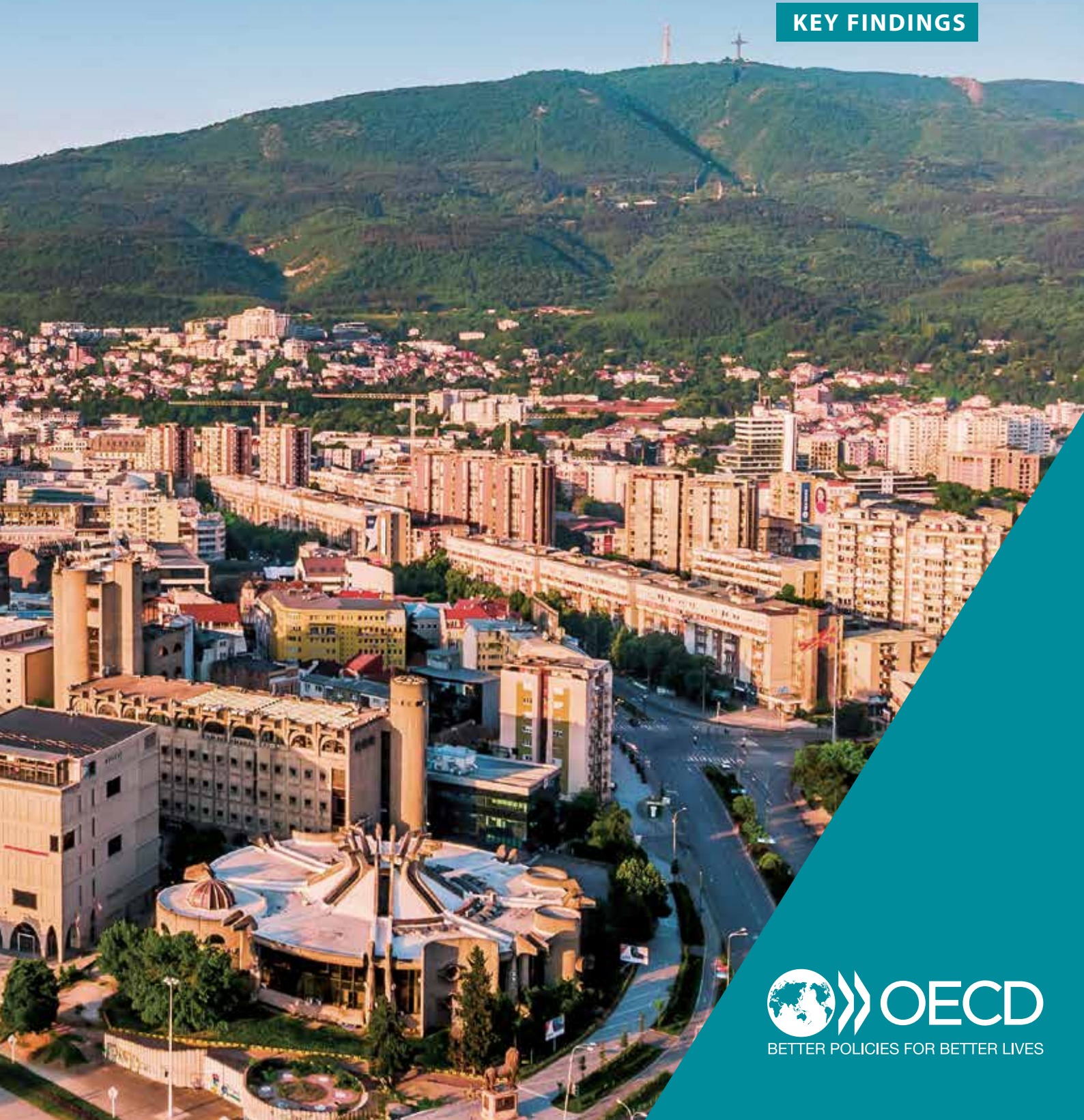


A Roadmap Towards Circular Economy of North Macedonia

KEY FINDINGS





North Macedonia can establish a robust circular economy framework by incorporating the measures outlined in this roadmap into its regulatory and policy framework. This would help facilitate the shift towards a sustainable and climate-neutral economy, promising various benefits such as higher resource efficiency, enhanced waste management, decreased environmental degradation, better public health, material security, industrial competitiveness and opportunities for job creation.





