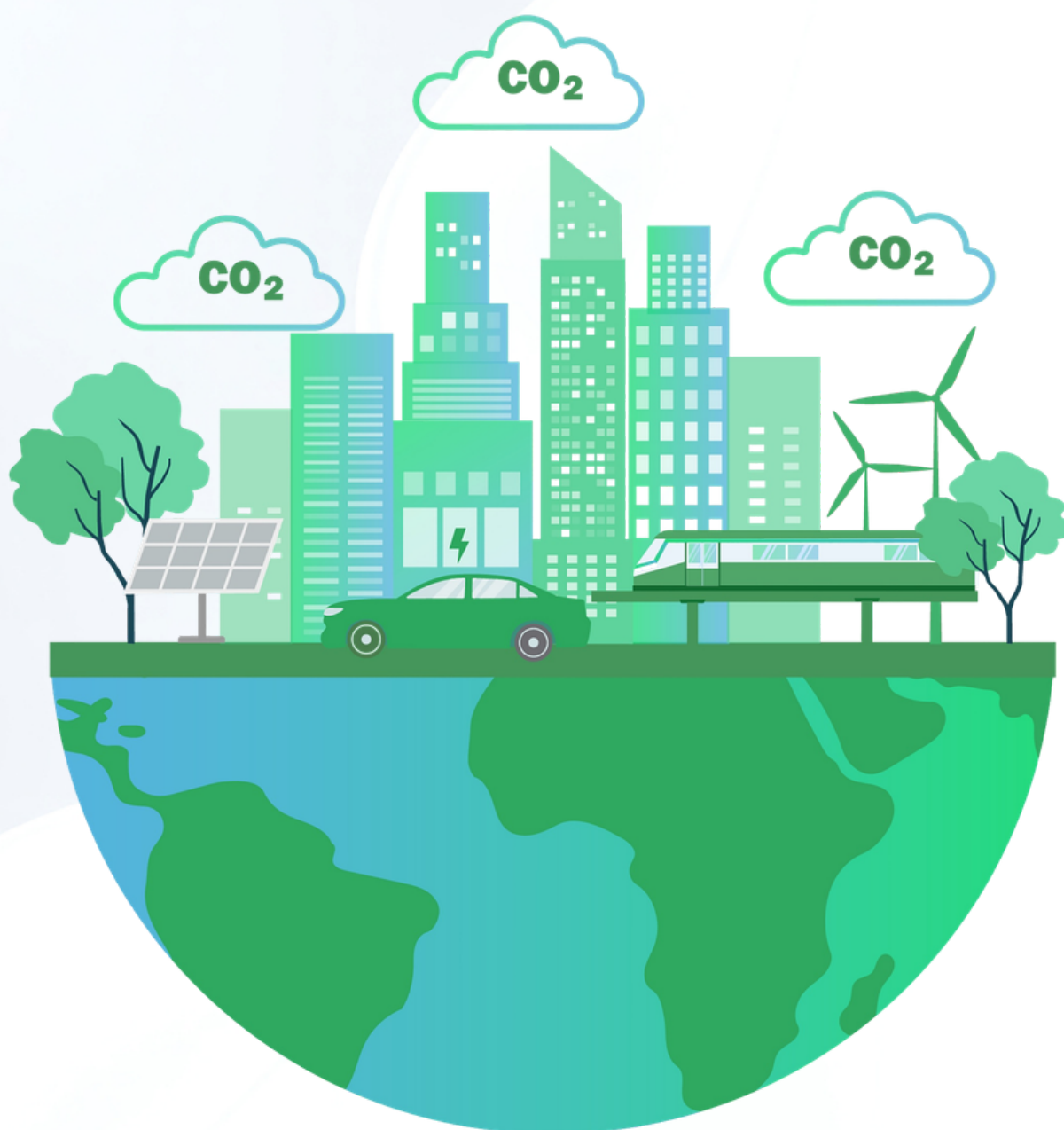


Decarbonising Kosovo to 2030

*Policy Pathways Investment Priorities and
Governance for the Green Agenda*



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***Policy Pathways, Investment Priorities, and
Governance for the Green Agenda***

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Executive Summary

Kosovo's decarbonisation pathway to 2030 is defined by a structural contradiction between its existing lignite-based electricity system and its binding obligations under the Energy Community framework and the Green Agenda for the Western Balkans. The adoption of an economy-wide emissions ceiling of 8.95 MtCO₂-eq by 2030, corresponding to a 16.3% reduction relative to 2016, establishes a fixed compliance threshold that requires systemic transformation rather than incremental efficiency gains. The transition is therefore not primarily driven by environmental considerations, but by regulatory alignment, energy security imperatives, and the economic consequences of integration into the European energy market.

Kosovo's emissions profile is dominated by the power sector, reflecting the central role of lignite-fired generation in electricity supply. This concentration creates a narrow but decisive decarbonisation lever: reducing emissions from electricity generation will determine Kosovo's overall emissions trajectory. Modelling presented in the Draft National Energy and Climate Plan confirms that existing policies alone are insufficient to achieve the 2030 target. Only the full implementation of additional measures, including renewable energy expansion, carbon pricing introduction, and structural changes in heating and electricity demand—allows Kosovo to approach compliance. Carbon pricing represents the central structural reform required to enable this transition. The absence of carbon pricing currently allows lignite generation to remain economically competitive despite its emissions intensity, preventing the electricity market from reflecting the true cost of carbon. The introduction of carbon pricing will alter generation economics, reduce lignite utilisation, and align Kosovo's electricity sector with European market conditions. At the same time, carbon pricing readiness has become an economic necessity due to the European Union's Carbon Border Adjustment Mechanism, which will progressively expose Kosovo's electricity and industrial sectors to carbon costs regardless of domestic policy decisions.

Renewable energy deployment constitutes the primary technological pathway for reducing emissions. Kosovo's strategic objective of deploying approximately 1.4 GW of renewable energy capacity by 2030 represents a fundamental shift in its electricity system. However, renewable deployment alone cannot achieve decarbonisation.

The transition requires parallel investment in transmission infrastructure, system flexibility, and market reform to enable the integration of variable renewable energy. Without these supporting measures, renewable expansion will be constrained and unable to displace lignite generation at the scale required.

The heating sector represents a critical supporting dimension of the decarbonisation pathway. Kosovo's widespread reliance on electricity for residential heating amplifies winter demand peaks and reinforces lignite utilisation. District heating expansion, building renovation, and electrification of heating through efficient technologies are essential for reducing electricity demand growth and enabling power sector decarbonisation.

Institutional readiness represents a parallel challenge. Kosovo has established the formal governance structures required for decarbonisation planning, including the National Energy and Climate Plan framework. However, further strengthening of regulatory capacity, emissions monitoring systems, and inter-institutional coordination is necessary to enable carbon pricing implementation and ensure compliance with Energy Community obligations.

Regional electricity market integration further reinforces Kosovo's decarbonisation trajectory. Participation in integrated electricity markets creates both regulatory pressure and economic incentives for decarbonisation, while also providing access to flexibility resources that facilitate renewable energy integration. At the same time, regional carbon pricing developments will progressively reduce the economic viability of lignite-based generation.

The transition also carries important social and economic implications. The lignite sector represents a major source of employment and economic activity, and electricity affordability remains a critical policy consideration. Ensuring a gradual and managed transition that preserves energy security and protects vulnerable households will be essential for maintaining social and political stability.



This study identifies four priority policy areas required to enable Kosovo's decarbonisation pathway. First, strengthening governance and emissions monitoring systems to enable carbon pricing readiness. Second, accelerating renewable energy deployment and implementing a sequenced lignite transition. Third, reducing structural electricity demand through heating sector reform and building efficiency improvements. Fourth, aligning Kosovo's regulatory framework with European carbon pricing mechanisms to protect economic competitiveness and facilitate market integration.

Kosovo's decarbonisation pathway is therefore best understood as a structural economic and regulatory transition. The decisions taken in the period to 2030 will determine not only Kosovo's emissions trajectory, but also its position within the European energy market and its broader economic and institutional integration into the European Union.

1. Introduction and scope

1.1 Purpose and Audience

Decarbonisation has emerged as a structural requirement for Kosovo's economic and institutional convergence with the European Union, rather than a discrete environmental policy objective. The European Green Deal and its external dimension, operationalised in the Western Balkans through the Sofia Declaration of 2020, extend the logic of the *acquis communautaire* into the domains of climate policy, energy market regulation, and industrial competitiveness.¹ For Kosovo, whose electricity system remains dominated by lignite-fired generation, alignment with these frameworks entails a fundamental shift in the carbon intensity of its energy system and, by extension, its broader economic structure. The decarbonisation agenda therefore intersects directly with three strategic imperatives: compliance with Energy Community Treaty obligations, mitigation of trade-related carbon costs arising from the EU Carbon Border Adjustment Mechanism (CBAM), and reinforcement of domestic energy security through diversification and efficiency improvements.²

The primary institutional audience for this study comprises Kosovo's Ministry of Economy (ME), the Energy Regulatory Office (ERO), and publicly owned energy enterprises, notably the Kosovo Energy Corporation (KEK) and the transmission system operator KOSTT. These institutions are responsible for implementing Kosovo's Energy Strategy 2022–2031 and operationalising the forthcoming National Energy and Climate Plan (NECP), including the adoption of market-based instruments, regulatory reforms, and investment frameworks consistent with Energy Community and EU requirements.³ At the same time, the study addresses international financial institutions and bilateral donors, including the European Commission, the German development cooperation system, and multilateral development banks, which play a central role in financing Kosovo's transition infrastructure and supporting institutional reform.

¹ Republic of Bulgaria and European Commission, "Sofia Declaration on the Green Agenda for the Western Balkans", Sofia/Brussels, 2020.

² Energy Community Secretariat, "Annual Implementation Report 2023", Vienna: Energy Community Secretariat, 2023.

³ Republic of Kosovo, Ministry of Economy, "Energy Strategy of the Republic of Kosovo 2022–2031", Pristina, 2023.

This study is intended to function as a policy roadmap linking Kosovo's national targets for 2030 with its regional and European obligations. It provides a structured assessment of policy pathways capable of delivering Kosovo's binding greenhouse gas (GHG) emissions reduction commitments under the Energy Community framework, including the quantified objective of reducing emissions to 8.95 MtCO₂-eq by 2030, representing a 16.3% reduction relative to the 2016 baseline.⁴ The analysis is grounded in the operational logic of the Sofia Declaration, which commits Kosovo and other Western Balkan economies to climate neutrality by 2050 and to the progressive introduction of carbon pricing mechanisms.

1.2 Definitions and System Boundaries

The scope of decarbonisation within this study reflects the accounting and reporting framework established under international climate governance and EU energy legislation. The analysis focuses primarily on Scope 1 and Scope 2 emissions associated with fossil fuel combustion in the power sector, residential and commercial heating, and transport. These sectors account for the majority of Kosovo's GHG emissions and are directly influenced by national energy policy, infrastructure investment, and regulatory oversight.⁵ Scope 1 emissions encompass direct emissions from lignite combustion in Kosovo A and Kosovo B power plants, as well as fuel use in transport and heating. Scope 2 emissions refer to indirect emissions associated with electricity consumption, particularly relevant in assessing electrification strategies and import-related carbon exposure.

The study also acknowledges the role of land use, land-use change, and forestry (LULUCF) as a carbon sink, consistent with EU climate accounting methodologies. While Kosovo's forest sector contributes positively to net emissions reduction, its mitigation potential remains limited relative to the magnitude of emissions from lignite-based electricity generation.⁶ As such, the primary analytical emphasis is placed on energy system transformation, reflecting both the structural composition of Kosovo's emissions profile and the regulatory competencies of national energy institutions.

