average savings of 1.5% from 2024–30).
- Increase the share of renewable energy in the energy mix to 42.5% by 2030 (doubling the existing share) (REPowerEU[116] plan, presented in May 2022).
- Reduce emissions from cars by 55% by 2030 and zero emissions from new cars and vans by 2035.

The EU is currently "charting a course" to achieve 90% emissions reduction by 2040.[117]

Translating this vision into reality will require significant changes across most industries. Legal and institutional frameworks will need to change to ensure rules and incentives exist to spur the transformation, significant investments are required in new infrastructure, new technologies need to be developed, support instruments for families, regions and businesses that suffer during the transformation need to be developed and implemented, and public and private financing needs to be mobilized and directed toward cleaner technologies. The GDIP and complementary initiatives spell out the changes needed to achieve the vision.

3. Green Deal Industrial Plan (GDIP)

The Green Deal Industrial Plan (GDIP) aims to ensure a supportive environment for increasing manufacture of net-zero technologies and products to meet Green Deal targets. It was unveiled by the European Commission in February 2023.[118] It contains four pillars: a predictable and simplified regulatory environment, faster access to funding, enhancing skills, and open trade for resilient supply chains.

110 The Paris Agreement | UNFCCC
111 The Paris Agreement | United Nations
112 All About the NDCs | United Nations
113 Paris Agreement on climate change – Consilium (europa.eu)
114 The European Climate Law writes into law the goals of the European Green Deal (European Climate Law – European Commission (europa.eu).
115 Delivering the European Green Deal – European Commission (europa.eu)
116 REPowerEU (europa.eu)
117 Recommendations for 2040 targets to reach climate neutrality by 2050 – European Commission (europa.eu)
118 The Green Deal Industrial Plan (europa.eu) . The full text is available at: COM_2023_62_2_EN_ACT_A Green Deal Industrial Plan for the Net-Zero Age.pdf (europa.eu)

Several other initiatives are either complementary to the GDIP or considered to be a part of it. These include the Net-Zero Industry Act (NZIA)[119], the Critical Raw Materials Act[120] and REPowerEU.[121] These are all designed to achieve elements of boosting renewable power generation in the EU, securing access to critical raw materials for the energy transformation and reducing external reliance for power. These initiatives are discussed in relevant sections below.

a. Predictable and simplified regulatory environment

i. Challenges to be addressed

Permitting has stifled development of renewable generation. Developers have pointed to a combination of complex rules, slow procedures, overlapping and unclear responsibilities by different layers of government and understaffed permitting authorities to process applications.[122] The challenges extend across all main types of renewable projects including offshore and onshore wind, solar and hydropower (both new and refurbishments) as well as grid connections. Project lead times for onshore wind farms are 8–10 years in many countries including Belgium, Croatia, Greece, Spain and Sweden. By comparison, construction takes around two years.[123] In a survey conducted in 2020 by Eurelectric[124] – a federation of the European electricity industry – the most common complaints were a "lack of administrative and human resources and expertise of competent authorities" and the "high number of requirements and studies often of a technical nature that add to the delays and costs." Delays on decisions even occur when rules clearly state deadlines – Eurelectric points to rules in one (unnamed) country stipulating decisions be made within two months but that take close to a year.

Permitting challenges increase project costs and risks.[125] Eurelectric member have provided numerous examples of project delays. One pointed to commissioning delays for a hydroelectric plant of 3–4 years, at an estimated cost of €120,000-€150,000 per year. Another described a 7-year delay for an onshore wind project of around 35MW. During this time, the equipment supplier, whose wind technology had been approved went out of business, requiring an application for a new license for a new turbine. This delayed the process for two years at an additional cost of €250,000. Overall, the 7-year delay cost €300,000 in legal fees and €650,000 per year in reduced feed-in-tariff. Even comparatively simple projects such a PV on residential buildings can take time – for example a 2-year process to obtain permits because each apartment in the building needed a separate license, increasing overall costs by around 10%. The CEO of WindEurope points out that the "higher renewable targets [are nice but] it will be academic if we don't tackle permitting".[126]

The EU has four times more wind capacity in permitting than under construction and this is worse than other major economies.[127] Just 19% of the EU's wind pipeline is under construction, compared to 21% in the US, 26% in China and 36% in India.[128] Some countries face particularly large permitting backlogs – for example in Spain, just 2.4 GW of the 24.5 GW pipeline is under construction

119 Net-Zero Industry Act – European Commission (europa.eu)
120 Critical Raw Materials Act – European Commission (europa.eu)
121 REPowerEU (europa.eu)
122 Permitting | WindEurope
123 Faster permitting cannot come quick enough | en:former (en-former.com)
124 eurelectric_statement_res_permitting-2020-030-0594-01-e-h-0C9C81A1.pdf
125 Examples in this paragraph are described in: eurelectric_statement_res_permitting-2020-030-0594-01-e-h-0C9C81A1.pdf
126 Fit-for-55 Package: Higher targets alone will not make for more wind energy | WindEurope
127 Data insight: The permitting problem for EU wind farms (energymonitor.ai)
128 Renewables 2021 – Analysis – IEA

and the remainder undergoing permitting. Significant discrepancies also exist within countries – one Eurelectric member noted that in a single country the "permitting process can last from 2 to 9 years for wind and from 9 months to 2 years for solar"[129] As a result, many potential projects do not go ahead and are canceled before they come to fruition.

ii. How the GDIP addresses

Set European standards on processing speed. The European Commission's REPowerEU plan proposes that renewables are legally presumed to be in the "overriding public interest". This would allow governments to prioritize renewable energy projects on a case-by-case basis. At the same time, the Renewable Energy Directive requires Member States to permit new renewable energy projects within 2 years and repowered ones (refurbishment or expansion of existing facilities)[130] within 1 year (excluding timing for completing Environmental Impact Assessments (EIA) and clearing legal challenges).[131]

Identify "go-to" zones for quick permitting. EU countries should establish "go-to" zones on land, sea or inland waters that are particularly suitable for renewable technologies and present lower environmental risks. Investments in these zones would be subject to simplified environmental impact assessments and projects should be permitted within just a year.[132]

Implement "positive rule of silence". In September 2023, the European Parliament approved efforts to boost renewable deployment including the introduction of a positive silence.[133] Under this rule, investments will be considered to be approved in the absence of feedback or objection from authorities.[134] This places the burden on permitting agencies to provide quick feedback.

Promote regulatory sandboxes. That is, experiment with new approval processes, especially for new technology. In addition, test different approaches and learn from each other's success stories. In an opinion piece on Euractiv, Sandrine-Dixsen-Declève of the Energy Transitions Commission and Co-President of the Club of Rome, identifies several examples of good practice from across Europe, that can be replicated.[135]

- "In Spain, the government is currently trialing "the rule of positive silence" until 2024. The "rule of positive silence" automatically grants permits to solar PV projects under 150 MW and wind farms under 75 MW if no objection has been made against the application within 2 months and if the project meets a specific set of technical criteria. This rule alone could save an average of 2 years out of a 4-year development time for solar projects.
- While in Denmark, the Danish Energy Agency has set up as a one-stop shop for offshore wind permitting. It offers a single comprehensive permit license to developers on behalf of 7 participating authorities, including the Ministry of Environment, Coastal Authority and Maritime Authority. This practical approach has resulted in a more efficient permitting process which helps developers move more quickly." Additionally, in Denmark,

129 eurelectric_statement_res_permitting-2020-030-0594-01-e-h-0C9C81A1.pdf
130 Extensions of up to 3 months can needed in specific circumstances: REPowerEU: Council agrees on accelerated permitting rules for renewables – Consilium (europa.eu)
131 Faster permitting cannot come quick enough | en:former (en-former.com)
132 REPowerEU: Council agrees on accelerated permitting rules for renewables – Consilium (europa.eu)
133 MEPs back plans to boost use of renewable energy | News | European Parliament (europa.eu)
134 EU lawmakers pass bill hiking renewable energy targets – EURACTIV.com
135 It takes longer to permit a wind farm than to build it – EURACTIV.com

"EasyPermits"[136] was developed by WindEurope, AWS and Accenture to trial faster permitting. It was tested in two Danish municipalities and could be adapted for use elsewhere.

Reform of electricity market design. As renewables grow as a share of electricity, it becomes important to: (i) make electricity prices less dependent on volatile fossil fuel prices, partly to win public acceptance; and (ii) to make electricity supply to the grid robust in the face of intermittency. On 14th December, 2023, the European Parliament and European Council reached an agreement in electricity market reform designed to achieve these.[137] Measures include:

- Long-term power purchase agreements (PPAs) for renewable generation facilities – providing stability for both energy suppliers and purchasers.
- Capacity remuneration mechanisms – to ensure sufficient renewable capacity is provided and can be activated during peak periods or when other renewable facilities face low generation ability (e.g. due to unexpectedly low wind or sun).
- Contracts for Difference (CfD) – a price-smoothing mechanism or "two-way contracts" that mean generators are paid when electricity prices fall below a threshold but "pay back" when prices rise above a certain threshold.[138]

b. Access to funding

i. Challenges to be addressed

Significant investment resources are needed for renewable energy projects to achieve climate neutrality by 2050. Globally, clean energy investment needs to triple by 2030 – to over $4 trillion annually to have a chance of limiting global warming to 1.5 °C.[139] The European Commission estimates that EU investments in energy needs to double compared to the past decade to meet Fit-for-55 objectives. This includes €120 billion in renewable power generation and grids. Over €200 billion more is needed to achieve the bloc's aim of cutting reliance on Russian gas.[140]

Some EU countries spend significantly less than others on renewable energy. In total, around 0.6% of the bloc's GDP was allocated toward renewable energy in 2020. However, the European Commission estimates significant differences between public financing for renewable energy by Member States, with some spending around 1% of GDP in this area and ten spending less than 0.3% of GDP.

ii. How the GDIP addresses

Boost national funding. To prevent member states from supporting national firms over those from other countries, the EU places significant controls on state aid to firms. However, in an effort to boost investment in renewables, increased flexibility has been granted for state aid in this area. This includes:[141] (i) eliminating the need for open tenders in less mature technologies; (ii) less stringent application of rules for Commission approval of state aid schemes related to renewable energy; (iii) more flexible aid ceilings (i.e. more state aid is permitted than previously); (iv) allowing aid to be a percentage of overall investment costs (rather than a fixed sum) for some technologies[142]; (v) "more

136 EasyPermits | WindEurope
137 Reform of electricity market design: Council and Parliament reach deal – Consilium (europa.eu)
138 Electricity market reform – Consilium (europa.eu)
139 Net Zero by 2050 – Analysis – IEA
140 Energy Overview 2023 (eib.org)
141 COM_2023_62_2_EN_ACT_A Green Deal Industrial Plan for the Net-Zero Age.pdf (europa.eu)
142 Hydrogen, energy efficiency, electrification.

investment support schemes for production of strategic net-zero technologies, including the possibility of granting higher aid to match the aid received for similar projects by competitors located outside of the EU while ensuring the proportionality of such aid"; (vi) more targeted aid in major new production projects of relevant goods in strategic value chains, particularly when there is a global funding shortfall; and (vii) increasing the thresholds at which member states need to notify the European Commission of state aid.

The first approvals for additional state aid began in January 2024, with the European Commission approving €902 million of state aid to build a new power plant for green batteries in Germany.[143] France also won EU approval for €2.9 billion of tax credits for companies manufacturing solar panels, batteries and heat pumps as well as their components and critical materials.[144]

Boost EU funding. Significant sources of EU funding have been allocated toward renewable energy innovation and investment. Financing comes from a broad range of sources, including:

REPowerEU.[145] Rolled out in 2022, this plan aims to reduce reliance on fossil fuels in general and, in particular, on Russian fossil fuels. The plan increases the EU's 2030 target to 42.5% renewables in the energy mix[146] as a binding target and with an aim of 45% through (i) accelerating solar PV (including rooftop) deployment; (ii) doubling the rate of head-pump roll-out[147]; (iii) increasing energy efficiency savings; (iv) speeding deployment of renewable projects.[148] The bulk of the financing comes from the existing Recovery and Resilience Facility (RRF)[149], which facilitate and encourage investment in sustainable energy.[150]

- Recovery and Resilience Facility (RRF) loans. €225 billion.
- €20 million in grants to Member States to "promote the greening of industry, support EU net-zero industry projects, and to assist energy-intensive industries in the face of high energy prices".[151]
- Brexit Adjustment Reserve. € 5.4 billion.
- Additional (as yet, undetermined) resources from the European Investment Bank (EIB) to support the achievement of the objectives of the RePower EU Plan.

InvestEU.[152] The InvestEU Fund provides €26.2 billion of financing to "back" investment by partners such as the EIB but also private funders in priority areas including battery technology, critical raw material recycling, hydrogen technologies and more. The fund provides guarantees to investors and aims to catalyze €372 billion in investments.

Innovation Fund.[153] €40 billion is available during 2020–30 to support research in highly innovative low-carbon technologies. This includes technologies with

143 Margrethe Vestager on X: "This is a 1st case of matching aid. We approved 902M€ #StateAid for @northvolt to build a new plant of green #batteries inDE . Without it, @northvolt would set the plant in US, where they were offered support under the #IRA Now investments & jobs will be in EU More w/ @BMWK https://t.co/gKzioLEz3i" / X (twitter.com)
144 Daily News 08 / 01 / 2024 (europa.eu)
145 REPowerEU (europa.eu)
146 The previous 2030 target was 40%
147 Target is 10 million heat pumps installed during 2023–27.
148 RePowerEU Plan : Joint European action on renewable energy and energy efficiency – Policies – IEA
149 com-2022-231_en.pdf (europa.eu)
150 Examples include increased co-financing by Member States, use of RRF funds to implement reforms that facilitate renewable energy research and investment. Details of amendments are available at: EUR-Lex – 32021R0241 – EN – EUR-Lex (europa.eu)
151 COM_2023_62_2_EN_ACT_A Green Deal Industrial Plan for the Net-Zero Age.pdf (europa.eu)
152 Home – European Union (europa.eu)
153 Innovation Fund – European Commission (europa.eu)

potential to reduce energy-intensive industries such as steel production, as well as hydrogen and carbon capture, use and storage (CCUS).

Boost private financing. There are no specifics on this in the Grean Deal Industrial Plan (with the exception of areas where the EU can support innovation or provide guarantees such as under InvestEU and the Innovation Fund – see above). However, simplification and de-risking of regulatory frameworks would help. Complex regulations and slow permitting processes add to costs and risks for renewable energy projects, as discussed above. Simplifying and speeding up these processes would reduce financing requirements. It would also attract additional capital into the sector as returns would be higher and risks lower.

c. Enhancing skills

i. Challenges to be addressed and opportunities

The green transition requires new workers and new skills. Employment in the EU renewable energy industry grew from 0.6 million full-time equivalent in 2000 to 1.9 million in 2020.[154] Demand for workers in the sector is set to grow with the green transition. The battery industry alone is estimated to require an additional 800,000 workers by 2025.[155] Demand for skills is outpacing countries' ability to train new workers. The Boston Consulting Group (BCG) estimates a global gap of 1.7 million workers with green skills in 2023.[156] Without significant intervention, this is expected to grow to 7 million by 2030. Overall, they estimate that delays in rolling out renewable energies due to skill and worker constraints could lead to rise in global temperatures of 0.1°C. The shortage of green workers is most significant in solar and wind, but other sectors face shortages too. For example, the roll-out of heat pumps is being constrained in Germany due to lack of skilled technicians. The German Central Association of Plumbing, Heating, and Air Conditioning reported at least 40,000 vacancies in early 2023, and a further 60,000 heat pump installers will need to be trained to meet national installation targets.[157] The OECD[158] finds that workers required for green industries tend to be better educated than their counterparts in fossil fuel sectors. This presents a risk of exacerbating labour market inequalities but also an opportunity to upskill all workers in the sector to provide access to better jobs for workers who are currently less well educated.

The demand for workers also offers an opportunity to provide employment and new skills for workers. Globally, the green transition represents a considerable job creation opportunity. The IEA estimates that 30 million new clean energy jobs will be created by 2030 in a scenario consistent with limiting global warming to 1.5°C. [159] This compares with 13 million job losses in the fossil fuel sector. As noted above, the OECD finds that increased skill levels tend to be required in greener jobs. This is reflected in productivity levels – productivity in the clean energy sector is about 20% higher than the average in the EU.[160] This provides an opportunity to boost training among current employees in fossil fuel sectors, giving them access to better-paid jobs in sustainable energy fields. In Romania, where large-scale shutdowns of coal mines and coal power plants is occurring, an estimated 33 000 jobs will be lost. Without support for clean energy the economy will not naturally replace all of these jobs. Yet, through support for

154 Environmental economy – statistics on employment and growth – Statistics Explained (europa.eu)
155 COM_2023_62_2_EN_ACT_A Green Deal Industrial Plan for the Net-Zero Age.pdf (europa.eu)
156 Will a Green Skills Gap Put Climate Goals at Risk? | BCG
157 Heat pump ramp-up: tackling the installers gap – EURACTIV.com
158 Action on jobs, skills and regional disparities vital for the green transition, says OECD
159 Clean technologies are driving job growth in the energy sector, but skills shortages are an increasing concern – News – IEA
160 https://publications.jrc.ec.europa.eu/repository/bitstream/JRC131001/2022.5375.pdf

green energy deployment and other sectors in impacted regions – including, but not limited to, training, an estimated 100 000 jobs can be created.[161]

ii. How the GDIP addresses

The GDIP builds on existing efforts to address skill shortages. Existing efforts include the European Pact for Skills, which supports 14 large-scale partnerships in European industry. These partnerships help coordinate actions by the private sector, workers, education and training providers, employment services and public authorities to train workers with skills needed for the green transition and the digital economy. There are plans to upskill or retrain 6 million people through these partnerships.[162]

Improving and expanding skills:

- **Bring more youth and females into the renewable sector.** The GDIP highlights the importance of women and youth in retraining and upskilling – the reflects both social priorities and also an opportunity to encourage workers with less labor market attachment to retrain and provide needed skills for the green transition. For example, women represent only one third of the renewables workforce, suggesting an opportunity to bring more talent into the sector.
- **Attract immigrants skilled in STEM.** Science, Technology, Engineering and Mathematics (STEM) skills are key for renewables. The GDIP highlights the need to attract more immigrants with these skills to the EU and retain those who come to study or work.
- **Work with renewable developers to identify and fill skill gaps.** For example, a large-scale skills partnership for onshore renewable wind will identify needed skills and develop a concrete plan to meet those needs. Similarly, a heat pumps skills partnership will target the same for that sector.
- **Net Zero Industry Academies will be rolled out.** These will be modelled on the European Battery Alliance Academy, which plans to train, reskill, and upskills around 800 000 workers by 2025 to meet demand for skills in the battery sector. Net-Zero Industry Academies aims to achieve something similar with a focus on raw materials, hydrogen and solar technologies among others.

Recognition and validation of skills. Facilitating recognition of skills and experience gained in third countries will make it easier for people with relevant skills to migrate to the EU and quickly find employment using those skills.

Financial support for skill development. The GDIP increases the ceiling governments can provide to SMEs for training (from €2 to €3 million) and exploring the potential for companies to consider tax treatment of training as an investment rather than an operating expense. In addition, the European Social Fund + (ESF+) will make €5.8 billion available for green skills training. The Just Transition Mechanism (discussed below) also supports training and worker skill development to the tune of €3 billion (available in regions that could suffer from the transition).

161 Estimations based on modelling carried out by the Frankfurt School of Economics for the Romanian Territorial Just Transition Plans.

162 COM_2023_62_2_EN_ACT_A Green Deal Industrial Plan for the Net-Zero Age.pdf (europa.eu)

d. Resilient supply chains

i. Challenges to be addressed

Clean technologies require sufficient availability of components and critical raw materials but many are not available within the EU. Not only are these often not available within the EU but, in some cases, just one or two suppliers dominate global supply. For example, heavy and light rare earth elements are critical raw materials for wind turbines and fuel cells but 98% percent of these are sourced from China.[163] Semiconductors are a key component for all renewable energy as well as grid infrastructure and more. One company – Taiwan Semiconductor Manufacturing Company (TSMC) – manufactures around 60% of all semi-conductors globally, and 90% of the most advanced semiconductors.[164] TSCM is opening new manufacturing facilities in the USA and Germany, helping to diversity geographical sources. However, all of the most advanced semiconductors are manufactured in Taiwan, where they generate 15% of GDP.[165]

This leaves the green transition vulnerable to geopolitics or supply chain bottlenecks. An inability to securely access key components or raw materials in sufficient quantities would constrain investment in clean technologies in Europe. This pillar therefore seeks to boost EU production of these inputs and to diversity supply globally, including through "near-shoring".

ii. How the GDIP addresses

- The GDIP and related efforts seek increased global trade while developing tools to reinforce a "level playing field" between inputs produced in the EU and those outside of it. Most efforts to tackle these challenges exist independently of the GDIP. These include:
- The **Critical Raw Materials Act** was adopted in December 2023.[166] It sets targets for the shares of critical raw materials (for green technologies) that should be mined and processed within the EU by 2030 (10% and 40%, respectively). It also sets a target of recycling 15% of critical raw materials by 2030, and a target of no more than 65% of EU annual consumption should come from any single third country. The Act reduces administrative burdens for mining and processing by setting maximum permitting times.
- **Trade Defense Instruments (TDI)**[167] to prevent dumping allow the EU to impose specific or ad valorem duties in imports or a variable duty to ensure a minimum cost. The aim is to combat the artificially-low priced imports.
- The **Regulation on Foreign Subsidies** (which entered into force on 12 July 2023)[168] aims to reduce the impact on the EU market and EU firms of subsidies in third countries. This includes preventing subsidized foreign companies gaining an advantage in EU procurement contracts. – In reality subsidies in China and the United States are clearly in mind.
- Establishing a **Coalition of Trade Ministers on Climate**[169] provides a global forum to discuss climate change and trade (established in January 2023).

163 DocsRoom – European Commission (europa.eu)
164 TSMC to make cutting-edge 2-nm chips at new plant in southern Taiwan – Nikkei Asia
165 Taiwan's dominance of the chip industry makes it more important (economist.com)
166 Critical Raw Materials Act – European Commission (europa.eu)
167 Trade defence measures – European Commission (europa.eu)
168 Foreign Subsidies Regulation – European Commission (europa.eu)
169 Coalition of Trade Ministers on Climate (europa.eu)

Although not in the GDIP, new efforts under or connected to the GDIP include:

- The **Net-Zero Industry Act** is an initiative stemming from the GDIP.[170] It aims to increase manufacturing of clean technologies in the EU.[171] It sets a strategic target of 40% of net-zero technologies deployed in the EU should be manufactured in the EU by 2030. The Act reduces administrative burden for net-zero manufacturing projects, speeds permitting procedures, increases availability of CO2 storage sites, boosts investment through establishment of the European Hydrogen Bank[172] (whose first auction for €800 million of subsidies for renewable hydrogen production was launched in November 2023).[173] The NZIA also includes overall Green Deal plans such as regulatory sandboxes and enhancing skills (discussed above).
- Establishing a **Critical Raw Materials Club** – a club that will "develop principles to bring together raw material consumers and resource-rich countries to foster cooperation to allow resources-rich developing countries to move up the value chain".[174] The structure of this club is not yet clear but several commentators suggests that other "user countries" such as the US, Japan and South Korea should be invited to join, while noting it is important it does not become a "buyer cartel"[175]. Others note that a key aim should be to diversify sources of raw materials, an aim clearly in line broader EU aims.
- **Promoting clean technology and a role for EU companies globally**. This will be achieved through development of Clean Tech/Net-zero Industrial Partnerships, and development of export facilitation products such as an EU export credit facility.

4. **Just energy transition**

The Just Transition Mechanism is the EU tool to support EU regions that are most negatively impacted economically or socially by the transition. These are regions that rely on fossil fuel mining, heavy industry or fossil-fuel power generation facilities for economic output or employment. It is not part of the Green Deal Industrial Plan yet it is a critical component of the transition. The Just Transition Mechanism provides support in the following areas:

- Protecting people in just transition territories by: (i) facilitating employment opportunities in new sectors and those in transition; (ii) offering re-skilling opportunities; (iii) improving energy-efficient housing; (iv) investing to fight energy poverty; (v) facilitating access to clean, affordable and secure energy.
- Supporting companies and sectors active in or comprising carbon-intensive industries by: (i) supporting the transition to low-carbon technologies and economic diversification based on climate-resilient investments and jobs; (ii) creating attractive conditions for public and private investors; (iii) providing easier access to loans and financial support; (iv) investing in the creation of new firms, SMEs and start-ups; (v) investing in research and innovation activities.
- Supporting regions with high dependency on fossil fuel and carbon

170 The Net-Zero Industry Act (europa.eu)
171 Technologies are: solar photovoltaic and solar thermal, electrolysers and fuel cells, offshore and onshore wind, sustainable biogas/biomethane, batteries and storage, carbon capture and storage, heat pumps, geothermal, and grid technologies.
172 The EHB was launched at the same time as the NZIP-Commission outlines European Hydrogen Bank to boost renewable hydrogen (europa.eu)
173 Commission launches first European Hydrogen Bank auction (europa.eu)
174 COM_2023_62_2_EN_ACT_A Green Deal Industrial Plan for the Net-Zero Age.pdf (europa.eu)
175 The EU needs a buyers' club for critical minerals. Here's why. – Atlantic Council

intensive industries by: (i) supporting the transition to low-carbon and climate-resilient activities; (ii) creating new jobs in the green economy; (iii) investing in public and sustainable transport; (iv) providing technical assistance; (v) investing in renewable energy sources; (vi) improving digital connectivity; (vii) providing affordable loans to local public authorities; (viii) improving energy infrastructure, district heating and transportation networks.

The Mechanism provides several layers of support:

- Just Transition Fund – a €19.2 billion fund[176] to support EU transition regions. An additional €6.2 billion of other (e.g. national) contributions are also expected.
- €10 billion of European Investment Bank (EIB) loans[177] for projects in just transition territories. This combines with €1.5 billion grants from the EU.
- InvestEU Just Transition scheme. The InvestEU programme[178] provides guarantees with the aim of mobilizing €10–15 billion from private sector investments that are complementary to the just transition.
- Just Transition Platform[179] is designed to be a "singly access point for information about the support for the EU territories most affected by the transition". It includes advice through a "helpdesk", organizes knowledge-sharing activities between regions most impacted, establishes thematic working groups and provides tailored technical assistance for regions.[180]

In practice, accessing support from the Just Transition Mechanism first requires the development of a Territorial Just Transition Plan (TJTP).[181] This plan first sets out why a territory is vulnerable economically or socially from the just transition – for example, indicating direct and indirect job loses, share of regional GDP impacted, or difficulties in accessing alternative power sources. This tends to be based on national plans or commitments, often outlined in National Energy and Climate Plans (NECPs).[182] Next, the plan lays out a vision for a greener future including challenges and opportunities. Finally, the plan discusses projects that can unlock the opportunities to support the transition. These projects could include re-training workers with skills in green (or, at least, non-fossil-fuel) industries; infrastructure; improved quality of life for citizens; improved environment; employment generation; business services; greener use of old industrial sites and other options.

The second stage requires developing projects aligned with the TJTP and applying for financing. The project should meet selection criteria overall and for the regional priorities.[183] JTF financing will fund up to 70% of a project so 30% of costs need to be raised elsewhere. Each country manages access to the finds in a different way through management authorities.[184]

A diverse range of beneficiaries can apply for funds. These include local authorities; public organizations like employment agencies or universities; NGOs; private businesses – particularly SMEs but also those involved in the transition. Foreign companies based in just transition regions can also apply.

176 €10 billion from the European Recovery Instrument; and the remainder from the EU's 2021–27 budget
177 Just transition: EIB to provide up to €10 billion in support of regions most affected by the shift away from fossil fuels
178 Home – European Union (europa.eu)
179 Inforegio – Just Transition Fund (europa.eu)
180 Inforegio – Apply for Just Transition Platform GROUNDWORK – new technical assistance for Just Transition Fund regions! (europa.eu)
181 Inforegio – The territorial just transition plans (europa.eu)
182 National energy and climate plans (europa.eu)
183 Inforegio – Accessing the funds (europa.eu)
184 Inforegio – Managing authorities (europa.eu)

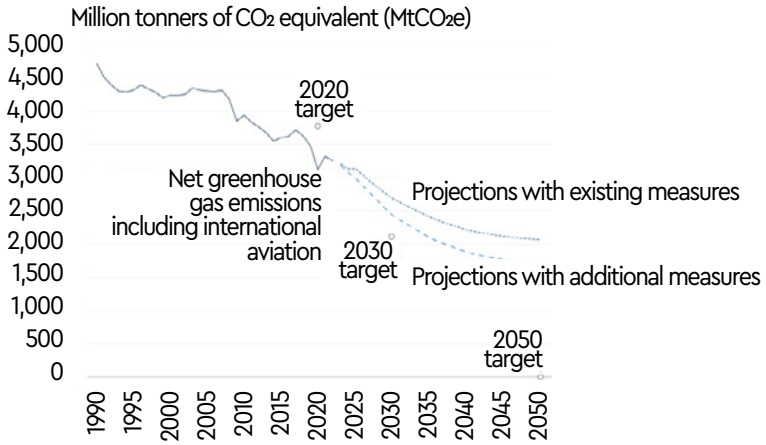
JTF funds are often significant for a transitional region. For example, in Romania – where six counties are considered just transition territories, the funds are worth over 10% of GDP between now and 2027. This is similar to the education budget.