Key messages

The objective of this roadmap is to assist the government of North Macedonia in formulating policies for a circular economy, with a focus on improving inter-institutional co-ordination and collaboration with stakeholders to drive the transition forward. Based on a comprehensive assessment of the circular economy landscape, it consolidates existing policies and promotes collaboration between various sectors, measures, and stakeholders.

While North Macedonia has made some progress in reducing material consumption, low productivity levels and pollution due to unsustainable resource consumption, most apparent in inadequate waste management, persist. Continued economic and consumption growth could lead to increasing demands for energy and materials, likely resulting in elevated production-related emissions that could impede resilience and competitiveness.

Institutions recognise the benefits of a circular economy in promoting sustainable production and consumption, which could further economic, environmental, and social objectives. However, low societal awareness of circular economy concepts and limited financing opportunities for businesses have hindered tangible progress in North Macedonia so far.

The cross-cutting nature and wide-reaching impacts of the transition highlight the need for a government-wide approach to policy formulation and implementation, coupled with collaboration among various other stakeholders.

Stakeholder engagement, especially through consultations with a diverse circular economy working group, has played a critical role in identifying priority areas and will be essential for realising and progressing circular economy objectives in North Macedonia.

Based on a multi-criteria analysis and frequent stakeholder consultations, the following have been identified as highly impactful priority areas when applying circular economy principles:

- **circular business models in the small and medium-sized (SME) sector**
- **textiles**
- **construction**
- **biomass and food**
- **mining and metallurgy.**

Policy measures identified across the five priority areas will contribute to the advancement of circular practices in addressing overarching challenges such as municipal waste management and enhancing awareness of the circular economy. Implementing these measures can also support North Macedonia in achieving climate change mitigation goals, as a considerable share of greenhouse gas emissions is associated with materials production and consumption.



Rationale for the roadmap

Growing raw material demand creates economic and environmental challenges

Despite some decrease in domestic material consumption between 2015 and 2019, North Macedonia still requires high volumes of material and energy per unit of its gross domestic product. This not only exacerbates waste management challenges, primarily relying on landfilling for end-of-life treatment, but also increases reliance on fossil fuels, the primary source of energy in the country, likely worsening environmental pollution and

climate change vulnerabilities. If resource consumption and energy supply diversification are not addressed, some strategic sectors risk becoming increasingly uncompetitive. This is especially pertinent as the demand for cleaner production is gaining relevance, particularly in light of the EU Carbon Border Adjustment Mechanism. A circular economy holds considerable promise for addressing these challenges.