⁴ Republic of Kosovo, Ministry of Economy, "Draft National Energy and Climate Plan 2025–2030", Pristina, 2023 (working document).

⁵ Ibid, NECP draft.

⁶ Republic of Kosovo, Ministry of Environment, Spatial Planning and Infrastructure, "Climate Change Strategy 2019–2028", <https://gzk.rks-gov.net/ActDetail.aspx?ActID=29356> Pristina, 2019.

Key operational definitions applied throughout this study include:

- ✓ **Decarbonisation:** *The reduction of carbon dioxide and other GHG emissions through structural changes in energy production, consumption, and efficiency.*
- ✓ **Carbon intensity of GDP:** *The ratio of GHG emissions to economic output, used as an indicator of economic decoupling.*
- ✓ **Merit-order dispatch:** *The operational principle whereby power plants are dispatched according to marginal cost, influencing emissions depending on the generation mix.*
- ✓ **MRV protocols:** *Monitoring, reporting, and verification systems required for carbon pricing and compliance with Energy Community climate obligations.*
- ✓ **Carbon leakage:** *The relocation of industrial production due to differential carbon pricing regimes, particularly relevant in the context of EU CBAM.*

These definitions establish the analytical boundaries necessary to assess Kosovo's decarbonisation trajectory within a framework compatible with EU legislation and Energy Community governance.

1.3 Methodological Approach

The analytical framework applied in this study is based on a multi-criteria policy assessment model combining regulatory analysis, emissions modelling review, and institutional feasibility assessment. The methodology synthesises three primary categories of evidence:

Document and policy review

Category	Key Document / Focus Area	Core Components & Objectives
Strategic Frameworks	Kosovo Energy Strategy (2022–2031)	Focuses on long-term decarbonization objectives and the roadmap for domestic carbon pricing.
	Draft National Energy & Climate Plan (NECP)	Analyzes the WEM (With Existing Measures) vs. WAM (With Additional Measures) scenarios for 2025–2030.
	Energy Community Climate Acquis	Ensures alignment with regional standards and tracks progress via official implementation reports.
Policy Benchmarking	EU “Fit for 55” Framework	Aligns Kosovo's emissions reduction trajectory with the broader European legislative goals.
	Regional Pathways	Compares decarbonization strategies within the Western Balkans to ensure regional synergy.
Feasibility & Market Analysis	Regulatory Readiness	An institutional assessment of the country's ability to implement and manage carbon pricing.
	Fiscal & Investment Review	Evaluation of the total investment required for the transition versus existing fiscal constraints.
	Energy Market Structure	Review of merit-order dispatch and the potential for future market coupling with neighboring grids.

The analytical model evaluates policy measures against four criteria:

- Emissions reduction effectiveness.
- Economic and fiscal feasibility.
- Compatibility with Energy Community and EU obligations.
- Institutional implementability within Kosovo's governance structure.

This approach allows for an integrated assessment linking emissions targets, regulatory reforms, and investment planning.

1.4 Alignment with the Green Agenda and Structural Transition

TKosovo's decarbonisation trajectory must be understood within the broader framework of the Green Agenda for the Western Balkans, which extends the European Green Deal into the region's energy, industrial, and environmental policy domains. The Sofia Declaration established a political commitment to align national energy systems with EU climate neutrality objectives, including the progressive phase-out of coal and integration into the EU carbon pricing architecture.⁷

Kosovo's starting position reflects a high degree of structural carbon dependence. Lignite accounts for over 90% of domestic electricity generation, placing Kosovo among the most carbon-intensive electricity systems in Europe.⁸ This generation structure exposes Kosovo to increasing financial and regulatory risks as the EU expands carbon pricing mechanisms and applies CBAM to imported electricity and carbon-intensive products. Without structural decarbonisation, Kosovo risks both direct fiscal losses and reduced industrial competitiveness in export markets.

⁷ European Commission, "Green Agenda for the Western Balkans", Brussels, 2020

⁸ Energy Community Secretariat, "Kosovo Energy and Climate Report", Vienna, 2023.

The policy challenge is not limited to technological substitution, but encompasses institutional reform, regulatory alignment, and investment mobilisation. Decarbonisation requires the integration of carbon pricing, renewable energy auctions, grid modernisation, and efficiency measures within a coherent governance framework. The effectiveness of this transition will depend on Kosovo's capacity to align national policy instruments with Energy Community requirements and EU legislative trajectories, ensuring both environmental compliance and economic sustainability.

2. Analytical framework

2.1 Baseline + target architecture

The definition of Kosovo's decarbonisation trajectory to 2030 is anchored in a baseline architecture that diverges from the conventional European benchmark of 1990. Instead, Kosovo's binding greenhouse gas (GHG) reduction target is calculated against a 2016 reference year, as formalised by the Energy Community Ministerial Council Decision 2022/02/MC-EnC, which established economy-wide emission reduction obligations for Contracting Parties for the first time.⁹ Under this framework, Kosovo is required to limit total GHG emissions to 8.95 MtCO₂-eq by 2030, corresponding to a reduction of 16.3% relative to its 2016 emissions level. This baseline selection reflects methodological and institutional constraints rather than environmental ambition, as Kosovo lacked a complete and internationally verified emissions inventory for earlier benchmark years such as 1990. The 2016 reference year therefore functions as the counterfactual baseline against which compliance is measured.

<i>Feature</i>	<i>WEM Scenario (Status Quo)</i>	<i>WAM Scenario (Compliance Path)</i>
Strategic Role	Policy Floor: Only measures already adopted in legislation.	Investment Ceiling: Full implementation of 2022–2031 Strategy.
Emissions Outcome	Above the Cap: The remaining emissions are greater than 8.95 MtCO ₂ -eq.	Below the Cap: Approaches or falls below 8.95 MtCO ₂ -eq.
Energy Mix	Lignite-fired generation dominates dispatch.	Lignite utilization drops; 1.4 GW of Renewables added.
Economic Lever	Low marginal cost for fossil fuels; no carbon cost.	Carbon pricing shifts the merit-order dispatch.
Efficiency	Incremental; offset by demand growth.	Large-scale building renovation and district heating.

⁹ Energy Community Ministerial Council, Decision 2022/02/MC-EnC on the adoption of integrated energy and climate targets and introduction of climate governance framework, Energy Community Secretariat, Vienna, 2022.

The implications of this baseline architecture are both technical and political. In purely mathematical terms, a 2016 reference year results in a less stringent percentage reduction requirement compared to the EU's 1990 benchmark, since Kosovo's emissions had already increased significantly due to structural reliance on lignite-fired electricity generation and rising electricity demand. In 2016, Kosovo's emissions profile was dominated by the Kosovo B thermal power plant, which operated at high load factors following intermittent outages at Kosovo A and constrained electricity imports.¹⁰ This operational configuration contributed to a relatively elevated baseline level of emissions intensity. While this creates an optical advantage in percentage reduction terms, it simultaneously complicates compliance due to projected growth in electricity demand and the absence of structural fuel switching in the reference scenario. As a result, maintaining emissions below the absolute cap of 8.95 MtCO₂-eq requires both stabilisation of power sector emissions and reductions in other sectors such as transportation, agriculture and waste, despite underlying economic and demographic growth pressures.

The baseline architecture also establishes the modelling reference point for Kosovo's National Energy and Climate Plan (NECP), which applies a scenario-based ex-ante assessment to evaluate compliance pathways. The Draft NECP distinguishes between two principal counterfactual trajectories: the With Existing Measures (WEM) scenario and the With Additional Measures (WAM) scenario. These scenarios function as analytical constructs rather than forecasts, providing a structured comparison between current policy commitments and the additional interventions required to achieve compliance with Energy Community obligations.

The WEM scenario represents the policy floor, incorporating only those measures that have already been adopted through legislation, regulatory decisions, or binding implementation programs. These include existing renewable energy support schemes, ongoing grid investments, and efficiency measures embedded in Kosovo's current legal framework. The WEM scenario therefore reflects a continuation of the status quo policy trajectory, assuming no additional decarbonisation instruments beyond those already operationalised. In modelling terms, WEM serves as the reference scenario against which incremental mitigation measures are evaluated. Under this trajectory, emissions reductions are limited by continued reliance on lignite-fired generation,

¹⁰ Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan of Kosovo 2025 - 2030, Pristina, 2023 (working document).

modest penetration of renewable electricity, and incremental efficiency improvements insufficient to offset demand growth.

By contrast, the WAM scenario represents the investment ceiling, incorporating a comprehensive package of additional mitigation measures aligned with the Energy Strategy 2022–2031 and Kosovo’s Energy Community obligations. These measures include the introduction of carbon pricing mechanisms, accelerated deployment of renewable electricity capacity reaching approximately 1.4 GW by 2030 (currently 0.237 GW), expansion of district heating systems, and large-scale building renovation programs aimed at reducing final energy consumption.¹¹ The WAM scenario also assumes increased electrification of heating and transport, supported by grid reinforcement and market reforms. From a modelling perspective, WAM represents a policy-driven decarbonisation pathway that internalises the economic impact of emissions through regulatory and fiscal instruments.

The "With Additional Measures" (WAM) scenario is **not an aspirational or "ambitious" pathway**, it represents the absolute minimum implementation required to meet Kosovo’s legally binding obligations. Under current policies (WEM), a structural compliance gap persists, as renewable deployment alone cannot displace lignite without the corrective fiscal pressure of Carbon Pricing.

The comparison between WEM and WAM trajectories provides the analytical basis for assessing Kosovo’s compliance gap. According to the Draft NECP, emissions under the WEM scenario remain above the 8.95 MtCO₂-eq cap throughout the projection period, indicating a structural compliance gap if no additional measures are implemented.¹²

¹¹ Republic of Kosovo, Ministry of Economy, Energy Strategy of the Republic of Kosovo 2022–2031, Pristina, 2023

¹² Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan of Kosovo 2025–2030, Pristina, 2023 (working document).

This gap reflects the inertia of the existing energy system, where lignite-fired generation continues to dominate merit-order dispatch due to its low marginal cost and the absence of carbon pricing. Under these conditions, renewable energy deployment alone is insufficient to achieve the required emissions reductions without complementary policy interventions that alter the relative cost structure of generation technologies.