A complementary tool is the Social Climate Fund. This is a €65 billion fund (plus 25% co-finance from Member States) that will help support for citizens considered to be in energy poverty.[185] The fund is funded from sectors (e.g. building and transport) added to the newly expanded EU Emissions Trading System (ETS).[186] The fund can be used by Member States to cover up to 37.5% of their expenses on (i) direct income support during energy price spikes for families and micro-enterprises that are considered vulnerable and (ii) on energy efficiency, decarbonization of buildings and low-emissions transport.[187]

5. How is the transition going so far: lessons learned

It is not possible yet to assess the success of the GDIP. The Plan is too new and not all elements are active, let alone completed. It is clear that emissions have been falling for some time in Europe.

Progress towards achieving climate targets in the EU-27



Source: Total net greenhouse gas emission trends and projections in Europe (europa.eu)

And it is also clear that, through the GDIP, the EU has made existing climate targets more ambitious and laid out certain additional objectives it would like to achieve while greening. These include increased energy independence and improved employment opportunities. It has also identified the main challenges for achieving these objectives including: additional financing requirements; skill upgrades; supply chain security.

However, it is already possible to draw preliminary conclusions on progress toward climate objectives. Indeed, a report in December 2023[188] finds that:

- If all NECPs are fully implemented, greenhouse gas emissions would fall by 51% by 2030 – short of the 55% reduction targeted.
- Renewable energy would contribute around 39% to the energy mix by 2030 – short of the 42.5% target.
- Energy efficiency would improve by 5.8% – short of the 11.7% target.

185 Social Climate Fund – European Commission (europa.eu)
186 EU Emissions Trading System (EU ETS) – European Commission (europa.eu)
187 Fit for 55: a fund to support the most affected citizens and businesses – Consilium (europa.eu)
188 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A796%3AFIN&pk_campaign=preparatory&pk_source=EURLEX&pk_medium=TW&pk_keyword=EUGreenDeal&pk_content=Communication&pk_cid=EURLEX_todaysOJ

- As a result, the EU called for additional efforts from Member States in improving and implementing their NECPs.[189]

Cautionary tales have emerged to reinforce the message that aims need to be clear and scarce public funds spent efficiently. In Germany, €902 million of state aid to Northvolt to build a battery plant is in response to the US inflation reduction act (IRA)[190], creating concerns about a "race to the bottom". Also in Germany, subsidies to chip manufacturers are proving costly – €6.8 billion, later increased to nearly €10 billion – to Intel may contribute toward increasing chip manufacturing in the EU but would come at a cost of €1 million per job (including temporary construction workers).[191] The legality of these subsidies is now being questioned under German law adding uncertainty to the business environment.[192] Germany is also pursuing an investment from TSMC at a cost of €5 billion in subsidies.[193]

189 Commission calls to improve updated NECPs (europa.eu) and Why EU countries are not on track to meet their 2030 climate target (ft.com) and EU warns countries are off track for 2030 climate goal | Reuters

190 Margrethe Vestager on X: "This is a 1st case of matching aid. We approved 902M€ #StateAid for @northvolt to build a new plant of green #batteries in DE. Without it, @northvolt would set the plant in US, where they were offered support under the #IRA Now investments & jobs will be in EU https://t.co/gKzioLEz3i" / X (twitter.com)

191 It is make or break for Intel's giant bet on Germany (economist.com)

192 German court ruling could cost Intel billions of euros in subsidies – state minister | Reuters

193 German region chief defends massive subsidies to lure chip producer – Euractiv

8. Annex II. National reports

8.1 Albania

Introduction and country context

Albania has undergone significant transformation since the fall of communism in the early 1990s. The transition to a market economy was marked by substantial reforms and economic liberalization, shifting the focus from agriculture to services and manufacturing. Initially, agriculture was the dominant sector, but over time, the country diversified its economic base, which now includes a growing industrial sector and a substantial services industry.

During the early years of transition, the Albanian government implemented a series of economic reforms aimed at stabilizing the economy, privatizing state-owned enterprises, and encouraging private sector development. These reforms were essential in moving away from a centrally planned economy to a market-oriented one. Key measures included price liberalization, fiscal austerity, and the establishment of a legal framework for private property and business activities.

The energy sector, particularly hydropower, has remained a cornerstone of the economy throughout this period. Hydropower provides both domestic energy needs and export revenue, contributing significantly to the national economy. The reliance on hydropower has shaped Albania's energy policy and infrastructure development, with numerous hydropower plants constructed along the country's rivers.

The industrial sector, while growing, still faces several challenges, such as limited access to finance, outdated technology, and regulatory hurdles. Despite these obstacles, sectors like textiles, footwear, and machinery manufacturing have shown robust growth. The influx of foreign direct investment, particularly from European countries, has played a crucial role in revitalizing these industries. These investments have brought in capital, technology, and expertise, helping to modernize production processes and improve product quality.

The mining sector has rich deposits of chromium, copper, and nickel and holds significant potential. However, this sector requires substantial investment and modernization to meet environmental and economic goals. Historical issues such as inefficient mining practices and inadequate environmental safeguards have hindered the sector's development. Modernizing the mining industry involves upgrading infrastructure, adopting sustainable extraction methods, and aligning with European Union standards.

The services sector has also expanded rapidly, driven by growth in tourism, banking, and telecommunications. Tourism, in particular, has become a vital part of the economy, leveraging Albania's natural beauty, cultural heritage, and strategic location on the Adriatic and Ionian Seas. The banking sector has undergone significant reforms to increase stability and efficiency, while the telecommunications sector has benefited from liberalization and technological advancements.

Overall, Albania's economic transformation since the 1990s reflects a broad shift from a centrally planned to a market economy, characterized by significant structural changes and economic diversification. The focus on modernizing key sectors and aligning with EU standards continues to shape Albania's economic policies and development strategies.

Strategic framework: motivation & targets

Albania is committed to international environmental agreements and initiatives, playing an active role in global efforts to combat climate change. The country is a signatory to the Paris Agreement, which aims to limit global temperature rise and mitigate the effects of climate change. Under this agreement, Albania has committed to reducing its greenhouse gas emissions by 11.5% by 2030 compared to 2016 levels, with further reductions planned towards 2050. It also plans to increase its use of renewable energy sources as part of its Nationally Determined Contributions (NDCs).

In addition to the Paris Agreement, Albania is also committed to the Green Agenda for the Western Balkans. This regional initiative aims to align the Western Balkans with the European Union's Green Deal, focusing on sustainable development, green energy transition, and environmental protection. The Green Agenda outlines a roadmap for achieving carbon neutrality by 2050, with specific targets for reducing emissions, enhancing energy efficiency, and promoting renewable energy.

Albania's National Energy and Climate Plan (NECP) is a key instrument in meeting its international commitments. The NECP sets out detailed goals for reducing greenhouse gas emissions, increasing the share of renewable energy in the national energy mix, and improving energy efficiency across various sectors. These targets are aligned with the EU's climate objectives and are essential for Albania's aspirations of EU accession. The plan includes specific measures to promote wind and solar energy, improve the efficiency of the transport and industrial sectors, and enhance the sustainability of the energy supply.

Aligning its environmental policies with EU standards is a crucial aspect of Albania's international commitments. This alignment not only supports Albania's EU accession process but also ensures that the country's environmental policies are robust and effective. Compliance with EU environmental directives and regulations involves adopting best practices, improving regulatory frameworks, and enhancing enforcement mechanisms.

Green industrial policy considerations

› Industry in Albania

Albania's economy has traditionally been characterized by its agriculture, textile, and energy sectors. Agriculture remains a vital part of the economy, employing a significant portion of the population and contributing to both domestic food security and export revenues. Key agricultural products include wheat, corn, tobacco, figs, olives, and grapes.

In 2023, the industrial sector contributed approximately 24.2% to Albania's GDP, with manufacturing accounting for about 13% of the total GDP, highlighting the sector's importance as a key driver of economic growth. Recent growth can be attributed to several factors, including favorable labor costs, strategic geographic location, and improvements in infrastructure and the business climate. The textile industry, in particular, has benefited from Albania's skilled labor force and competitive wages, producing garments for export and attracting foreign direct investment. Similarly, the footwear industry operates as subcontractors for well-known European brands, leveraging cost advantages and proximity to European markets. The machinery sector, while smaller, has shown promising growth through investments in technology and machinery, enhancing productivity and quality.

The government has undertaken various initiatives to support industrial growth and attract investment. These include improving the business environment, enhancing infrastructure, and offering incentives for foreign direct investment. Policies aimed at reducing bureaucratic hurdles, providing tax incentives, and ensuring political stability have been pivotal in fostering a conducive environment for industrial development.

Future prospects for Albania's industrial sector look promising, with potential for further growth and diversification. It will be important to consider a balanced approach between basing selecting smart specialization strategies based on existing strengths and capacities, and a smart diversification strategy designed to reduce risks of an overly focus economy. At the regional level, smart diversification could be supported by leveraging regional strengths and inserting Albania into relevant regional supply chains. Options may include, embracing advanced manufacturing technologies, such as automation and digitalization, can enhance productivity and competitiveness. Sustainable practices in manufacturing and a circular economy approach can attract eco-conscious investors and consumers, while improving resource efficiency and sustainability.

Diversification is not only a strategy for energy security but also for attracting foreign direct investment (FDI). France, for instance, has seen a significant increase in FDI due to its clean energy production from nuclear power. In 2020, France's nuclear sector accounted for approximately 70% of its electricity production, attracting billions in FDI and positioning the country as a leader in clean energy innovation.

Albania has the potential to attract similar, if not greater, investments due to its abundant and untapped renewable energy resources, such as hydropower, solar, and wind energy. With its commitment to green energy, Albania could become a prime location for data centers, which are essential for the rapidly growing AI industry. Data centers require vast amounts of electricity, and tech companies are increasingly seeking locations that can provide clean, sustainable energy to power their operations. For example, the global data center market is expected to grow significantly, with the AI industry driving much of this demand. By offering a reliable and green energy supply, Albania can position itself as an attractive destination for these high-tech investments. Such investments would not only boost the economy but also promote sustainable development, leveraging Albania's natural resources to their fullest potential.

Additionally, Albania's strategic location offers logistical advantages for accessing European and Mediterranean markets. Improving logistics and transportation infrastructure, including ports, roads, and railways, will enhance connectivity and reduce the cost of moving goods, making Albanian industries more competitive. Improved logistics would also help Albania play an active role in regional supply chains, connected to European supply chains.

Exports play a crucial role in Albania's economy, accounting for around 30% of GDP in 2023. The country's primary export markets are in the European Union, reflecting strong trade ties and geographic proximity. Key export products include textiles, footwear, crude oil, and minerals, which form the backbone of Albania's export economy.

Textiles and footwear are significant export items, benefiting from Albania's competitive labor costs and proximity to European markets. The textile industry, in particular, has seen robust growth due to foreign investments and

subcontracting opportunities with well-known European brands. Footwear manufacturing, often operating as subcontractors, similarly thrives on these economic advantages.

Minerals, including chromium, copper, and nickel, also play a vital role in Albania's export profile. The country is one of Europe's leading producers of chromium, and its mineral exports contribute significantly to the economy. However, the mining sector faces challenges such as outdated infrastructure and environmental concerns, necessitating modernization to maintain its competitive edge and ensure sustainability. Albania's supply chains for chromium, copper, and nickel are predominantly focused on mining and initial processing stages, with limited refining and manufacturing capabilities: (i) Chromium is significantly mined and partially processed, but advanced refining is scarce, leading to the export of semi-processed chromium; (ii) Copper mining is active, yet the lack of developed refining infrastructure results in exporting semi-processed copper, with minimal local manufacturing. Similarly, nickel deposits are actively mined, with limited processing facilities; recent efforts aim to enhance initial processing, but comprehensive refining and manufacturing are still absent.

The recent opening of the Regional Innovation Center of the European Institute of Innovation and Technology (EIT) for Raw Materials in Albania marks a significant milestone in the advancement of the country's raw materials sector. This center is set to become a hub for innovation, cooperation, and sustainable practices, reinforcing Albania's commitment to the EU Act on critical raw materials. It aims to transform the sector by integrating advanced technologies, fostering research and development, and promoting STEM education tailored to industry needs. The center will also support the modernization of the mining sector, aligning it with international standards and enhancing Albania's role as a strategic partner within the EU's value chain. By participating in this initiative, Albania not only strengthens its own industrial capabilities but also contributes to the broader development and strategic positioning of the Western Balkans region.[194]

The services sector contributes around 60% to Albania's GDP, reflecting a shift from primary sectors like mining to more varied and sustainable economic activities. In particular, Albania's focus on diversifying its economy has led to the growth of other sectors such as tourism and services. The tourism sector, for instance, has become a significant contributor to the national income, especially during the summer months, generating substantial revenue.[195]. Additionally, investments in infrastructure and renewable energy have also shifted focus away from traditional mining activities.

The introduction of the European Union's Carbon Border Adjustment Mechanism (CBAM) is set to have significant implications for Albania's export sectors, particularly those that are carbon-intensive. The CBAM aims to prevent carbon leakage by imposing a carbon price on imports of certain goods from outside the EU, thereby encouraging industries globally to adopt greener practices.

For Albania, complying with the CBAM requirements means implementing policies and measures to reduce the carbon intensity of its exports. This involves aligning with the EU's emissions trading systems and investing in green technologies to lower emissions from industrial processes. The CBAM specifically targets sectors such as steel, cement, fertilizers, aluminum, and electricity, which are integral to Albania's export economy. The export status of key industrial sectors are as follows:[196]

194 S3 Albania: ABOUT S3 – S3 Albania
195 Albania Economy: GDP, Inflation, CPI & Interest Rates – FocusEconomics (focus-economics.com)
196 Albania (ALB) Exports, Imports, and Trade Partners | The Observatory of Economic Complexity (oec.world)

- **Steel**: Albania has limited production capabilities for steel, primarily focusing on domestic use with minimal export activities to the EU. Most steel products are imported for local consumption rather than exported.
- **Cement**: Albania does produce and export cement. In 2022, Albania exported approximately $29 million worth of cement, mainly to neighboring countries such as Montenegro, Italy, Serbia, North Macedonia, and Malta . While some cement is exported to EU countries, Albania is not a major exporter within the EU market.
- **Fertilizers**: The production of fertilizers in Albania is limited, with the country relying heavily on imports for its fertilizer needs. There is minimal production for export, and any raw materials used are typically imported and processed locally for domestic use rather than for export to the EU.
- **Aluminum**: Albania has some aluminum processing capabilities, but the production is limited mainly to semi-finished products. Most of the aluminum is processed further in other countries before reaching the EU market, indicating limited direct export of aluminum products to the EU.
- **Electricity**: Albania primarily generates electricity from hydropower, which is considered clean and renewable. This sector is largely unaffected by the CBAM as it does not have a high carbon footprint. The export of electricity to the EU is minimal and generally occurs through regional interconnections.

Aligning with EU emissions trading systems will not only ensure compliance with CBAM regulations but will also raise much-needed revenues for tackling climate change and addressing social concerns, as well as driving emissions reductions. It can also help to attract investment as investors seek cleaner economies for export-focused industries. It will require establishing a robust framework for carbon pricing and emissions reporting. This framework will need to include mechanisms for monitoring, reporting, and verifying emissions across various sectors. By adopting such measures, Albania can ensure that its exports are competitive in the EU market and compliant with CBAM regulations.

Investing in green technologies is another crucial step for Albania to meet CBAM requirements. This includes upgrading industrial equipment to more energy-efficient models, adopting renewable energy sources for production, and implementing best practices for reducing emissions. These investments not only help in complying with CBAM but also enhance the overall sustainability and competitiveness of Albanian industries.

Additionally, the Albanian government will need to support industries through financial incentives and technical assistance to facilitate the transition to lower-carbon production methods. This could involve subsidies for renewable energy projects, tax incentives for energy-efficient technologies, and grants for research and development in green technologies. However, it will be important to avoid a fragmented approach and aim to align incentives, both within and among WB countries. The region should avoid over-regulation but, rather, can become a "sandbox" to test different regulatory frameworks, including those from outside of the EU. Several options to consider include:

- **Integrated Policy Planning:** Develop comprehensive frameworks that simultaneously address environmental and industrial objectives. This involves joint planning sessions and consultations between environmental and industrial policymakers in Albania and the Western Balkans to ensure alignment of goals and measures, avoiding the fragmented approach seen in the EU.

- **Cross-Sectoral Coordination:** Establish inter-departmental and cross-sectoral committees or working groups within Albania and across the Western Balkans that regularly coordinate on policy development, implementation, and monitoring. This will ensure coherence between green and industrial policies, overcoming the lack of integration seen in the EU's implementation.
- **Accountable Funding Practices**: Improve upon the EU model by avoiding "helicopter money"—free grants with no strings attached—and pairing funding with cooperative efforts with the private sector to ensure effective and accountable use of resources.
- **Public-Private Partnerships (PPPs):** Foster partnerships between governments, industries, and research institutions in Albania and the Western Balkans to accelerate the development and deployment of green technologies. These partnerships can leverage local expertise and resources to drive innovation, ensuring the region doesn't face the same funding and innovation gaps as the EU, where overregulation and lack of collaboration with the private sector have been problematic.
- **Regulatory Sandbox Programs:** Implement regulatory sandbox programs in Albania and the Western Balkans that allow industries to test and scale up innovative green technologies and practices within a controlled and supportive regulatory environment. This flexibility can help overcome the EU's challenge of overregulation.
- **Green Product Standard**: Establish and promote green product standards and eco-labels within Albania and the Western Balkans to incentivize industries to produce environmentally friendly products. This should be aligned with EU and can help local industries meet EU market requirements and align with global best practices.
- **Green Public Procurement:** Implement green public procurement policies that prioritize the purchase of sustainable goods and services, driving demand for green products and encouraging industries in Albania and the Western Balkans to adopt greener practices, ensuring market-driven support for sustainability.
- **Performance-Based Regulations:** Introduce performance-based regulations in Albania and the Western Balkans that set clear environmental targets for industries while allowing flexibility in how those targets are achieved. This approach supports gradual improvements and reduces the risk of non-compliance.
- **Inclusive Policy Development:** Engage a wide range of stakeholders, including industry representatives, environmental groups, and civil society, in the policy development process within Albania and the Western Balkans. This ensures that policies are practical, broadly supported, and economically viable, avoiding the pitfalls of top-down approaches.

› Economic opportunities

A more efficient and circular economy

Improving resource productivity is crucial for sustainable development. It allows economic growth with less environmental harm, and makes companies more competitive. Albania is working on this as part of regional and European efforts to increase efficiency and shift to a circular economy.

In 2019, Albania's use of natural resources was relatively low at 10.5 tonnes per person, compared to the EU average of 14.5 tonnes. However, the country struggles with efficiently using these resources. This resource productivity measures how much economic output is generated per unit of material used.

Albania's resource productivity stands at €0.455 per kilogram, which is below the EU's average of €1.987 per kilogram and slightly above the Western Balkans' average of €0.418 per kilogram.[197]

Albania's energy use is relatively efficient, primarily because it relies heavily on hydropower. Hydropower accounts for 99.5% of Albania's electricity. As a result, Albania's energy intensity, which measures energy consumption per unit of GDP, is lower than in many neighboring countries. In 2020, Albania's energy intensity was 2 megajoules (MJ) per dollar of GDP, a significant improvement from 4 MJ per dollar in 2001.[198] This may soon change as Albania plans to establish a gas heating terminal. On the one hand, if this replaces hydropower in industry, it would increase emissions. On the other hand, to the extent that it replaces firewood use it homes, it could reduce emissions and indoor and outdoor air pollution.

Despite these efficiency gains, Albania still faces challenges with CO2 emissions, especially from the transport sector. Reducing these emissions is a focus of Albania's National Energy and Climate Plan (NECP), which aims to cut greenhouse gas emissions by 11.5% by 2030 compared to 2016 levels, with further reductions planned by 2050. These goals align with the EU's climate targets and support Albania's EU membership ambitions.

Albania's relatively low consumption of resources reflects its less industrialized economy. However, inefficiencies in resource use indicate a need for better management. Transitioning to a circular economy is vital for sustainable development. This model emphasizes using resources more efficiently, increasing recycling, and reducing waste. It involves rethinking how products are made and used to ensure that materials are reused and recycled rather than discarded.

To support this transition, Albania must set clear objectives and policies that promote circular economy practices. This could include tax breaks or subsidies for businesses that adopt resource-efficient technologies, and regulations that mandate recycling and waste reduction. Enhancing resource productivity means optimizing the use of materials from extraction to disposal. This reduces reliance on raw materials, cuts production costs, and strengthens economic resilience.

Developing effective recycling infrastructure is also crucial. Investing in modern recycling technologies and comprehensive systems for collecting and processing materials can improve recycling rates. Public education and awareness campaigns can further encourage sustainable consumption behaviors.

Raw materials potential

Albania has rich deposits of critical minerals, including chromium, copper, and nickel, which are vital for various industries. Chromium is essential for producing stainless steel, copper is extensively used in electrical wiring and electronics, and nickel is crucial for creating industrial alloys. Conducting aerial geophysical surveys in Albania is crucial for accurately assessing the country's nickel and other raw material reserves. Given Albania's rich mineral deposits, particularly nickel, utilizing advanced remote sensing technologies such as magnetometry, hyperspectral imaging, and LiDAR can provide detailed insights into the quantity and quality of these resources. This approach not only enhances the precision of exploration efforts but also significantly reduces the environmental impact compared to traditional methods. The potential return on investment is substantial, as these surveys can attract foreign investments, boost local industries, and increase export revenues. By identifying and quantifying mineral reserves efficiently, Albania can position itself as a key player in the global

197 DMC, GDP, resource productivity — European Environment Agency (europa.eu)
198 Albania Energy intensity, 1960–2023 - knoema.com

raw materials market, driving economic growth and sustainability. The industry faces many challenges, yet the green transition also presents opportunities.

Challenges in the Mining Sector

Despite the abundance of these resources, Albania's mining sector has seen a decline in its contribution to GDP. Several factors contribute to this decline:

- Outdated infrastructure: Many mining operations suffer from aging and inefficient equipment, which hampers productivity.
- Insufficient investment: The sector has struggled to attract the investment needed to modernize and adopt new technologies.
- Environmental concerns: Issues such as pollution and land degradation from mining activities have raised significant environmental concerns, necessitating the shift towards more sustainable practices.

Leveraging mineral wealth

Albania's substantial reserves of chromium, copper, and nickel are critical for its export economy and industrial sector. Despite current challenges, these resources have the potential to significantly contribute to economic growth if managed and utilized efficiently. Adopting modern, sustainable practices and aligning with international standards will not only revitalize the mining sector but also enhance Albania's competitiveness in global markets. Furthermore, the establishment of a complete value chain, including local processing and the manufacturing of clean technologies and goods, is essential. This integrated approach will elevate Albania's economy within the global value chain, adding significant value to its raw materials and positioning the country as a key player in the production of high-value, sustainable products.

Such advancements will attract foreign investments, stimulate economic growth, and promote sustainable development, ultimately transforming Albania into a hub for green industrial innovation.

To revitalize its mining sector, Albania must:

- Modernize and invest: Upgrading infrastructure and attracting investment are crucial. Modern equipment and technologies can increase operational efficiency and output.
- Align with EU standards: Meeting European Union environmental standards is essential. This involves adopting sustainable extraction and processing methods to reduce environmental impact and ensure long-term viability.
- Research and Development: Investing in R&D for sustainable practices can help minimize emissions and improve waste management, aligning with global best practices.

› A cleaner living environment

Air pollution, particularly in urban areas, is a significant issue in Albania, with transportation and industrial activities being the primary contributors. The rapid increase in vehicle numbers, coupled with an aging fleet and poor fuel quality, exacerbates air pollution. Emissions from vehicles, including CO_2, NOx, and particulate matter, significantly impact air quality, especially in cities like Tirana and Elbasan.

Industrial activities also contribute heavily to air pollution. Manufacturing plants, power stations, and other industrial facilities release pollutants such as sulfur dioxide (SO_2), nitrogen oxides (NOx), and volatile organic compounds (VOCs) into the atmosphere. These emissions result from outdated technologies and

insufficient pollution control measures, necessitating the modernization of industrial processes and stricter enforcement of environmental regulations.

Water pollution is another critical concern in Albania. Industrial discharge, often untreated or inadequately treated, contaminates rivers and other water bodies with heavy metals, chemicals, and other pollutants. Agricultural runoff, including fertilizers, pesticides, and animal waste, further degrades water quality, leading to issues like eutrophication and harming aquatic ecosystems. These pollutants pose risks to public health and biodiversity, underscoring the need for better wastewater treatment and sustainable agricultural practices.

Implementing practices that clean the environment and recover critical raw materials from polluted areas can establish an industrial recycling chain for these valuable resources. This approach addresses environmental pollution while contributing to the circular economy by reclaiming critical raw materials, enhancing sustainability and resource efficiency. Success stories from other developing countries, such as India's e-waste recycling programs and Ghana's efforts in gold recovery from mining waste, demonstrate the economic and environmental benefits of such initiatives. These examples highlight the potential for Albania to not only improve its water quality but also create new economic opportunities through the recycling of critical raw materials.

The Albanian government is actively working to improve environmental regulations and invest in pollution control measures. Strengthening the enforcement of existing laws and introducing new standards for emissions and effluents are critical steps. Additionally, adopting advanced pollution control technologies and infrastructure upgrades in industries and wastewater treatment plants are necessary to mitigate the impacts of air and water pollution.

Public awareness and community engagement are essential components in addressing pollution. Educating the public about the health and environmental impacts of pollution and promoting sustainable practices can drive behavioral changes. Community initiatives and partnerships with non-governmental organizations (NGOs) play a significant role in local pollution management efforts.

Monitoring and data collection are crucial for effective pollution control. Establishing comprehensive air and water quality monitoring networks provides accurate data to identify pollution sources, assess trends, and evaluate the effectiveness of mitigation measures. This data-driven approach supports the development of targeted and efficient pollution control strategies, enhancing the overall environmental quality in Albania.

› Cheap green energy

Albania's energy sector stands out in the Western Balkans due to its heavy reliance on hydropower. In 2023, hydropower accounted for 98% of the country's total installed capacity of 2,444 MW, making Albania one of the leaders in renewable energy in Europe. This reliance on hydropower not only meets the majority of domestic energy needs but also allows Albania to export electricity to neighboring countries, contributing significantly to its economy.

Advantages and Challenges of Hydropower

Hydropower provides Albania with a clean and renewable energy source, resulting in low carbon emissions compared to countries dependent on fossil fuels. This has kept Albania's energy intensity, a measure of energy consumption relative to economic output, lower than the regional average. In 2020, Albania's carbon intensity was 0.3

kg CO_2 per dollar of GDP, which is significantly lower than other Western Balkan countries, demonstrating its efficiency in producing economic output with minimal CO_2 emissions.

However, this dependence on hydropower brings its own set of challenges. Climate variability, especially changes in rainfall and water levels, can disrupt electricity generation, affecting energy security and reliability. To mitigate these vulnerabilities, Albania needs to diversify its energy sources. Diversification is not only a strategy for energy security but also for commercial gains. Hydropower, which is more stable, can be utilized during peak demand periods in the EU when prices are highest, maximizing profits. This strategic use of hydropower, rather than for basic needs, would position Albania as a key partner in EU energy security. Meanwhile, intermittent sources like solar and wind can be used for domestic base needs, enhancing overall energy reliability and efficiency. This approach would significantly increase the profitability of hydropower and solidify Albania's role in the European energy market.

Potential for Diversification

Albania has substantial potential to develop other renewable energy sources, particularly wind and solar power. Estimates suggest that by 2030, Albania could achieve up to 2,500 MW of wind capacity and 2,000 MW of solar capacity. Despite this potential, progress in developing these energy sources has been slow due to regulatory challenges, insufficient investment, and infrastructure limitations.

The National Energy and Climate Plan (NECP) sets out ambitious targets for expanding renewable energy and improving energy efficiency. Key goals include:

- Expanding Renewables: Increasing the share of wind and solar energy to complement hydropower.
- Improving Energy Efficiency: Implementing measures across residential, commercial, and industrial sectors to reduce overall energy consumption and greenhouse gas emissions.

These initiatives align with the European Union's climate objectives and support Albania's aspirations for EU accession.

Enhancing Energy Infrastructure

To realize its renewable energy potential, Albania needs substantial investments in infrastructure and regulatory reforms. This includes:

- Modernizing infrastructure: Upgrading and developing new facilities for wind and solar energy.
- Attracting investment: Creating a favorable environment for private sector investment through incentives such as feed-in tariffs, tax breaks, and subsidies.
- Simplifying regulations for clean energy: Streamlining approval processes for renewable energy projects and improving the regulatory framework to encourage development.

Diversifying the energy mix with wind and solar power will not only enhance Albania's energy security but also open new economic opportunities. Investing in renewable energy can reduce greenhouse gas emissions, improve resilience against climate variability, and create jobs in the green energy sector.