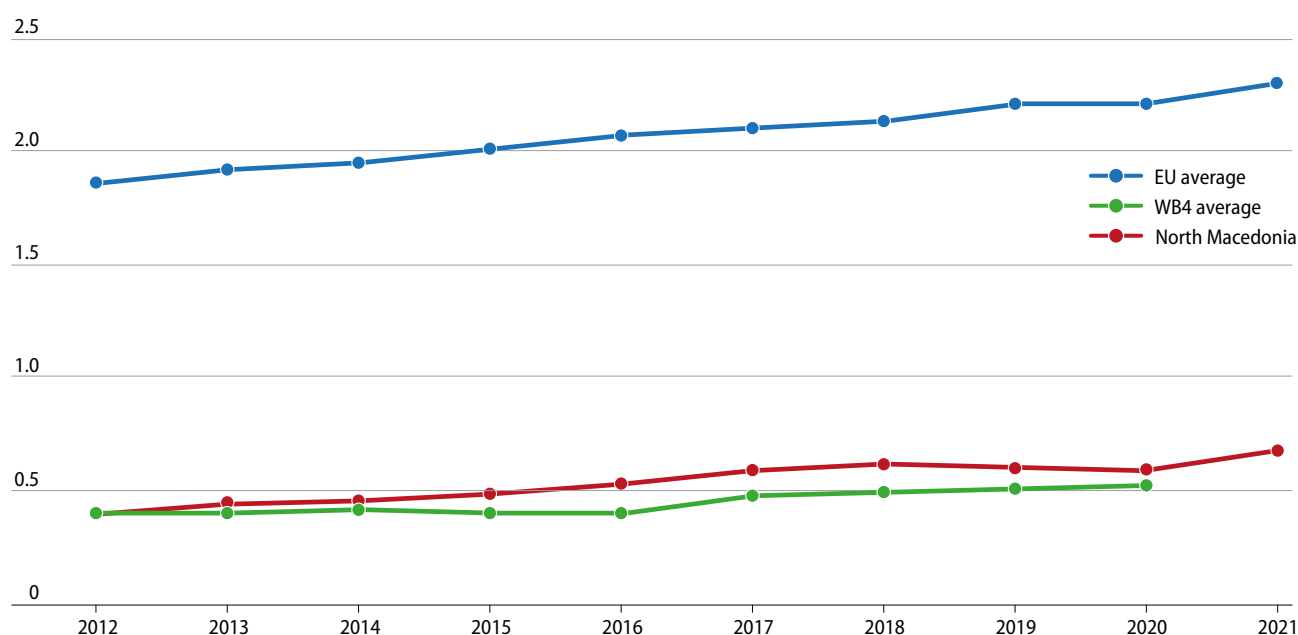
Towards an even path with the EU Green Deal and Green Agenda for the Western Balkans

There is a growing commitment to tackling environmental degradation in North Macedonia, with collective endeavours to enhance energy and resource efficiency, minimise waste generation, and promote circular action gaining significant traction. As the country progresses towards EU accession, it is

strategically aligning its environmental policies with EU standards and actively participating in regional initiatives to further the Green Agenda for the Western Balkans. Nevertheless, these efforts should be intensified and better co-ordinated.

Despite some decrease in domestic material consumption between 2015 and 2019, North Macedonia still requires high volumes of material and energy per unit of its gross domestic product.

Figure 1. Resource productivity in North Macedonia, the European Union and Western Balkans, 2012-2021



Note: WB4: Western Balkans 4: Albania, Bosnia and Herzegovina, North Macedonia, and Serbia.

Source: Eurostat (2023), Resource productivity, https://doi.org/10.2908/ENV_AC_RP.

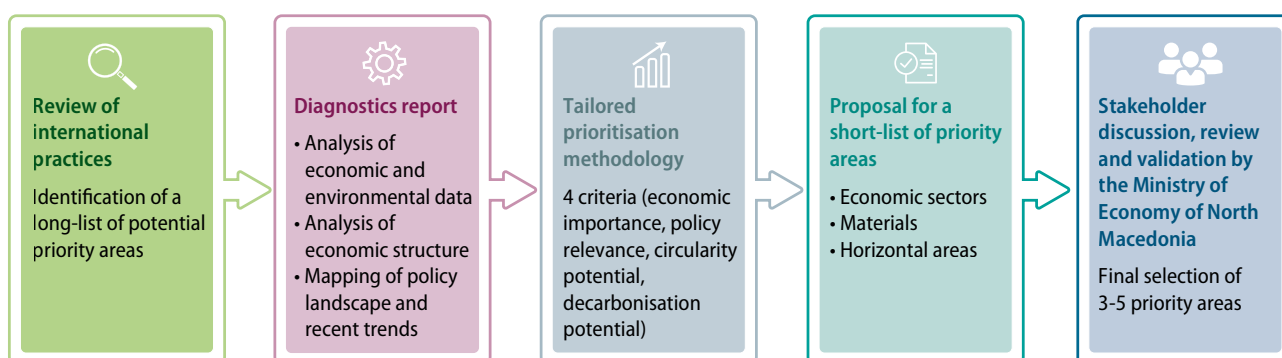
Taking a collaborative approach to shaping North Macedonia's circular economy agenda