The WAM scenario significantly narrows this compliance gap by introducing structural changes in both supply and demand. Renewable energy expansion reduces the utilisation rate of lignite units, while efficiency improvements moderate demand growth. Carbon pricing further accelerates emissions reductions by increasing the marginal cost of fossil fuel generation, thereby shifting dispatch patterns in favour of lower-emission technologies. According to the NECP's central modelling results, the WAM scenario enables Kosovo to approach or marginally undershoot the 8.95 MtCO₂-eq target by 2030, although the margin of compliance remains narrow and sensitive to implementation risks.¹³

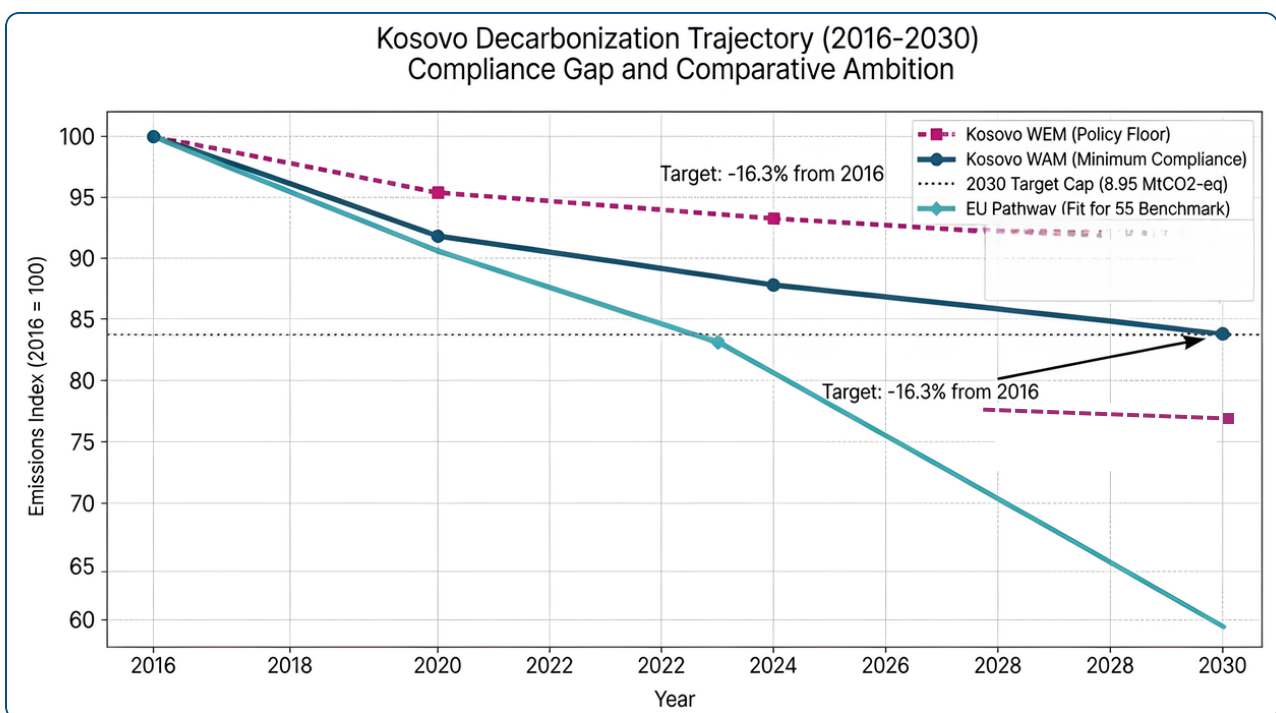


Figure 1. Kosovo Decarbonization Trajectory - Compliance Gap

¹³ Ibid.

This narrow compliance margin highlights the structural fragility of Kosovo's decarbonisation pathway. The WAM scenario assumes full and timely implementation of all planned measures, including large-scale renewable energy deployment, carbon pricing introduction, and efficiency improvements. Any delays in these measures, particularly in renewable capacity expansion or carbon pricing implementation, would widen the compliance gap and jeopardise Kosovo's ability to meet its Energy Community obligations. This risk is compounded by uncertainties related to electricity demand growth, hydrological variability affecting renewable output, and institutional capacity constraints.

The baseline and target architecture therefore establishes both the mathematical framework and the policy logic for Kosovo's decarbonisation strategy. The 2016 reference year defines the quantitative boundary of compliance, while the WEM and WAM scenarios define the policy pathways available to achieve that objective. The existence of a persistent compliance gap under the WEM scenario underscores the insufficiency of current policies and reinforces the central role of additional regulatory and investment measures in achieving decarbonisation targets. In this sense, the WAM scenario does not represent an aspirational pathway but a minimum compliance pathway necessary to meet Kosovo's legally binding obligations under the Energy Community Treaty.

2.2 Sectoral decarbonisation decomposition

Kosovo's emissions profile is structurally concentrated in a limited number of sectors, with the power and heat sector accounting for the dominant share of total greenhouse gas emissions. This concentration reflects the country's reliance on lignite-fired generation, which supplies over 90% of domestic electricity production and constitutes the principal source of Scope 1 emissions within the national inventory.¹⁴

¹⁴ Republic of Kosovo, Ministry of Economy, Energy Strategy of the Republic of Kosovo 2022–2031, Pristina, 2023.

The combustion of lignite in Kosovo A and Kosovo B thermal power plants alone represents the single largest emissions category, exceeding the combined emissions of transport, industry, and waste.¹⁵ As a result, the decarbonisation trajectory of the electricity sector is the decisive variable determining Kosovo's overall compliance with its 2030 emissions cap.

The structural characteristics of Kosovo's power system amplify the complexity of this transition. Electricity demand is highly seasonal, with pronounced winter peaks driven by widespread use of electricity for residential heating. This heating structure is a legacy of limited district heating coverage, low penetration of alternative fuels, and relatively high energy poverty, which constrains fuel-switching options. Winter demand spikes frequently exceed available domestic generation capacity (1,100 MW), requiring imports that are both economically costly and carbon-intensive depending on the regional generation mix.

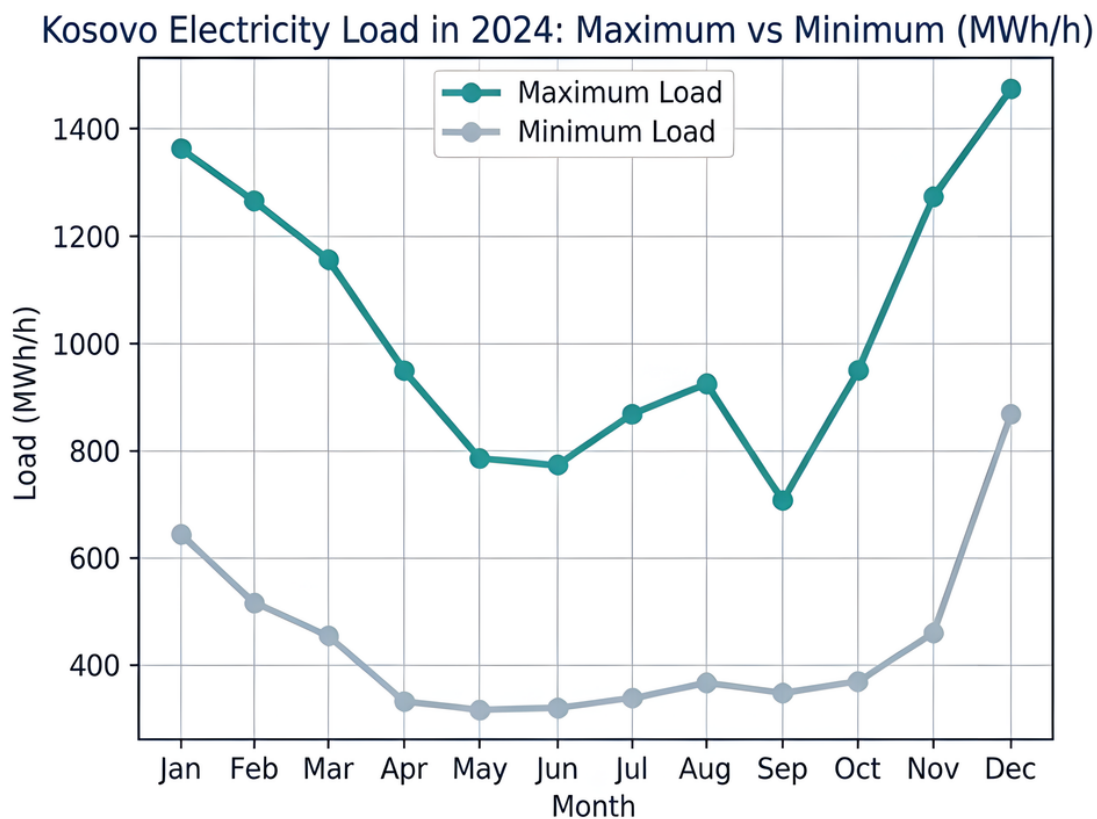


Figure 2. Electricity Load. Source: ERO report 2024

¹⁵ Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan of Kosovo 2025 - 2030, Pristina, 2023 (working document).

Electrification of heating, while essential for long-term decarbonisation, therefore introduces a transitional challenge: without parallel deployment of renewable capacity and flexibility mechanisms, electrification risks reinforcing reliance on lignite generation in the short term.

The transport sector constitutes the second-largest source of emissions outside electricity generation, although its relative share remains significantly lower than in EU Member States. Transport emissions are driven primarily by road traffic, characterised by an ageing vehicle fleet and high dependence on imported fossil fuels. The absence of electrified transport infrastructure and limited penetration of alternative fuels constrains emissions reduction potential under current policy settings. As electrification progresses, transport emissions will increasingly shift from direct combustion (Scope 1) to indirect emissions associated with electricity generation (Scope 2), reinforcing the centrality of power sector decarbonisation.

Industrial emissions in Kosovo are comparatively modest due to the limited scale of heavy industry, but certain subsectors remain exposed to carbon pricing risks through indirect electricity consumption. This exposure is particularly relevant in the context of the EU Carbon Border Adjustment Mechanism, which will progressively incorporate electricity-related emissions into the carbon cost structure of traded goods.¹⁶ While industrial emissions do not currently dominate Kosovo's emissions profile, their economic relevance extends beyond their absolute emissions contribution due to their implications for trade competitiveness and investment attractiveness.

The waste sector represents a smaller but non-negligible source of greenhouse gas emissions, primarily through methane emissions from unmanaged or poorly managed landfills. Kosovo's Integrated Waste Management Strategy foresees progressive expansion of controlled waste disposal and increased recycling rates, which are expected to reduce methane emissions over time.¹⁷ Although the quantitative mitigation potential in this sector is limited relative to the power sector, waste management improvements provide cost-effective emissions reductions with ancillary environmental and public health benefits.

¹⁶ European Commission, Carbon Border Adjustment Mechanism Regulation, Brussels, 2023.

¹⁷ Republika e Kosovës, Ministria e Mjedisit, Planifikimit Hapësinor dhe Infrastrukturës, Strategjia për Menaxhimin e Integruar të Mbeturinave 2021–2030, Prishtinë, 2021.

The Agriculture, Forestry, and Other Land Use (AFOLU) sector plays a distinct role in Kosovo's emissions balance by acting as a net carbon sink. Forest ecosystems absorb carbon dioxide through biomass accumulation, partially offsetting emissions from fossil fuel combustion. However, the scale of this sink is insufficient to materially alter the overall emissions trajectory, and its contribution remains subject to uncertainties related to land management practices and climate variability.

As Kosovo electrifies transport and heating, "Direct Emissions" (Scope 1) are converted into "Indirect Emissions" (Scope 2). This means the success of the entire national climate strategy depends exclusively on the carbon intensity of the grid. If the grid remains coal - heavy, **electrification simply relocates the pollution rather than eliminating it.**

This sectoral decomposition underscores a central structural reality: Kosovo's decarbonisation pathway is overwhelmingly determined by developments in the electricity and heating sectors. While emissions reductions in transport, waste, and industry contribute to the overall mitigation effort, they cannot compensate for stagnation in power sector decarbonisation. Consequently, policy interventions targeting generation structure, heating electrification, and demand-side efficiency constitute the primary levers for achieving compliance with Energy Community climate obligations.

2.3 Policy instrument taxonomy

The transformation of Kosovo's energy system requires a coordinated policy framework combining economic incentives, regulatory mandates, and investment support mechanisms. These instruments operate through distinct but complementary channels, influencing both the supply and demand sides of the energy system.