› A fairer society: opportunities for all

Investing in education and vocational training programs to develop a skilled workforce, coupled with labor market reforms to improve labor mobility, productivity, and working conditions, will further attract both local and foreign investors. The country's commitment to EU integration and alignment with EU environmental standards provides a framework for sustainable development, with policies and initiatives supporting renewable energy expansion and emissions reduction.

Financing a GIP

Achieving Albania's climate and environmental goals requires substantial financing. Mobilizing funds from both public and private sources, as well as from international financial institutions and European Union (EU) funding, is essential for supporting green policies and projects. The National Energy and Climate Plan (NECP) outlines specific targets and measures, but their successful implementation hinges on adequate financial resources.

One key approach to bridging the financing gap is through innovative financial instruments such as green bonds and carbon taxation. Green bonds, which are specifically earmarked for environmental and climate-related projects, can attract investors interested in sustainable development. These bonds provide a means to raise capital for large-scale renewable energy projects, energy efficiency improvements, and other green initiatives. Similarly, carbon taxation can serve as a financial tool to incentivize reductions in greenhouse gas emissions while generating revenue for green investments.

In addition to these instruments, capacity building and technical assistance are crucial for the effective implementation of green policies and projects. Building the necessary institutional capacity involves training and equipping government agencies, financial institutions, and private sector entities with the skills and knowledge required to develop and manage green projects. Technical assistance from international organizations and development partners can provide the expertise needed to design, finance, and execute sustainable projects.

Furthermore, international cooperation and partnerships play a vital role in securing financing for Albania's green transition. Engaging with international financial institutions such as the World Bank, the International Monetary Fund (IMF), and the European Investment Bank (EIB) can provide access to loans, grants, and technical support. These partnerships can also facilitate the exchange of best practices and innovative solutions, enhancing Albania's capacity to meet its climate and environmental objectives.

To attract private sector investment, it is important to create a favorable investment climate through clear and consistent policies, regulatory frameworks, and financial incentives. Reducing bureaucratic barriers, ensuring transparency, and providing stable and predictable policy environments can enhance investor confidence. Offering incentives such as tax breaks, subsidies, and risk-sharing mechanisms can further encourage private sector participation in green projects.

By leveraging a combination of public and private financing, innovative financial instruments, capacity building, and international cooperation, Albania can secure the necessary resources to achieve its ambitious climate and environmental goals.

Albania's transition to a green economy is driven by both internal needs and external pressures. The country's commitment to European Union (EU) integration and alignment with EU environmental standards provides a framework for sustainable development. This transition involves investing in renewable energy, improving resource productivity, and adopting circular economy practices.

Policy recommendations

Below we provide policy recommendations, which could be considered as part of a GIP for Albania and accompanying policies, categorized by policy area.

1. Economic and Industrial Development

- Enhance Industrial Competitiveness:
  - » Encourage adoption of advanced manufacturing technologies (automation, digitalization) to improve productivity and competitiveness.
  - » Reduce regulatory and bureaucratic hurdles to foster a conducive business environment for industrial growth.
  - » Make efforts to attract foreign direct investment (FDI), especially in key sectors like textiles, footwear, and machinery manufacturing.
- Revitalize the Mining Sector:
  - » Modernize mining infrastructure and technology to enhance operational efficiency and output.
  - » Align mining practices with EU environmental standards to promote sustainable extraction and processing methods.
  - » Invest in research and development for sustainable mining practices, minimizing emissions, and improving waste management.

2. Environmental and Climate Commitments

- Implement the National Energy and Climate Plan (NECP):
  - » Pursue targets to reduce greenhouse gas emissions by 11.5% by 2030, aligning with EU climate objectives.
  - » Expand the use of renewable energy, especially wind and solar, to complement hydropower.
  - » Enhance energy efficiency across residential, commercial, and industrial sectors.
- Align with European Green Deal and CBAM:
  - » Establish a robust framework for carbon pricing and emissions reporting to comply with the EU's Carbon Border Adjustment Mechanism (CBAM).
  - » Encourage industries to adopt green technologies and lower-carbon production methods to meet CBAM requirements.

3. Resource Efficiency and Circular Economy

- Promote Resource Productivity and Circular Economy:
  - » Set clear objectives for increasing resource productivity and adopting circular economy practices.
  - » Reduce risks for businesses implementing resource-efficient technologies and recycling initiatives.
  - » Develop infrastructure for modern recycling technologies and comprehensive systems for material collection and processing.
- Reduce Environmental Impact of Resource Use:
  - » Address inefficiencies in resource use to enhance economic output per unit of material used.
  - » Reduce reliance on raw materials through recycling, waste reduction, and sustainable production methods.

4. Energy Sector Development

- Diversify Energy Sources:
  - » Invest in infrastructure for wind and solar energy to diversify beyond hydropower and improve energy security.
  - » Simplify regulatory frameworks and streamline approval processes for renewable energy projects.

- » Create favorable conditions for private sector investment in renewable energy through incentives like feed-in tariffs and tax breaks.
- Enhance Hydropower Efficiency and Reliability:
  - » Mitigate the impact of climate variability on hydropower by investing in infrastructure that supports water management and storage.
  - » Explore opportunities for integrating energy storage solutions to balance the intermittent nature of renewable sources.

5. Pollution Control and Environmental Quality

- Strengthen Air and Water Quality Regulations:
  - » Modernize industrial processes to reduce emissions of pollutants such as sulfur dioxide (SO2), nitrogen oxides (NOx), and volatile organic compounds (VOCs).
  - » Enhance enforcement of environmental regulations and introduce new standards for emissions and effluents.
  - » Upgrade wastewater treatment facilities to address industrial and agricultural pollutants affecting water quality.
- Promote Public Awareness and Engagement:
  - » Conduct public education campaigns on the health and environmental impacts of pollution.
  - » Support community initiatives and partnerships with NGOs for local pollution management and sustainability efforts.
  - » Improve Monitoring and Data Collection:
  - » Use data-driven approaches to develop targeted and efficient pollution control strategies.

6. Social and Economic Equity

- Invest in Workforce Development:
  - » Develop education and vocational training programs to create a skilled workforce aligned with green economy needs.
  - » Implement labor market reforms to improve mobility, productivity, and working conditions.
- Promote Inclusive Economic Opportunities:
  - » Ensure that green economy initiatives provide benefits across different social and economic groups, fostering a fairer society.
  - » Align green policies with EU integration goals to support sustainable and inclusive development.

7. Financing the Green Transition

- Mobilize Diverse Financial Resources:
  - » Leverage public and private financing, including international financial institutions and EU funding, to support green policies and projects.
  - » Utilize innovative financial instruments like green bonds and carbon taxation to raise capital for sustainable development projects.
- Build Institutional Capacity:
  - » Enhance the capabilities of government agencies, financial institutions, and private sector entities to manage and implement green projects.
  - » Seek technical assistance and best practices from international organizations and development partners.
- Create a Favorable Investment Climate:
  - » Reduce bureaucratic barriers and ensure transparency in policy implementation to attract private sector investment.
  - » Offer financial incentives and stable regulatory frameworks to encourage investment in green projects.

8.2 Bosnia & Herzegovina

Introduction and country context

Before the 1990s conflict, Bosnia and Herzegovina (BiH) boasted a diverse economy. The country's abundant mineral resources, such as coal, iron ore, and bauxite, were extensively mined to meet both domestic demands and international markets. The manufacturing sector, focusing on metal processing, machinery, textiles, and wood products, played a pivotal role, contributing approximately 25% to the GDP.

The energy sector, comprising hydropower and thermal power plants, further bolstered the economy by meeting energy needs, generating substantial revenue, and supporting energy-intensive industries. In 1990, BiH's exports, including metals, machinery, textiles, and food products were valued at approximately $2 billion, with Germany and Italy as key trading partners.

BiH's economy featured numerous industrial firms, including major conglomerates like Energoinvest, Unis, Šipad, and RMK Zenica, spanning energy, steel, and wood processing sectors. The defense industry, centered around Mostar as a significant metallurgical hub, was particularly developed. The automotive sector also expanded in the 1950s, with plants in Sarajevo, Mostar, and Banja Luka.

BiH's economic framework before the conflict was shaped by Yugoslavia's industrial development model, emphasizing state ownership, central planning, and heavy industry. While fostering growth in key sectors, this framework also introduced dependencies and inefficiencies that later contributed to economic challenges.

The war inflicted over €200 billion in material damages, causing a 90% GDP decline (excluding services) from 1990 to 1995. The conflict severely damaged the economy and industry, leading to widespread unemployment and instability. Post-war, BiH underwent significant industrial restructuring due to the war's impact and transition to a market economy. Sectors like metals and mining saw declines, while the energy sector faced challenges in reconstruction and modernization.

Despite these obstacles, BiH displayed resilience in its economic recovery, improving its macroeconomic environment and implementing political and economic reforms. Nevertheless, the country continues to grapple with significant challenges, including limited foreign investment, labor emigration, and enduring political tensions and impasses.

Strategic framework: motivation & targets

As BiH moves towards EU accession negotiations, aligning with the EU's climate policy package and implementing the EU environmental acquis are crucial areas requiring substantial reforms, financial resources, and infrastructure investments. The EU sets rigorous standards for environmental protection and climate action, covering air and water quality, waste management, nature conservation, industrial pollution, and chemical usage. BiH, as an EU candidate, is expected to harmonize its environmental policies accordingly.

BiH is committed to achieving carbon neutrality by 2050 and aligning with the EU's environmental and climate objectives as outlined in the Paris Agreement and the Green Agenda for the Western Balkans, which focuses on several key areas:

- Climate Action: BiH aims to achieve carbon neutrality by 2050, setting ambitious targets to reduce greenhouse gas emissions.
- Decarbonization: Enhancing energy efficiency, increasing the share of renewable energy sources, and promoting green transport are priorities.
- Circular Economy: BiH is dedicated to improving waste management, boosting resource productivity, and advancing sustainable production and consumption practices towards a zero-waste society.
- Depollution: The country seeks to improve air and water quality and manage waste effectively.
- Sustainable Agriculture: BiH aims to promote organic farming and sustainable land use practices.
- Nature and Biodiversity Conservation: Efforts include preserving ecosystems, protecting endangered species, and ensuring sustainable natural resource management.

As part of the Roadmap for Decarbonization, BiH submitted its draft National Energy and Climate Plan (NECP) for review to the Energy Community Secretariat in June 2023. Draft NECP includes ambitious targets and commitments to be met by 2030, including:

- 41.2% reduction of emissions compared to 1990 (from 19.8 MtCO2 projected for 2023 to 15.6 MtCO2)
- 43.6% share of Renewable Energy Sources (RES) in total gross final energy consumption (from 39.7% projected for 2023)
- 6 844.0 ktoe, primary energy consumption (from 7 322 ktoe projected for 2023)
- 4 339.0 ktoe, final energy consumption (from 4 388.0 ktoe projected for 2023)

The draft NECP also highlights key policies until 2030, such as legal framework adoption, market establishment for electricity and natural gas, emissions trading schemes, and ensuring a just transition in coal regions. The plan also includes the decommissioning of 410 MW of thermal power plants, no new fossil fuel power plants, over 2 000 MW of renewable sources, and an increase in photovoltaic power plants of over 1 500 MW. Estimated investments needed range from BAM 13.5 billion to 16 billion by 2030 (€6.9 to €8.2 billion).[199] However, the Energy Community Secretariat found that the draft was missing the analytical part, which is essential for providing an overview of BiH's planned path towards achieving its 2030 targets in GHG emission reduction, renewable energy, and energy efficiency. There is a need for a more concrete formulation of policies and measures reflecting the precise actions that the authorities of BiH are planning to take to facilitate the green transition, including the coal phase-out year. Once agreed, the NECP targets should be translated into Climate law, making them mandatory for the whole economy.

— Green industrial policy considerations

› Industry in BiH

Bosnia and Herzegovina's industrial sector activity contributed to close to 25% of the GDP in 2022, with manufacturing alone adding close to 14%. The metal processing sector is the most valuable segment of the mining industry, and the mineral industry is the largest source of goods by value. Apart from metal processing, in the manufacturing sector, the production of base metals, metal products, automotive parts, and food, along with wood and furniture, are the key branches within the sector, which collectively contribute to half of the

199 Draft NECP BiH

total value added in manufacturing. Still, the service sector accounts for most of BiH's GDP. Tourism is emerging as one of the most rapidly expanding sectors, presenting significant potential for further growth. Before the pandemic hit, tourism constituted 11% of the GDP during 2017–2019. The agricultural sector is marked by a high number of informal workers, with a predominance of small-scale farming.

Energy sector within the economy

The energy sector has been a significant contributor to the country's economic growth. With a total installed capacity of 4 563 MW (2076 MW of hydropower, 2 065 MW of lignite, 182 MW of small hydropower, 135 MW of wind power, 102 MW of solar power, and 93 MW of industrial power generation). The country is a net exporter of energy, exporting about 24% of its electricity production and 5% of its total energy to neighboring countries, valued at $606 million in 2022. Electricity-regulated prices are significantly lower than international rates, with implicit subsidies accounting for about 20% of BiH's GDP.[200] This provides a short-term competitive edge to firms but discourages investment in efficient production techniques and results in under-investment in infrastructure, both harming long-run competitiveness.

Exports and industry dynamics.

Exports of goods accounted for around 31% of GDP in 2022, while nearly 75% of total exports were destined to EU markets, consisting largely of raw materials and manufactured goods like aluminum, electricity, and iron structures. Over the medium-term, export from BiH have shown resilience, increasing from $6.92 billion in 2017 to $10.2 billion in 2022 before declining to $9.6 billion in 2023 due to economic slowdowns in EU markets. The manufacturing sector, particularly in the Federation of Bosnia and Herzegovina (FBiH), has been dynamic, contrasting with Republika Srpska's (RS) more stable growth trajectory. Medium and high-tech manufacturing contributed significantly to the sector's growth, reflecting BiH's potential in green and complex products.

EU regulations and Carbon Border Adjustment Mechanism (CBAM)

BiH's adherence to EU environmental standards, including the upcoming CBAM, poses challenges and opportunities for its industries. The CBAM, effective from 2026, aims to curb carbon leakage by imposing tariffs on carbon-intensive imports. Approximately 44% of Bosnia's exports, including electricity, cement, iron, steel, aluminum, and fertilizers, are subject to CBAM, potentially affecting export revenues and GDP.

To mitigate CBAM's impact, BiH plans to implement a national Emission Trading System (ETS) by 2026, aligning with EU standards by 2030. This initiative aims to generate domestic revenue, support renewable energy transition, and reduce CO_2 emissions across relevant sectors.

Despite challenges, BiH's industrial and export sectors show resilience and potential for growth, particularly through alignment with EU standards and the adoption of cleaner technologies. These efforts not only facilitate compliance with international regulations but also enhance competitiveness and sustainability in the long run.

200 IMF, BIh Article 4 Staff Report 2023

› Economic opportunities

A more efficient economy

In 2019, BiH consumed 40 million tons of natural resources, equivalent to 11.5 tons per capita, marking a 28.5% increase from 2010. While this figure is lower than the EU average per capita consumption of 14.5 tons, it surpasses that of North Macedonia, Albania, and seven other EU countries. Bosnia and Herzegovina's resource productivity, defined as the ratio of gross domestic product to national resource consumption, stands at 0.9, which is significantly below the EU average of 2.2.[201]

Energy Intensity and CO2 Emissions

Energy intensity in Bosnia and Herzegovina remains four times higher than the EU average, though this gap has been narrowing over the past two decades.[202] Furthermore, BiH's CO2 emissions per dollar of GDP are considerably higher than those of EU member states, indicating a more carbon-intensive economy. Interestingly, carbon intensity in BiH has remained relatively stable over the last 20 years. The energy sector is the primary contributor to greenhouse gas emissions in the country, accounting for over 70% of total emissions, with industry contributing 8%.

Prioritizing Energy Efficiency

Given the current low levels of energy and resource efficiency, BiH could benefit significantly from prioritizing energy efficiency initiatives. Investments in building renovations and enhanced energy efficiency not only promise long-term cost savings but also create opportunities for the construction industry. Adopting energy-efficient technologies can spur the development of new industries and jobs, while simultaneously reducing the country's reliance on fossil fuels.

Resource Consumption

Global consumption of natural resources is on an upward trajectory, projected to require the equivalent resources of three Earths by 2050 at current growth and population rates. This escalating demand, coupled with limited resource availability and disruptions in supply chains, has led to substantial price increases. These dynamics underscore the unsustainable nature of current resource utilization models and highlight potential risks of economic instability.

A more circular economy

The circular economy represents a transformative shift from the traditional linear model of 'take-make-dispose' to a system that prioritizes resource efficiency, waste reduction, and the continuous use of resources. The European Union (EU) has championed this approach through various directives and regulations, including the Waste Framework Directive, the Circular Economy Action Plan, and the Green Deal targets. As BiH seeks closer alignment with EU standards and advances its EU membership candidacy, adopting these circular economy principles is crucial.

Only 2.2% of BiH's waste is recycled, and the country exports nearly 28 times more non-hazardous waste than it imports. These statistics highlight substantial room for improvement in resource management and recycling.

201 Centre For Policy and Research, Circular Economy White paper BiH
202 Ibid

Strategic imperatives for a circular economy

Transitioning to a circular economy is not only essential for complying with EU environmental regulations but also supports BiH's sustainable development, economic growth, and job creation. To achieve this transition, BiH should set clear strategic objectives and implement comprehensive measures:

- Resource Efficiency: Enhance policies to optimize resource use in production processes and minimize waste.
- Renewable Energy Transition: Move away from coal-dependent energy production towards renewable sources to cut carbon emissions and diversify energy supply.
- Sustainable Consumption: Promote products designed for durability, reparability, and recyclability, reducing the overall environmental impact.
- Regulatory Framework Enhancement: Develop a Circular Economy Roadmap aligned with the EU's Circular Economy Action Plan, including ambitious recycling targets and strategies to achieve EU standards.
- Economic Incentives: Provide financial support for industries to upgrade to cleaner technologies and establish a green investment fund to support sustainable projects.
- Infrastructure Development: Improve waste management systems to boost recycling rates and reduce reliance on landfills. Invest in renewable energy infrastructure to decrease dependence on fossil fuels.
- Capacity Building: Integrate sustainability and circular economy principles into educational curricula and vocational training programs to prepare the workforce for green industries.

Producing for green industries

With a relatively diverse manufacturing base, BiH could significantly benefit from producing fast-growing renewable energy, consumer electronics, and automotive industries. The country ranks 41st on the Green Complexity Index, indicating potential for developing competitiveness in green and complex products. Industrial policy therefore should focus among others on increasing the complexity of the product base, as we as greening the product base to integrate more into the European value chains for electric vehicles, batteries, wind turbines, and other green products.

Raw materials

BiH is rich in various mineral resources, including substantial reserves of coal, iron, zinc, lead, and bauxite. In addition, there are significant deposits of magnesite, chromite, and chrysotile asbestos. In 2019, the country produced 16.6 million tons of minerals, (valued at $718 million) out of which 739 600 tons of iron, 67 690 of aluminum, 1 million tons of bauxite, and also significant amounts of lead, zinc, and industrial minerals.

Despite this wealth, the mining sector's contribution to the Gross Value Added (GVA) has been in decline since 2009. In 2021, BiH's total mineral production was valued at 718 million USD, producing 16.7 million tons. However, the financial sustainability of coal, which accounted for 54% of the national energy supply and 66% of electricity generation in 2020, is in question. For example, EPBiH coal mines reported losses of EUR 122 million and accumulated arrears of EUR 257 million from 2019 to 2021.[203]

203 Launch: Bosnia and Herzegovina Country Economic Memorandum (worldbank.org)

The reliance on coal, which dominates the energy mix, has proven financially unsustainable, reflecting a global trend towards de-emphasizing coal in favor of cleaner energy sources. This shift is compounded by the EU's stringent decarbonization policies, impacting BiH's coal mining industry significantly. As global and EU decarbonization policies push the coal industry towards obsolescence, BiH is beginning to explore and invest in other critical raw materials.

Global and EU market trends

Global markets for raw materials have seen significant changes due to fluctuating demand, technological advances, and geopolitical shifts. The demand for critical raw materials such as lithium, cobalt, copper, nickel, and rare earth elements is expected to surge by 400% by 2030, driven by the renewable energy, electronics, and automotive sectors. Specifically, lithium demand could increase by up to 40 times by the decade's end. With critical material supplies concentrated primarily in China (66%), South Africa (9%), and the Congo (5%), the EU's Critical Raw Materials Act aims to secure a sustainable supply for EU green industries. The Act encourages diversifying supply sources, reducing import dependencies, and promoting sustainable extraction and recycling, aligning with the circular economy principles.

Strategic alignment with EU policies

The rich mineral base in BIH, including the most critical and strategically important raw materials, as defined by the European Union's Critical Materials Act could serve well both domestic and EU industries. The Act emphasizes issues of fair and transparent access to raw materials, responsible sourcing, and supply chain transparency. It requires the development of national geological resource exploration programs and measures to improve the collection and recycling of waste rich in critical materials. The recent EU Growth Plan for the Western Balkans aims to integrate the region into EU industrial chains through strategic projects on raw materials and batteries. These initiatives cover all stages from research and extraction to processing, production, and recycling.

Considering those developments, the country is in urgent need of deepening its understanding of the geological and economic potential in the context of structural changes in raw materials markets, and policies of the European Union in this area. BiH is beginning to align with these goals, evidenced by investments in a silver, zinc, copper, and bornite mine in Vareš and ongoing geological research for nickel on Ozren Mountain and lithium in Lopare. Such projects promise economic benefits. However, environmental concerns from local communities and organizations about mining's potential impact on forests, rivers, and biodiversity must be addressed. A comprehensive assessment of the sector's economic potential and its environmental risks is crucial for BiH's sustainable development.

To define strategic interests in this area, a broad public debate among all concerned about the future of mining in the country is urgently needed. Issues such as the negotiating power of the state, nature protection, and balance between economic, environmental, and social interests should be adequately addressed. In this regard, the new industrial policy should look into all stages of critical materials value chains, from research and sustainable extraction, processing, production, recycling, and reuse of materials in line with circular economy principles.

Several efforts could be made to advance BiH's green raw materials sector:

- Enhance Green Geological Data Quality: Improve the accuracy and comprehensiveness of geological data by classifying resources, estimating reserves, and applying sustainable (green) standards to geological assessments. This will ensure responsible resource management and inform strategic decisions.
- Raise Public Awareness and Engage Stakeholders: Promote the importance of resource management for the green economy through public, evidence-based discussions about the future of mining in BiH. Actively engage all stakeholders, including government bodies, local communities, environmental organizations, and industry leaders, to address key issues like state negotiation power, environmental protection, and balancing economic, social, and ecological interests.
- Align with EU Raw Materials Act: Focus on the EU Raw Materials Act's emphasis on manufacturing, recycling, and promoting sustainable supply chains and circularity. Implement measures to reduce dependencies on external raw materials sources and increase resilience and preparedness within the sector.
- Streamline regulatory processes: For example, for obtaining permits in the green industry. Simplify bureaucratic hurdles and improve areas critical for business operations, such as easing access to credit and resolving insolvency efficiently.
- Boost competitiveness in the critical resource management sector: Strengthen the resource management sector by participating in European Institute of Innovation and Technology Regional Innovation Scheme (EIT RIS) projects. Conduct comprehensive feasibility studies to form the most promising, sustainable new investments.
- Capacity Building and Skills Development: Engage in training programs focused on green industries to build expertise and capacity within the workforce. Implement Lifelong Learning and Train the Trainers programs to ensure continuous skill development and adaptation to evolving green industry standards.

› A cleaner living environment

Air pollution

Air pollution is a significant issue in BiH, particularly in urban areas such as Sarajevo and Tuzla. In Sarajevo, the primary pollutants are residential heating, traffic, and industrial plants, while Tuzla, an industrial city, recorded PM2.5 values at 22µg/m^3, making it one of the most polluted cities in Europe. Industrial pollution is substantial, especially in the Zenica area, where Kakanj's thermal power plant and ArcelorMittal steel plant emit 20% of the total SO2 emissions in BiH[204]. These sources contribute 72% to the total emission of PM particles in the Federation of BiH. Industrial emissions of CO2 contributed to 8% of total emissions in 2022. Bosnian coal plants, primarily fueled by high-sulfur lignite, are a significant source of sulphur dioxide (SO2) emissions, exceeding the limits set by the National Emissions Reduction Plan (NERP). Despite being a signatory to the Energy Community Treaty and subject to the Large Combustion Plant Directive (LCPD) since 2018, BiH continues to surpass agreed emission limits[205].

The health impact of pollution is significant. The health impact of air pollution is severe, with BiH having one of the highest average mortality rates attributed to air pollution exposure. Every year, an estimated 3,300 people die prematurely from

204 Amika.org
205 Energy Community

exposure to air pollution, and thousands more live with increased respiratory and cardiovascular conditions.[206]

Water pollution and land degradation

Water pollution is another significant environmental issue in BiH. The pollutant status of two of the longest rivers in Bosnia and Herzegovina, Bosna and Neretva, has been updated recently. The main land degradation drivers identified for BiH included floods, erosion, drought, bare land and unsuccessful afforestation, a sizable percentage of mining contamination on 2.3% of the country's territory, and over-use of pesticides and mineral fertilizers. Land degradation is a pressing issue in BiH. In 2010, 1.2 million people were living on degrading agricultural land, an increase of 2% in a decade, bringing the share of rural residents who inhabit degraded agricultural land up to 52% of the total rural population. Climate change-induced land degradation has become extreme in BiH, as manifested through more frequent floods, drought, and wildfires.

As BiH prepares to open negotiations for EU accession, prioritizing the implementation of the EU environmental acquis presents significant opportunities for industrial development. Investments required to comply with EU standards—such as building waste treatment facilities and establishing air quality monitoring stations—could invigorate the construction industry and generate employment. Additionally, enforcing the acquis may foster the growth of new sectors, including environmental consulting and waste management services, paving the way for a more sustainable and diversified economy.

BiH needs a shift towards a greener growth model driven by both internal and external factors. Internally, the country's economy is hindered by low energy and resource productivity, while pollution severely impacts public health and the environment. Externally, BiH has committed to ambitious climate and energy targets, and global trade trends increasingly favor green products, especially within the EU, which is BiH's primary export market. To capitalize on the burgeoning global green economy, BiH needs to transition from its current carbon-intensive energy mix to a more diverse and environmentally sustainable array of export products. Leveraging its existing capacities to enhance competitiveness in emerging green industries is crucial. This shift is essential not only to maintain a foothold in the EU market but also to align with the growing international demand for green technologies and support the global green transition.

206 WHO

› Cheap green energy

BiH heavily relies on fossil fuels, which constitute about 83% of its primary energy use, exceeding the EU average of 70%. Coal and lignite dominate power generation and industry, comprising 46% of the energy mix, while oil accounts for 29% in transport. Natural gas contributes 8%. Renewable energy currently constitutes only 17% of total energy consumption, primarily from biomass (10%) and hydroelectricity (6%).[207] Investment in newer renewables like wind and solar has been minimal. Unlike Albania, BiH generates electricity predominantly from domestic lignite.

BiH's energy sector is pivotal for its economic growth, boasting a diverse portfolio in 2022: 2 076 MW from hydropower, 2 065 MW from lignite, 182 MW from small hydropower, 135 MW from wind power, 102 MW from solar power, and 93 MW from industrial sources. As the sole net energy exporter in its region, BiH supplied approximately 24% of its electricity and 5% of its total energy to neighboring countries, valued at $606M in 2022. Despite challenges, regulated electricity prices remain lower than international rates, providing a significant competitive edge for local industries. Coal, primarily lignite, accounts for 2 065 MW (44% of capacity) and 68% of primary energy, shielding BiH from recent energy supply shocks but facing declining exports due to aging infrastructure limitations at JP Elektroprivreda BiH.

BiH has substantial untapped potential in solar and wind energy. By 2030, forecasts from the draft NECP suggest capacities could reach 2 955 MW for solar and 12 810 MW for wind, surpassing current installations. Current capacities stand at 135 MW for wind and 102 MW for solar power, with legislative improvements enhancing renewable energy frameworks. Full implementation and robust support schemes could make renewable electricity generation economically viable, attracting private sector investments. Grid accessibility improvements are crucial to incentivize participation from households, industries, and energy communities. Environmental risks associated with solar and wind energy necessitate alignment with EU standards. BiH's journey towards a decarbonized energy market demands a supportive regulatory environment.

› A fairer society: opportunities for all

BiH faces a challenge in its transition away from coal-dominated electricity production. With 2065 MW of installed capacity spread across 11 thermo-plants and 14 coal mines producing 15 million tons annually, the decarbonization agenda appears complex. The roadmap for this transition, outlined in the National Energy and Climate Plan (NECP), is still under development, albeit with potential acceleration due to the CBAM. CBAM could hasten decarbonization beyond initial NECP targets, impacting industries reliant on coal extraction and electricity production, potentially spilling over into other carbon-intensive sectors.