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Moving towards a circular economy demands a sustained effort requiring broad societal consensus. This roadmap was developed through a multi-step process engaging diverse stakeholders from the government, private sector, civil society, academia, and the international community in an ongoing dialogue, co-ordinated by the Ministry of Economy.

The development of the roadmap started with a comprehensive diagnostic of key economic and environmental factors, identifying gaps in both policy and practice. Based on its results and a tailored OECD prioritisation methodology, key priority areas for the circular economy transition in North Macedonia were determined. This encompassed qualitative and quantitative analyses, coupled with stakeholder discussions, which informed the choice of the final priority areas.

Figure 2. **Proposed approach for the selection of the priority areas of the Circular Economy Roadmap in North Macedonia**



MONITORING FRAMEWORK – AN INTEGRAL FEATURE OF THE ROADMAP

A circular economy monitoring framework intends to provide a comprehensive overview of relevant indicators that can help monitor the implementation of the recommendations as well as North Macedonia's overall circular economy transition.

The proposed monitoring framework has a two-tier structure:

1. A set of headline indicators to monitor the economy-wide circular transition in North Macedonia, largely based on the European Union's circular economy monitoring framework and grouped into five categories:
 - 1) production and consumption;
 - 2) waste management;
 - 3) secondary raw materials;
 - 4) competitiveness and innovation; and
 - 5) global sustainability and resilience.
2. A set of indicators per priority area to monitor the progress made on specific recommendations (e.g. qualitative ones: the implementation has started, is ongoing or completed).



1

Circular business models for SMEs

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The focus on circular business models for SMEs in North Macedonia is driven by their crucial role in the economy, accounting for 99.9% of enterprises and a major share of GDP and employment, especially in the service sector. Recognising SMEs' significant environmental footprint and potential for innovation, a deliberate transition to circular models is seen as crucial for both sustainability and economic opportunity. This shift offers more than just environmental benefits, it allows SMEs to capitalise on novel business prospects and streamline operations through sustainable practices.



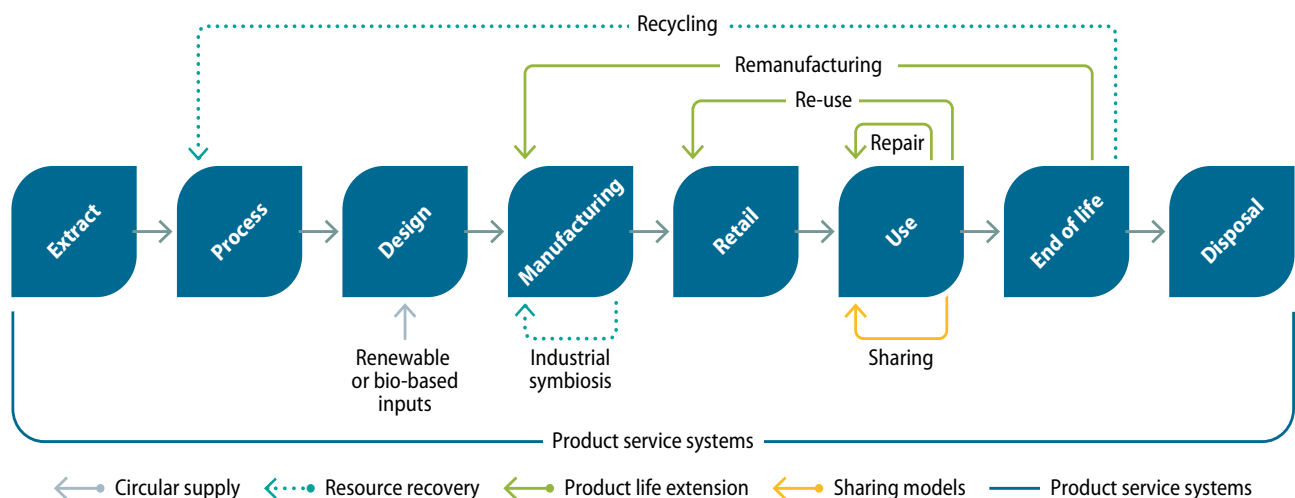
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Key policy recommendations to support the adoption and scaling up of circular business models for SMEs across various sectors include:

- Raise SMEs' awareness and understanding of the circular economy through various tools (e.g. communication campaigns, training, mentoring, or acceleration programmes).
- Improve multi-stakeholder co-operation within/across value chains by improving collaboration (e.g. grants for collaborative R&D, stakeholder platforms, investor-entrepreneur matchmaking events).
- Provide financial support for scaling up circular business models by introducing calls for SMEs within existing funding programmes and offer corresponding non-financial support.
- Implement supportive legislation and economic instruments to support circular business models and resource recovery (e.g. extended producer responsibility schemes, green public procurement, ecodesign requirements).

Recognising SMEs' significant environmental footprint and potential for innovation, a deliberate transition to circular models is seen as crucial for both sustainability and economic opportunity.

Figure 4. Typology of circular business models



Source: Adapted from Lacy and Rutqvist (2015), *Waste to Wealth: The Circular Economy Advantage*, Springer.

2

Establishing a circular textile industry

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As the second largest industrial sector in North Macedonia, the textile industry is integral to the economy, accounting for 10% of exports and 13% of industrial GDP. However, it also generates significant environmental challenges, with a notable 4.7% contribution to total municipal waste (which is primarily landfilled), alongside minimal recycling and fabric underutilisation.



These issues underscore the urgent need for the industry to transition towards a circular economy model to mitigate its environmental impact, improve waste management, and reduce greenhouse gas emissions. By adopting such sustainable practices, North Macedonia can align with European Union accession requirements and position itself as a leader in circular textile innovation, crucial for achieving its climate-neutrality goal.

Key recommendations for making textiles more circular include:

- Develop a national strategy for sustainable and circular textiles that covers the entire textile value chain.
- Reduce and better manage textile waste through improved production processes (e.g. by providing financial and technical support) and increased recycling and reuse of textiles (e.g. by supporting investments in targeted projects, mandatory extended producer responsibility take-back schemes).
- Strengthen the circular design of textiles by introducing ecodesign requirements and supporting innovations (e.g. support local projects and innovation for circular textile design).

The Macedonian textile industry generates significant environmental challenges, with a notable 4.7% contribution to total municipal waste (which is primarily landfilled).

GOOD PRACTICE

EXTENDED PRODUCER RESPONSIBILITY FOR TEXTILES AND CLOTHING IN FRANCE

France's EPR scheme for textiles pushes the industry towards a circular economy by making producers financially responsible for the end-of-life of their products. This incentivises them to design more sustainable and recyclable clothing. Additionally, the scheme rewards producers using recycled materials and discourages landfilling by offering subsidies for reuse and recycling facilities. While the system has achieved high collection rates and minimised landfill waste, challenges remain, such as limited uptake of eco-modulation incentives and dependence on foreign markets for reused clothing.