Carbon pricing represents the most direct economic instrument for reducing emissions by internalising the external cost of carbon into energy market prices. The introduction of carbon pricing, as foreseen in Kosovo's Energy Strategy and Draft NECP, would increase the marginal cost of lignite-fired generation, altering merit-order dispatch in favour of lower-emission technologies.

This price signal would accelerate renewable energy deployment, improve the competitiveness of efficiency investments, and align Kosovo's electricity market with emerging regional carbon pricing frameworks. In parallel, fiscal reforms including the gradual removal of implicit fossil fuel subsidies would reinforce these price signals and prevent distortion of investment decisions.

Regulatory instruments provide the legal foundation for decarbonisation by establishing binding performance standards and operational constraints. These include emissions limits for power plants, renewable energy targets, building efficiency requirements, and permitting procedures governing new generation capacity. Phase-out schedules for ageing lignite units represent a particularly important regulatory instrument, as they provide long-term investment certainty and prevent carbon lock-in. Grid codes and connection rules further influence decarbonisation outcomes by determining the technical conditions under which renewable energy can access the electricity system.¹⁸

Public investment and financial de-risking mechanisms play a critical role in addressing capital market barriers that constrain low-carbon investment. Renewable energy projects in Kosovo face elevated financing costs due to perceived regulatory and market risks. Public guarantees, concessional financing, and blended finance instruments can reduce these risks and mobilise private capital. Investment in transmission infrastructure and system flexibility, including storage and demand response capabilities, is equally essential to accommodate higher shares of variable renewable energy.

Market design instruments determine how electricity is traded and how generation assets are remunerated. Competitive auctions for renewable energy provide cost transparency and reduce investment risk, while long-term power purchase agreements (PPAs) and contracts for difference (CfDs) provide revenue stability. These mechanisms are consistent with Energy Community requirements for market-based renewable energy support and reduce fiscal exposure compared to administratively set tariffs. Flexibility markets, including balancing and ancillary service markets, further enable decarbonisation by ensuring system reliability in the presence of variable renewable generation.

¹⁸ Energy Regulatory Office, Grid Code of Kosovo, Pristina, latest version.

Finally, enabling instruments underpin the entire decarbonisation framework by ensuring transparency, accountability, and institutional effectiveness. Monitoring, reporting, and verification (MRV) systems provide the data infrastructure necessary for carbon pricing and compliance assessment. Institutional capacity within regulatory authorities and system operators determines the effectiveness of policy implementation, while data transparency supports investor confidence and policy evaluation. Without these enabling conditions, the effectiveness of pricing, regulatory, and investment instruments would be significantly constrained.

Policy instruments like Carbon Pricing and CfDs cannot function in a vacuum. They rely on "Enabling Instruments" - specifically Monitoring, Reporting, and Verification (MRV) systems.

The taxonomy outlined above reflects the multidimensional nature of decarbonisation policy. Pricing instruments alter economic incentives, regulatory measures establish binding constraints, investment instruments mobilise capital, and market design mechanisms ensure efficient system operation. The effectiveness of Kosovo's decarbonisation strategy depends not on any single instrument, but on the coordinated application of these tools within a coherent governance framework aligned with Energy Community obligations and the Green Agenda for the Western Balkans.

2.4 Results framework

The effectiveness of Kosovo's decarbonisation strategy depends not only on the adoption of policy measures, but on the establishment of a results framework capable of translating policy inputs into measurable emissions reductions. This study applies a logic model consistent with the governance structure of the National Energy and Climate Plan and the monitoring methodology of the Green Agenda for the Western Balkans.¹⁹ This model distinguishes between outputs, outcomes, and impacts, thereby linking policy implementation with measurable climate and energy system transformation.

¹⁹ Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan.

Outputs refer to the immediate and quantifiable products of policy implementation, including installed renewable energy capacity, number of buildings renovated, carbon pricing mechanisms established, and regulatory instruments adopted. These outputs are directly measurable and correspond to NECP implementation milestones. Within the RCC Green Agenda framework, output indicators include renewable energy capacity additions, energy efficiency improvements, and waste management infrastructure deployment.

Outcomes capture the structural changes in the energy system resulting from these outputs. These include reductions in lignite generation, decreased energy intensity of GDP, increased renewable energy share in final energy consumption, and reduced electricity import dependency. These indicators reflect systemic transformation rather than individual project implementation. They correspond directly to RCC monitoring indicators tracking renewable energy penetration, energy efficiency, and decarbonisation progress.

Impacts represent the ultimate objective of the decarbonisation process, measured primarily through reductions in total greenhouse gas emissions and carbon intensity. The central impact indicator for Kosovo is compliance with the legally binding emissions ceiling of 8.95 MtCO₂-eq by 2030. Additional impact indicators include reductions in emissions per unit of GDP, improved energy security metrics, and alignment with EU climate acquis requirements.

Monitoring of these outputs, outcomes, and impacts relies on the establishment of robust MRV systems, consistent with Energy Community governance requirements. These systems ensure that emissions reductions are accurately measured and verified, enabling compliance assessment and policy adjustment where necessary. Data collection responsibilities are distributed across multiple institutions, including the Ministry of Economy, the Kosovo Agency of Statistics, and the Energy Regulatory Office.

The RCC's Green Agenda monitoring mechanism provides an additional layer of oversight by aggregating national indicators into a regional performance framework.

Kosovo's progress is evaluated against indicators including total greenhouse gas emissions, renewable energy share, energy intensity, and alignment with climate governance requirements. This regional monitoring framework reinforces accountability by linking national policy implementation with regional and EU integration benchmarks.

The results framework applied in this study ensures that policy recommendations are evaluated not only in terms of their theoretical mitigation potential, but in terms of their measurable contribution to Kosovo's legally binding decarbonisation targets. By linking policy inputs to emissions outcomes through clearly defined indicators, the framework provides a transparent basis for monitoring progress, identifying compliance risks, and adjusting policy measures where necessary.

3. EU and regional policy framework - “Review of relevant EU and regional policies”

3.1 EU climate and energy direction (context for alignment)

The European Union's climate and energy policy architecture establishes the external regulatory environment within which Kosovo's decarbonisation trajectory must be defined. Although Kosovo is not yet a Member State, its participation in the Energy Community extends substantial portions of the EU energy and climate acquis to its domestic legal framework. This alignment is no longer limited to market liberalisation but increasingly encompasses binding emissions reduction trajectories, carbon pricing readiness, and integration into the EU's climate governance system.²⁰ As a result, Kosovo's decarbonisation pathway must be assessed not only against national policy objectives but also against the evolving structure of EU climate legislation.

²⁰ Energy Community Secretariat, Annual Implementation Report 2023, Vienna, 2023.

Energy Source	2023 Share (%)	2024 Share (%)
Renewables (Total)	45.4%	47.5%
Wind & Hydro	~30%	31.0%
Solar PV	~10%	11.1%
Nuclear	22.5%	22.9%
Fossil Fuels (Coal/Gas)	32.1%	29.6%

Figure 3. EU's Clean Energy Shift (2023–2024). Source: EUROSTAT

The central legislative framework guiding the EU's decarbonisation trajectory is the "Fit for 55" package, adopted between 2021 and 2023, which establishes a binding target of reducing greenhouse gas emissions by at least 55% by 2030 relative to 1990 levels.²¹ This target is operationalised through a combination of carbon pricing expansion, renewable energy mandates, and energy efficiency obligations. The Fit for 55 package strengthens existing instruments and introduces new regulatory mechanisms designed to accelerate emissions reductions across all sectors, including power generation, buildings, and transport. For Kosovo, the relevance of this framework lies in its role as the benchmark for Energy Community target-setting and its influence on electricity market design, investment flows, and cross-border trade conditions.

At the core of the EU's decarbonisation framework is the European Union Emissions Trading System (EU ETS), which functions as a cap-and-trade mechanism covering power generation, industry, and aviation. The EU ETS establishes a declining emissions cap and allows market participants to trade emissions allowances, thereby creating a carbon price signal that internalises the cost of emissions. The carbon price within the EU ETS has increased substantially in recent years, exceeding €80 per tonne of CO₂ in several trading periods, significantly altering the cost competitiveness of fossil fuel generation.²² This carbon price signal has accelerated coal phase-out across EU Member States and driven investment toward renewable energy and low-carbon technologies.

²¹ European Commission, Fit for 55 Package, Brussels, 2021.

²² Energy Community Secretariat, Carbon Pricing Design Options for the Energy Community, Vienna, 2023.

Kosovo's electricity sector currently operates outside the EU ETS, but this regulatory separation is increasingly temporary. The Energy Community Ministerial Council has adopted a decarbonisation roadmap that foresees the introduction of carbon pricing mechanisms in Contracting Parties, either through linkage to the EU ETS or through equivalent national schemes. This requirement reflects the need to prevent carbon leakage within the integrated European electricity market and to ensure a level playing field between EU Member States and neighbouring economies. For Kosovo, the introduction of carbon pricing will represent a structural shift in electricity market economics, fundamentally altering the merit-order dispatch of generation assets and reducing the competitiveness of lignite-fired generation.

The Carbon Border Adjustment Mechanism (CBAM), which entered its transitional phase in October 2023, reinforces this dynamic by extending carbon pricing to imports of electricity and carbon-intensive goods. CBAM requires importers into the European Union to report embedded emissions and, from 2026 onwards, to purchase carbon certificates corresponding to the EU ETS carbon price.²³ This mechanism is designed to prevent carbon leakage and ensure that imported electricity and industrial goods face carbon costs equivalent to those produced within the EU.

The implications for Kosovo are significant. Electricity exports to EU Member States, or to neighbouring Energy Community countries that adopt carbon pricing earlier, will face increasing carbon cost exposure. Even in the absence of direct exports, Kosovo's electricity price formation will be influenced by regional carbon pricing through market coupling and cross-border electricity trade. As regional electricity markets integrate, the EU ETS carbon price will increasingly function as the implicit marginal cost of electricity generation across interconnected systems.

²³ Ibid.

Country	Est. Emissions Intensity (tCO₂/MWh)	CBAM Fee per MWh (Est. 2026)	Competitive Risk
Kosovo	~0.94	€70 – €80	Highest: Fees often exceed the market price of the power itself.
Serbia	~0.70 – 1.04	€55 – €70	Critical: High volume exposure reaching ~ €612M annually.
North Macedonia	~0.75	€59.71	High: Rapidly shrinking export margins.
Montenegro	~0.78	€62.45	High: Risk of "overnight" drop in export income.

Figure 4. "CBAM Wall" for Electricity Exports (2026). Source: Energy Community Secretariat (2025/2026 CBAM Readiness Tracker) & CEE Bankwatch Network.

This dynamic introduces both risks and incentives for Kosovo's decarbonisation pathway. On the one hand, continued reliance on lignite-fired generation risks exposing Kosovo to rising carbon costs and reducing the competitiveness of its energy-intensive industries. On the other hand, alignment with EU carbon pricing structures can facilitate investment in renewable energy, reduce long-term electricity price volatility, and support Kosovo's integration into the EU internal energy market.

The EU climate framework therefore functions as both a regulatory constraint and an investment signal. Compliance with Energy Community obligations will progressively align Kosovo's electricity system with EU carbon pricing and renewable energy targets, regardless of the pace of formal EU accession. In this sense, decarbonisation is not a discretionary policy choice but an operational requirement for participation in the European energy market.

The interaction between carbon pricing, renewable energy deployment, and electricity market integration defines the structural parameters within which Kosovo's decarbonisation strategy must operate. The EU ETS establishes the long-term cost trajectory of carbon emissions, while CBAM ensures that carbon pricing cannot be avoided through trade. Together, these instruments create a regulatory environment in which lignite-based electricity generation becomes progressively less economically viable.