The coal mining and thermal power sectors play a critical role in BiH's economy, employing 16 200 workers directly. An additional 2 400 jobs are supported upstream in the coal value chain. However, the impending phase-out of coal poses risks, potentially jeopardizing the livelihoods of 18 600 workers directly tied to these sectors.[208] The social and economic repercussions extend beyond immediate job losses, affecting families, local businesses, and communities reliant on coal-related activities and subsidized electricity prices.

207 The Draft NECP BiH
208 Ministry for Foreign Trade and Economic Relations BiH and the World Bank estimates

Transitioning to a greener economy necessitates a comprehensive Just Transition strategy in BiH. This strategy demands substantial investments and structural reforms to mitigate adverse impacts on affected communities and industries. It calls for robust measures to retrain and redeploy affected workers, develop new economic opportunities in renewable energy and green industrial sectors, and support regional development plans tailored to affected areas. The shift towards renewable energy technologies and energy efficiency measures could foster a diversified economy, attracting green investments and enhancing competitiveness in international markets.

Financing a GIP

Meeting climate and environmental commitments, including securing sufficient financing for a green and just transition, is among the highest policy priorities. While BiH is in the early stages of its green transition, achieving defined environmental and climate goals will require financial resources far exceeding current public sector capacities and national resources at large. Closing this financing gap is crucial to achieving strategic objectives. Given current investment trends across sectors, mobilizing funds for implementation will be a challenging yet necessary endeavor that requires systematic and timely approaches. There is a growing array of innovative financial instruments on both the revenue and expenditure sides related to the environment, alongside an increasing availability of green financing options—from carbon taxation to green bonds—through international finance institutions, EU funds, and investments channeled through Western Balkan Investment framework and the EU Growth Plan for the Western Balkan Facility among others.

Policy recommendations

Below we provide policy recommendations, which could be considered as part of a GIP for BiH and accompanying policies, categorized by policy area.

1. **Environmental and Climate Policy:**

- Carbon Neutrality and Climate Action:
  - » Aim for carbon neutrality by 2050.
  - » Reduce greenhouse gas emissions.
  - » Increase the share of renewable energy sources to 43.6% by 2030.
  - » Decommission thermal power plants and expand renewable energy capacity (wind, solar).
- Environmental Regulations:
  - » Harmonize environmental policies with EU standards and regulations.
  - » Implement EU environnemental acquis and Climate Law.
  - » Develop a national Emission Trading System (ETS) by 2026.
- Circular Economy:
  - » Improve waste management and resource productivity.
  - » Foster sustainable production and consumption practices.
  - » Promote biodiversity conservation.

2. **Industrial Policy and Economic Development:**

- Green Industrial Policy:
  - » Focus on producing for green industries (renewable energy, electric vehicles, batteries).
  - » Increase complexity and sustainability of manufacturing.
- Raw Materials and Mining:
  - » Align with EU Raw Materials Act: Focus on the EU Raw Materials Act's

emphasis on manufacturing, recycling, and promoting sustainable supply chains and circularity.
  - Develop critical raw materials sector in line with EU environmental standards.
  - Enhance geological data quality and sustainable extraction practices.
  - Promote the importance of strategic resource management for the green economy through public, evidence-based discussions about the future of mining in BiH

3. **Energy Policy and Transition:**

- Energy Sector Reforms:
  - Shift from fossil fuels to renewable energy sources.
  - Develop solar and wind energy potentials.
  - Improve energy efficiency and grid infrastructure.

4. **Social and Economic Policies:**

Just Transition Strategy:

- Implement measures to mitigate the socio-economic impacts of coal phase-out.
- Support affected workers and communities with retraining and new job opportunities.

5. **Environmental Quality and Public Health:**

- Pollution Control and Management:
  - Address air pollution (SO_2, PM particles) from industrial and energy sectors.
  - Improve water quality and land degradation management.

6. **Financial and Investment Framework:**

- Financing Green Projects:
  - Mobilize funds for green and just transition through international finance institutions, EU funds, and private sector investments.
  - Explore innovative financial instruments like carbon taxation and green bonds.

8.3 Kosovo

Introduction and country context

After the economic decline and extensive war damages, Kosovo has implemented a robust transition process, instituting legal and institutional reforms aimed at establishing an open market economy. In February 2008, Kosovo declared its independence. Still, resolving the final status did not yield the anticipated positive impact on the economic situation, even though numerous aspects of its progress were conditioned by the resolution of its final status. This has complicated the development of Kosovo's small economy. In recent years, the Kosovan economy has experienced steady economic growth. However, growth is mainly consumption driven and it remains relatively underdeveloped compared to EU standards.

Kosovo faces significant social challenges, including high poverty and unemployment. The unemployment and inactivity rates have consistently been high, driven by slow structural transformation and economic diversification, skills gaps, outdated education curricula, insufficient practical training, weak integration of universities into research, and inadequate activation policies. Recently, the Kosovan labor market has been further strained by labor shortages due to emigration, with individuals possessing advanced digital skills being more likely to emigrate.

Services dominate the economy, with significant expansion in ICT and diaspora tourism. The industry sector, including construction, contributes one-third of the value added, with key priority sectors being the manufacture of rubber and plastic and manufacture of wood-processing and furniture. However, manufacturing's overall importance to the economy remains relatively limited, as it is concentrated in low-value-added industries and faces challenges such as outdated infrastructure, limited access to finance, and a need for innovation.

Despite its strategic location at the crossroads of the Western Balkans and the rest of Europe, Kosovo has struggled to capitalize on these advantages in trade. It faces significant external competitiveness challenges and weak integration into global value chains. FDI remains limited, even though Kosovo has the lowest FDI regulatory restrictiveness score in WB6. The economy still faces a substantial trade deficit, largely stemming from limited domestic production, resulting in low exports value lacking complexity. Remittances play a crucial role in financing the trade deficit and are primarily channeled into consumption and the real estate sector rather than productive industries.

Energy production relies almost exclusively on low energy-efficient coal plants, resulting in significant environmental concerns due to high carbon emissions. Despite having substantial lignite reserves, the sector faces challenges such as outdated infrastructure, frequent power outages, and inefficient energy use. Efforts to diversify the energy mix and integrate renewable solutions such as solar and wind power are underway but progressing slowly.

Kosovo is endowed with various mineral resources. In addition to holding the 5th largest reserve of lignite coal globally, it possesses significant deposits of metallic minerals such as lead, zinc, nickel, and chromium. It also has abundant non-metallic minerals, including limestone, clay, and marl (the latter is used in the manufacture of products such as cement). However, only a portion of these resources has been utilized, with large reserves remaining untapped, underutilized, and insufficiently explored. Traditionally, most mined minerals, particularly the metallic ones, are exported in an unprocessed or minimally processed state.

Strategic framework: motivation & targets

Addressing climate change and accelerating its green transition is imperative for Kosovo to make its economy environmentally sustainable and resilient to future shocks. In 2020, Kosovo joined other Western Balkans countries in endorsing the Green Agenda at the Sofia Summit, committing to achieving net-zero emissions by 2050. The following year, Kosovo reinforced its commitment to sustainable development by pledging to adopt the Green Agenda Action Plan. Kosovo's aspirations for EU accession make it mandatory for it to align its legal framework with the EU acquis relating to addressing environmental and climate challenges. Green industrial policies, aligned with EU environmental and industrial standards, are mandatory for Kosovo's EU accession process and integration into EU industrial supply chains.

In addition to being a legal obligation, addressing environmental and climate challenges can enhance competitiveness and prevent various deteriorations. Implementing green industrial policies can attract more diversified FDI and better integrate Kosovo into EU value chains. Sustainable practices can make Kosovo's industries more appealing to international investors who prioritize environmental responsibility. This shift could help diversify the economy, increase the value of exports, and create new economic opportunities. Moreover, aligning with the EU Green Agenda, Kosovo can benefit from EU initiatives aimed at fostering economic growth and development in the Western Balkans region, which includes Kosovo. One such initiative is the EU Economic and Investment Plan, designed to support the long-term economic recovery of the region, improve connectivity within the Western Balkans and with the EU, and promote green and digital transitions.

As a member of the Energy Community Treaty, Kosovo is obligated to implement its energy regulations and adhere to the Energy Community Ministerial Council Decision No 2022/02/MC-EnC. This decision outlines Kosovo's targets for 2030 regarding energy and climate change, integrated into the national energy and climate change plan (NECP) and the energy strategy (ES). In 2023, Kosovo regulated its Nationally Determined Contributions (NDC) through Climate Change Law No. 08/L-250.

Progress towards meeting these internationally-binding targets has been limited. Kosovo has nearly achieved its target for the share of energy from renewable sources, reaching approximately 19% in 2022, thanks mainly due to increased investments and government focus. However, there was a decrease from the 25.7% achieved in 2020. Coal-based power plants supply about 85% of its energy needs. These plants have low efficiency, and the power grid suffers from high transmission losses, requiring upgrades to meet emission standards.

Kosovo's heavy reliance on coal presents significant challenges in achieving its targets and undermines efforts to align with the principles of the Green Agenda. Moreover, it contributes to adverse health and environmental impacts on the population.

Type of target	Specific value	Current state (EUROSTAT)
Renewable Energy Sources		
Share of energy from renewable sources in gross final consumption of energy, 2005 (S2005)	18.9%	
Target for share of energy from renewable sources in gross final consumption of energy, 2020 (S2020)	25%	25.7% (in 2020)
Target for share of energy from renewable sources in gross final consumption of energy, 2030 (S2030)	30%	18.8% (in 2022)
National Energy Efficiency Contributions in 2020 and 2030		
Maximum Share of Primary Energy Consumption, 2020	2.61	2.61
Maximum Share of Final Energy Consumption, 2020	1.53	
Maximum Share of Primary Energy Consumption, 2030	2.70	2.82 (in 2021)
Maximum Share of Final Energy Consumption, 2030	1.80	
Net Greenhouse Gas Emissions		
Target for net Greenhouse Gas Emissions compared to 2016 levels	-16.3% 8.95 MtCO2eq	

Green industrial policy considerations

› Industry in Kosovo

The service sector is the largest contributor to the Kosovo economy, making up about 46% of GDP on average. The industrial sector, including construction, contributes around 28%, while agriculture, forestry, and fishing account for approximately 6.5%. The contribution of the industrial sector to the overall value has remained stable over the years, with only minor fluctuations.

The manufacturing sector faces challenges such as outdated infrastructure, limited access to finance, and a need for innovation. Its overall economic importance remains relatively limited, being primarily focused on low-value-added industries. In 2022, manufacturing accounted for 12.8% of the gross value added (GVA), which is close to the average for the Western Balkans but significantly lower than the EU average. This sector is not very diverse, dominated by industries such as processed food and beverages and metals. Recently, furniture production has started to emerge as a notable contributor to manufacturing output and exports. While it accounts for 12% of total employment, wages in manufacturing are among the lowest in Kosovo, with the average monthly gross wage being €409 in 2022, higher only than wages in accommodation and food services (€323), and in agriculture, forestry, and fishing (€351).[209]

Risks and Actions Related to the EU CBAM

The EU is a significant trading partner for Kosovo, accounting for one-third of Kosovan exports. While the overall impact of the CBAM on Kosovo's economy will be negligible, with only about 1% of its GDP in 2021 coming from exports affected by the CBAM, Kosovo's exporting industrial sector will face substantial challenges.[210] A particular challenge is Kosovo's heavy reliance on coal, which

209 https://askdata.rks-gov.net/pxweb/en/ASKdata/ASKdata__Labour%20market__Niveli%20i%20Pagave/tab03.px/table/tableViewLayout1/

210 https://www.germanwatch.org/sites/default/files/germanwatch_impacts_of_the_cbam_on_the_western_balkans_and_ukraine_2023.pdf

accounts for 85% of its energy production, with renewable energy sources making up only 15% (Energy Strategy 2031). This means embedded emissions from electricity (scope 2 emissions) are high and most exports could therefore be subject to CBAM without additional efforts.

According to the National Energy and Climate Plan (NECP) for 2023, Kosovo plans to address these challenges by introducing a tax on emissions through a national emission trading system (ETS). This system will align with the EU ETS and is expected to be fully integrated by 2031. By making companies accountable for their CO2 emissions costs, this system aims to encourage the use of renewable energy, foster innovation, and promote investment in green technologies. This approach will help Kosovo's industries comply with the EU's CBAM, which imposes carbon costs on imports into the EU.

› Economic opportunities

Business surveys point to where efforts could be made to improve the environment for businesses, encouraging investment and job creation in new green sectors. These surveys highlight infrastructure deficiencies, such as unreliable electricity supply, inadequate transport infrastructure, inadequate network of waste management facilities, and limited access to finance pose significant impediments to Kosovo's competitiveness and attractiveness (OECD, 2022). These challenges create barriers for businesses and investors, affecting operational efficiency, supply chain logistics, and overall economic development, thereby constraining the green transition of the industry sector. Another study on the manufacturing sector, reveals that the average index on supporting infrastructure showed a slight increase from 4.99 to 5.05 between 2019 and 2021, indicating negligible progress in infrastructure development and accessibility. [211]

A more efficient and circular economy

A more resource efficient economy reduces pollution and waste and, especially for energy efficiency, cuts costs, making companies more competitive. In alignment with the energy efficiency acquis of the Energy Community and Law no. 06/L-079 on Energy Efficiency, Kosovo should establish an Energy Efficiency Obligation (EEO) scheme and the draft Building Renovation Strategy (BRS). According to the NECP for 2025–2030, EEO scheme is under implementation, whereas the BRS has been drafted but not yet approved. The total estimated investment required for the energy efficiency component is approximately €350 million.

Currently, Kosovo is implementing various energy efficiency schemes. These initiatives include renovating 0.3% (WEM) and 1% (WAM) of commercial building area, promoting nearly zero-energy buildings with on-site renewable sources, energy certification of buildings, mandatory energy audits for large companies, and setting minimum criteria for energy audits within energy management systems. There are also programs to inform businesses and building owners about energy management benefits and encourage SMEs to undergo energy audits, along with subsidies for SMEs to purchase energy-efficient production processing machines. Progress in these efforts, however, has been limited despite significant contributions from the EU and other donors.

Kosovo has made progress in aligning its legislation with EU directives on waste management, a crucial step towards developing a circular economy model. It has approved the Law on Environmental Protection No. 03/L-051 and the Law

211 https://www.amchamksv.org/wp-content/uploads/2019/05/Indeksi-i-Prodhimit-2019.pdf

on Waste Management, along with the Integrated Waste Management Strategy 2021–2030, and the corresponding Action Plan (2021–2030). Additionally, Kosovo has amended the Law on Waste, introducing the principles of Extended Producer Responsibility and the Deposit Refund System. In 2023, Kosovo adopted the Circular Economy Road Map. By 2035, Kosovo plans to increase the reuse and recycling of waste to a minimum of 65% of the weight, with an estimated investment of €600 million required for this purpose.

Total waste generated was 521 172 tons in 2022, a 15.8% increase compared to 2020. Most (95%) of this waste comprised waste from households, which among others includes plastic due to the lack of infrastructure for sorting. This is followed by paper at 2.5%, metals at 0.5%, and plastic at 0.25%. The Let's Do It campaign identified more than 1 600 illegal landfills, mostly in villages not covered by the public waste management companies.[212] Key challenges include the need to invest in infrastructure and capacity building for waste management and recycling, as well as the need for awareness-raising campaigns to change the behavior, habits, and mindset of the public and businesses, making them active participants and beneficiaries of the circular economy. Additionally, the effective enforcement of existing laws and regulations is required to ensure that circular economy practices are effectively implemented.

The percentage of total waste recycled in Kosovo has shown consistent growth over time. From 0.83% in 2019, it rose to 4.39% by 2022, indicating increased efforts in recycling, heightened environmental awareness, or improved waste management infrastructure. Analysis of recycled materials reveals notable trends: there has been a significant decrease in scrap metal recycling, a notable increase in paper and cardboard recycling, and relatively stable proportions of plastic recycling. These trends may reflect evolving business opportunities in paper, cardboard, and plastic recycling, advancements in recycling technologies, or the influence of governmental or donor policies targeting specific materials.

Despite these efforts, little progress has been made in establishing the circular economy model. The overall percentage of waste recycled remains low, representing less than 5% of total waste generated. This underscores a significant opportunity for increased investment in recycling initiatives, aligning with Kosovo's commitment to advancing the Green Agenda.

A more competitive environment for clean investments and jobs

The OECD's "Competitiveness in South East Europe 2021" report provides valuable insights across several policy dimensions essential for enhancing competitiveness in Western Balkan economies. Since 2008, Kosovo has shown improvement in 9 out of 15 policy dimensions, particularly in trade, tax, education, and energy policies, scoring above the WB6 average in these areas. However, to improve its competitiveness, it needs to focus efforts on employment, investment policy and promotion, science, technology and innovation, transport, agriculture productivity, and environment, particularly quality and waste, where Kosovo scores the lowest and below the WB6 average.

The World Bank's Doing Business report (2020) indicates Kosovo's overall business environment ranking has regressed globally from 44th in 2019 to 57th in 2020 among 190 economies. Kosovo has made slight improvements in its business-enabling environment, yet challenges remain in licensing processes, contract enforcement, and combating unfair competition.

212 https://eeb.org/wp-content/uploads/2021/01/guideline-WBT_INCIEN_final.pdf

Despite having favorable regulatory frameworks for foreign investment, such as equal treatment laws and incentives like special economic zones, Kosovo's manufacturing sector attracts only 2% of total FDI inflows from 2011 to 2021, according to EBRD (2022). Real estate and financial sectors dominate FDI inflows due to perceived higher returns and lower risks.

A study by IFME highlights challenges faced by foreign investors in Kosovo, including skills gaps in the labor market, difficulties in contract execution, perceived corruption, high financing costs, and inadequate transport infrastructure. These barriers affect the sector's attractiveness and competitiveness.[213]

A green industrial policy should consider investment environment deficiencies in order to attract investment in green industries and create new jobs in these sectors to ensure the benefits of the transition are felt broadly within the population.

A more innovative society

The government recognizes the need to promote research and development (R&D) and has integrated it into the National Development Strategy 2030 (NDS 2030). This includes new laws and policy documents to support this goal. Additionally, the National Science Council has created the National Science Program 2023–2028. This program outlines key research areas, new funding mechanisms, and the creation of an innovation fund equal to 0.7% of GDP. It also plans to improve research infrastructure and capabilities, aligning with the European Research Area (ERA) and the Horizon Europe project.

- Current Challenges: Despite these initiatives, Kosovo's R&D sector faces significant challenges. According to the OECD (2021), Kosovo ranks low among the Western Balkan countries in science, technology, and public research systems. It also shows weak collaboration between business and academia, ranking below the average in the region across these areas.
- Funding Issues: A major issue is the lack of sufficient public funding. Although the government has identified R&D as a priority, it has consistently failed to meet the funding target of 0.7% of GDP. For example, in 2015 and 2023, only about 0.1% of GDP was allocated to R&D, far below the EU average of 2.2% (European Commission Report 2023). Donor funds, including 2.6 million euros from the Horizon Europe program since 2021, remain the main source of support for Kosovo's R&D sector. Since 2007, Kosovo has participated in various EU research and innovation programs.
- Operational and Structural Issues: Beyond funding, the R&D sector in Kosovo struggles with several operational challenges. There is a lack of coordination among business, academia and the public sector in implementing innovation policies. Furthermore, Kosovo lacks sufficient research infrastructure and skilled personnel for developing and managing research projects (SPHERE 2017). The OECD (2021) also highlights the absence of clear priorities for science and technology and the incomplete implementation of existing policies and laws.

A green industrial policy can be an opportunity to boost innovation and competitiveness in local industries in order to ensure that businesses and individuals are fully able to take advantage of opportunities provided by the transition.

213 https://ietl-oek.com/wp-content/uploads/2020/09/19-12-24-Foreign-Direct-Investment-in-Kosovo-The-InvestmentClimate-Potential-and-Barriers-ENG.pdf

Better and greener transport infrastructure

Kosovo lags its neighbors in various transport sectors, including the length and quality of its highways, overall road network, rail network, and the amount of freight transported.[214] According to AmCHam (2021), the rail infrastructure index remains the lowest among all transport indicators. This suggests minimal development or maintenance of the railroad infrastructure. While the road infrastructure initially had a relatively high index score of 7.44, it decreased to 6.59, indicating a possible decline in road quality.

In line with the EU's Sustainable and Smart Mobility Strategy, the Transport Community Permanent Secretariat has developed a strategy for the Western Balkans as part of the Connectivity Agenda. This strategy includes integrating digital technologies and automation in passenger and freight transport, modernizing railways, and establishing road/rail border crossing points. It aims to enhance the climate resilience of the transport sector by making it more efficient and sustainable. The strategy emphasizes reducing reliance on road transport, boosting the role of railways, supporting multimodal transport, and removing barriers along main transport routes.

Historically, Kosovo's investments have mainly focused on road infrastructure. However, the current priority has shifted towards rehabilitating and modernizing railways. Kosovo is investing around €200 million in the Route 10 railway, which links southern and northern Kosovo, connecting the Serbian border and Pristina with the capital of North Macedonia. This project is part of Kosovo's Connectivity Agenda and aims to link the country to the broader European network for both passengers and freight.

A green industrial policy can include considerations of improved green transport that reduces pollution, facilitates competitiveness, and improves access to green transport for citizens.

Improved accreditation for exporters

In addition to physical infrastructure, an important determinant of industry's competitiveness and attractiveness is quality assurance infrastructure. The Amcham (2021) study provides an assessment of this infrastructure for the manufacturing sector. Over the period 2019–2021, individual indicators show notable improvement in the availability of accreditation and certification labs, as well as qualified workforce. This suggests better access to accredited testing and validation services, along with enhanced quality control and adherence to product standards.

Despite progress in these areas, the possibility to obtain certification for product standards has surprisingly worsened. Although somewhat contradictory, it may indicate that it has become more challenging to obtain certification for standards. Since Kosovo has endorsed the green transition, which is expected to introduce new product standards and technical regulations, addressing these issues effectively and promptly is crucial to enhance Kosovo's economic competitiveness and integration into international markets.

214 OECD (2021). Competitiveness in South East Europe 2021. A Policy Outlook. https://www.oecd-ilibrary.org/docserver/dcbc2ea9-en.pdf?expires=1718984916&id=id&accname=guest&checksum=105B72B1D76B9A959082E3F0B0A72531

Industrial policy in Kosovo

Kosovo has already outlined plans to address some of these challenges in its industrial policy. Efforts include, among others:

1. **Support Creation of Modern Industrial Parks with Eco-Friendly Features.** Four new eco-industrial parks will be established, with one of them being fully climate-neutral, with carbon-neutral energy supply, waste-management facilities, and other eco-friendly features.
2. **Establish a National Product Certification Facility.** This instrument seeks to assist companies in improving the quality and safety standards of their products, as well as meeting export regulations, by offering financial assistance.
3. **Co-finance conformity assessment bodies.** The rationale of this action is to facilitate the acquisition of internationally recognized product certifications domestically at reduced cost. This action foresees upgrading equipment and enhancing operational capacities for existing laboratories, as well as supporting the establishment of new certification bodies capable of international accreditation.
4. **Scale-Up Export Finance Facility of Kosovo Credit Guarantee Fund** (KCGF). This instrument aims at improving access to finance which in turn would facilitate larger-scale capex investments and productions supply capacity expansions.
5. **Scale-Up EBRD Reboot Program to Support Further Investment in Green Technology.** To facilitate the manufacturing sector's green transition, this instrument plans to improve access to green finance for technological advancements.
6. **Upgrade Procurement to Create Advantages for Domestic Manufacturing Companies and Support Green Transition.** To facilitate the sector's green transition and its expansion, this action envisions the amendment of the public procurement law to align with EU Green Public Procurement (GPP) criteria.
7. **Provide Tax Incentives for Investment in Product Innovation.** The action aims at encouraging investment in high-value added product innovation through developing a registry of product innovation entities and providing tax incentives to companies investing in these entities.

These policy actions pursue the enhancement of the sector's competitiveness and expansion through, inter alia, facilitating access to finance, product quality and safety standards, and upgrading of skills. Further, most of them, directly or indirectly, focus on facilitating the green transition of the sector, through the establishment of eco-industrial parks, improving access to green finance for green technologies, financing product certifications, skill enhancements, as well as adopting green public procurement criteria.

› A cleaner living environment

Air quality is notably poor in several areas of Kosovo, including Pristina, Obiliq, Drenas, and Mitrovica (World Bank, 2013). Whilst 88% of pollution in Kosovo is composed of CO2, other pollutants include particulate matter (PM), sulfur dioxide (SO_2), nitrogen oxides NO and NO2 (NOx), ozone (O3), lead (Pb), and dioxin.[215] Kosovo ranks as the 42nd most polluted country in the world in terms of air quality and 17th in Europe for annual average PM2.5 (12.5 µg/m³), exceeding more than twice the WHO's recommended annual PM2.5 guideline of 5 µg/m³.[216]

215 https://documents1.worldbank.org/curated/en/282361468047686579pdf/750290ESW0P1310LIC00Kosovo0CEA0Rprt.pdf
216 https://www.iqair.com/dl/2023_World_Air_Quality_Report.pdf

Approximately 760 premature deaths occur annually due to ambient air pollution (AAP), with Prishtina accounting for about 11% of this burden. Of these deaths, 90% are due to ischemic heart disease (IHD) and stroke, with AAP contributing to 53% of IHD cases and 63% of strokes occurring in individuals under 70.[217] The economic cost associated with mortality from air pollution exposure in Kosovo is estimated between $160 million and $310 million annually, which represented approximately 2.5% to 4.7% of the country's GDP in 2016.

The primary sources of pollution, including CO_2, NO_x, SO_2, and PM2.5, in Kosovo are the coal power plants Kosovo A and Kosovo B, along with the associated coal-mining areas.[218] In 2019, electricity production and the use of wood and lignite for heating accounted for 73% of total CO_2 emissions. Road transport contributed 15%, whilst the industry sector was responsible for just 7%.[219] The coal power-plants rank as Europe's first and 3rd most polluting power plants for PM2.5 emissions, realizing four times more PM2.5 than most other coal power-plants in the WB region. Other significant polluters include the Mitrovica Industrial Park (Trepca), nickel mining and production in Drenas/Gllogovc (Ferronikeli), and the cement factory in Hani Elezit (Sharrcem). Additional pollution sources include agriculture and landfills handling urban and industrial waste.[220]

While the energy sector is a major source of pollution, the Kosovo government has primarily focused its efforts on energy production and household and district heating (NECP 2023–2030). This focus overlooks significant industrial polluters such as the Mitrovica Industrial Park (Trepça), Ferronikeli, and Sharrcem.

Public concern about pollution has grown. According to the OECD, in 2022, 74% of people in the Western Balkans viewed pollution as a "serious" or "somewhat serious" problem, up from 64% in 2019.[221] This increase may indicate greater awareness and a perceived worsening of environmental conditions.

› Cheap green energy

Electricity supply is not reliable in Kosovo. In the latest BEEPS, 78% of manufacturing firms identified electricity as a major issue. Firms in Kosovo report experiencing more frequent and costly power outages compared to businesses in peer economies (World Bank, 2020). The AmCham (2021) study assesses this component of infrastructure through the presence of alternative sources of energy. The increase in this index over time, hints to the manufacturing firms' perceptions of improvements in this regard.[222]

Electricity supply is also very polluting. Around 85% to 95% of electricity comes from coal generation[223], which contributes to around two-thirds of CO_2 emissions. Given the limited government focus, the key decarbonization policies and measures expected to have the largest impacts on emission reduction include those to be undertaken in the energy sector, as it presents the sector with the highest contribution to emissions. In this regard, Kosovo plans to phase out one or two Kosovo A units by 2050 at the latest, implement environmental measures on Kosovo B, increase the share of renewable capacities (from around 300 MW

217 World Bank, 2019, Western Balkans Regional AQM. Western Balkans. Report – AQM Kosovo. https://documents1.worldbank.org/curated/en/214511576520047805/pdf/Air-Pollution-Management-in-Kosovo.pdf
218 https://www.iqair.com/kosovo
219 https://www.ammk-rks.net/assets/cms/uploads/files/Publikime-raporte/Raporti_GHG_2014-2019_(final_ueb_version).pdf
220 https://documents1.worldbank.org/curated/en/282361468047686579pdf/750290ESW0P1310LIC00Kosovo0CEA0Rprt.pdf
221 14. A green recovery in the Western Balkans | Multi-dimensional Review of the Western Balkans: From Analysis to Action | OECD iLibrary (oecd-ilibrary.org)
222 However, it is not clear whether alternative energy sources in this case mean renewable energy sources in which companies have invested as a hedge against the risk of power outages.
223 https://me.rks-gov.net/wp-content/uploads/2023/04/Energy-Strategy-of-the-Republic-of-Kosovo-2022-2031-1-1.pdf

of existing capacity to a total of 1.6 GW by 2031, including 100 MW in prosumer renewable capacities), investing in wind and photovoltaic technologies supported by renewable auctions, and introduce carbon-pricing by 2025. Further, the government does not foresee any new hydropower projects due to their adverse environmental impacts.