3

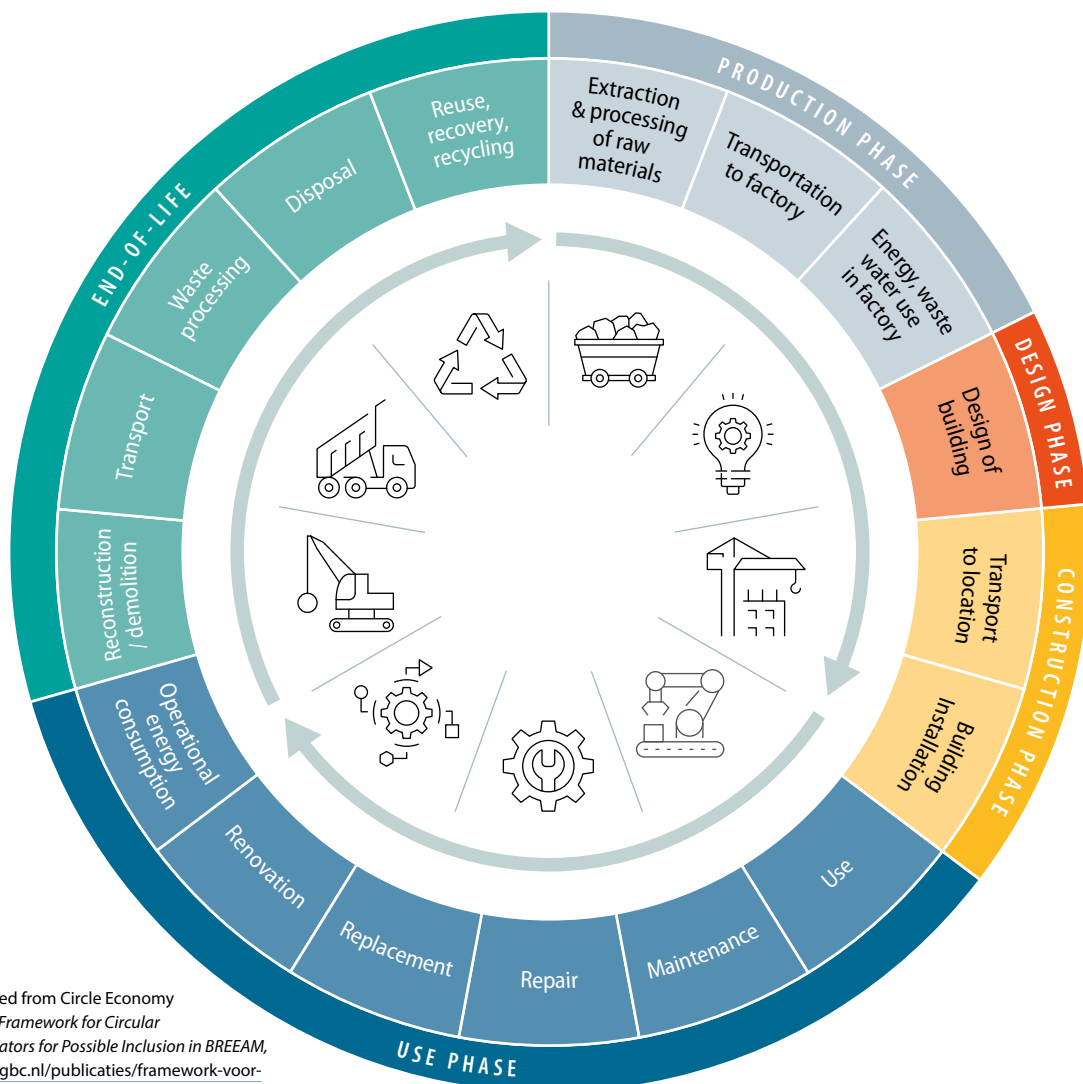
Towards a circular construction sector

The construction sector, contributing to 5.5% of GDP and 5% of total employment in 2022, is a focal area for policy intervention due to its economic significance, policy relevance, and potential for circularity and decarbonisation. Intrinsically linked with the domestic economy, especially through its connection with the metallurgy sector supplying essential materials, it presents opportunities for advancing circular economy

practices to reduce resource consumption and waste generation. Furthermore, given its high emissions intensity, adopting circular economy measures aligns with efforts to decarbonise, supporting the government's commitment to greener infrastructure investments and addressing a crucial gap in the country's circular economy initiatives.