For Kosovo, the critical policy challenge is therefore not whether to decarbonise, but how to sequence the transition in a manner that maintains energy security, preserves economic competitiveness, and minimises fiscal and social disruption. The EU climate and energy framework provides the reference architecture for this transition, defining both the compliance obligations and the economic incentives that will shape Kosovo's energy system through 2030 and beyond.

3.2 Green Agenda for the Western Balkans

The Green Agenda for the Western Balkans constitutes the principal political and policy framework through which the European Green Deal is operationalised in the six Western Balkan economies, including Kosovo. Endorsed at the Sofia Summit in November 2020, the Green Agenda represents a formal commitment by the region's governments to align their economic and energy systems with the European Union's decarbonisation trajectory and climate neutrality objective by 2050.²⁴ Unlike earlier regional environmental initiatives, the Green Agenda is explicitly linked to the EU accession process and functions as a mechanism for the progressive transposition of climate, energy, and environmental components of the *acquis communautaire*.

²⁴ Regional Cooperation Council, Green Agenda for the Western Balkans Monitoring Framework, Sarajevo, 2023.

Within this framework, Kosovo has committed to implementing integrated energy and climate policies consistent with EU legislative trajectories. This includes the preparation and implementation of a National Energy and Climate Plan, which serves as the central planning instrument for achieving emissions reduction targets and coordinating sectoral policies. The NECP governance structure mirrors that of EU Member States, requiring the establishment of monitoring, reporting, and verification systems, periodic progress reporting, and policy adjustment mechanisms. The Green Agenda thus institutionalises decarbonisation as a continuous governance process rather than a one-time policy intervention.

A central element of the Green Agenda's decarbonisation pillar is the progressive introduction of carbon pricing. The Sofia Declaration explicitly commits Western Balkan economies to the development of carbon pricing instruments aligned with EU carbon market principles.²⁵ This commitment reflects the recognition that carbon pricing is necessary to ensure compatibility with the EU Emissions Trading System and to avoid carbon leakage within an increasingly integrated European electricity market. For Kosovo, this introduces a structural requirement to develop monitoring and regulatory infrastructure capable of supporting emissions trading or equivalent carbon pricing mechanisms.

The Green Agenda also emphasises the expansion of renewable energy as a primary decarbonisation strategy. Renewable energy deployment is framed not only as a climate mitigation measure but also as a tool for reducing import dependency and strengthening energy security. This framing is particularly relevant for Kosovo, whose electricity system is vulnerable to supply disruptions due to ageing generation infrastructure and limited domestic flexibility resources. Renewable energy expansion, combined with regional electricity market integration, is expected to improve system resilience while reducing emissions intensity.

²⁵ Ibid.

Energy efficiency constitutes a complementary pillar of the decarbonisation strategy, particularly in the buildings sector. The Green Agenda prioritises building renovation programs aimed at reducing final energy consumption, lowering household energy costs, and mitigating energy poverty. For Kosovo, where electricity is widely used for residential heating, energy efficiency improvements play a critical role in reducing winter peak demand and alleviating pressure on lignite-fired generation.

The Green Agenda also integrates decarbonisation objectives into broader economic policy through its emphasis on industrial competitiveness and innovation. Decarbonisation is framed as a driver of economic modernisation, facilitating technological upgrading and integration into EU value chains. This approach reflects the EU's broader strategy of linking climate policy with industrial policy, ensuring that emissions reduction efforts contribute to economic development rather than constraining growth.

Implementation of the Green Agenda is supported through a combination of financial and institutional mechanisms. The European Union has committed substantial financial resources to support decarbonisation investments in the Western Balkans, including renewable energy projects, grid infrastructure, and energy efficiency programs. These investments are channelled through instruments such as the Instrument for Pre-Accession Assistance and the Western Balkans Investment Framework, which provide concessional financing and technical assistance.

Monitoring and oversight of Green Agenda implementation is conducted through a regional governance structure coordinated by the Regional Cooperation Council and the Energy Community Secretariat. This monitoring framework tracks progress across a set of quantitative indicators, including greenhouse gas emissions, renewable energy deployment, and energy efficiency improvements. Kosovo's performance under these indicators directly influences its alignment with EU climate policy and its progress toward accession.

The Green Agenda therefore serves as the primary policy bridge between Kosovo's national decarbonisation strategy and the European Union's climate governance system. It establishes both the institutional mechanisms and the policy trajectory necessary for Kosovo's integration into the EU's low-carbon economy. In practical terms, the Green Agenda transforms decarbonisation from a domestic policy objective into a regional and European compliance requirement.

For Kosovo, participation in the Green Agenda introduces both obligations and opportunities. Compliance with Green Agenda commitments requires significant structural reform of the energy sector, including investment in renewable energy, introduction of carbon pricing, and strengthening of regulatory institutions. At the same time, alignment with EU climate policy enhances Kosovo's access to financial support, facilitates integration into regional electricity markets, and strengthens its position within the EU accession process.

The Green Agenda thus functions as the central policy framework guiding Kosovo's decarbonisation trajectory. Its implementation will determine not only Kosovo's emissions reduction performance but also its economic and institutional integration into the European energy system.

3.3 Energy Community framework

The Energy Community constitutes the central legal and institutional mechanism through which the European Union's energy and climate acquis is extended to Kosovo. Established by the Energy Community Treaty in 2005, this framework obliges Contracting Parties to implement core elements of EU energy legislation, including market liberalisation, renewable energy promotion, energy efficiency, and, increasingly, climate governance and emissions reduction. In contrast to the Green Agenda, which operates primarily as a political commitment, the Energy Community establishes legally binding obligations enforceable through institutional compliance mechanisms.

A structural shift in the Energy Community's mandate occurred in December 2022 with the adoption of Ministerial Council Decision 2022/02/MC-EnC, which introduced binding climate and energy targets for 2030 and established an integrated governance framework aligned with EU Regulation (EU) 2018/1999. This decision formalised, for the first time, economy-wide greenhouse gas reduction obligations for Contracting Parties, including Kosovo's commitment to limit emissions to 8.95 MtCO₂-eq by 2030, representing a 16.3% reduction relative to 2016 levels. These targets transformed decarbonisation from a voluntary policy objective into a legal compliance requirement under the Energy Community Treaty.

Central to this governance framework is the National Energy and Climate Plan (NECP), which serves as the primary planning and reporting instrument for achieving climate and energy targets. The NECP integrates policies across five dimensions: decarbonisation, energy efficiency, energy security, internal energy market integration, and research and innovation. For Kosovo, the NECP functions as both a strategic planning document and a compliance instrument subject to review and monitoring by the Energy Community Secretariat. Failure to implement NECP measures or achieve emissions targets may trigger formal dispute resolution procedures under the Treaty framework.

As of early 2026, the absence of an adopted National Energy and Climate Plan (NECP) creates a "Regulatory Void." While the 2030 targets remain legally binding, the lack of an adopted NECP delays the release of funds from the EU Reform and Growth Facility and prevents the formal introduction of Carbon Pricing.

Carbon pricing readiness represents a core element of this compliance architecture. While Kosovo is not yet directly integrated into the EU Emissions Trading System, the Energy Community has established a decarbonisation roadmap requiring Contracting Parties to develop national carbon pricing mechanisms or equivalent policy instruments. This requirement reflects the need to ensure compatibility with EU carbon pricing structures and to prevent distortions in the integrated regional electricity market. The introduction of carbon pricing is therefore not solely an economic instrument but a governance obligation linked to participation in the European energy system.

This governance dimension is reinforced by the Monitoring, Reporting, and Verification (MRV) framework established under Energy Community Decision 2022/06/MC-EnC, which requires Contracting Parties to develop emissions inventories, projections, and policy impact assessments consistent with EU methodologies. MRV systems provide the technical foundation for emissions accounting, carbon pricing implementation, and compliance assessment. Without reliable MRV infrastructure, Kosovo would be unable to implement carbon pricing or demonstrate compliance with its emissions reduction targets.

The Energy Community framework also integrates renewable energy and energy efficiency targets into a unified compliance structure. Kosovo is required to achieve a renewable energy share consistent with regional targets and to implement efficiency measures that reduce final energy consumption. These obligations are legally binding and subject to monitoring by the Energy Community Secretariat.

Institutionally, the Energy Community Secretariat functions as the primary oversight body, reviewing national policy implementation, evaluating NECP progress, and initiating enforcement proceedings where necessary. This supranational oversight introduces an external compliance discipline analogous to EU accession conditionality, reinforcing the credibility of Kosovo's decarbonisation commitments.

The Energy Community framework therefore transforms Kosovo's decarbonisation trajectory from a national policy choice into a legal obligation embedded within a regional governance system. Compliance with this framework is essential not only for achieving emissions reduction targets but also for maintaining Kosovo's integration into the regional electricity market and its broader EU accession pathway.

3.4 Regional cooperation and power market integration

Regional electricity market integration constitutes a critical structural enabler of Kosovo's decarbonisation pathway. As a small electricity system with limited domestic flexibility resources, Kosovo faces structural constraints in integrating large shares of variable renewable energy without access to regional balancing and reserve capacity. Market integration mitigates these constraints by enabling cross-border electricity flows, improving system flexibility, and reducing the cost of decarbonisation.

The Energy Community Treaty establishes the legal foundation for integrating Kosovo into the European internal energy market through harmonisation of market rules, transmission access regulations, and system operation standards.²⁶ This integration is operationalised through the implementation of the EU's Electricity Regulation framework, including market-based dispatch, balancing market integration, and cross-border capacity allocation.

Market coupling represents the most advanced form of electricity market integration, enabling electricity prices to be determined simultaneously across interconnected markets based on marginal generation costs. Under market coupling, electricity flows automatically from lower-cost to higher-cost regions, optimising system efficiency and facilitating renewable energy integration.²⁷ For Kosovo, market coupling offers a mechanism for exporting surplus renewable generation and importing electricity during periods of low domestic generation, thereby reducing reliance on lignite-fired capacity.

The decarbonisation benefits of market integration arise from its impact on merit-order dispatch and system flexibility. Renewable energy sources such as wind and solar have near-zero marginal costs and are therefore dispatched ahead of fossil fuel generation when available. Regional integration increases the geographic diversity of renewable generation, smoothing variability and reducing the need for fossil fuel backup capacity. This dynamic lowers the average carbon intensity of electricity supply and reduces overall system emissions.

²⁶ Energy Community Secretariat, Energy Community Treaty, Vienna, 2005.

²⁷ Energy Community Ministerial Council, Decision 2022/02/MC-EnC, Vienna, 2022.

The functionalization of the Albanian Power Exchange (ALPEX) marks a decisive shift from isolated national planning to a unified, market-based regional energy block, providing Kosovo with the transparency and liquidity essential for a low-carbon transition. According to the latest ALPEX 2025 Performance Report, trading volumes increased by 56% year-on-year, with 15 Kosovar companies now active on the exchange. This liquidity is what makes the 2030 renewable targets "bankable" for international investors.

Market Milestone	Implementation Status (Feb 2026)
Day-Ahead Coupling	Operational: Fully integrated Albania-Kosovo zone since Jan 2024.
Intraday Auctions	Operational: Supplementary regional auctions launched late 2024.
Continuous Intraday	In Progress: Targeting full rollout by late 2026 to support real-time balancing.
Regional Expansion	Negotiation: MoUs signed for coupling with the Greek and N.Macedonian markets (2027–2028).