The Kosovo transmission system is interconnected with neighboring countries through eight interconnection lines and its electricity interconnection capacity significantly exceeds the EU target of 15% for 2030. The robust interconnection capacity positions Kosovo favorably for regional electricity exchange and integration, supporting grid stability and energy security, even when considering long-term perspectives. Kosovo and Albania have operationalized the Albanian Power Exchange (ALPEX) to conduct a coupled and organized Day-Ahead Market and Intra-Day Ahead Market and to operate as the nominated electricity market operator (NEMO) for Albania and Kosovo. Kosovo plans to integrate ALPEX with the upcoming North Macedonian day-ahead market, as well as with Greece. This integration aims at enhancing market liquidity, promoting efficient electricity trading, and strengthening regional energy cooperation.

› A fairer society: opportunities for all

Kosovo has an opportunity to broaden the benefits of the green transition, while becoming more productive and boosting its economic performance. Findings from analyses of skills gaps in manufacturing conducted in 2017[224] and 2018[225] by different researchers indicate that employers are encountering significant challenges in finding skilled and qualified workers. The earlier study revealed that the most pronounced gaps were observed among production engineers, technologists, and professionals responsible for production quality and safety control. A subsequent study conducted in 2022[226] highlights that approximately two-thirds of employers struggle to fill positions for skilled technicians, associate professionals, professionals, and workers in craft and related trades. All three studies point out the views of industry employers, particularly those engaged in manufacturing, who identify the skills gap as a major impediment to sectoral growth and, not surprisingly, a major driver of costs. Similar results are reported in the OECD (2022)[227] report, which referring to BEEPS data shows that 44% of employers consider the inadequately educated workforce to be their main impediment.

The studies conducted in 2017 and 2022 delve deeper into the anticipated growth in demand for specific skill sets. The 2017 study indicates that within the manufacturing sector, 74% of companies intend to hire employees with advanced technical skills relevant to the industry. Results from the 2022 study show significant growth expectations, particularly for technicians and associate professionals (83%), legislators, senior officials, and managers (76.7%), and professionals (49%). Given the situation, it is not unexpected that demand will outgrow supply of, in particular, individuals with vocational and professional education and professional certificates.

Furthermore, the skills gap analysis from 2017 reveals that two-thirds of employers believe that the education system is grappling with structural challenges in providing candidates with the required skill set. This suggests that the education system is struggling to align study programs with the demands

224 https://helvetas-ks.org/eye/file/repository/Skills_Gap_Analysis_ENG.pdf
225 https://www.amchamksv.org/wp-content/uploads/2019/02/ENG-Education-and-Labor-Market-in-Kosovo-and-EU.pdf
226 https://alled.eu/wp-content/uploads/2022/02/Kosovo-Skill-Barometer.pdf
227 https://www.oecd-ilibrary.org/docserver/dcbc2ea9-enpdf?expires=1714151949&id=id&accname=guest&checksum=A70CB25CB623DEBD1FC02D04C86B67D3

of the labor market. The OECD (2022) competitiveness study argues that the vocational education and training (VET) system and higher education system are not adequately aligned with labor market needs. The study highlights that ineffective implementation, monitoring, and evaluation of reforms negatively impact educational outcomes. Insufficient funding and limited stakeholder engagement further compound these issues, which are essential for informed policy making in education.

According to the 2017 study, 85% of companies invest in upskilling their employees through on-the-job trainings. Further, 60% of the companies highlight the absence of funded training plans, with half of them having to finance training programs on an ad-hoc basis. This situation drives up costs and undermines the sector's competitiveness.

Kosovo will struggle to implement green industrial policies without significantly boosting the skill level of its workers. Yet, doing so presents a win-win opportunity for both workers and businesses. As such, the Ministry of Industry, Entrepreneurship and Trade (MINT) has included a number of measures aimed to improve skills and ensure the benefits of the green transition are broad-based. These include, among others:

1. **Launch a Labor Manufacturing Program.** Within the Active Labor Market Measures (ALMM) framework, this instrument aims to create employment opportunities through workplace internships and wage subsidies.
2. **Introduce a Skills Credit Scheme.** Aiming at enhancing competitiveness through skill enhancement, this action plans to finance participation in good quality industrial training programs offered by non-public accredited organizations. This will be facilitated through a voucher scheme.

› Financing GIP

For Kosovo to implement its green and just transition, it must address budgetary and human resource constraints. Diverse funding sources are crucial for financing this transition. Kosovo can prioritize sustainable projects using budget revenues, while Public-Private Partnerships (PPPs) and diaspora funds can attract private sector expertise and capital. EU and other donor funds, as well as international financial institution (IFI) funds are also crucial to finance climate adaptation and mitigation projects. Strategically integrating these funding streams will create a strong financial basis for Kosovo's sustainable development.

In addition to continuing to use budget revenues for renewable energy and energy efficiency schemes, the upscaling of the Kosovo Credit Guarantee Fund (KCGF), and other climate-mitigation related projects, Kosovo can finance its green and just transition through carbon pricing and green bonds. Carbon pricing would incentivize emissions reduction by levying fees on greenhouse gases, with revenues directed to renewable energy and energy efficiency projects. These revenues could also subsidize electricity bills for the poor and fund re-skilling programs for those affected by the green transition. Simultaneously, issuing green bonds, particularly to local communities and the diaspora, would attract investments for sustainable initiatives like renewable energy infrastructure and eco-friendly urban planning. Kosovo could also provide tax incentives for investments in high-value-added product innovation, encouraging companies to develop new, sustainable products.

Kosovo's large diaspora presents a significant opportunity to support its green transition. Through diaspora partnership investors, business angels, PPPs, and green bonds, Kosovo can attract investments and expertise for sustainable

projects. Diaspora involvement in renewable energy, agriculture, and eco-friendly infrastructure could accelerate Kosovo's progress towards environmental goals, while fostering economic growth and further strengthening ties with the diaspora.

Kosovo can leverage support from the donor community, IFIs, and other lending institutions to finance its green and just transition. Given Kosovo's aspirations for EU membership, it has access to several EU funds and programs, including IPA III, Western Balkans Investment Framework (WBIF), Connecting Europe Facility (CEF), Horizon Europe, and Erasmus +. As a signatory to the Sofia Agreement, Kosovo is eligible to benefit from the EU Economic and Investment Plan for the Western Balkans through the Western Balkans Guarantee Facility, which is part of the European Fund for Sustainable Development Plus (EFSD+). Additionally, the Millennium Challenge Corporation (MCC) and Kosovo have launched the $202 million MCC-Kosovo Compact aiming at transitioning toward a more sustainable, inclusive, reliable, and affordable energy future. By leveraging such donor funds, Kosovo can further advance its sustainable development agenda, fostering resilience and prosperity across various sectors of its economy.

There is an increasing global interest from international financial institutions (IFIs) and other lenders in offering conditional finance based on environmental, climate, and social criteria. Kosovo is already benefiting from the EBRD Green Economy Financing Facility, the European Investment Bank and KfW Development Bank. Kosovo can tap into additional international climate funds through IFIs and lending institutions to finance green projects. However, Kosovo's non-membership in some international organizations and forums, along with perceived security risks, may result in higher capital costs and potentially reduced interest from international investors.

Policy recommendations

Below we provide policy recommendations, which could be considered as part of a GIP for Kosovo and accompanying policies, categorized by policy area.

1. **Energy Transition and Carbon Reduction**

- Approve and Implement the National Energy and Climate Plan 2025–2030.
- Implement the Action Plan on the Green Agenda for the Western Balkans 2021–2030.
- Phase out both units of Kosovo A by 2050 and implement environmental measures on Kosovo B.
- Expand renewable energy, including wind and photovoltaic technologies only.
  - » Improve the regulatory framework to boost private investments in the sector.
- Enhance grid stability and energy security through regional electricity exchange and integration.
- Establish Energy Trading System
  - » Introduce carbon pricing.
- Establish a Task Force on Green and Sustainable Development
  - » Develop comprehensive legislation and regulatory frameworks for carbon pricing and emissions reporting.
  - » Ensure alignment with international standards and guidelines to effectively comply with the EU CBAM.
- Establish a knowledge platform to support exporting companies that will be impacted by the EU CBAM.

- Boost the Kosovo Credit Guarantee Fund (KCGF) with special financial instruments, such as Green Finance and Transition Finance, in particular for exporters that will be impacted by the EU CBAM.
- Offer financial incentives, such as tax breaks or subsidies, to industries that invest in green technologies and adopt lower-carbon production methods.
- Promote knowledge-sharing and collaboration among industries to accelerate the adoption of best practices for reducing carbon emissions.
- Promote knowledge-sharing and collaboration with diaspora businesses to accelerate the adoption of best practices for reducing carbon emissions.
- Develop efficient and low-emission public transportation systems.
- Encourage and support the transition towards sustainable modes of private transportations.

2. **Industrial Quality Infrastructure and Financial Support**

- Review the Industrial Policy 2030 focusing on better aligning it with the Green Agenda, and implement it.
- Improve quality infrastructure
  - » Establish a national product certification facility to support companies in meeting international standards.
  - » Co-finance conformity assessment bodies to assist in obtaining internationally recognized product certifications domestically.
  - » Direct subsidies for exporters requiring green product certifications.
  - » Establish monitoring systems to track the improvements in green quality infrastructure projects.
- Establish new eco-industrial and climate-neutral parks.
- Boost the Kosovo Credit Guarantee Fund (KCGF) to support larger-scale investments and capacity expansions in green technologies.
- Encourage FDI.
- Encourage the establishment of diaspora investor partnerships and business angles
- Upgrade public procurement laws to adopt EU Green Public Procurement (GPP) criteria.

3. **Circular economy**

- Implement the Action Plan on the Green Agenda for the Western Balkans 2021–2030.
- Invest in infrastructure and capacity building for waste management and recycling.

4. **Biodiversity**

a) Implement the Action Plan on the Green Agenda for the Western Balkans 2021–2030

b) Develop and implement a national biodiversity strategic plan.

c) Establish the biodiversity information hub and cooperate with the other WB6 countries.

d) Implement the state strategy on water.

e) Implement conservation strategies to address deforestation in Kosovo.

5. **Skills Development for the Green Transition**

- Develop Green Skills Program for Manufacturing under the Active Labor Market Measures (ALMM) framework.
- Introduce Green Skills Credit Scheme to enhance competitiveness.
- Address green skills gaps in manufacturing through targeted vocational and professional education reforms aligned with industry needs.

- Implement structured green reskilling and upskilling programs for employees, including financed training plans to improve workforce competencies.

6. **Just Transition and Inclusive Stakeholder Engagement**

a) Offer retraining and reskilling programs for workers transitioning from fossil fuel-based industries to green jobs.

b) Subsidize electricity bills for the poor.

c) Subsidize energy-efficient housing.

d) Engage communities, especially those most affected by the transition, in the decision-making process.

7. **Public Awareness Campaigns, Education Programs, and Capacity Building Initiatives**

a) Integrate the Geen Agenda into primary and high school curricula.

b) Promote green technology and sustainability courses in universities and colleges.

c) Launch public awareness campaigns on circular economy.

d) Launch awareness campaigns on the importance of green skills and on career opportunities in the green economy.

e) Conduct workshops to educate the public about the benefits and opportunities of the green transition.

f) Develop Targeted Green Upskilling and Reskilling Training Programs to enhance capacity building at both local and central level.

8.4 Montenegro

Introduction and country context

Montenegro has been a candidate for EU membership since June 2012 and has opened negotiations on all chapters. The country is moderately prepared to develop a functioning market economy. To align with the EU's renewed Industrial Policy and current global economic trends, Montenegro needs to integrate key areas such as innovation, digitalization, investment, circular and low-carbon practices, and human capital development.

Montenegro's Industrial Policy framework is guided by national documents and the principles of the EU Industrial Policy outlined in Article 173 of the Treaty on the Functioning of the EU. In December 2022, Montenegro adopted the National Circular Transition Strategy for the period until 2030 to align with the EU's goals. In 2023, the country introduced the Strategy for the Development of Micro, Small, and Medium Enterprises (2023–2026), while the previous Industrial Policy Strategy expired the same year. Additionally, in April 2023, Montenegro signed the Association Agreement for participation in the EU's Single Market Program, focusing on three key areas: improving the internal market, supporting SMEs, and protecting consumers.

The European Commission's 2023 Montenegro Report highlights the need for substantial progress in aligning with the EU's climate policies. It recommends adopting the National Energy and Climate Plan (NECP), as mandated by the EU Governance Regulation (EU 2018/1999). This includes a just transition strategy for phasing out the Pljevlja Thermo Power Plant. The NECP should align with the 2030 Energy Community targets, the EU's 2050 zero-emission goal, and the Green Agenda for the Western Balkans (GAWB). Montenegro is currently working on the NECP, with a completion target of June 2024, which failed to be met.

To fully align with EU Energy Policy, Montenegro must adopt and implement the Electricity Integration Package, shift to market-based support for renewable energy production, streamline permitting and connection processes, and develop a functional energy market ready for integration into the European single market.

Strategic framework: motivation & targets

Montenegro is a non-Annex-I country of United Nations Framework Convention on Climate Change (UNFCCC), highly vulnerable to the effects of climate change. The country updated its Greenhouse Gas Emission (GHG) Inventory in 2020, covering the period 1990–2019. National GHG emissions represent only 0.01% of global emissions[228] and the net per capita GHG emissions in Montenegro in 2018 amounted to 5.4 Mg CO_{2eq} [229]. Emissions are concentrated in sectors that contribute a relatively small share of GDP. However, it should be noted that while the energy sector contributes the most to the GHG emissions, it enables the functioning of all others economic sectors in the country.

As a signatory of the Paris Agreement, Montenegro has a requirement to set economy wide emissions reductions targets through submission of a Nationally Determined Contribution (NDC) to the UNFCCC. According to the revised NDC from 2021, at least a 35% reduction in total national GHG emissions (excluding: land use, land use change, and forestry (LULUCF)) has to be achieved by 2030 compared to 1990 (base year). Further significant emission reductions depend

228 Source: CAIT data, excl. LULUCF
229 In the EU-27 this is 8.4 Mg CO2eq per capita (source: EEA GHG data viewer).

on policies for which the following climate mitigation measures are provided in the NDC: 1. Carbon pricing for coal fired TPP "Pljevlja"; 2. Development of new renewable power plants; 3. Multiple energy efficiency measures; 4. Development of the transmission and distribution networks; and 5. Refurbishment of small hydroelectric power plants. However, Montenegro has indicated an intention to increase the level of ambition to target a 55% reduction relative to 1990 in line with the target of the EU, since revised NDC of 35% is not the highest level of ambition required by the Paris Agreement, as assessed by the EC in the Annual Report for Montenegro in 2021.

A Law on Protection against Adverse Impacts of Climate Change also commits Montenegro to the development of a Low Carbon Development Strategy which will be adopted for a period of 30 years – through to mid-century or 2050 (with an associated 5-year Action Plan).

Montenegro's membership in the Energy Community initiated the implementation of key elements from the previous Decision on Effort Sharing. This included setting goals for improving energy efficiency and increasing the share of renewable energy sources (RES). By the decision of the Energy Community's Ministerial Council, Montenegro committed to implementing the Directive on promoting the use of energy from renewable sources. Montenegro set a national goal to achieve 33% renewable energy in total final energy consumption by 2020. In 2021, the share of electricity produced from RES reached 39.3%, surpassing this target. Hydropower plants "Perućica" and "Piva" are the main contributors, providing about 75% of the total electricity from renewable sources. Wind farms at "Krnovo" and "Možura" also play a significant role, contributing around 18%. The remaining renewable energy comes from small hydropower plants and solar power installations. The Energy Community targets for Montenegro are:

- Maximum share of primary energy consumption: 0.99 and 0.92 in 2020 and 2030, respectively.
- Maximum share of final energy consumption: 0.70 and 0.73 in 2020 and 2030, respectively.
- Target for net GHG emissions (excluding LULUCF emissions and removals): 2,42 $MtCO_{2eq}$ (-55%) in 2030, which excludes LULUCF (Land Use, Land-Use Change and Forestry) emissions and removals.
- Target for share of energy from renewable sources in gross final consumption of energy: 33% and 50% in 2020 and 2030, respectively.

Green industrial policy considerations

› Industry in Montenegro

Montenegro's economy is heavily dominated by the services industry, with services and wholesale and retail trade making up 69% of GDP. The absence of diversification presents a considerable deficiency of the Montenegrin industry, in terms of the number and type of products being exported, as well as the number of countries in which they are exported.

GDP has shown moderate growth in recent years, increasing from €4.141 million in 2017 to €5.924 million in 2022. As a result of economic recovery, Montenegro's per capita income in purchasing power parity reached 50% of the EU-27 average in 2022, the highest in the Western Balkans.[230] The current account deficit rose to 13.3% of GDP in 2022, driven by significant growth

230 Source: EC Report 2023 for Montenegro

in both exports and imports. Exports of goods, particularly aluminum and electricity, surged by 60% compared to 2021. Although the labor market has improved, there are ongoing structural issues such as regional disparities and gender gaps (persisting at 9.0 percentage points: 70.6% for men compared to 61.6% for women), with similar unemployment rates for men and women (13.0% and 13.2% respectively), potentially influenced by lower female workforce participation. Informal employment remains prevalent, and youth and long-term unemployment together account for 74.3% of total unemployment. The banking sector continues to be well capitalized and liquid. Despite an increase in new businesses, efforts to enhance the business environment have slowed down.

Carbon pricing and CBAM

The Law on the Protection against Adverse Impacts of Climate Change establishes Montenegro's national Emissions Trading System (ETS) for the industry and power sectors, enacted in 2020. The accompanying Decree outlines activities requiring a greenhouse gas (GHG) permit and aligns Montenegro's ETS with EU standards, including Monitoring, Reporting, and Verification (MRV) of GHG emissions.

The national ETS has operated for nearly three years with limited participation, involving historically only three emitters: two industrial plants and TPP "Pljevlja." Following the closure of the Aluminum Plant (KAP) in 2022 and the acquisition of the Steel Factory "Nikšić" by the utility company Electrical Company of Montenegro (EPCG), TPP "Pljevlja" is now the sole participant. It receives partial allowances with the remainder obtained through auctions at €24 per tonne of CO_2 equivalent. The first public auction in February 2023 generated €9.2 million in carbon price revenues, funding activities through the Eco Fund, such as renewable energy projects and environmental protection.

Efforts are needed to align Montenegro's legislation with EU regulations, including the EU ETS, Effort Sharing Regulation, and Regulation on Governance. Establishing a carbon pricing mechanism aligned with the EU ETS is crucial to comply with EU requirements and prepare for the EU CBAM. By 2034, CBAM fees will fully align with EU ETS prices. Montenegro's electricity mix of hydro, wind, and coal will affect CBAM certificate prices differently for exporters.

As a member of the Energy Community, Montenegro cooperates regionally on carbon pricing. Power exports to the EU are likely exempt from CBAM until 2030, with the Montenegro-Italy transmission line being pivotal. Post-2030, power exports must demonstrate renewable generation to avoid CBAM fees. Montenegro forecasts minimal risk from CBAM due to its expected shift towards renewable electricity exports by 2034, aided by advancing low-carbon technologies.

Increasing the carbon price reduces coal-generated electricity output and demand, thus lowering GHG emissions from TPPs. Higher electricity prices impact sectors reliant on electricity, such as professional services, by increasing production costs and reducing output. The coal mining and energy sectors in Montenegro are most affected by carbon price increases.

› Economic opportunities

Circular economy

According to the Statistical Administration of Montenegro (Monstat) data during 2021, 1.5 million tonnes of waste were generated, of which 46.3% came from the industry sector. Compared to the previous year, waste production registered an increase of 11.1%. About 20.6% of the total amount of generated waste is hazardous. Almost the entire amount of that waste (292,496 tons) originates

from the industry sector, of which almost the entire share (99.7%) originates from the mining and quarrying sector. Total amount of processed waste with export in 2021 is by 10.6% greater compared to the previous year. Of the total amount of processed waste in Montenegro, 58% was disposed of.

According to the Monstat data in 2021, 682,773 tonnes of industrial waste were produced in Montenegro (10.5% less compared to the previous year). The largest share in the production of industrial waste belongs to the mining and quarrying sector (48.1%) and the electricity, gas, steam and air conditioning supply sector (46.8%). Almost the entire amount of waste from industry belongs to the category of non-hazardous waste (99%). Of the total generated and stored waste, industrial companies processed and disposed of 76.7% of the waste themselves, temporarily stored 4.9% and exported 0.6% of waste, while handed over 17.6% of the waste to other companies in Montenegro.

An innovative and competitive economy

Enterprises that adhere to sustainability principles and actively contribute to the green transition can enhance their image, improving perceptions among consumers and partners, thereby strengthening their competitive position. Montenegro ranks 73rd among 140 countries in the 2019 edition of the Global Competitiveness Report published by the World Economic Forum. The country's competitiveness rank averaged 67.6 from 2008 to 2019, peaking at 82.0 in 2008 and hitting a low of 49.0 in 2011.[231]

Over the past three years, efforts to enhance Montenegro's regulatory business environment have slowed down. The dynamic growth of local companies and foreign investor activities face challenges stemming from regulatory weaknesses, including administrative inefficiencies, delays, and the complexity of the legal framework. Additionally, burdensome local taxation and parafiscal charges hinder business operations. Transparency issues in decision-making, arbitrary enforcement of laws by public authorities, and limited access to finance for SMEs further complicate the business landscape.[232]

According to the Chamber of Commerce of Montenegro's 2023 report on the business environment, conditions are moderately unfavorable, with an average rating of 2.41 out of 5. Entrepreneurs particularly highlight high fiscal and parafiscal levies, such as VAT rates and local fees. A 2022 IPSOS survey among households and businesses underscores that the high taxes and numerous parafiscal charges, such as permits and fees, contribute significantly to the prevalence of the gray economy in Montenegro. The unpredictability resulting from frequent regulatory changes poses challenges for new investments, business registration, and SME operations. Combined with administrative complexities and limited transparency in decision-making, these factors collectively impede the overall business environment.

In 2019, Montenegro's total domestic spending on research and development (R&D) amounted to 0.36% of GDP, equivalent to 17.985 million euros in gross expenditures. The R&D sector employed 2 330 individuals in organizations, institutions, and companies, including 1 586 researchers, 495 technicians, and 249 support staff. Given that R&D activities are part of broader job roles, the actual engagement is measured in full-time equivalent (FTE), representing the ratio of hours an employee devotes to R&D compared to total working hours. In 2019, the total FTE was 685, with researchers accounting for 469 FTE.[233]

231 Source: World Economic Forum
232 Source: EC Report for Montenegro 2023
233 Source: Government of Montenegro

Raw materials

Investing in the valorization of Montenegro's abundant mineral resources is crucial for revitalizing industrial production. Creating conditions for industrial sector companies to adopt technologies that enhance value-added creation, productivity, and reduce the export of low-value finished products is essential. Montenegro boasts numerous mineral resources, including energy, metallic, non-metallic, and techno-gene minerals, alongside sea salt and underground water. Currently, 15 of these resources are actively exploited, while 23 others hold economic significance and await further valorization. Key solid mineral resources include metallic resources such as red bauxite and lead-zinc ore, energy resources like dark lignite coal, and non-metallic resources including decorative and technical-construction stones, and white bauxite. Additionally, Montenegro recognizes significant mining potential in resources such as copper ore, cement marl, clay for bricks, dolomites, quartz sand, barite, oil, and gas. Managing these resources sustainably and protecting the environment through rational exploitation is critical for the metal industry, construction sector, and the broader industrial value chain, requiring strategic planning for their optimal utilization.

› A cleaner living environment

Biodiversity Montenegro is characterized by extraordinary genetic and ecosystem diversity with a high degree of endemism and diversity of phenotypes between species populations, which ranks it in the so-called "hot-spots" of European and world biodiversity.[234] The most widespread ecosystem are forests, which cover 60% of the country's surface (a much higher share than the EU average of 39.9%[235]), which ranks Montenegro among the three most forested countries in Europe. Total of 3 250 plant species are registered on the territory of Montenegro. The index of the number of species per unit area (0.8) is among the highest in Europe. Total of 22 locations were identified as Important Plant Areas. Montenegro's position along the main migratory corridor (Adriatic route) makes it the habitat of a large number of birds, some of which are rare and endangered. Internationally Important Bird Areas are: Skadar Lake, Ulcinj Salina, Šasko Lake, Durmitor and Biogradska Gora. Out of a total of 526 European bird species, 333 (63%) can be found in Montenegro.

The national network of protected areas covers 185 270 ha or 13.4% of the land territory of Montenegro, of which the largest part (100 427 ha or 7.3%) consists of five national parks: Durmitor, Lake Skadar, Lovćen, Biogradska gora and Prokletije.

Water quality

Montenegro is a water-rich economy with numerous rivers, lakes, and springs, contributing to its overall water wealth. Its underground potential is estimated at 14 000 liters/second and its average runoff of 44 litters/second/km^2 (compared to the world average of 6.9 litters/second/km^2).[236] Although endowed with substantial water resources, Montenegro faces escalating pollution challenges, mainly stemming from untreated wastewater (in 2022, only 55% of domestic wastewater is safely treated, in contrast to over 90% in the EU).[237]

234 Ministry of Sustainable Development and Tourism, 2015
235 World Bank, 2023
236 Environmental Protection Agency, 2023
237 UN Water, 2023

Air quality

Air quality remains an important environmental challenge in Montenegro. There is high air pollution in the Northern and Central zones, primarily with suspended particles (PM_{10} and $PM_{2.5}$), most often as a result of burning solid fuels (wood and coal) used for heating buildings. The presence of these particles in concentrations above the prescribed, from the aspect of health protection, is the highest in Pljevlja and Bijelo Polje, but they are also significant in Podgorica and Nikšić. The municipality of Pljevlja is one of the most polluted municipalities in Montenegro and the fact that almost the entire energy-mining complex of Montenegro is located in it (TPP "Pljevlja", Coal Mine "Pljevlja", Lead and Zinc Mine "Gradir Montenegro") puts this region in the focus when it is about a process of just energy transition in Montenegro. The Pljevlja coal region is included in the "Initiative for Coal Regions in Transition in the Western Balkans and Ukraine".

› Cheap green energy

Montenegro's power system is characterized by lignite-based electricity generation, with TPP "Pljevlja" (225 MW) that provides baseline power generation and typically generates 42–55% of Montenegro's electricity requirement, alongside two hydroelectric generation facilities HPP "Perućica" (307 MW) and HPP "Piva" (342 MW). Since majority of renewable energy generation comes from hydro, there is a problem of overdependency on hydropower. Hydro generation's contribution to electricity generation varies dependent on the hydrological situation each year. Private generators operate the majority of small-scale hydro generation with 52.5 MW capacity, while EPCG operates a much smaller total capacity of 3.4 MW. By the end of 2022, a total of 38 small hydropower plants was connected to the power distribution system of Montenegro, of which 24 are under 1 MW. In addition to the mentioned power plants in commercial operation, a small hydroelectric power plant is also connected to the distribution system, which is in the buyer-producer mode, with an installed power of 12 kW. Two wind power plants (WPP "Krnovo" and WPP "Možura" in the total capacity of 118 MW) and six solar installations (2 319 MW) have been part of the power generation mix since 2017 and 2019 respectively, but their contribution remains limited.

As Montenegro phases out coal, it seeks new, clean alternatives. The country possesses various energy resources, including hydropower from rivers and streams, wind energy, solar radiation, biomass (and coal reserves). The development of these potentials could sufficiently meet domestic energy needs. Currently, the existence of hydrothermal potential, oil, and natural gas reserves remains unconfirmed.

Montenegro has tapped into its hydroelectric potential with major plants like HPP "Perućica" and HPP "Piva", utilizing 39% of the technically feasible capacity of its main watercourses. Wind energy potential has been assessed through the "Potential Assessment of Renewable Energy Sources in Montenegro" study by CETMA, highlighting coastal areas with wind speeds of 7–8 m/s and around Nikšić with 5.5–6.5 m/s. These areas and those with moderate wind productivity could yield an estimated 900 GWh annually. Collaborative projects like "POWERED" suggest offshore wind farms along the coastal area between Montenegro and Albania could also be viable.

Montenegro currently operates two wind farms, WPP "Krnovo" and WPP "Možura", with a combined capacity of 118 MW. In 2022, these plants produced 323 GWh. Plans include the construction of two more wind farms: WPP "Gvozd", financed by an €82 million credit arrangement with the EBRD, and WPP

"Brajići". WPP "Gvozd" (54.6 MW) is scheduled to start operating in 2024 as per Montenegro's long-term energy balance. WPP "Brajići" (101 MW) has secured land lease but its construction has not yet started.

Montenegro also holds significant solar energy potential, with over 2 000 hours of insolation per year across most of its territory and over 2 500 hours along the coast. However, large-scale solar power facilities are not developed, except for plans to construct SPP "Briska Gora" with a 250 MW capacity. The first phase (50 MW) was expected to commence operations in 2024, urging intensified efforts to avoid delays as per the energy balance.

Montenegro has substantial biomass energy potential, primarily from forestry and agriculture. A 2012 study estimated biomass could generate 4 200 GWh/year of electricity. Further assessment and data updating are crucial to strategize and achieve national energy goals effectively.