Intrinsically linked with the domestic economy, the construction sector presents opportunities for advancing circular economy practices to reduce resource consumption and waste generation.

Figure 3. Construction life cycle phases and the circular economy



Source: Adapted from Circle Economy et al. (2018), *A Framework for Circular Buildings: Indicators for Possible Inclusion in BREEAM*, <https://www.dgbc.nl/publicaties/framework-voor-circulaire-gebouwen-nieuwbouw-27>.



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Key recommendations to support a circular construction sector include:

- Improve stakeholder engagement and collaboration, and ensure that funding is available for circular construction projects through different measures (e.g. working group on circular construction, launch and fund circular construction pilots).
- Manage construction and demolition waste in a more environmentally sound manner, including increasing its recovery and reuse through information-driven processes (e.g., systemic data collection) and legal tools (e.g. mandatory selective demolition, end-of-waste criteria).
- Boost the production and uptake of sustainable construction materials in construction and renovation by leveraging green public procurement and introducing quality standards for secondary and recycled construction materials.

GOOD PRACTICE

THE CZECH REPUBLIC'S ELECTRONIC REGISTRY FOR WASTE (INCLUDING CONSTRUCTION AND DEMOLITION WASTE)

An exemplary model for a successful national waste information database and recognised as Europe's best for waste data management, Czechia's electronic waste registry, operates through a dual approach:

- 1) mandatory data reporting by entities subject to relevant legal acts and
- 2) verification, processing and evaluation of the reported data.

This streamlined process is further enhanced by extending verification authority to municipal and regional authorities, with the Environmental Information Agency acting as the central hub. It promotes transparency, facilitates compliance, and aids in informed and evidence-based waste management policy making.



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4

Circular transition for biomass and food

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Accounting for around 15% of gross value added and 10% of employment, the sector is characterised by strong export capabilities and emerging organic farming growth. Though a key employer in North Macedonia, it is still characterised by low-skilled, low-wage jobs, primarily due to subsistence farming. National strategies emphasise improving sector competitiveness and sustainability, aligning with EU environmental standards as North Macedonia moves towards EU accession.

The sector's potential for circularity and decarbonisation is notable, with initiatives aimed at reducing environmental impacts through better waste management and resource efficiency. This approach is crucial for mitigating climate change and supporting the transition to a bioeconomy, making the biomass and food sector central to national development and circular economy strategies.

The agriculture sector is a key employer in North Macedonia, though it is characterised by low-skilled, low-wage jobs, primarily due to subsistence farming.