Figure 5. ALPEX Implementation Status

Balancing market integration further enhances this flexibility by enabling transmission system operators to procure reserve capacity across national borders. This reduces the need for domestic reserve generation and lowers system costs. For Kosovo, participation in regional balancing markets is particularly important given the limited flexibility of its existing lignite fleet.

Interconnection infrastructure plays a critical role in enabling this integration. Kosovo's transmission system is already interconnected with neighbouring countries, including Albania, North Macedonia, Montenegro, and Serbia, providing the physical basis for cross-border electricity trade. These interconnections enable Kosovo to access regional renewable energy resources, particularly Albania's hydropower system, which provides valuable seasonal balancing capacity.

Regional integration also strengthens investment incentives for renewable energy by expanding the effective market size available to investors. Access to regional markets increases revenue stability and reduces investment risk, facilitating renewable energy deployment. This dynamic is particularly relevant for Kosovo, where domestic electricity demand alone may be insufficient to absorb large-scale renewable generation.

From a decarbonisation perspective, regional integration therefore functions as both a flexibility mechanism and an investment enabler. It reduces the cost of renewable energy integration, improves system reliability, and facilitates compliance with emissions reduction targets. However, regional integration also introduces exposure to carbon pricing developments in neighbouring countries. As neighbouring Energy Community Contracting Parties introduce carbon pricing, electricity imports from carbon-intensive generation will become more expensive, reinforcing incentives for domestic decarbonisation.

Regional market integration thus represents a structural component of Kosovo's decarbonisation pathway. It enables renewable energy deployment, reduces system costs, and aligns Kosovo's electricity market with the EU internal energy market. Participation in integrated regional electricity markets is therefore not only an economic opportunity but a functional requirement for achieving Kosovo's decarbonisation objectives.

4. Kosovo context and decarbonisation baseline

4.1 Strategic direction from Energy Strategy 2022–2031

Kosovo's Energy Strategy 2022–2031 establishes decarbonisation as a core structural objective of the national energy system, explicitly linking emissions reduction to energy security, market integration, and economic development.²⁸ Unlike earlier sector strategies, which prioritised security of supply through rehabilitation of lignite generation, the current strategy redefines system adequacy in terms of diversification, decarbonisation, and integration with the European energy market. This shift reflects both external regulatory pressures arising from the Energy Community and internal economic constraints associated with maintaining ageing lignite infrastructure.

The strategy defines five strategic objectives (Increase renewable energy generation; improve energy efficiency; ensure security and reliability of energy supply; reduce greenhouse gas emissions and align with EU climate policies; modernize energy infrastructure and integrate with regional energy markets.), among which decarbonisation and promotion of renewable energy constitute the primary transformation axis. The document explicitly recognises that Kosovo's continued reliance on lignite-fired generation is incompatible with European climate policy trajectories and will expose the country to increasing regulatory and economic risks, particularly in the context of carbon pricing and the EU Carbon Border Adjustment Mechanism.²⁹ As a result, the strategy adopts a long-term decarbonisation horizon extending to 2050, consistent with the climate neutrality objective established in the Sofia Declaration.

A central component of the strategy is the planned expansion of renewable electricity generation capacity. The Energy Strategy foresees a significant increase in installed renewable capacity, particularly from solar photovoltaics and wind power, supported through competitive auction schemes and integration into the liberalised electricity market. This expansion is intended to reduce reliance on lignite generation, lower the carbon intensity of electricity supply, and improve system flexibility. Renewable energy deployment is therefore positioned not only as a climate mitigation measure but as a structural component of energy security policy.

²⁸ Republic of Kosovo, Ministry of Economy, Energy Strategy of the Republic of Kosovo 2022–2031, Pristina, 2023

²⁹ Ibid.

In parallel, the strategy emphasises decarbonisation of the heating sector, which represents a critical source of winter electricity demand and indirect emissions. The expansion of district heating systems, including integration of renewable and waste heat sources, is identified as a key policy priority. Electrification of heating, combined with efficiency improvements in buildings, is expected to reduce peak demand pressures and moderate overall electricity consumption growth.

The Energy Strategy also introduces the principle of gradual carbon pricing, marking a significant departure from Kosovo's previous regulatory approach. The strategy recognises that carbon pricing will be required to align Kosovo with Energy Community obligations and to ensure compatibility with EU electricity markets.³⁰ The introduction of carbon pricing is framed as a necessary structural reform rather than a discretionary policy option, with implications for electricity price formation, generation dispatch, and investment decisions.

Despite these structural changes, the strategy acknowledges that lignite will remain part of Kosovo's generation mix during the transition period. However, it establishes a long-term trajectory toward coal phase-out, with a view to eliminating unabated lignite generation by 2050. This approach reflects both technical constraints, including the limited availability of replacement capacity in the short term, and economic considerations related to the cost and timing of system transformation.

The Energy Strategy therefore provides the strategic foundation for Kosovo's decarbonisation pathway. It establishes the policy direction, identifies priority sectors for intervention, and aligns Kosovo's energy system transformation with its obligations under the Energy Community and the Green Agenda for the Western Balkans.

³⁰ Republic of Kosovo, Ministry of Economy, Energy Strategy of the Republic of Kosovo 2022–2031, Pristina, 2023

4.2 NECP decarbonisation dimension: targets and trajectories

The National Energy and Climate Plan operationalise the strategic objectives of the Energy Strategy by translating long-term decarbonisation goals into quantified emissions reduction targets and sector-specific trajectories. The central quantitative target established under the Energy Community framework is the reduction of Kosovo's greenhouse gas emissions to 8.95 MtCO₂-eq by 2030, corresponding to a 16.3% reduction relative to the 2016 baseline. This target constitutes a legally binding ceiling rather than an aspirational objective, and compliance requires structural changes in the energy system.

The NECP evaluates Kosovo's emissions trajectory using two core modelling scenarios: the With Existing Measures (WEM) scenario and the With Additional Measures (WAM) scenario. The WEM scenario reflects a continuation of current policies without additional decarbonisation interventions, while the WAM scenario incorporates the full implementation of planned policy measures, including renewable energy expansion, energy efficiency improvements, and carbon pricing mechanisms.³¹

Under the WEM scenario, emissions remain above the Energy Community target, reflecting continued reliance on lignite generation and increasing electricity demand. This trajectory indicates that existing policies are insufficient to achieve compliance with Kosovo's emissions reduction obligations. By contrast, the WAM scenario demonstrates a pathway through which emissions can be reduced to levels consistent with the 2030 target, although the margin of compliance remains narrow and dependent on full policy implementation.

A central component of the WAM scenario is the large-scale deployment of renewable energy capacity. The NECP projects substantial growth in solar and wind generation, supported by investment in grid infrastructure and regulatory reform. Renewable energy is expected to increase its share in gross final energy consumption across electricity, heating, and transport sectors.

³¹ Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan, Pristina, 2023

The NECP also emphasises the role of district heating expansion in reducing electricity demand for residential heating. By replacing electric heating with district heating systems incorporating renewable and waste heat sources, Kosovo can reduce winter electricity demand and associated emissions.³² This measure is particularly important given the structural link between heating demand and lignite generation.

The transport sector is expected to contribute more modest emissions reductions, primarily through gradual electrification and efficiency improvements. However, the effectiveness of transport electrification in reducing emissions depends on the decarbonisation of electricity generation.

Overall, the NECP establishes a decarbonisation trajectory that is technically feasible but institutionally demanding. The transition from the WEM to the WAM pathway requires the introduction of new regulatory instruments, large-scale infrastructure investment, and effective implementation of carbon pricing mechanisms.

4.3 Emissions structure and key drivers

Kosovo's greenhouse gas emissions profile is dominated by the energy sector, reflecting the central role of lignite-fired electricity generation. Fossil fuel combustion for electricity and heat production accounts for the majority of total emissions, significantly exceeding emissions from transport, industry, and waste sectors combined. This structural concentration distinguishes Kosovo from many EU Member States, where emissions are more evenly distributed across sectors.

The dominance of the energy sector is primarily attributable to Kosovo's reliance on domestic lignite resources. The Kosovo A and Kosovo B power plants together supply the vast majority of domestic electricity generation.

³² Ibid.

These facilities operate as baseload generators due to their low marginal cost and limited availability of alternative generation capacity. As a result, electricity generation represents the single largest source of Scope 1 emissions in Kosovo.

Electricity demand patterns further reinforce this emissions structure. Kosovo experiences pronounced seasonal demand fluctuations, with peak demand occurring during winter months due to widespread use of electricity for residential heating. This heating structure reflects limited access to alternative heating fuels and insufficient coverage of district heating infrastructure. During peak periods, domestic generation capacity is often insufficient to meet demand, requiring electricity imports.

These imports introduce additional complexity into Kosovo's decarbonisation trajectory. While imports can reduce domestic emissions if sourced from lower-carbon generation, they also expose Kosovo to electricity price volatility and external carbon pricing mechanisms. As regional electricity markets adopt carbon pricing, the cost of imported electricity is expected to increase, reinforcing the economic case for domestic renewable energy deployment.

Transport represents the second-largest emissions source, although its overall contribution remains significantly lower than that of the power sector. Transport emissions are driven primarily by road traffic, with limited electrification and a relatively inefficient vehicle fleet. However, electrification of transport will shift emissions from direct fuel combustion to the electricity sector, reinforcing the importance of power sector decarbonisation.

The waste and agriculture sectors contribute smaller shares of total emissions but remain relevant within the overall emissions balance. The land use and forestry sector provides a partial carbon sink, offsetting a portion of emissions from fossil fuel combustion. However, this sink is insufficient to offset the structural emissions associated with lignite-fired electricity generation.

Kosovo's emissions profile therefore reflects a structural dependence on lignite-based electricity generation, combined with demand patterns that reinforce fossil fuel utilisation. This concentration of emissions within the energy sector means that decarbonisation of electricity generation represents the single most important determinant of Kosovo's overall emissions trajectory.

4.4 Institutions and governance readiness

The institutional framework governing Kosovo's decarbonisation process reflects the distribution of competencies across multiple ministries, regulatory authorities, publicly owned enterprises, and municipal actors. While the formal allocation of responsibilities broadly aligns with Energy Community governance requirements, implementation capacity remains uneven, particularly in areas related to climate monitoring, carbon pricing readiness, and cross-sectoral coordination.

At the centre of the governance architecture is the Ministry of Economy (ME), which holds primary responsibility for energy policy formulation, implementation of the Energy Strategy 2022–2031, and preparation of the National Energy and Climate Plan. The Ministry is responsible for defining renewable energy targets, coordinating decarbonisation measures, and ensuring alignment with Energy Community obligations. It also serves as the principal interface with international financial institutions and EU bodies supporting Kosovo's energy transition.

The Ministry of Environment, Spatial Planning and Infrastructure (MESPI) plays a complementary role, particularly in relation to greenhouse gas inventory development, climate policy coordination, and implementation of environmental legislation. MESPI is responsible for preparing national emissions inventories consistent with international reporting standards and Energy Community monitoring requirements. This function is essential for the development of Monitoring, Reporting, and Verification (MRV) systems required for carbon pricing and compliance assessment. However, institutional capacity constraints and data fragmentation continue to affect the accuracy and timeliness of emissions reporting.

The Energy Regulatory Office (ERO) serves as the independent regulatory authority responsible for electricity market regulation, tariff setting, licensing, and implementation of market rules. The regulator's role is critical in facilitating decarbonisation through the design of renewable energy support schemes, approval of grid access conditions, and integration of market-based instruments. As Kosovo moves toward carbon pricing, ERO will also play an essential role in incorporating carbon costs into electricity tariff structures and ensuring non-discriminatory market access.