Montenegro's electric network is well connected, which will help the transition to more renewable power, though more connections could be made. The current transmission network in Montenegro spans 1 416 km and includes 56 lines and cables. Montenegro's transmission system is strategically interconnected with five neighboring systems:

- Albania: Connected via one 400 kV transmission line (DV Podgorica 2 – Tirana 2) and one 220 kV transmission line (DV Podgorica 1 – Koplik).
- Bosnia and Herzegovina: Linked through one 400 kV transmission line (DV Lastva – Trebinje), two 220 kV transmission lines (DV HPP Perućica – Trebinje and DV Buk Bijela – HPP Piva), and two 110 kV transmission lines (DV Herceg Novi – Trebinje and DV Vilusi – Bileća).
- Italy: Connected via a 500 kV HVDC cable.
- Kosovo: Linked through one 400 kV transmission line (DV Ribarevine – Peć 3).
- Serbia: Connected via two 220 kV transmission lines (DV B. Bašta – Pljevlja 2 and DV Pljevlja 2 – Požega) and one 110 kV transmission line (DV Pljevlja 1 – Potpeć).

Montenegro is currently finalizing a domestic 400 kV ring and plans to develop a second undersea cable to Italy (up to 1.2 GW). The interconnection with Italy serves as a critical link between the EU and the Energy Community member states' electricity networks. Future decarbonization plans in the Italian electricity sector may impact this interconnection.

Decent regulations for clean energy

Expanding and diversifying renewable energy sources in Montenegro requires substantial investment, yet investors encounter specific challengess. A critical barrier is the absence of comprehensive spatial planning documentation. The surge in solar energy capacity in 2019, driven by new commercial power plants entering incentivized regimes, was followed by a notable increase in installations by consumer-producers with solar panels. Amendments to the Energy Law aimed to facilitate greater participation of consumers in generating clean electricity, supporting Montenegro's green transition objectives.

Furthermore, amendments to the Spatial Planning and Building Construction Law in 2022 streamlined the process for obtaining urban planning permissions for renewable energy projects, allowing grid connection applications to precede formal planning or environmental permitting. This change led to approximately 1.5 GW of connection requests to CGES (Transmission System Operator),

indicating substantial interest in new renewable energy projects. While the current grid capacity appears sufficient to accommodate these projects without upgrades, potential congestion at international interconnectors remains a concern. These projects are still in early stages, lacking financial closure and clarity on power sales given limited domestic demand, leading to uncertainty about their realization and delivery.

› A fairer society: opportunities for all

Some regions will require particular support during the transition. In the Pljevlja region, approximately 1 200 people work in the mining and energy sectors, constituting 17% of the total workforce (6 939) in Pljevlja. The Coal Mine "Pljevlja" stands out as the largest employer in the municipality, employing 934 men (83.1%) and 190 women (16.9%). Beyond direct employment at the mine, many private and public companies are dependent on coal production, forming what is known as the "coal value chain". This dependency significantly influences the overall revenues of Pljevlja municipality's budget. The Thermal Power Plant (TPP) "Pljevlja" employs 158 workers, with 93% being male (147) and 7% female (11). Mining and energy have been integral parts of the local economy for decades, involving a substantial portion of the population. Therefore, the transition away from coal must be managed carefully to avoid increasing energy poverty and job losses that could harm the sustainability and living standards of the community. Phased alignment with the EU Emissions Trading System (ETS) price could aid in this transition, considering that this sector accounts for a small percentage of Montenegro's economy but has a concentrated impact on emissions.

There is a lack of planning for future good job opportunities in Pljevlja region. Montenegro currently lacks a National Energy and Climate Plan (NECP), so there is no definitive timeline for phasing out coal, including the closure of TPP "Pljevlja" and cessation of coal processing at Coal Mine "Pljevlja". However, any transition must include a well-designed strategy focused on fostering new businesses and jobs in Pljevlja's diversified economic structure. This could involve initiatives such as organic agriculture (e.g., "Pljevlja cheese"), IT, low CO_2 emissions cement production, renewable energy sources (RES), crafts, and rural tourism. Strategic business zones are pivotal for attracting investors who can contribute to the transformed economic development of Pljevlja. Currently, Montenegro lacks a cohesive vision for sustainably restructuring the economy in this region, along with policies to support it and estimates on job creation during the green transition. Recent initiatives for new spatial planning documents aim to facilitate economic diversification away from traditional coal industries. The construction of new RES-based energy plants (wind and solar) is particularly encouraged, not only to advance energy transition goals but also to foster a green economy and the creation of environmentally sustainable jobs, driven by market dynamics.

Better skills and better jobs

In the second quarter of 2023, Montenegro recorded a 76.2% activity rate among individuals aged 20–64, with an employment rate of 66.1% and a reduced unemployment rate of 13.2%. Positive trends were observed among youth aged 15–24, with an employment rate of 41.8% and unemployment decreasing to 17%. However, the proportion of youth not in employment, education, or training (NEET) remained high at 23.2%. The employment landscape in Montenegro has shown resilience, with continued growth throughout 2022 and into 2023, potentially offering new opportunities for workers transitioning from high-carbon industries. Managing the labor market implications of an increased workforce can help mitigate broader economic impacts, with targeted support

programs crucial in reallocating labor into productive sectors. An inter-sectoral mobility scheme for young researchers supported by EU IPA III 2024 aims to enhance skills and knowledge transfer within the green economy.

A significant challenge remains the structural mismatch between labor supply and demand for skills and competencies. Higher education quality in Montenegro has not improved post-pandemic, with graduates from secondary vocational schools often lacking essential skills. Montenegro's performance in the latest PISA test (2022) underscores educational shortcomings, ranking 54th in mathematics, 56th in reading, and 62nd in science out of 81 countries, the lowest since 2012. Structural reforms should prioritize enhancing youth labor market access and educational quality, particularly in vocational education aligned with green and digital transformations. This involves ensuring practical education quality, promoting enrollment in programs offering relevant qualifications like digital and green job skills (e.g., heat pump installation, renewable energy construction), and upgrading teaching staff competencies. Legislative amendments to implement the Youth Guarantee Program, as outlined in the National Employment Strategy 2021–2025, are planned to support these efforts.

Future industrial policy development in Montenegro must anticipate sector-specific skill needs and enhance entrepreneurship training tailored to industry requirements. Modernizing educational programs is crucial to aligning knowledge and skills with economic demands, focusing on occupational standards, vocational education levels III and IV, practical industrial training, and tailored education and training programs. Emphasis on natural and technical sciences and entrepreneurship development will bolster Montenegrin competitiveness. Continuous training and retraining initiatives are essential for employees impacted by just transition measures, ensuring they acquire necessary skills for evolving industries. The Employment Office of Montenegro and local governments will play pivotal roles in defining and supporting these activities, facilitating a smooth transition for the workforce.

Financing GIP

Significant financing will be required to support investments in new low-carbon projects. Currently, there is insufficient direct investment in priority sectors for modernizing Montenegro's industry. Financing will be crucial for the success of the deep green transition in the industrial sector. The introduction of high environmental standards through the European Green Deal (EGD) and Green Agenda for the Western Balkans (GAWB) adds financial pressure. Existing production technologies need technical, technological, and organizational improvements, especially in sectors like metal processing and food processing, to create innovative products and adopt new technologies for efficient production management.

Small and medium-sized enterprises (SMEs) form the backbone of Montenegro's economy. Due to limited funding and capacity, SMEs require support to effectively collaborate with larger firms in research and innovation partnerships. SMEs should also be informed about commercial opportunities in the circular economy, emphasizing resource-efficient production processes and secure supply chains through recycled or sustainably sourced materials.

Current financial resources and instruments do not fully meet existing or potential demands. Companies increasingly seek external financing, mainly through loans from banks, which remain the primary source for growth and development. However, startup financing options are limited due to unfavorable loan terms, inadequate project proposals, insufficient creditworthiness, and collateral.

Geopolitical uncertainties further complicate securing financing for large-scale power generation investments incentivized by rising carbon prices, potentially limiting access to favorable financing terms.

Montenegro requires support from the international and donor communities to accelerate its transition and align with EU member states advancing towards climate neutrality. Key financing possibilities in Montenegro include:

- The Economic and Investment Plan (EIP) for the Western Balkans, which offers substantial investment through the reformed Instrument for Pre-Accession Assistance III (IPA III). This includes grants from EU funds (mainly IPA/WBIF), crucial for enhancing national capacities and supporting green policies.
- The EU Growth Plan for the Western Balkans (2024–2027), providing €6 billion combining grants and concessional loans. This initiative aims to integrate and decarbonize energy markets and industrial supply chains, crucial for economic convergence with the EU and attracting foreign investments.
- Investment grants within the Western Balkans Investment Framework (WBIF), managed by the European Investment Bank (EIB), supporting renewable energy production, energy efficiency, and low-carbon transitions.
- The Regional Energy Efficiency Program (REEP), supported by the European Bank for Reconstruction and Development (EBRD) and KfW banking group, which offers over 600 million euros for energy efficiency projects in Montenegro.
- The Green Growth Fund (GGF) under WBIF mechanisms, promoting green activities in the region, including Montenegro.
- Multilateral financial institutions (MFIs) such as the World Bank, EIB, EBRD, and KfW, which provide favorable loans critical for Montenegro's green industrial transition.

The Eco Fund focuses on financing environmental conservation, energy efficiency, and renewable energy projects at national and local levels in Montenegro. It is in charge of the implementation of the national Emission Trading Scheme (ETS) and supports small-scale solar programs (e.g., Project "Solari"). Efforts are ongoing to establish sustainable financial models to support green transition projects and mitigate adverse impacts on vulnerable groups affected by energy cost increases.

The Investment and Development Fund of Montenegro (IDF) plays significant role in providing favorable financing conditions compared to the market, supporting economic development through loans, guarantees, and other incentives. However, there is a need to enhance environmental assessments and establish clearer criteria linking loans to environmental impacts, ensuring investments contribute measurably to climate change mitigation and environmental protection.

Montenegro also has a Fund for Innovations aimed at funding programs and projects promoting innovation within the context of green transition. However, regulatory framework improvements are necessary to implement new financial instruments effectively. The establishment of the Credit Guarantee Fund, intended to ease SMEs' access to credit, remains suspended by the government.

Policy recommendations

Below we provide policy recommendations, which could be considered as part of a GIP for Montenegro and accompanying policies, categorized by policy area.

1. **Green Industrial Development and EU Integration**
- Align all future investments in Montenegro with the EU Taxonomy to achieve green industrial development goals.
- Prevent fossil fuel-intensive investments by facilitating discussions on climate ambition and possible policy responses.
- Shape future industrial development in accordance with the concept of circular and low carbon economy.
- Align the national strategic framework with the new EU Industrial Policy to foster sustainable industrial growth and competitiveness.

2. **Innovation and Technology**
- Integrate into EU industrial development programs and projects (IPA III, Horizon 2020, etc.).
- Strengthen innovation and technology transfer, including developing innovative infrastructure, enhancing innovation potential for companies, and promoting cooperation with scientific and research institutions.

3. **Digitalization and Economic Development**
- Improve digitalization of the economy and society to enhance competitiveness and efficiency.

4. **Financial Market Development**
- Develop the financial market and enhance access to funds for medium and high technology sectors.

5. **Corporate Governance and Synergy**
- Improve corporate governance in state-majority-owned companies.
- Enable synergy and coordination across different sectors of the economy and areas of social development to achieve a competitive economy and job creation.

6. **Climate Policy and Transition**
- Facilitate a just energy transition by planning for those most affected.
- Climate policy and targets should drive future industrial sector evolution.

7. **International Position and Competitiveness**
- Recognize Montenegro's specifics and build an international position to maintain economic competitiveness and prevent carbon leakage.
- Send clear economic signals around technological trends and long-term growth plans.

8. **Climate Financing and NDCs**
- Facilitate climate financing through budgeting mechanisms to support decarbonized development pathways.
- Recalculate NDCs to ensure significant reduction of GHG emissions while supporting economic development.

9. **Circular Economy and Business Development**
- Prepare for strengthening the economy and adapting to the new circular business model.
- Use public-private partnerships to promote sustainable economic practices.

10. **Regulatory Environment and Administrative Procedures**
- Reduce barriers to business development and improve access to markets.
- Improve the regulatory environment and streamline administrative procedures.

8.5 North Macedonia

Introduction and country context

North Macedonia is assessed as having made some progress in the economic criteria required to join the EU, as assessed in last EC country report, and is at a good level of preparation in developing a functioning market economy. The country is in between a moderate and a good level of preparation in the area of economic and monetary policy. It has a good level of preparation in the areas of science and research, a good level of preparation on trans-European networks and some level of preparation on environment and climate change. The country is moderately prepared on transport and energy policy with some progress made on energy, particularly on regional gas interconnectors and on renewables.[238] North Macedonia has had an average growth rate of 1% over the past 4–5 years, the lowest among countries in the Western Balkans (WB) region. For comparison, the average growth rate for WB countries during the same period is about 2.5%.

Currently, North Macedonia's GDP per capita stands at 42% of the EU average, placing it among the European countries with the lowest economic development levels. One of the key reasons for this slower growth is the country's economic structure, which has seen slow change over the last two decades. Moving forward, a major challenge for North Macedonia will be the structural transformation from low-productivity sectors to those with higher added value, supported by policies stimulating innovation, investments, and access to new technologies.

The service sector dominates the economy, contributing over 61% to GDP. Within this sector, wholesale and retail trade, motor vehicle and motorcycle repair, transport and storage, and accommodation and food services are the largest contributors to GDP.

Republic of North Macedonia is NATO member and EU candidate country, expecting the opening of the negotiations.

Strategic framework: motivation & targets

North Macedonia faces dual responsibilities regarding climate change as both an EU candidate country and a developing country under the UNFCCC. Energy and climate policies are closely connected since over 70% of North Macedonia's greenhouse gas (GHG) emissions come from the energy sector (75% in 2019). The country's reliance on electricity and fossil fuel imports makes it vulnerable to changes in energy markets. To address these issues, North Macedonia has committed to ambitious international and national climate goals, including a plan to phase out coal by the end of the decade while ensuring energy security.

Energy policy in North Macedonia is outlined in the National Energy Development Strategy until 2040, adopted in December 2019. The Energy Development Strategy includes plans to phase out coal entirely by 2027 and aims for 45% of total energy production to come from renewable sources by 2040. North Macedonia's Energy Law, adopted in July 2024, aligns with the EU's Third Energy Package.

As a member of the Energy Community Treaty, North Macedonia must align its energy and climate laws with EU regulations and implement a National Energy and Climate Plan (NECP). North Macedonia was the first Western Balkan

238 https://neighbourhood-enlargement.ec.europa.eu/system/files/2023-11/SWD_2023_693%20North%20Macedonia%20report.pdf

economy to adopt its National Energy and Climate Plan (NECP), in 2022. The NECP recognizes renewable energy sources (RES) as a key driver of energy security and contains ambitious measures and targets for their development. The NECP also aims to bolster energy security by diversifying energy imports and improving regional interconnection capacity, especially for natural gas for which North Macedonia is entirely reliant on imports.

The National Energy and Climate Plan (NECP), covers the period from 2021 to 2030 and sets out the path to achieving 2030 targets. It integrates policies from the Energy Strategy and additional measures from the industry, agriculture, forestry, land use, and waste sectors. The NECP addresses all five dimensions of the Energy Union: decarbonization (covering GHG emissions and renewable energy sources), energy efficiency, energy supply security, the internal energy market, and research, innovation, and competitiveness.

Following the Energy Community Ministerial Council's decision in December 2022, which set more ambitious 2030 targets for greenhouse gas reduction, energy efficiency, and renewable energy, both the National Energy Strategy and the NECP need to be updated.

To build on this positive momentum and complete the legal and policy framework for energy sector decarbonization, the Law on Climate Action (LCA) need to be adopted. With adoption of the LCA is expected to be established a legal framework for a national system of carbon inventories and prices, encouraging emission reductions in high-emitting sectors and supporting the transition to a low-emission economy. Additionally, the Law on Environment provides the legal foundation for planning GHG mitigation and maintaining the national GHG inventory system.

Under the Energy Community Treaty, North Macedonia is committed to harmonizing its legislation with EU standards. The country aims to join the EU in pursuing a carbon-neutral continent by 2050, though it has not yet set a specific net-zero target.

In September 2021, the Government adopted the Long-term Climate Action Strategy, which includes the introduction of a carbon tax for stationary installations and aviation operators as outlined in the draft LCA. The Energy Community is exploring a coordinated approach to introducing an Emissions Trading System (ETS) in the Western Balkans, though details are still being finalized. Achieving a climate-resilient economy and society is a key goal.

North Macedonia's enhanced Nationally Determined Contributions (NDC) and NECP set a target for an 82% reduction in economy-wide GHG emissions by 2030 compared to 1990 levels, or a 78% reduction compared to a business-as-usual scenario defined in the Energy Strategy. Specific targets for 2030 include:

- 38% renewable energy share in gross final energy consumption.
- 66% renewable energy share in gross electricity production.
- 45% renewable energy share in heating and cooling.
- 10% renewable energy share in final energy consumption in transport.

These objectives are reaffirmed in the NECP. Both the NECP and the National Strategy for Energy Sector Development outline the policies and measures needed to achieve these targets, providing mitigation scenarios through 2030 and 2040. North Macedonia's GHG reduction commitment is the most ambitious

among the Western Balkan countries, supported by 63 mitigation policies and measures in the NDC. North Macedonia's key mitigation targets are:

Nationally Determined Contribution (NDC)		Clean Energy Package (CEP) and NECP 2030 targets			
GHG emission reduction target for 2030compared to 1990 levels	**Net GHG emissions reduction compared to1990 level** *(CEP and NECP)*	**Emissions level, MtCO2eq** *(CEP)*	**Share of energy from RES in gross final consumption** *(CEP and NECP)*	**Final Energy Consumption, (energy efficiency contribution) Mtoe** *(CEP)*	**Energy savings relative to BAU scenario (NECP)**
-51% (without land use, land-use change, and forestry -LULUCF) or -82% net GHG emission reduction (with LULUCF)	-82% (with LULUCF)	2.2	38% from 17% in 2021*	2 from 1.83 in 2020	20.8% savings of final energy consumption or 34.5% of primary energy

Sources: Enhanced Nationally Determined Contribution and National Energy and Climate Plan of the Republic of North Macedonia. *Eurostat (for the actual share of renewable energy in gross final energy consumption in 2021).

Beyond 2030, North Macedonia plans to meet all new electricity demand with solar and wind power, using hydro and natural gas to balance the variable output of these renewable sources. To achieve net-zero emissions by 2050, the country will also need to make significant improvements in energy efficiency and adopt large-scale use of electricity and zero-carbon energy sources, such as biofuels and biomass, in key areas like transport, heating, and industry.

Key national laws and strategies (as of December 2023) are:

	Paris Agreement		Strategies					Laws			
	Entry into force	NDC* last update	LT-LEDS**	NECP	Climate change / Low-carbon Development Strategy	National Adaptation Plan	Energy Strategy	Law on Climate Action	Law on Air Quality	Law on Energy Efficiency	Law on Renewable Energy
Status	Nov 2017	Apr 2021	Nov 2021	(Until 2040)	(Until 2050)		(Until 2040)				

Legend: Green: document approved and valid. Blue: draft document exists but has not yet been approved. Red: document does not exist or expired.

*NDC: Nationally Determined Contribution
**LT-LEDS: Long-term low-emissions development strategy in accordance with Article 4 of the Paris Agreement.
Source: World Bank National Climate Actions Strategies & Policies Database (NCASPD).

— Green industrial policy considerations

› Industry in North Macedonia

The manufacturing sector in North Macedonia accounted for 12.4% of GDP, down from 13.4% in 2019, showing a decreasing trend over this period. Similarly, the mining and quarrying, and energy sectors have also seen their contributions to GDP decline, from 4.7% in 2019 to 3.5% in 2023.

As of 2024 principal components of industrial production were manufacturing (78%), mining and quarrying (9%) and electricity, gas, steam and air conditioning supply (13%). The most important sectors in manufacturing are: food and beverage, motor vehicles and semi-trailers, textiles and clothing, manufacture of electrical equipment , machinery and equipment, manufacture of basic metal, other non-metallic mineral products, etc.

Employment patterns mirror the economic contributions of each sector. The service sector employs the largest share of the workforce, while industry accounts for about 30–31% of total employment, of which manufacturing employs 19%.

North Macedonian exports have grown significantly over the past two decades. Over the last five years, despite the negative impact of the Covid-19 crisis, exports grew at an average annual rate of over 7%. However, the country faces a persistent trade deficit because imports outweigh exports. The import-export ratio, indicating how much of the imports are covered by exports, is less than 75%. This trade deficit has limited the positive impact of export growth on the overall economic growth of the country.

The lack of trade diversification and economic transformation limits the role of trade in North Macedonia's growth model. However, gradually the situation is changing, partially affected by the FDI in free economic zones. For example, automotive components and chemical industry products are becoming important share in export, bringing necessary improvements in export structure. Through implementation of Industrial policy and a newly adopted Export Promotion Strategy, new initiatives for improved export readiness and export promotion will be launched.

The Industrial Strategy of the Republic of Macedonia 2018–2027 with Action Plan aims to promote industrialization by stimulating the growth and development of the manufacturing sector to boost productivity, create good jobs, raise incomes and strengthen human capital while addressing the challenges of the circular economy. In addition, further support of the smart specialization concept will enable a comprehensive model for research and innovation to support sustainable economic growth build on the capacities of the endogenous industry, science and society. Thus, new innovation and product diversification can be expected in the smart specialization domains. Under the smart specialization strategies, there are four vertical and two horizontal priority domains:

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

Export performance in North Macedonia

Export performance	2019	2020	2021	2022	2023
Export, mil. euros	6443.3	5781.084	6969.766	8299.582	8322.815
Import, mil. euros	8441.049	7599.42	9648.126	12125.23	11148.54
Net-export, mil. euros	-2247.47	-2078.29	-3155.97	-4027.41	-3056.5
Import-export ratio, %	76.2	76.2	72.3	68.4	74.6

Source: National Statistical office of Republic of North Macedonia

Carbon pricing and CBAM

North Macedonia will be affected by the introduction of the EU's Carbon Border Adjustment Mechanism (CBAM). Starting in 2026, EU importers must purchase certificates for goods coming from outside the EU. These certificates will be equivalent to the weekly EU carbon price unless the imported goods are already subject to a carbon pricing system comparable to the EU's Emissions Trading System (ETS). Initially, CBAM will apply to imports in specific high-emission sectors: cement, iron and steel, aluminum, fertilizers, hydrogen, and electricity. To prepare for this impact and support a transition to a greener economy, North Macedonia should consider implementing a form of carbon tax.

› Economic opportunities

The green transition implies a shift towards economically sustainable growth and an economy that is not based on fossil fuels and over consumption of natural resources. A sustainable economy relies on low-carbon solutions that promote circular economy and biodiversity. The sustainability of the energy sector is a pressing concern, with the country's reliance on fossil fuels and energy-intensive growth model contributing to environmental degradation and public health issues. Transitioning to a cleaner energy mix, improving energy efficiency, and investing in renewable energy sources are imperative for reducing environmental impact, ensuring energy security, and supporting environment-friendly economic development.

A more efficient and circular economy

North Macedonia is taking proactive measures to confront the challenges arising from growing vulnerabilities to climate change, dependence on imported raw materials, and increasing waste levels. These challenges significantly impact North Macedonia's efforts to regional integration an alignment with the European Union. Prioritizing competitiveness, fostering fair and equitable growth, decarbonizing the economy, and preserving the environment stand prominently as key priorities in North Macedonia's national interests.

The principal aim of the newly developed Circular Economy Roadmap is to assist the government of North Macedonia in establishing a sound policy framework for its transition to a circular economy. This involves strengthening inter-governmental co-ordination and stakeholder engagement, thereby facilitating the necessary transformations. Drawing on a thorough diagnostic of the state of play of the circular economy in North Macedonia, and integrating ongoing policy initiatives, the roadmap seeks to foster synergies across various sectors, measures, and stakeholders involved in the circular economy. It provides essential policy recommendations for five selected priority areas: circular business models for SMEs, construction, biomass and food, textile, and mineral resources/mining and metallurgy.

Energy efficiency measures can reduce demand in various sectors. Coal and oil need to be replaced by natural gas and electricity. After 2030–2035, carbon capture and storage (CCS) may become economically viable for industrial emissions reduction. By 2050, CCS could potentially remove about 1 MtCO2eq/year of industrial process emissions. A carbon price, possibly through a carbon fee, could support decarbonization efforts. This fee could generate revenue for investment needs and transition policies. Extending the scope to Carbon Border Adjustment Mechanism (CBAM) sectors could reduce exposure to CBAM charges. Carbon pricing can accelerate decarbonization and promote renewable energy expansion, especially in a regional electricity market.

Better waste management and more recycling can improve resource efficiency. In 2020, total generated waste was 1.5 million tonnes (of which close to half comes from industry). Non-hazardous waste accounted for 71.9%, while hazardous waste was 28.10%. The mining and quarrying sector generates the most waste. Of the 1.5 million tonnes of treated waste, 62% was landfilled and 37% was recycled.

The mining sector has particular circular economy challenges. However, extraction methods have caused long-term water and soil pollution, impacting biodiversity and local health. Recent legislation aims to improve health and environmental protection. Enhancing circularity in mining operations and recovering critical raw materials from current and historical mining waste could improve sustainability and environmental protection.

Boosting efficiency and circularity would help North Macedonia take advantage of EU trade agreements and avoid the impacts of the CBAM. The Stabilization and Association Agreement with the EU provides favorable export conditions for Macedonian companies. The EU accession process involves gradual integration into the EU single market. North Macedonia exports nearly 80% to the EU market. Companies need to adapt to EU environmental policies such as the Ecodesign Directive, ESG standards, and CBAM. The government should support companies in this transition through legislation, institutional support, and promoting competitiveness. Chambers of commerce assist with information dissemination and training, especially regarding CBAM and Emissions Trading System opportunities. Companies that fail to meet these standards may lose competitiveness and market opportunities, particularly in CBAM-covered sectors.

Raw material potential

Mining and quarrying contribute 1.3% to North Macedonia's GDP (as of 2018) and 10.9% to industrial production. The sector employs less than 1% of the workforce and accounts for 2.8% of total exports (as of 2021). Over 100 active mines operate in the country, extracting both non-metallic and metallic mineral resources.

North Macedonia possesses diverse mineral resources. Metallic minerals include copper, silver, gold, zinc, and lead. Non-metallic minerals include bentonite, talc, gypsum, quartz, and quartz sand. The country also has energy materials such as coal (lignite). The mineral potential of North Macedonia is considered significant and requires further geological investigations to identify additional natural mineral resources.

A Strategy for geological research and sustainable use and exploitation of mineral resources for 2025–2045 is being developed. This strategy aims to provide a sustainable and scientific approach to geological research. Its objectives include understanding the geological evolution of North Macedonia, improving living conditions, reducing accident risks, and enhancing the standard of living for citizens.

The mining and materials sector has significant decarbonization potential. Metals and minerals extraction and production account for a large share of total greenhouse gas (GHG) emissions. Estimates range from 45%-67% of total emissions, depending on geographical scope, methodological approach, and time period of analysis. Most emissions related to materials are associated with the production of materials, goods, and infrastructure, including energy-related emissions from manufacturing products and materials.

› A cleaner living environment

A healthy and sustainable environment is crucial for economic competitiveness as it supports resource efficiency, enhances resilience to climate-related risks, fosters innovation, and attracts investments while mitigating environmental degradation and associated costs.

The national commitment to sustainable development, as outlined in North Macedonia's National Strategy for Sustainable Development (2010–2030), relies on the successful adoption of circular economy principles aligned with the UN Sustainable Development Goals. Pointedly, the journey towards sustainable development and EU integration mandates a comprehensive strategy for waste management. This is the central focus of both the National Plan for Waste Management (2021–2031) and the National Waste Prevention Plan (2022–2028). These plans are designed to facilitate the necessary shift from a linear waste model to a circular approach that emphasizes the promotion of reuse and recycling.

While North Macedonia has yet to strengthen its comprehensive framework for environmental protection, extending beyond climate change mitigation to align with the EU acquis, the long-term Strategy on Climate Action (2021-2051) places a strong emphasis on enhancing institutional capacity to cut greenhouse gas emissions. This strategy aligns with the EU climate framework and the objectives of the Paris Agreement. Other environmental considerations are increasingly incorporated into industry-specific policies. A notable example of this is evident in the Smart Specialization Strategy, which strives to facilitate a green transition across North Macedonia's key sectors (including, for example, the agriculture and food sector and manufacturing industries). This involves reshaping supply chains to accommodate more circular products and services while fostering eco-innovation in crucial economic domains.

While waste management remains an important challenge in North Macedonia, the revised legal and policy frameworks are expected to accelerate the circular transition by reducing waste production and increasing levels of reuse, recycling, and recovery of products.

Ongoing efforts are under way to strengthen the protection of ecosystems, with specific initiatives focused on regulating freshwater, forestry, and biodiversity management. Shifting to a circular economy includes addressing the complete life cycle of products, from design and manufacturing to consumption, repair, reuse, recycling, and reintegrating resources into the economy.

Concepts envisioning sustainable resource use, consumption, and production have been increasingly mainstreamed in policy documents across different sectors, namely the National Plan for Waste Management (2021–31) and the National Waste Prevention Plan (2022–28), the Long-Term Strategy on Climate Action, and the newly adopted Smart Specialization Strategy.