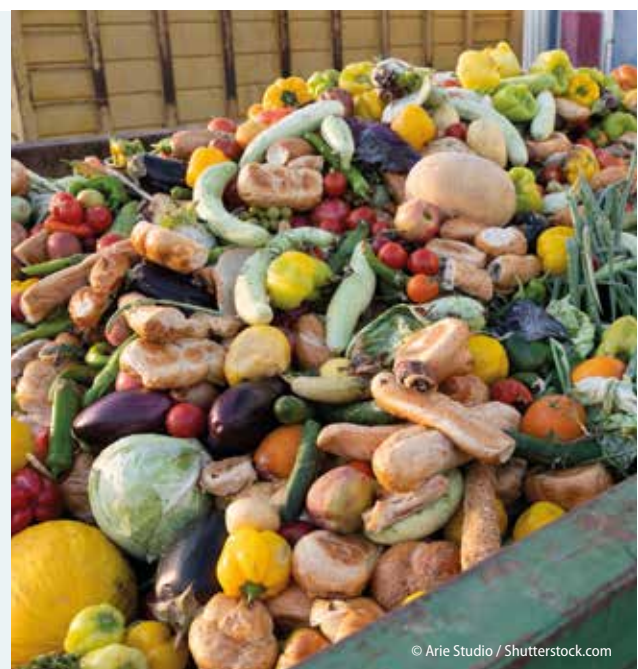
GOOD PRACTICE

SLOVENIA'S INNOVATIVE DECREE ON BIODEGRADABLE WASTE TREATMENT

This legislative framework mandates stringent treatment and utilisation standards for biodegradable waste, including compulsory recovery operations and market placement conditions. The decree outlines specific criteria for biogas plant design and operation, types of processable waste, and rigorous composting and anaerobic digestion protocols. It ensures that digestate undergoes further composting post-anaerobic digestion and mandates quality control by authorised entities. By imposing these regulations, Slovenia aims to set a model for waste management that prioritises the highest standards of conversion of organic waste into valuable compost and digestate.

Key recommendations for advancing a circular food and biomass sector include:

- Improve the management of agricultural waste and bio-waste and close their biological cycle by taking action to improve infrastructure and incentives for separate collection, investing in composting facilities and strengthening the regulatory framework by developing quality assurance systems.
- Move towards a sustainable consumption of food by preventing waste (e.g. through tax incentives for food donations) and create demand for sustainable food products (e.g. through green public procurement).
- Incentivise the development of the circular bioeconomy through better funding and technical support in research and innovation projects.
- Improve stakeholder engagement and collaboration, and awareness raising through various key actions (e.g. dedicated working groups on circular bioeconomy, circular economy platforms, voluntary agreements and leveraging existing measures under the Smart Specialisation Strategy).



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5

Mining and metallurgy

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Focus on mining and metallurgy stems primarily from their economic importance, strong policy relevance and important decarbonisation potential. With mining and quarrying significant to GDP and metallurgy as a key exporter to the EU, adopting circular practices becomes essential for ensuring sustainability and competitiveness, especially considering the EU Carbon Border Adjustment Mechanism.



Key recommendations for achieving more circularity in mining and metallurgy include:

- Improve stakeholder engagement, education and collaboration, and raise awareness (e.g. develop a circularity potential study, assess data to map out material flows, facilitate industrial symbiosis in green industrial zones).
- Provide financial support and economic incentives for upstream eco-innovation and research and development to enhance metal and mineral value chains for a low-carbon economy.
- Support legislation and policies for circular value chains in mining and metallurgy by mainstreaming circularity principles in strategic documents, procedures for permits and concessions, and considering material recovery obligations.

With mining and quarrying significant to GDP and metallurgy as a key exporter to the EU, adopting circular practices becomes essential for ensuring sustainability and competitiveness.

GOOD PRACTICE

HOW THE UNITED KINGDOM TURNS STEEL SLAG INTO VALUABLE AGGREGATES

The UK's steel slag quality protocol, developed in collaboration between regulatory bodies and the industry, promotes a circular economy in metallurgy. It transforms waste steel slag into a valuable construction resource, exempting it from waste controls when specific standards are met, including the use of appropriate materials, compliance with European standards, and adherence to best practices. This initiative enables the environmentally responsible production of aggregates for diverse construction needs, streamlining resource use and minimising waste. By mandating rigorous quality control and documentation, it fosters sustainable construction and resource efficiency.



These Key findings are based on the OECD South East Europe Regional Programme's publication ***A Roadmap towards Circular Economy of North Macedonia***, produced as part of the project "Supporting Green Transition through Circular Economy Roadmaps in the Western Balkans".

This publication presents a strategic roadmap, designed to guide North Macedonia's path towards a circular economy. It provides a rationale and outlines key objectives for the circular transition, followed by a thorough analysis of the current state of the circular economy in the country. Drawing from this comprehensive analysis, it proposes more than 40 targeted recommendations across five priority areas, accompanied by pertinent examples of effective measures. Complemented by a monitoring framework, this roadmap serves as a foundation for policy development and action implementation, aiming to instigate significant transformations and fostering a more sustainable future for North Macedonia.

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