Through a Memorandum of Understanding, ERO now recognizes energy licenses from Albania automatically. This has allowed companies like Protergia Energy Albania and EZ5 Energy to enter the Kosovo market, increasing competition and lowering the barriers for regional energy trade.

Operational implementation of decarbonisation measures within the electricity sector is concentrated among publicly owned energy enterprises. The Kosovo Energy Corporation (KEK), which operates the Kosovo A and Kosovo B lignite power plants, represents the single largest source of emissions in Kosovo's economy. KEK's operational decisions, investment planning, and eventual lignite phase-out trajectory will therefore determine the pace of power sector decarbonisation. At present, KEK's operational model remains oriented toward baseload lignite generation, reflecting both economic incentives and system reliability requirements.

The transmission system operator, KOSTT, plays a central role in integrating renewable energy and maintaining system stability. KOSTT is responsible for transmission planning, balancing operations, and cross-border electricity trade. Its ability to integrate variable renewable energy sources depends on investments in grid infrastructure, system flexibility, and balancing capacity. The distribution system operator, KEDS, is responsible for managing the distribution network and facilitating connections for distributed renewable energy systems, including prosumers.

Municipal governments also play a significant role, particularly in the heating and buildings sectors. Municipal authorities are responsible for district heating systems, local energy planning, and implementation of building efficiency measures. The effectiveness of decarbonisation measures in the heating sector therefore depends on municipal implementation capacity and financial resources.

The NECP development process has established a formal inter-institutional coordination mechanism through a dedicated working group involving relevant ministries, regulatory authorities, and public enterprises. This structure is intended to ensure policy coherence and facilitate implementation of decarbonisation measures. However, coordination challenges persist, particularly in aligning climate policy objectives with energy market regulation and infrastructure planning.

A central institutional gap relates to the development of MRV systems required for carbon pricing implementation. Accurate emissions measurement and reporting are prerequisites for participation in emissions trading systems or equivalent carbon pricing mechanisms. Kosovo's current MRV infrastructure remains under development, and further investment in technical capacity, data systems, and verification procedures will be required to meet Energy Community climate governance standards. Without robust MRV systems, Kosovo will be unable to implement carbon pricing or demonstrate compliance with emissions reduction obligations.

Institutional readiness therefore represents a critical determinant of Kosovo's decarbonisation trajectory. While the formal governance structure is largely in place, effective implementation will require strengthening regulatory capacity, improving inter-institutional coordination, and developing technical infrastructure necessary for emissions monitoring and market integration.

4.5 Just transition and distributional considerations

Decarbonisation of Kosovo's energy system carries significant social and economic implications, particularly given the central role of lignite in electricity generation and employment. The concept of a just transition is therefore essential to ensure that emissions reduction measures do not generate disproportionate economic hardship or undermine social stability. The Energy Strategy 2022–2031 explicitly recognises the need to balance decarbonisation objectives with employment protection, affordability, and regional economic development.³³

The lignite sector represents a major source of employment and economic activity, particularly in municipalities such as Obiliq, where the Kosovo A and Kosovo B power plants are located. These facilities provide direct employment as well as indirect economic benefits through supply chains and local economic activity. The gradual phase-out of lignite generation therefore carries implications for employment, municipal revenues, and regional economic development.

Electricity affordability represents a parallel concern. Kosovo has one of the lowest electricity tariffs in Europe, reflecting both domestic lignite availability and regulatory pricing policies.³⁴ While low electricity prices provide short-term affordability benefits, they also create structural challenges for decarbonisation by reducing incentives for energy efficiency and renewable energy investment. The introduction of carbon pricing and renewable energy support mechanisms is likely to increase electricity costs, at least during the transition period.

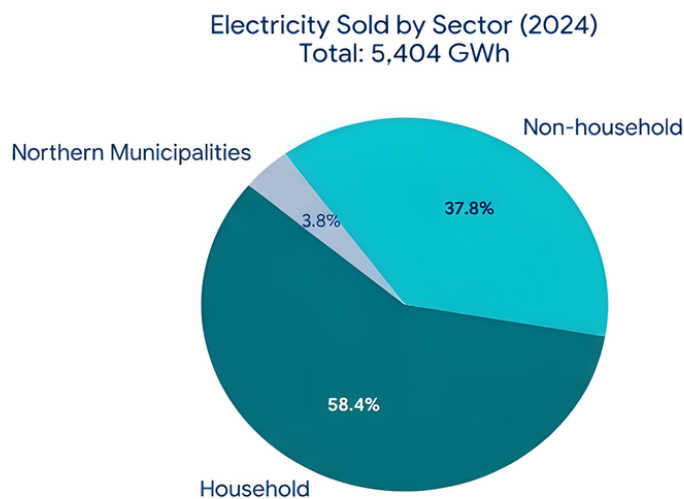
Energy poverty remains a significant issue in Kosovo, with many households spending a substantial share of income on energy consumption.³⁵ Electricity is widely used for heating due to limited access to alternative fuels and district heating systems. As a result, electricity price increases resulting from decarbonisation measures may have disproportionate effects on lower-income households.

³³ Republic of Kosovo, Ministry of Economy, Energy Strategy of the Republic of Kosovo 2022–2031, Pristina, 2023

³⁴ Energy Regulatory Office, Annual Report, Pristina, latest edition

³⁵ INDEP, Energy Poverty in Just Transition.

Mitigating these impacts requires the development of compensatory mechanisms, including targeted social support, energy efficiency programs, and investment in alternative heating infrastructure. Energy efficiency improvements in residential buildings represent a particularly important measure, as they reduce energy consumption while lowering household energy costs.



Regional economic diversification represents another key component of the just transition framework. Investments in renewable energy, grid infrastructure, and energy efficiency can create new employment opportunities, partially offsetting job losses in the lignite sector. The Energy Strategy emphasises the role of renewable energy deployment in supporting economic development and job creation.³⁶

Decarbonisation also presents long-term economic benefits by reducing exposure to carbon pricing and improving competitiveness in export markets. As the European Union expands carbon pricing through the EU Emissions Trading System and the Carbon Border Adjustment Mechanism, failure to decarbonise would impose increasing economic costs on Kosovo's economy.

³⁶ Republic of Kosovo, Ministry of Economy, Energy Strategy of the Republic of Kosovo 2022–2031, Pristina, 2023

The just transition framework therefore requires a coordinated policy approach integrating climate policy with social protection, labour market policy, and regional economic development. Ensuring affordability, protecting vulnerable households, and supporting affected workers will be essential for maintaining political and social support for decarbonisation.

5. Decarbonisation pathways for Kosovo (to 2030)

Kosovo's decarbonisation trajectory to 2030 is structurally defined by the transformation of its electricity system, complemented by parallel transitions in heating, transport, and land-use sectors. The concentration of emissions within the power sector creates both a constraint and an opportunity: meaningful emissions reductions can be achieved through targeted interventions in a limited number of assets, but failure to transform the electricity system would render compliance with Energy Community emissions ceilings unattainable. The National Energy and Climate Plan (NECP) therefore frames decarbonisation as a system-wide transformation centred on generation structure, demand-side efficiency, and electrification.³⁷

5.1 Power sector transformation pathway

The power sector represents the decisive component of Kosovo's decarbonisation strategy due to its dominant share in national greenhouse gas emissions. Electricity generation is currently based to a large extent on lignite-fired thermal power plants, with Kosovo A and Kosovo B providing the vast majority of domestic supply. These units operate as baseload generators due to their low marginal cost and the absence of carbon pricing, which allows lignite to remain economically competitive despite its high emissions intensity.

The NECP and Energy Strategy establish a gradual coal transition pathway centred on reducing lignite utilisation while maintaining system reliability. A key structural measure is the phased decommissioning of Kosovo A units, beginning with the permanent closure of at least one unit before 2030.³⁸ Kosovo A represents the least efficient and most carbon-intensive component of Kosovo's generation fleet, and its retirement constitutes a necessary step in reducing emissions intensity.

³⁷ Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan, Pristina, 2023

³⁸ Republic of Kosovo, Ministry of Economy, Energy Strategy of the Republic of Kosovo 2022–2031, Pristina, 2023

However, coal phase-out cannot occur in isolation. The removal of lignite capacity must be sequenced with the deployment of replacement generation and flexibility resources to avoid supply shortages. The Energy Strategy foresees the deployment of approximately 1.4 GW of renewable energy capacity by 2030, primarily from solar photovoltaic and wind power installations. This renewable expansion is expected to reduce lignite utilisation rates by displacing fossil generation in merit-order dispatch.

Renewable energy deployment fundamentally alters the operational logic of Kosovo's electricity system. Unlike lignite plants, which operate continuously at stable output levels, renewable generation is variable and dependent on weather conditions. This variability introduces flexibility requirements that must be addressed through a combination of grid reinforcement, energy storage, and balancing market integration.

Transmission infrastructure investment therefore constitutes a central component of the decarbonisation pathway. KOSTT's Transmission Development Plan identifies grid modernisation and reinforcement as necessary preconditions for integrating large-scale renewable energy. Without these investments, renewable energy deployment would be constrained by network limitations, slowing decarbonisation progress.

Market design reform represents an equally important component of power sector transformation. The introduction of competitive renewable energy auctions, foreseen in the Energy Strategy, replaces administratively determined feed-in tariffs with market-based support mechanisms. Auctions reduce investment costs, improve price transparency, and align Kosovo's electricity market with EU regulatory principles.

Carbon pricing represents the structural mechanism that will ultimately determine the economic viability of lignite generation. The introduction of carbon pricing increases the marginal cost of fossil fuel generation, shifting dispatch patterns toward lower-emission technologies. Over time, this price signal will reduce the operating hours of lignite plants, accelerating emissions reductions.

The power sector transformation pathway therefore consists of three interdependent components: gradual lignite phase-out, renewable energy expansion, and market and infrastructure reform. Successful implementation of this pathway is essential for achieving Kosovo's 2030 emissions target.

5.1 Heating and buildings decarbonisation

The heating sector represents a critical component of Kosovo's emissions profile due to its strong interaction with electricity demand. Electricity is widely used for residential heating, contributing to winter demand peaks that increase lignite generation and associated emissions. Decarbonisation of heating therefore, plays a dual role in reducing both direct and indirect emissions.

The Energy Strategy and NECP prioritise expansion of district heating systems as a central decarbonisation measure. District heating allows the use of alternative heat sources, including biomass, solar thermal energy, and waste heat, reducing reliance on electric resistance heating.³⁹ Expansion of district heating coverage is expected to reduce winter electricity demand and moderate peak load requirements.

Building energy efficiency improvements represent a complementary measure. Kosovo's residential building stock is characterised by low insulation standards and high energy consumption. Renovation programs targeting building envelopes, heating systems, and insulation can significantly reduce energy demand.

Electrification of heating through heat pumps also represents a long-term decarbonisation pathway. Heat pumps provide significantly higher efficiency compared to electric resistance heating, reducing electricity consumption and associated emissions. The decarbonisation of heating and buildings therefore contributes to emissions reductions both by lowering energy demand and by reducing reliance on lignite-fired electricity generation.

³⁹ Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan, Pristina, 2023

5.3 Transport decarbonisation pathway

Transport represents a smaller but growing source of emissions within Kosovo's economy. The sector is characterised by high reliance on imported fossil fuels and an ageing vehicle fleet. Decarbonisation of transport therefore requires structural changes in both vehicle technology and energy supply.