Innovation can lead to the development of new technologies and processes that can help reduce greenhouse gas emissions, improve energy efficiency, promote the use of renewable energy sources, reduce the environmental impact of farming by promoting sustainable practices and reducing waste. Innovation can also help promote the circular economy by developing new products and services that are designed to be reused, recycled, or repurposed.

› Cheap green energy

North Macedonia's installed electricity capacity is 2.06 GWh, with a production mix of thermal (48%), hydro (34%), gas (15%), and renewable energy sources (3%). The country has been experiencing a decline in coal production and an increase in RES production. However, it still maintains a high import dependence, with about 30% of total electricity consumption coming from imports.

The integration of higher shares of renewable energy sources (RES) in a country's energy mix can exert a notable impact on its Gross Domestic Product (GDP). Transitioning to renewable energy contributes to environmental sustainability and can stimulate economic growth through various channels. Investments in renewable energy infrastructure, such as wind, solar, and hydropower facilities, creates employment opportunities and spurs economic activity in the construction and manufacturing sectors. Additionally, the development and deployment of renewable technologies often foster innovation, attracting investments in research and development.

As the energy sector transforms, it can enhance energy security, reduce dependency on fossil fuel imports, and mitigate the economic risks associated with energy price volatility. Promotion of RES aims to increase RES installed capacity in the country to 1 493 MW by 2025.

The NECP sets the target for the share of renewable energy sources in gross final consumption of energy in 2030 at 38%, and the indicative target for 2023 at 26%. The share of RES in the gross final energy consumption for 2022 was 18.8%. Investments in 105 hydropower should be compliant with the relevant environmental acquis. Optimizing balancing services and investments in energy transmission and energy storage should be promoted to improve the integration of renewable energy sources into the grid. An upgrade of the grid system is necessary.

The country has a well-developed transmission network, including 577 km of 440 kV and 1 601 km of 110 kV power lines, with five interconnection points to neighboring countries. Despite this, there's potential to improve power reliability in the distribution network. Natural gas currently accounts for 7% of primary energy consumption, with plans for network expansion.

The construction of a new 400kV electricity transmission interconnector line with Albania is under way. On gas interconnections, the government has finalized the initial design phase for the construction of an interconnection line with Greece and has drawn up feasibility studies for a line to Serbia and to Kosovo.

North Macedonia possesses significant renewable energy potential, including excellent solar resources, good wind sites, and available land and water bodies. In 2022, 267 new renewable energy power plants were built, increasing capacity by 18% (144.4 MW). By the end of 2022, renewable energy power plants with a total installed capacity of 946 MW.[239]

The renewable energy sector is considered strategic for North Macedonia's economy. Investments in this sector are expected to create jobs and improve energy infrastructure. The government has simplified procedures for rooftop solar installations and provides support for technology transfer, circular economy, and green transition initiatives.

239 https%3A%2F%2Fwww.energy-community.org%2Fdam%2Fjcr%3Af0c98e19-9500-4b08-981e-c41a1d7827fe%2FEnC_IR2023_North_Macedonia.pd

Looking ahead, North Macedonia aims to diversify its energy sources and decarbonize its energy system. However, the country faces several challenges in this transition, including the need to revitalize the existing transmission network and develop new large power plants to support system stability.

To address these challenges and support the energy transition, North Macedonia is considering new regulations, such as mandatory battery systems for new plants, to enhance grid stability and support renewable energy integration.

› A fairer society: opportunities for all

Supporting impacted regions and people

The green transition in North Macedonia is expected to affect approximately 66 000 workers, who may need to change occupations. To address this, the country needs to (i) modify the education system to meet new skill requirements; (ii) adjust social protection mechanisms to support affected workers; (iii) provide retraining programs for those changing careers.

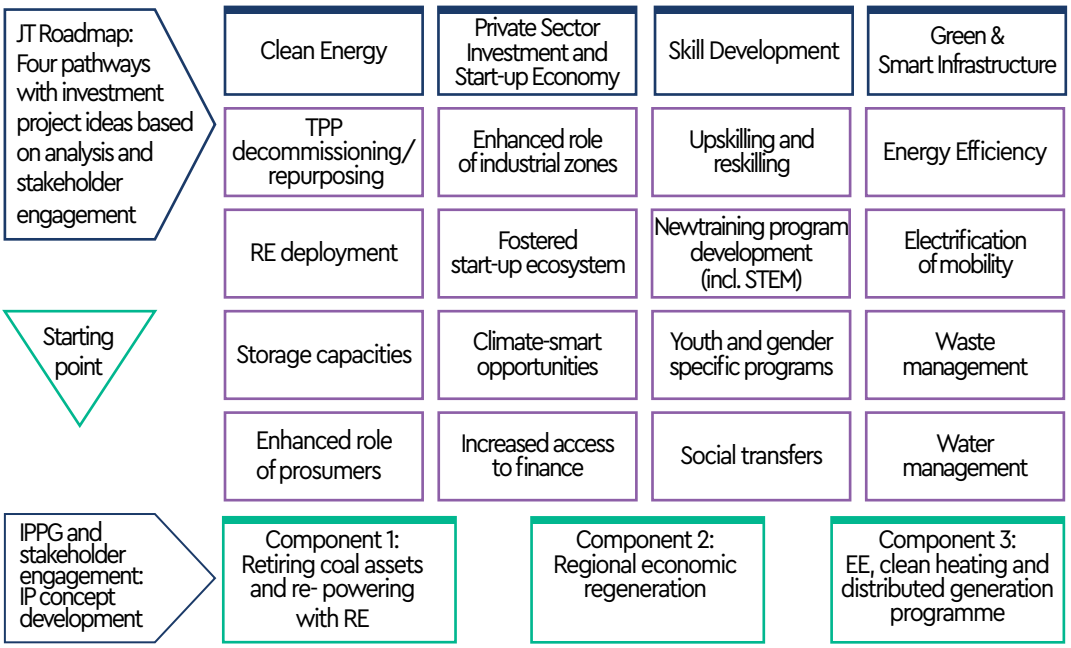
North Macedonia adopted a Roadmap for Just Transition in June 2023 which aims at launching activities that will enable the transition away from coal, and further align with the EU policies for accelerated green growth. The roadmap includes measures on alternatives to conventional energy sources while mitigating impacts on coal workers and communities through the transition to new "green" jobs. The Roadmap for Just Transition is composed of four pillars: 1) the path for clean energy (modernization and development of the energy sector); 2) the path for private investment and start-up support; 3) the path for green and smart infrastructure; and 4) the skills development path.

To support the energy transition in the country, Republic of North Macedonia has been selected by the Climate Investment Fund to participate in the Accelerating Coal transition Program and to develop an Investment Plan with an initial funding of $85 million (loan and grant). The Government, intends to establish Just Energy Transition Investment Platform of North Macedonia, supported by EBRD, EIB, KfW. The Platform intends to holistically facilitate the country's rapid and just low carbon energy transition, in line with its climate and development goals, the Nationally Determined Contribution to Climate Change and the Strategy for Energy Development of the Republic of North Macedonia up to 2040. The Platform's financing needs are estimated at EUR 3 billion. The Platform intends to mobilize financing and resources, including grants and concessional resources to support its implementation.

Given that coal-dependent regions face structural labor market challenges, including coal-income trap, low activity and high unemployment, the roadmap calls for an integrated approach to the transition. This includes vocational education, improvement of non-formal education, early retirement options, creating new economic/job opportunities and upskilling/reskilling packages with subsidizing schemes for the job transition of workers affected by the coal phase-out. The total cost of the proposed Just Transition Roadmap actions ranges between €29.4–44.6 million annually depending on a mix of technology and policy drivers for emissions reduction, including carbon prices/taxes, sector-specific and cross-sectoral price- and non-price-related policies and measures.

The Just-Transition Roadmap also provided socio-economic inputs for the Accelerating Coal Transition Investment Program developed by the Government of North Macedonia in December 2023, targeting $676.3 million sourced from multilateral development banks, but also public and private investment.

Just Transition Roadmap Guiding development of ACT IP



Just-transition roadmap for North Macedonia

Clean energy	Private investments and startup economy	Green and smart infrastructure	Skills development
Conversion of the existing lignite-fired thermal power plants	Improving the attractiveness of coal-dependent regions for investment	Energy efficiency	Systemic interventions
Increase participation of storage units in electricity markets and energy systems by prioritizing the coal-dependent regions	Connecting local business with large enterprises	Smart and sustainable local mobility	Continuing vocational training
Increase in the share of renewables in gross final energy consumption through large scale industrial development	Setting up a startup ecosystem to boost local innovation	Waste management	Integrated actions for ALMPS
Promoting prosumers as one of the key actors of the just energy transition	Promoting networking and creating a critical mass of start ups	Water supply and management	Work-based learning
	Removing infrastructure barriers	Digital innovation	Youth guarantee initiative
	Upgrading the industrial zones		Active labor market measures
	Greening production processes		Smooth transition on the labor market

Source: Just-Transition Roadmap for North Macedonia, May 2023.

A focus on better education and skills

Transitioning to greener forms of production, distribution and consumption will affect the labor market, requiring new knowledge for technology opportunities, optimization of production process, new business models, digital skills

supporting solutions for green transition, etc. These requirements goes beyond the high polluting sectors and require upskilling. The green transition will require comprehensive reforms in education and training system due to its complexity and importance.

Due to the new requirements, specific focus should be given on propoting and co-financing the collaboration between public and private sectors in research, development and innovation, as is envisaged in North Macedonian strategic documents.

Education must provide students with the skills and competencies needed in the current and future labor market and should be supported by active labor market policies to reskill and upskill persons affected by the green transition. This will require investment in retraining, reskilling and upskilling to remain productive in a given occupation, or to move to another occupation with similar skill requirements.

Adaptation of the education system should start from early learning to the Technical and Vocational Education and Training (TVET), continuing to Higher Education levels so that the education systems produces green skills ready for the new economy.

The green transition will affect approximately one out of six workers in the entire labor force due to changes in technology or business models. The national Just transition roadmap estimated that at least 66 000 workers are employed in occupations for which a high percentage of jobs will need retraining and for which the skills gap is large, and therefore are most at risk. Missing the required investments in retraining and upskilling will put individuals at risk of unemployment, and firms at risk of missing growth opportunities due to a lack of adequate workforce.

In the medium-term, the implementation of the Circular Economy Roadmap North Macedonia could also support capacity building and entrepreneurship skills as well as vocational training on circular economy. Education and capacity building instruments include tailored training courses for companies and entrepreneurs and advise/consulting support for startups, companies and entrepreneurs. This could be provided by a variety of institutions in the country or within international projects funded by development cooperation partners.

Awareness raising initiatives and education activities are especially relevant for SMEs and start-ups, which, besides their already lesser exposure to domestic R&D and innovation activities, might also not be fully aware of the opportunities offered by circular business models and might lack skills in accessing and using existing data, information and knowledge.

The funding support also needs to be combined with support for education and training of employees working in the industry to improve their digitalization and engineering skills to deal with new software and technologies that help optimize production process and reduce generated waste. Developing eco-design, innovative textile production, repair and reuse skills is also crucial and will become even more so in the future (EU Strategy on Sustainable and Circular Textile). In order to facilitate this change, Active Labor Market Policies (ALMPs) supporting on-the-job training or upskilling for unemployed people will not be sufficient and need to be complemented with long-term education and training reforms. This also requires adjustments on the supply side of training provision, including training for adult workers, with an increasing role for the private sector to play.

Financing GIP

To enable and foster the green transition and climate change-related investments different forms of investment schemes and access to various sources of finances, as well as a stable regulatory environment are required. It should be aligned with the climate-related national strategies, laws, and action plans, and be compatible with the EU green taxonomy.

Sources of finance can be different depending on the scope and the type of investment, varying from private investments, public private partnership, blended financing with international organizations, donors, EU projects, commercial banks, budgetary programs by different institutions.

North Macedonia is already attracting private sector investment via auctions and PPPs to fund and implement renewable energy projects. For example, the first large-scale solar power plant in North Macedonia, built on the site of the spent Oslomej lignite coal mine with the support of EBRD, combined investment from the SOE power utility (Elektranina Severna Makedonija) and private investors via PPP (EBRD, 2022; EBRD 2021). Since then, the government has awarded several renewable energy auctions, and there are a series of site-specific auctions for solar power investments in the pipeline to ensure more solar PV capacity in the country.

Funding sources include:

- **PPPs** can be further used for attracting private capital into municipal district heating and cooling.
- Issuance of **green debt instruments** can help mobilize financing for low carbon infrastructure. Green bonds can help the country scale up public and private investment to boost green growth and facilitate the realization of mitigation and adaptation priorities. North Macedonia issued the first green bond in October 2023, with a two-year repayment period and an interest rate of 4.75 percent in the amount of €10 million, that is expected to finance investments via the Energy Efficiency Fund. The latter is established as a revolving fund for energy-efficiency investments in the public sector with a funding size of million (of which 10million come from green bonds and €5 million come from the World Bank-financed Public Sector Energy Efficiency Project), but the Government can also tap into additional funds (Green Climate Fund and EU IPA).
- **Commercial banks** in North Macedonia have already scaled up efforts in response to demand for green financial products. Most of the commercial banks in the country (10 out of 12 banks) have already introduced green loans in their portfolio to respond to the increased demand of households and companies to invest in better insulation and roof-top photovoltaics in order to mitigate increased energy costs, in particular for heating and cooling of facilities. However, their participation in the credit portfolio is still low (4.4%). Green loans are often provided by financial support by Ministry of Finance or IFI credit lines (such as EIB, EBRD, French Development Agency) channeled through the Development Bank[240] or directly through commercial banks. Some of them also include advisory support and a performance-based grant component to encourage uptake of early adopters of green solutions. International banks operating in North Macedonia also have access to capital optimization instruments from guarantee agencies to reduce the regulatory risk-weighting applied to mandatory reserves and free up capital for climate financing. The freed-up capital can then be used to support green lending in areas such

240 https://www.mbdp.com.mk/

as renewable energy, energy efficiency and green buildings.

- North Macedonia can also tap into **EU pre-accession and guarantee funds** to leverage additional financing.
- At the international level, financial support from the EU and other international donors for climate actions could be further utilized to promote adaptation and sustainable economic development. The Green for Growth Fund invests in measures designed to cut energy use and CO2 emissions and improve resource efficiency in 19 markets across Southeast Europe, providing such financing directly to renewable energy projects, corporates and municipalities, or indirectly, via selected financial institutions.)
- Projects financed by bilateral organizations (SECO, GIZ are most visible in North Macedonia) as well as multilaterals as well as other funds such as the Adaptation Fund, the Green Climate Fund, and the Special Climate Change Fund, have also deployed billions of dollars in adaptation and could be leveraged further.

At the national level, public financing schemes and budgetary planning for adaptation need to be enhanced. The government should allocate adequate financial sources to support adaptation, identify the responsibilities of relevant institutions, and mainstream climate into budgetary planning at national and municipal levels. Instruments that have already been established include:

- A guarantee scheme within the Development Bank, wherein the state offers an opportunity for easier access to finance by taking part of the credit risk together with commercial banks.
- The Development Fund has already been established in 2022 within the Development bank, which will support export-oriented companies in the field of research and development with favorable credit products, as well as financing projects to improve energy efficiency and long-term energy sustainability. Also, within the Development bank the mechanism for the functioning of the Hybrid Strategic Green Investment Fund has been put into operation, for support to export of innovations and to European Green Deal practices. To mitigate the effects of the energy crisis and high inflation, the government introduced support measures that should be better targeted.
- The mechanism for the functioning of the Hybrid Strategic Green Investment Fund has been put into operation, with the aim of supporting investments in practices in accordance with the European Green Agreement.
- The **Energy Efficiency Fund** is being established within the **Development Bank of North Macedonia.** The funding was provided through the issuance of the first-ever green government bond in the amount of €10 million. It will finance energy efficiency projects.
- A set of instruments by the Fund for Innovation and Technological Development stimulating innovation and technology transfer and forthcoming IPA Project Green Business Facility valued more than €20 million.
- Stimulation of private investments in new technologies, capacities for growth including green transition through financial support enabled by the Law on financial support to investments.

Policy recommendations

Below we provide policy recommendations, which could be considered as part of a GIP for North Macedonia and accompanying policies, categorized by policy area.

1. **Energy transition and decarbonization**

- Implement energy efficiency measures to reduce demand across sectors.
- Replace coal and oil with natural gas and electricity.
- Develop carbon capture and storage (CCS) technology for industrial emissions reduction.
- Introduce a carbon pricing mechanism, possibly through a carbon fee.
- Accelerate the transition to renewable energy sources, particularly solar and wind power.
- Improve energy infrastructure, including transmission and distribution networks.
- The NECP should be updated following the requirements of the Law on Energy and Law on energy efficiency, as well as the requirements from the Clean Energy package for all Europeans, as adopted and adapted by the Energy Community. The revised NECP would need to include plans for the practical implementation of the obligations set out in updates to the Energy Community acquis – such as the update of the Renewable and Energy Efficiency Directives, the adoption of the Clean Energy Package with new rules regarding the electricity and gas markets and security of supply, as well as the rules for the monitoring, reporting, and verification of GHG emissions at the installation level. The NECP should reflect on the policy developments in the EU via the Fit for 55 package and elaborate on areas that are high on the policy agenda, such as energy poverty and the fairness of the transition. In this respect, the incorporation of the activities and plans of the ongoing program of the EBRD related to just transition in the NECP would also be needed.

2. **Circular economy and resource efficiency**

- Enhance waste management practices, focusing on increasing recycling rates.
- Improve circularity in mining operations.
- Recover critical raw materials from current and historical mining waste.
- Develop and implement a strategy for sustainable use of mineral resources.
- Support companies in adapting to EU environmental policies (e.g., Ecodesign Directive, ESG standards).
- Adopt and implement the Circular Economy Roadmap.

3. **Just transition and social protection**

- Modify the education system to meet new skill requirements.
- Adjust social protection mechanisms to support affected workers.
- Provide retraining programs for those changing careers due to the green transition.
- Implement the Just Transition Roadmap, including measures for coal workers and communities.
- Develop and implement active labor market policies to support the transition.

4. **Green finance and investment**

- Develop a green taxonomy aligned with EU standards.
- Issue green bonds to finance low-carbon infrastructure projects.

- Encourage commercial banks to expand green financial products.
- Leverage EU pre-accession and guarantee funds for green investments.
- Establish and expand green investment funds (e.g., Energy Efficiency Fund, Hybrid Strategic Green Investment Fund).
- Promote public-private partnerships (PPPs) for renewable energy and municipal services projects.

5. **Skills development and education reform**

- Invest in retraining and upskilling programs, particularly in STEM fields.
- Reform the education system to produce green skills needed for the new economy.
- Promote collaboration between public and private sectors in research, development, and innovation.
- Develop specialized training programs for adult workers.
- Focus on raising awareness on the circular economy and circular business models through communication campaigns and capacity-building programmes, including showcasing of good practices and access-to-finance possibilities.

6. **Climate adaptation and resilience**

- Strengthen capacity to access international climate finance for adaptation projects.
- Enhance public financing schemes and budgetary planning for adaptation.
- Mainstream climate considerations into national and municipal budgeting.
- Improve disaster risk financing to strengthen financial resilience to climate disasters.
- Promote private sector involvement in adaptation activities and climate finance.
- Strengthen the climate change adaptation framework and ensure the capacity for its implementation.

8.6 Serbia

Introduction and country context

According to the official data, Serbia has faster economic growth than the EU and the rate of growth has been increasing in recent years. Based on data of World Economics,[241] Serbia's Compound Annual Growth Rates (CAGR) over the last 10, 5 and 3 years were 2.9%, 3.4% and 4.4% respectively.[242] While data of the National Bank of Serbia, shows that cumulative growth of real GDP in the period 2020–2022, was 9.5%. In 2022, GDP was €67 billion. Compared to the previous year, GDP increased by 13.2% in nominal terms, and by 2.5% in real terms.[243] In 2022 GDP per capita was €9 839.[244] Serbia's GDP per capita is less than half the EU average (in 2021, around 42% of the EU-27 lagging by nearly the same proportion as in 2013).

The European Council granted Serbia the status of candidate country in 2012. The Stabilization and Association Agreement (SAA) between Serbia and the EU entered into force in September 2013. Alignment of the national legislation with the EU Acquis Communautaire and policy commitments is an obligation of the Republic of Serbia since ratification of the SAA in the Parliament.

Strategic framework: motivation & targets

Alignment of climate and energy goals

In November 2020, the Serbia signed the Sofia Declaration on the Green Agenda for the Western Balkans and commits to work towards the 2050 target of a carbon-neutral continent together with the EU through mainstreaming a strict climate policy and reforming energy and transport sectors. In addition, as a Contracting Party to the Energy Community (EnC) Treaty, Serbia has the obligation to implement the energy and climate acquis. In December 2022, the 2030 energy and climate targets were adopted[245], aiming to put the EnC Contracting Parties on a path towards achieving climate neutrality and decreasing dependence on fossil fuels. Serbia accepted the following targets:

Target indicator	Share of energy from renewable sources in gross final consumption of energy, 2030	Primary Energy Consumption, 2030	Final Energy Consumption, 2030	Target for net GHG emissions compared to 1990 levels
Adopted under the EnC	40.7%	14.94 Mtoe	9.54 Mtoe	-40.3% (47.82 MtCO2eq)
Draft NECP[246]	33.6%	14.68 Mtoe	9.7 Mtoe	-40% (47.76 MtCO2eq)

The draft NECP is an important part of aligning with EU standards. It recognizes need for modernization of industrial process technology and increased material

241 https://www.worldeconomics.com/Information/What-We-Do/
242 https://www.worldeconomics.com/Countries-With-Highest-Growth/Serbia.aspx
243 Gross Domestic Product, 2022, Statistical Office of the Republic of Serbia, https://www.stat.gov.rs/en-us/vesti/statisticalrelease/?p=13820
244 EC, https://webgate.ec.europa.eu/isdb_results/factsheets/country/overview_serbia_en.pdf
245 Decision 2022/02/MC-EnC by the Energy Community Ministerial Council
246 EnC Secretariat, Recommendations on the draft integrated National Energy and Climate Plan of the Republic of Serbia covering the period 2025–2030, https://www.energy-community.org/news/Energy-Community-News/2023/11/13.html

efficiency in the production process in many hard-to-decarbonize sectors such as the cement industry and the iron and steel industry, as well as the coal mining industry. It also calls for the cooperation between research institutes and the industry in order to maximize the use of the research results, development of innovative energy-saving technologies, such as energy efficient heating and cooling technologies, heating and cooling recovery and systems integration; promotion of innovative circular economy technologies to improve businesses competitiveness etc. In the process of alignment with the EU Large Combustion Plants Directive under the EnC, National Emission Reduction Plan (NERP) was adopted in 2020, aiming to reduce the emissions from large combustion plants. However, there is lack of implementation of the NERP and the Secretariat of the Energy Community initiated proceedings against Serbia.

Serbia is the Party to the Paris Agreement since 2017. In 2015, the Government submitted its first National Determined Contribution (NDC), committing on the GHG emissions reduction of 9.8% by 2030 compared to 1990 (without LULUCF sector). In August 2022, updated Nationally Determined Contribution (NDC2) is submitted, increasing the GHG emission reduction to 13.2% compared to 2010 level (i.e. 33.3% compared to 1990) by 2030 (without LULUCF sector). The Serbian NDCs also refer to losses and damages associated with extreme weather events and indicates the need to adapt to climate change. The GHG emissions reduction commitment includes reduction from the industrial processes and product use (IPPU) sector.

The long-term horizon to the NDC2 is provided in Low-Carbon Development Strategy (LCDS)[247]. The vision of the Strategy is that, by 2050, Serbia will be a carbon-neutral society with a competitive and resource-efficient economy which provides citizens new, green jobs and a quality life in a climate-resilient society. The general objective of the LCDS is: Reduction of the GHG emissions (excluding LULUCF) by 13%, up to 2030, and at least 55% to 69% by 2050 compared to 2010, that is equivalent to the GHG emission reduction of 33% in 2030, and at least 65% to 76% by 2050 compared to the GHG emissions in 1990.

Such national GHG emission reduction without the LULUCF, assumes reduction of GHG emissions in electricity and heat production by 17% by 2030 and between 78%-89% by 2050, compared with 2010 and throughout increase of energy efficiency and RES, in the industrial sector by 15% by 2030 and between 37%-55% by 2050, and in the residential and commercial sectors by 40% by 2030 and between 70%-78% by 2050, compared with 2010. Contribution of the other sectors is presented through specific objectives that are:

Specific objective 1: Reduce GHG emissions covered by the EU-ETS by 15% in 2030 and between 66,4% and 76,8% by 2050 compared to 2010.

Specific objective 2*:* Reduce GHG emissions not covered by the EU-ETS by 9,7% in 2030 and between 33,5% and 54,5% by 2050 compared to 2010, that include the following sectoral targets, compared with 2010:

- Reduce emissions, through the increase of energy efficiency and use of RES, in the industrial sector by 15% by 2030 and between 37%-55% by 2050, and in the residential and commercial sectors by 40% by 2030 and between 70%-78% by 2050.
- Limit GHG emissions growth in the transportation sector by 10% by 2030 and reduce emissions by 30%-54% by 2050.

247 Low-Carbon Development Strategy for the period 2023–2030, with projections up to 2050 ("Official Gazeta of the RS", No. 46/2023)

- Limit GHG emissions growth from Industrial Processes and Product Use by 7% and retain emissions between the range of +3% to -3 by 2050.
- Reduce GHG emissions in agriculture by 15% by 2030 and retain emissions between the range of +2% to -24% by 2050.
- Reduce GHG emission in the waste sector by 13% by 2030 and between 29%-69% by 2050; compared with 2010.

Specific objective 3: Increase the carbon sink by 17% by 2030 and between 22% and 132% by 2050, compared to 2010.

Specific objective 4: Preserve the potential of mitigation measures, determined for 2030 and 2050, by increasing the resilience to climate change of the water management, agriculture and forestry.

Serbian industrial policy

In the framework of its EU accession negotiations, under Chapter 20 – Entrepreneurship and Industrial Policy, Serbia is committed to adopting a comprehensive industrial policy aligned with EU principles. This policy is informed by the "Smart Specialization Strategy of the Republic of Serbia for 2020–2027"[248] (4S), which identifies four priority areas: Food for the Future, Future Machines and Manufacturing Systems, Information and Communication, and Creative Industries. The first two areas emphasize the need for environmental protection, while Food for the Future also addresses climate change. In Creative Industries, smart packaging development, which includes green materials like degradable and renewable resources, is prioritized. The 4S highlights the absence of industries based on green technologies and prioritizes water and soil treatment, waste recycling, and environmental innovations for long-term sustainable development.

The Industrial Policy Strategy of Serbia for 2021–2030[249] aims to enhance the competitiveness of Serbian industry through five specific goals. These goals are supported by measures focusing on digitalization, innovation, investment, and restructuring. The strategy includes both horizontal measures to support SMEs, entrepreneurship, and competitiveness, and vertical policies based on the 4S, targeting both traditional and new industrial sectors. Key areas of focus include education, digital transformation, infrastructure, the circular economy, and a conducive business environment.

The 2030 Vision for Serbia's industrial sector is to establish an open, regionally and globally competitive, investment-driven, educated, innovative, and digitally transformed industry that fosters economic growth and improves citizens' quality of life. The overarching goal of Serbia's industrial policy is to enhance industry competitiveness, driving sustainable economic growth, measured by national GDP growth and improved living standards, reflected in GDP per capita. The policy also acknowledges a general lack of awareness among industry representatives regarding environmental protection and climate change, particularly in waste management and the potential to repurpose waste as raw material.

One of the five specific objectives in the policy is to transform the industry from a linear to a circular model. Sectors like manufacturing (especially food processing), construction, and primary agriculture have significant potential

248 https://pametnaspecijalizacija.mpn.gov.rs/wp-content/uploads/2021/06/Strategija-pametne-specijalizacije_EN_WEB.pdf

249 Adopted in 2020

for adopting circular economy principles. The Action Plan[250] for the strategy's implementation from 2021 to 2023 outlines three key measures (with seven activities) under Objective 5:

- Promoting circular economy practices and educating companies.
- Encouraging investment in circular and low-carbon solutions as growth drivers.
- Improving resource and energy efficiency in industrial processes.

Legal framework

Serbia has passed domestic legislation to align with EU standards. Among others, these include:

- The Law on Climate Change (LCC)[251] sets the basis for the establishment of a system for monitoring, reporting and verification (MRV) of emissions from stationary industrial and energy installations, in compliance with the EU Emissions Trading System (EU ETS). Hence, according to the LCC an installation that performs activity that leads to the GHG emission must obtain a GHG emissions permit, before the start of operations. In a case of installation that is already in operation, it must submit request for permit in prescribed timeline, that is the end of June 2024.
- The Law on Integrated Prevention and Pollution Control (IPPC Law, adopted in 2004) was amended in 2021, postponing the deadline for issuing IPPC permits, until the end of 2024. The IPPC permits ensure that polluters apply the best available technologies, operate in accordance with high standards of environmental protection and do not cause harm to human health and the environment. According to the preliminary list, there are a total of 227 facilities subject to the issuance of an IPPC permit. By summer 2024, permits have been issued for less than a quarter of a total number of facilities, while around 180 facilities are carrying out activities in Serbia without the necessary permit.[252]
- In 2021, Republic of Serbia adopted a Law on Use of Renewable Energy Sources[253] and amended the Law on Energy.[254] The Law on Use of RES (hereafter: Law on RES) envisages the development of a new incentive system for electricity generation from RES in the form of market premiums, but at the same time enables another incentive pricing scheme in the form of limited feed-in-tariff (for projects with installed capacities under 3 MW solar wind and under 0.5 MW for power plants using other RES), in the separate quotas and auction processes. The Law on RES also facilitate the establishment of energy communities and an opportunity of becoming the prosumer. The Law on RES prescribes two types of incentives: (i) incentives for use of innovative technologies and new RES such as green hydrogen, and (ii) incentives for the production of biofuels. Renewable hydrogen can be used in the heat and transport sectors, as well as replace natural gas. Additional incentive measures are prescribed for the use of RES in the heating sector.
- The Law on Energy defines long-term goals in the field of energy, recognizes the main players in the field of energy, as well as introduces the term "energy poverty", while the opportunities addressed to vulnerable customers have been expanded, covering heating sector as well.

250 Official Gazette, No. 37/21
251 March 2021, published in "Official Gazeta of the RS", No. 26/2021"
252 https://reri.org.rs/en/government-of-republic-of-serbia-once-again-proposed-delay-in-application-of-the-law-on-the-integrated-prevention-and-pollution-control/
253 Official Gazette of RS, no. 40/21
254 Official Gazette of RS, no. 40/21

- The Law on Energy Efficiency and Rational Use of Energy (2021) ensures conditions for efficient energy use and improvement of energy efficiency.
- The Law on Innovation Activity[255] regulates the basic principles, goals and organization of the application of scientific knowledge, technical and technological knowledge, inventiveness and innovation for the existing technical the technological base, new and improved products, processes and services, as the driving force for the development.

Green industrial policy considerations

› Industry in Serbia

Serbia has a strong industrial heritage but today, GDP is dominated by services which account for over a half of the country's output and two-thirds of total employment. Sectoral shares of the economy have remained broadly stable over the past decade. In 2022, the share of services sector in GDP was about 52%, with trade, transportation, accommodation, and food service as the most significant portion of services, followed by public administration, education and healthcare. In 2022, industry contributed approximately 25.6% and agriculture with 6.5%. Industry is a prominent growth driver. Manufacturing has been driving exports and its share in the GDP is 13.5%.[256] The mining sector contributes less than 1% to GDP, but Serbia has a rich mineral endowment that has for the past decade attracted the interest of multi-national exploration and mining companies.

The exports of Serbia increased from $11.8 billion in 2011 to $19.5 billion in 2020, a growth of around two thirds. The greatest export increases were recorded for commodities. The smallest export growth was for machinery and transport equipment and the export of beverages and tobacco. Exports of food and live animals, crude materials, inedibles, except fuels, animal and vegetable oils, fats and waxes, manufactured goods classified by material, also had good growth rates.

SMEs were responsible for 3.8% of experts in 2020 and the total share of exports in SME turnover was 9.2%. The main obstacle to increasing exports were competitive pressures and higher product and production requirements.

CBAM related challenges

The EU is traditionally Serbia's key trading partner, accounting for 54% of total external trade of Serbia[257] in 2022. Manufacturing is a key contributor to the exports, accounting 85% of the country's goods exports in 2022.[258] Exports to the EU-27, of products subject to the CBAM, that includes: Iron and steel, Fertilizers, Aluminum, Cement, and Electricity have grown from 11%, 15% and 18% (% in total export to the EU) in 2020, 2021 and 2022 respectively[259]. The most significant impact could be expected in iron and steel and aluminum industry.

The likely loss of income due to the initial implementation of the CBAM range from 0.2% to 0.43% of GDP annually by 2035, where ferrous and non-ferrous metals exports is the most sensitive. The potential reduction in production puts at risk more than 2.5% of the wage bill and reduce to 3% of employed population.[260] Moreover, the indirect impacts will be felt the most by direct and

255 Official Gazette of the Republic of Serbia, No. 129/21
256 https://www.statista.com/statistics/440654/share-of-economic-sectors-in-the-gdp-in-serbia/#:~:text=This%20statistic%20shows%20the%20share,sector%20contributed%20about%2051.99%20percent
257 https://www.stat.gov.rs/en-us/vesti/20230717-spoljnotrgovinska-robna-razmena-konacni-podaci-2022/
258 Trade, EU in Serbia, https://europa.rs/trade/?lang=en
259 Serbia country diagnostic 2023, EBRD
260 The World Bank. 2022. Supporting Serbia's Transition to Greener and More Resilient Growth. Policy and Institutional Reforms. World Bank

indirect suppliers of inputs for the production of the CBAM-affected products.

Despite the risks that the expansion of CBAM poses for Serbian industry, there is not yet a policy or legal document(s) that explore and design carbon price instruments, internalize the costs of emissions and ensure compliance with the EU's CBAM.

› Economic opportunities

A more efficient economy

Serbia's economy is four times more energy intensive, use four times more energy to produce a unit of output or add much lower value to energy use, as compared to the EU27 average. Additionally, the source of energy is heavily dominated by domestic, low-quality lignite. These directly increase the carbon footprint and exposure to energy crises (such as the one in 2021 and 2014) of Serbia's businesses. The inefficiency of industry is most frequently attributed to poor regulation and insufficient enforcement of environmental standards. Moreover, unclear decarbonization commitments lead to the slow development of renewable energy generation capacity and infrastructure, increase of energy efficiency and poor governance of SOEs.

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

According to the World Bank, manufacturing companies in Serbia need three times as many workers to produce the same output as the EU company, even productivity has increased in the last decade.[261] The low level of labor productivity, an inadequate price–product quality ratio, the insufficient application of the quality management system are some of the key problems of the insufficient market successfulness of the business operations. In particular, the poor performance of SOEs acts as a drag on the productivity of sectors that have real potential for growth. Manufacture of Food Products and Beverages industry have a positive comparative advantage in long-term and with appropriate changes, export value of these industries could be increased. Low productivity limits income convergence and the creation of well-paid jobs.

SOEs reforms and privatization brought downsizing and pushed up of productivity. SOEs are still about 20% less productive than private companies in the same sector. Wages in the public sector remain higher than in the private sector, by 9%.[262] In 2021, there were 575 public companies, with some 314 at least partly owned by the central government.[263] SOEs and the public sector together account for around a quarter of employment among the working-age population. While most SOEs access financing on the market, they frequently do not have the same terms as private sector, due to implicit or explicit state guarantees. In April 2021, the government of Serbia adopted the SOE Ownership and Governance strategy for the period 2021–27, which recognizes weaknesses

261 https://pubdocs.worldbank.org/en/822851576650043739/Serbia-CEM-Productivity-Note-17-12-sm.pdf
262 as at January 2023
263 Serbian Business Registers Agency

in the existing regulations and practices and specifies the reform measures needed to align with best practices.

A more circular economy

A GIP can support circular economy objectives, reducing waste and, if well-implemented, making exporters more competitive. The overall objective of the Circular Economy development program for the period 2022 – 2024[264] is to create a stimulating environment for the development of circular economy to support green transition in the country. In order to fulfil the overall objective, five specific objectives are envisaged, with measures and activities to be implemented in the period 2022–2024. Support to industry in transforming towards a circular business model is ta primary objectives.

Reducing waste would also help meet climate commitments. Economic activity sectors generated 69.6 million tonnes of waste in 2021. A total of 64.5 million tonnes of waste were treated, of which 16.7% more waste was recycled compared to the previous year. In 2021, 74.7% of the total GHG emissions in waste sector were a consequence of solid waste disposal in landfills, and 25.3% of wastewater, and this ratio remained similar during the entire 2010–2021 period. Increased emissions from solid waste disposal was recorded between 2017–2021 due to the rising quantities of disposed waste and the lack of adequate solid waste management and treatment. Municipal waste totaled 2.9 million tonnes in 2020. Of the total amount, 444,274 tons of materials were recycled and 11,183 tonnes of waste were subjected to composting and digestion. 2.8 million tonnes were disposed of or reused.

Serbia processes only 5–10% of its wastewater and needs to build 320 wastewater treatment facilities. Wastewater treatment plants exist in 21 municipalities, but even the largest cities (e.g. Belgrade) discharge their wastewater into rivers. Wastewater is primarily generated by households (67%) and 19% from industry. Approximately 57% of industrial plants lack wastewater treatment, and around 50% of industrial wastewater samples do not meet the required wastewater quality standards.

Raw materials potential

Serbia has a long tradition of coal mining. Over 30, 000 people were employed in mining sector.[265] These jobs are at risk during the transition but just transition considerations are not yet considered in the NECP or other important development document.

Serbian raw materials already attract significant investment and the country contains minerals important for the energy transition. Mining and quarrying already accounted for 7.6% of foreign direct investment (FDI) Inflows to Serbia during the period 2010 – 2017. There is potential to attract additional investments. New mineral projects in lithium-boron and copper could boost exports, GDP, government revenue and employment.[266] Serbia has significant mineral resources, including precious, base and industrial metals, and hydrocarbons. These include the high-grade copper-gold mineralization at Cukaru Peki/Timok south of Bor and the presence of substantial lithium-borate deposits in Jadar.

An integrated strategic framework for Serbia's mining sector is lacking, while

264 Circular Economy development program in the Republic of Serbia 2022 – 2024, https://www.cirkularnezajednice.rs/wp-content/uploads/2023/03/Program-for-development-of-circular-economy-in-the-Republic-of-Serbia-for-the-period-2022-2024.pdf

265 Statistical Office, 2022

266 The World Bank, 2020, Serbia Mining Sector Diagnostic (MSD), Final Report,

development of a mineral sources strategy is on-going. Concrete policies and measures for reduction of the methane emissions (particularly form in coal mines, oil and gas sector) are not developed, even Serbia joins to the Global Methane Pledge.[267] In addition, there is significant opposition from the general public and local communities to these projects, due to potential displace of local communities and environmental disasters (such as current in Bor) that could be caused by the mineral extraction processes.

A more innovative country

In 2019 and 2020, Serbia's investment in research and development (R&D) was about 0.9% of GDP, much lower than the EU average of 2.2%. Facilities like Science and Technological Parks in Belgrade, Niš, Novi Sad, and Čačak, established since 2015, play a crucial role in fostering innovation. Serbia has also made strides with the Platform for Open Science adopted in 2018 and the AI platform launched in Kragujevac in 2021. Universities and the Ministry of Innovation are actively supporting startups and creating "Innovation Centers" to strengthen ties between academia and industry.

Despite these initiatives, Serbia's R&D investment remains low, and only a third coming from the private sector, compared to the EU average. The Science Fund, established in 2018, provides vital funding, and tax incentives are in place for R&D investments. However, barriers such as high costs and limited early-stage funding persist, and most innovation spending goes towards equipment and facilities rather than groundbreaking projects.

The Faculty of Technical Sciences in Novi Sad stands out for its successful spin-offs and significant intellectual property contributions, attracting foreign R&D investments. However, Serbia faces a shortage of R&D personnel, with only 3 308 employees per million inhabitants, about half the EU average. Patent applications are also low, with Serbia submitting only 8 to the European Patent Office in 2020, far fewer than neighboring countries.

Strengthening innovation and digitalization is a government priority, supported by initiatives like innovation parks and the Innovation Fund.[268] The ICT sector's rapid growth, with a 20% annual increase in exports from 2015 to 2019, underscores the potential for linking ICT with traditional industries to drive broader development.

Collaboration between academia and industry remains limited, with only 9% of researchers employed in the business sector.[269] A green industrial policy can significantly enhance innovation and R&D by promoting sustainable practices and technologies. Emphasizing green technologies and the circular economy can attract investments, foster new industries, and improve Serbia's economic sustainability and competitiveness.

A better regulatory framework

A good business environment is essential to attract the investment needed under green industrial policies. Serbia's business environment for SMEs has improved in recent years. It now ranks first among the Western Balkans economies on the OECD's SME Policy Index. In the 2019–21 period, business licensing procedures are centralized and digitalized, the scope of SME support services offered by the

267 Participants joining the Pledge agree to take voluntary actions to contribute to a collective effort to reduce global methane emissions at least 30 percent from 2020 levels by 2030. This is a global, not a national reduction target.
268 http://www.inovacionifond.rs/en/
269 ERP 2021–2023, https://rsjp.gov.rs/wp-content/uploads/Economic-Reform-Programme-2021-2023.pdf

Development Agency of Serbia is scaled up, two additional guarantee funds as well as new customs law, to simplify procedures, are introduced. According to the World Bank's Doing Business report, it takes just 7 days to start a business in Serbia, which is below the EU average of 12 days. The cost of starting a business in Serbia as a share of income per capita – which currently stands at 2.3% – is also lower than the EU average of 3%.

Nonetheless, there are still gaps[270] among which the most notable remain in the areas of green economy, where awareness of environmental concerns remains low and access to green financing is ad hoc; while insolvency prevention, as bankruptcy procedures remain difficult to predict and lack the efficiency needed for entrepreneurs to subsequently reintegrate into the market.

» A cleaner living environment

A cleaner living environment should be one of the main outcomes of a green industrial policy. This will benefit poorer communities most, as they tend to suffer from the worst pollution. A such, the Strategy of Sustainable Urban Development until 2030[271] identifies necessity for improvement of conditions for local sustainable economic and urban development, as well as innovations and development of a low-carbon, resource-efficient "green" economy.

Air pollution

Serbia experiences some of the poorest air quality recorded in Europe. A combination of coal-powered thermal power-plant emissions, a transport sector dominated by out-of-date vehicles, waste dump sites and poorly regulated industrial activity cause air, water and soil pollution, including a high concentration of PM2.5, often far exceeding values prescribed by the World Health Organization and national legislation. Exposure to outdoor air pollution caused 6 592 premature deaths, and 131 183 years of life lost during 2016.[272] Furthermore, there are estimates that show that over 1 000 people in Serbia suffer from chronic bronchitis as a direct result of outdoor air pollution, while 600 are hospitalized as a consequence of respiratory or cardiovascular symptoms.[273]

The mining town of Bor is one of the most polluted places in Serbia. Despite significant air and water pollution, Chinese mining company Zijin, which runs Bor's large-scale copper mining and smelting complex, is expanding its operations. Air quality tests in Bor have found traces of sulphur dioxide, arsenic, iron, nickel and cadmium, which all have a severe impact on air quality and the health. One sample from the Pek river showed levels of copper 17 times higher than those prescribed in the regulations as well as high concentrations of arsenic, copper and lead in river sediment.[274]

A more resilient country

Severe weather events associated with climate change have also significant impact on Serbia's economic growth. The water and agriculture sector has been identified as already particularly sensitive, and the high sensitivity of the energy production sector can be expected through the direct and indirect impacts of climate change in the forthcoming years. Areas of the country that have been particularly affected by droughts and weather variability have also experienced significant land degradation, increasing the risk of other natural

270 OECD SME Policy Index
271 Official Gazette of the Republic of Serbia, No. 47/19
272 World Health Organization. "Health impact of ambient air pollution in Serbia". United Nations Serbia website, 2019.
273 Health and Environment Alliance (HEAL). "Air Pollution & Health in Serbia". HEAL website, December, 2014.
274 RERI, 2021

disasters, including landslides. These impacts are expected to lead to declines in employment and thus increases in poverty, unless timely and appropriate disaster risk reduction measures are enforced.[275]

› Cheap green energy

The energy sector consists of the oil and gas industries, coal mines, electrical power system, the decentralized district heating system and industrial energy. In 2021, 38.2 billion kWh of electricity was generated, while consumption was at 29.2 billion kWh. Most of the electricity is generated in thermal power plants (62% of electricity), 31% in hydro power plants, 3% in wind power plants. About 80% of electric power from renewable energy sources in Serbia is generated by hydro power plants. "Elektroprivreda Srbije" (Electric Power Industry of Serbia - EPS) owns most of energy production infrastructure, while the electricity transmission system is operated by the company "Elektromreža Srbije" Public Enterprise (EMS).

The primary energy consumption per capita is around 2.12 toe/capita (24.6 MWh). All EU-27 countries, with exception of Bulgaria, have lower consumption per capita than Serbia, at an average of 30% lower. After the residential sector, the transport sector and industry together make up half of total final energy consumption. In 2020, the residential sector was responsible for 40% of the final energy consumption, while the industrial and transport sectors had shares of 23% and 25% respectively. The final energy consumption of the industrial and transport sectors decreased in the period 2010–2020 by 17% and 1.5% respectively, while the final energy consumption of the residential sector increased by 13.3%. The contribution of the services and agricultural sectors to the final energy consumption was considerably lower in the period 2010–2020 compared to the other end-use sectors.

The Energy Sector Development Strategy of the Republic of Serbia until 2025, with projections until 2030[276] and the Regulation on establishing the Program for the Implementation of the Strategy[277] provide basic guidelines and directions for applying the principles of efficient energy use, increase of energy efficiency and use of renewable sources. However, the coal and gas remain as the main power production sources. Drafting of the Energy Sector Development Strategy of the Republic of Serbia until 2040, with projections until 2050 is on-going.

More renewables for more cheap, reliable power

The current energy mix is neither reliable nor sustainable; a GIP should make a significant contribution to improving this situation. Energy production relay on power generation from domestic brown coal – lignite, that should have shielded the economy from external shocks. However, in December 2021 the biggest coal-powered thermal power plant had the breakdown, that lead to an urgent ramp-up of electricity imports. Gas imports increased in parallel, driven by inadequate storage levels and insufficient storage capacity. While unfavorable weather conditions, that impact production from hydro potential, and the poor quality of coal at a time of unusually high prices, were marked as causes of the crisis. However, a more structural problems, such as prolonged underinvestment in energy infrastructure, unclear decarbonization commitments, the slow development of renewable energy generation and waste to energy capacities and poor governance in the sector, were substantial key causes. In 2014 the

275 The World Bank. 2022. Supporting Serbia's Transition to Greener and More Resilient Growth. Policy and Institutional Reforms. World Bank.
276 Official Gazette of the Republic of Serbia, No. 101/15
277 Official Gazette of the Republic of Serbia, No. 104/17

most affected sector by the worst flooding over a century was the mining and energy sector (€494 million and 32% of the total damages and losses), followed by housing (€231 million and 15%), agriculture (€228 million and 15%), trade (€225 million and 15%) and transport (€167 million and 11%).

While electricity production has stabilized in mean time, the long-term structural issues of the energy sector, worsened by new standards and requirements of the EU and international market (e.g. carbon border adjustment mechanism – CBAM), will take a considerable amount of time to be resolved. In addition, the sector suffers from poor governance and prolonged underinvestment. Hence, the energy sector remains one of the key vulnerabilities and sources of risks for the economy and domestic industry in Serbia.

Increased renewables can provide more reliable power at a sustainably price, while diversifying the energy mix and attracting investment. Electricity production from renewables could rise by 40% from current levels without significant further investment in renewable energy grid capacity. While estimates of potential of renewables are significant, current levels are low, providing opportunity for increase. The establishment of a market with sufficient liquidity (to be achieved through market coupling) is a precondition to debottlenecking renewable deployment under the balancing decree. Potential exists to considerably scale up solar, wind and geothermal energy, bringing significant benefits particularly considering their increasing cost-competitiveness.

› A fairer society: opportunities for all

A GIP offers the opportunity to cushion the negative impacts of the transition on some workers, while providing significant opportunities. Over 30, 000 people were employed in mining sector.[278] These jobs are at risk during the transition but just transition considerations are not yet considered in the NECP or other important development document.

Overall, it is estimated that decarbonization of the energy sector will lead to small net job loss (-2% in 2050). This net job loss is mainly due to the reduction of jobs in the sectors related to fossil fuels, mainly in the iron and steel, and, to a certain extent, in agriculture. However, these losses could be compensated by job gains in sectors related to renewable energy sources, energy efficiency, construction, in the forestry and forestry related sectors.[279]

Yet, there is not yet policy planning in regard gradual coal phase-out nor clear deadline regarding complete phase-out. LCDS defines 2050 as the year of climate neutrality, that can be assumed complete coal phase-out deadline. Nor is there yet just transition action plan for that.

The overall goal of the Employment Strategy of the Republic of Serbia 2021–2026[280] is to create a stable and sustainable employment growth underpinned by knowledge and decent work. However, neither Strategy nor following the Action Plan for the period 2021–2023 do not recognize needs and opportunities for green jobs. In the Strategy only lack of a nationally agreed definition of green jobs is noted, while such type of jobs is linked with the waste management sector.

278 Statistical Office, 2022
279 Low Carbon Development Strategy of the Republic of Serbia
280 Official Gazette of RS, No. 18/21

Tackling energy poverty

In 2019, approximately 76 900 citizens in Serbia acquired status as a vulnerable energy consumer.[281] The status is determined by the local authority where the consumer applies for such status. In 2019, almost 10% of Serbian households had difficulties in keeping their homes adequately warm during heating season, compared to 7.3% of households in the EU.[282] In 2022, 12.3% of population was living in absolute poverty.[283] Many of these are also subject to energy poverty, meaning they cannot afford up-to-date dwellings and appliances or spend most of their income on energy bills. Introducing renewable energy could be a solution to this issue, as it could help provide currently living in poverty with more efficient energy and a resulting higher standard of living, as well as create new jobs, foster economic growth and prevent further environmental damages associated with fossil fuels.

The draft NECP does not include measures for assessing and mitigating energy poverty as well as providing extensive protection for vulnerable energy consumers. In addition, current definitions of vulnerable consumers rely primarily on factors such as health and income level, targeting only the most vulnerable consumers. Currently, there are two national-level measures for protecting vulnerable customers, that are aimed at reducing monthly electricity and gas expenditures.[284] These measures are short term and for the most vulnerable households.

A green industrial policy could help to fill these important gaps in the social aspects of the transition.

Financing GIP

The Serbian government has designed a proactive investment-promoting and investment attraction policy, but it should be led by the green transition, fossil fuel phase out and decarbonization of all sectors of the economy. Energy poverty reduction and just transition should be integral part of the green transition. A particular focus should be on regional economic diversification efforts and the reskilling of affected workers to ensure minimum job losses.

Among the financing options could be the polluter pays-principle is set out in the Treaty on the Functioning of the European Union (Article 191(2) TFEU), that is also the part of the Serbian national legislation, and has been one of key a dominant EU concepts in the combating climate change and in financing long-term sustained emissions reductions. This principle helps consumers to recognize the true costs of pollution.

- In addition, in compliance with the EU ETS, least 50% of the revenues generated from the auctioning of allowances should be used for financing policies and measures such as:
- Develop renewable energies.
- Improve energy efficiency, district heating systems and insulation, or to provide financial support in order to address social aspects in lower- and middle-income households.
- Encourage a shift to low-emission and public forms of transportation.
- Promote skill formation and reallocation of labor in order to contribute to

281 Study on Addressing Energy Poverty in the Energy Community Contracting Parties, EnC
282 State and Resilience Building Contract for Serbia, Annual Action Plan contributing to the Western Balkans Energy Support Package in favor of Serbia for the year 2023, https://neighbourhood-enlargement.ec.europa.eu/document/download/fd5a3092-262d-4e87-ab35-87cc8cba799d_en?filename=C_2022_9159_F1_ANNEX_EN_V2_P1_2394850.PDF
283 U.N. Joint Programme
284 Ordinance on Energy Vulnerable Consumers

the fairness of the effort to reduce emission across the economy and the society, in particular in regions most affected by the transition, in close coordination with the social partners.

Hence, the introduction of measures the equivalent to the EU ETS could be a financing option for greening the industry as well as to reduce or eliminate negative impacts of the CBAM.

In total, the implementation of these two "polluter pays" principles, in the period 2022–2050, can generate more than €25 billion that could be used for decarbonization of the Serbian industry.[285] Another potential option is use of budgetary funds such as:

- Fund for energy efficiency – maintained by the Ministry in charge for energy.
- Green Fund – maintained by the ministry on charge for environment.
- Development Fund of the Republic of Serbia – which has decades of experience in cooperation with the economy and could add climate criteria into selection process.

The key sources of financing from the EU for the purpose of economic convergence by less-developed regions, employments, social inclusion and good governance, agriculture, regional and urban development, research, innovation and modernization and sustainable development are:

- Instrument for Pre-Accession – IPA
- IPARD (until accession), after accessions
- the European agricultural guarantee fund (EAGF),
- the European agricultural fund for rural development (EAFRD). – regional and urban development
- LIFE – Program for the Environment and Climate Action
- Western Balkan Investment Framework
- EU Territorial Cooperation Programmes (INTERREG)
- Horizon 2020 / Horizon Europe
- Action Plan: Financing Sustainable Growth (COM (2018) 97 Final)

For 2021–2023, the IPA III funding for national programmes amounts to €571 million for Serbia. This includes the dedicated €165 million from the 2023 Energy Support Package.

Launched in 2020, the Economic and Investment Plan (EIP) for the Western Balkans aims to mobilize up to €30 billion in cooperation with international financial institutions until 2027. Under the EIP for Serbia, the EU has already mobilized €5.7 billion in investments, out of which €1.1 billion in grants. The EIP flagship projects in public sector for Serbia, endorsed between 2020 and 2023, support sustainable transport, clean energy, environment and climate, digital infrastructure and human capital.

The key sources of bilateral and multilateral financing for Serbia are:

- The Green Climate Fund
- The Global Environment Facility
- The World Bank
- The European Investment Bank (EIB)
- The European Bank for Reconstruction and Development (EBRD)

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- The Council of Europe Development Bank (CEB)
- KFW (German Development Bank)
- AFD (French Development Agency)

The demand for green finance is bound to increase substantially in Serbia as the transition to an inclusive, low-carbon and circular economy unfolds.

Many companies, incl. SMEs have already invested in energy efficiency and renewable energy sources (e.g., solar panels), replace of inefficient equipment etc. Future investments are likely to focus on energy and water efficiency, renewable energy sources and resource efficiency through the digitalization of business operations. Some of the key challenges for the SMEs are lack of capital, insufficient skills and information about green technologies and financial products, and inadequate support from the regulatory environment (does not incentivize to reduce environmental and carbon footprint).

Policy recommendations

Below we provide policy recommendations, which could be considered as part of a GIP for Serbia and accompanying policies, categorized by policy area. The new green growth agenda for Serbia will require action to further boost investment, mobilize financing for growing companies, equip workers with the right skill mix, raise productivity levels, and promote competition and a better business environment. It will require reduction of dependency on fossil fuels (domestic lignite), improvement of energy efficiency, and promotion of green development across sectors. Hence, significant efforts and financing are needed to achieve a climate-resilient society and economy. Some of the most urgent and/or significant actions and measures include:

1. **Improve policy and legal framework**

Develop the Green Development Strategy with Action Plan, based on targets accepted under the EnC and aligned with the EU Green Deal, that will define ambitious targets for an energy transition that includes coal phase-out deadline and pathway; include CBAM requirements; include industry's needs to achieve fair and efficient transition to carbon neutral and resilient economy, consider impacts of climate change and assume disaster risk reduction measures. It should replace industrial strategy, Circular Economy Program, Energy Strategy and Carbon Development Strategy.

- Carry out industry, and particularly, SME regulatory impact assessments when formulating laws and implementing legislation.
- Ensure predictability and transparency in the adoption and implementation of legislation.
- Ensure decarbonization incentivizing measures in all sectors and application of low-carbon and other climate criteria in public procurement.
- Define climate performance indicators to be included into sectoral policies and legislation planning and monitoring of implementation.
- Establish an Inter-Ministerial Steering Committee (MSC) under the PM's or Minister of Finance office to coordinate, implement and monitor all activities required for the implementation of a Green Development Strategy with Action Plan. MSC is expected to propose and develop all necessary new primary and secondary legislation and amend accordingly existing legislation, as required for the implementation of the Green Development Strategy.
- Ensure rapid implementation of Serbia's Law on Climate Change and other relevant laws that impact decarbonization.
- Ensure a more transparent and inclusive process for industry, energy and climate policy making.

2. **Unlock new areas of economic growth – Reform the energy sector**

The energy sector remains one of the key vulnerabilities and sources of risks for the economy and domestic industry, besides gradual coal phase-out some of the key measures are:

- Increase the share of renewable energy sources (in particularly Wind, PV and hydro) in gross final energy consumption, ensuring among else legal predictability and incentives.
- Power networks strengthening and digitalization in order to enable integration of large amounts of RES at all voltage levels.
- Increase electrification in the industrial, transport and heating sectors.
- Promotion of the concept of "Energy Communities", "Waste to Energy", efficient water use, rooftop heat collectors for hot water, just transition.
- Increase energy efficiency of process and buildings, transport of products etc.
- Increase support to SMEs, innovative products and services (supporting startups, exploitation and collaboration with research).
- Improve SMEs specialization (such as the emergence of renewable energy generation or advanced manufacturing industries or the development of new product lines within the same industry or results of the research institutes).
- The construction of infrastructure for water management and wastewater treatment and the introduction of reforms that promote efficient and sustainable use of water resources

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A framework for Green Industrial Policies in the Western Balkans

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