Electrification of transport represents the primary decarbonisation pathway. Electric vehicles produce no direct emissions, shifting emissions to the electricity sector. As the electricity system decarbonises, transport electrification will contribute to overall emissions reductions.

Infrastructure development represents a key enabling factor. The deployment of charging infrastructure is necessary to support electric vehicle adoption. Policy incentives, including financial support and regulatory measures, will also play a role. Modal shift toward public transport represents an additional decarbonisation pathway, although its quantitative impact is expected to remain limited relative to electrification.

5.4 Industry and CBAM exposure

Kosovo's industrial sector contributes a relatively small share of total emissions but faces significant indirect exposure to carbon pricing through electricity consumption. The introduction of the EU Carbon Border Adjustment Mechanism will progressively incorporate carbon costs into electricity and industrial products traded with the European Union.

Industrial competitiveness therefore depends on reducing electricity carbon intensity. Renewable energy deployment and carbon pricing alignment will reduce carbon exposure and improve export competitiveness. Failure to decarbonise would increase industrial production costs and reduce investment attractiveness.

5.5 Non-energy measures and removals

Non-energy sectors contribute modest but important emissions reductions. The waste sector represents a key opportunity for methane emissions reduction through improved landfill management and increased recycling rates. Methane has a significantly higher global warming potential than carbon dioxide, making these reductions particularly valuable.

The land use and forestry sector provides carbon removals through forest growth and biomass accumulation. While the quantitative impact of these removals is limited relative to energy sector emissions, they contribute to net emissions reductions. Afforestation and forest management improvements can enhance carbon sink capacity.

Kosovo's decarbonisation pathway is defined by structural transformation of the electricity system, supported by complementary measures in heating, transport, and land use sectors. The power sector remains the decisive component due to its dominant share in emissions. Renewable energy deployment, lignite phase-out, and carbon pricing introduction represent the core pillars of this transition. Supporting measures including grid investment, energy efficiency improvements, and institutional reform ensure system stability and regulatory compliance. Successful implementation of this pathway will enable Kosovo to achieve its emissions reduction target while strengthening energy security and aligning with EU climate policy.

6. Policy and measures assessment

Kosovo's ability to comply with its 2030 emissions ceiling and align with European climate policy depends not only on the structural transformation pathways identified in the National Energy and Climate Plan (NECP), but also on the timely implementation of a coherent package of policy instruments. These instruments must address the economic drivers of emissions, the regulatory conditions governing infrastructure deployment, and the institutional capacities required for implementation and enforcement.⁴⁰ The policy and measures assessment presented in this chapter evaluates Kosovo's decarbonisation toolkit with particular emphasis on carbon pricing readiness, coal transition sequencing, renewable energy scale-up, system flexibility, and complementary non-energy mitigation measures. The analysis is grounded in the NECP policy and measures framework and the Energy Strategy 2022–2031, which together define the policy architecture for Kosovo's energy transition.

6.1 Carbon pricing and CBAM readiness package

The introduction of carbon pricing represents the single most consequential structural reform required to align Kosovo's electricity sector with European climate policy. Carbon pricing operates by incorporating the cost of greenhouse gas emissions into electricity generation costs, thereby altering the relative competitiveness of generation technologies and incentivising emissions reduction. Kosovo's current electricity market operates without an explicit carbon price, allowing lignite-fired generation to maintain a cost advantage despite its high emissions intensity. This regulatory gap creates both compliance risks under the Energy Community framework and economic risks associated with the European Union's Carbon Border Adjustment Mechanism (CBAM).

⁴⁰ Republic of Kosovo, Ministry of Economy, Draft National Energy and Climate Plan 2025–2030, Pristina, 2023.

The Draft NECP explicitly identifies the development of carbon pricing as a priority policy measure and foresees the preparation of a feasibility study for the introduction of carbon pricing mechanisms. This study is intended to evaluate options including participation in the EU Emissions Trading System (EU ETS), establishment of a national emissions trading scheme, or implementation of a carbon tax. Each of these options requires the development of supporting institutional infrastructure, including emissions monitoring systems, registry platforms, and regulatory oversight mechanisms.

Carbon pricing readiness is fundamentally dependent on the establishment of strong Monitoring, Reporting, and Verification (MRV) systems.⁴¹ These systems ensure that emissions data are accurate, consistent, and verifiable, forming the technical foundation for emissions trading or taxation. Kosovo's current MRV capacity remains under development, with emissions inventories prepared periodically but without the continuous monitoring infrastructure required for market-based carbon pricing. Strengthening MRV capacity therefore constitutes a prerequisite for carbon pricing implementation.

The introduction of carbon pricing would significantly alter electricity market economics by increasing the marginal cost of lignite generation. This price signal would shift merit-order dispatch toward renewable energy and reduce lignite utilisation rates.⁴² Carbon pricing would also align Kosovo's electricity sector with regional carbon pricing developments, facilitating market integration and reducing exposure to CBAM-related trade costs.

CBAM readiness represents a related but distinct policy objective. The European Union's CBAM Regulation requires reporting of embedded emissions in electricity and carbon-intensive goods imported into the EU, with financial obligations beginning in 2026. Even in the absence of direct electricity exports to the EU, Kosovo's integration into regional electricity markets exposes it indirectly to CBAM-related carbon pricing dynamics. Aligning Kosovo's carbon pricing framework with EU carbon pricing structures would reduce the risk of carbon leakage and improve investment conditions.

⁴¹ Energy Community Secretariat, MRV Guidelines, Vienna, 2022.

⁴² Energy Community Secretariat, Carbon Pricing Roadmap, Vienna, 2023.

A staged implementation approach is therefore required. The first stage involves development of MRV systems and legal frameworks. The second stage involves introduction of carbon pricing at a moderate level, allowing market participants to adjust gradually. The final stage involves full alignment with EU carbon pricing mechanisms. Carbon pricing readiness is therefore not merely an economic reform, but a structural requirement for Kosovo's integration into the European energy market.

6.2 Coal transition package

The coal transition represents the most politically and economically sensitive component of Kosovo's decarbonisation pathway. Lignite-fired generation currently provides the majority of domestic electricity supply and constitutes the largest source of greenhouse gas emissions.⁴³ The gradual reduction of lignite utilisation is therefore essential for achieving emissions reduction targets.

The NECP identifies the phased closure of Kosovo A units as a key policy measure. Kosovo A represents the least efficient and most emissions-intensive component of Kosovo's generation fleet. Its closure would produce immediate emissions reductions while improving overall system efficiency.

However, coal phase-out must be sequenced carefully to avoid compromising energy security. Renewable energy deployment, grid reinforcement, and flexibility measures must be implemented prior to or in parallel with lignite capacity retirement. Premature coal closure without replacement capacity would increase electricity imports and expose Kosovo to price volatility.

Economic considerations also play a significant role. KEK's financial position, employment impacts, and regional economic dependence on lignite generation must be managed through a just transition framework. The coal transition package therefore requires coordinated implementation of retirement schedules, investment in replacement capacity, and social mitigation measures.

⁴³ Energy Strategy 2022–2031

6.3 Renewables scale-up package

Renewable energy deployment represents the primary structural mechanism for reducing emissions in Kosovo's electricity sector. The Energy Strategy and NECP establish ambitious targets for renewable capacity expansion, with solar and wind generation expected to play dominant roles.

Competitive auctions represent the preferred mechanism for renewable energy deployment. Auctions allow market forces to determine renewable energy prices, reducing support costs and improving investment efficiency.⁴⁴ This approach aligns Kosovo's renewable energy policy with EU best practices.

Grid connection procedures represent a critical enabling factor. Renewable energy projects require timely and transparent grid access to ensure investment viability. Strengthening regulatory procedures and grid infrastructure is therefore essential.

Distributed renewable energy, including prosumer installations, also represents an important component of renewable deployment. Prosumers reduce demand on the centralised generation system and contribute to emissions reductions. Renewable energy scale-up therefore requires coordinated implementation of auctions, grid investment, and regulatory reform.

6.4 System Flexibility and Market Integration Package

The integration of variable renewable energy requires the development of system flexibility resources. Flexibility allows the electricity system to maintain balance between supply and demand despite fluctuations in renewable generation. Flexibility measures include energy storage, demand response programs, and balancing market development.⁴⁵ These measures allow system operators to manage variability without relying on fossil fuel backup generation.

⁴⁴ Energy Community Secretariat, Renewable Auctions Guidelines, Vienna, 2021.

⁴⁵ Energy Community Secretariat, Electricity Market Integration Report, Vienna, 2023.

Regional electricity market integration represents an additional flexibility resource. Cross-border electricity trade allows Kosovo to access balancing resources in neighbouring countries. Market design reform is necessary to support flexibility development. This includes the establishment of balancing markets and ancillary service markets. System flexibility measures therefore represent a critical enabling component of renewable energy deployment.

6.5 Waste/forestry/AFOLU Recommendations

Non-energy sectors contribute modest but important emissions reductions. Waste management improvements reduce methane emissions from landfills.⁴⁶ The Integrated Waste Management Strategy establishes targets for controlled waste disposal and increased recycling.

The forestry sector contributes carbon removals through forest growth.⁴⁷ Sustainable Forest management enhances this carbon sink. While these sectors cannot replace power sector decarbonisation, they contribute to overall emissions reduction

Kosovo's decarbonisation policy framework consists of five interdependent components:

- Carbon pricing establishes economic incentives for emissions reduction.
- Coal transition reduces emissions from existing generation assets.
- Renewable energy deployment provides replacement low-carbon generation.
- System flexibility enables renewable integration.
- Non-energy measures provide complementary emissions reductions.

The effectiveness of Kosovo's decarbonisation strategy depends on coordinated implementation of these measures. Delays in any component would jeopardise compliance with emissions reduction targets.

⁴⁶ Integrated Waste Management Strategy 2021–2030, Pristina

⁴⁷ Climate Change Strategy 2019–2028.

7. Conclusions

Kosovo's decarbonisation trajectory to 2030 is structurally defined by the interaction between its existing lignite-based electricity system, its legally binding obligations under the Energy Community framework, and its strategic objective of integration into the European Union's energy and climate architecture. The adoption of an absolute emissions ceiling of 8.95 MtCO₂-eq by 2030 establishes a fixed compliance boundary that cannot be achieved through incremental improvements alone. Structural transformation of the energy system is required.

The analysis confirms that the electricity sector remains the central determinant of Kosovo's emissions trajectory. The concentration of emissions in lignite-fired generation means that decisions related to generation structure, renewable energy deployment, and market reform will largely determine whether Kosovo achieves its emissions reduction target. The NECP modelling framework demonstrates that existing policies are insufficient to meet this objective. Only the full implementation of additional measures, including renewable energy expansion, heating sector reform, and the introduction of carbon pricing, enables Kosovo to approach compliance.

Carbon pricing emerges as a structural instrument rather than an optional policy tool. Its introduction will align Kosovo's electricity market with regional and European market conditions, reduce carbon intensity, and address emerging competitiveness risks associated with the Carbon Border Adjustment Mechanism. At the same time, carbon pricing requires supporting institutional infrastructure, particularly emissions monitoring and reporting systems.

Renewable energy deployment constitutes the primary technological pathway for reducing emissions. However, renewable expansion must be accompanied by investments in transmission infrastructure, system flexibility, and market reform. Without these enabling measures, renewable energy deployment will be constrained by technical and operational limitations.

The heating sector plays a critical supporting role in the decarbonisation process. Kosovo's reliance on electricity for heating amplifies demand peaks and reinforces lignite utilisation. District heating expansion and building efficiency improvements therefore represent essential components of the decarbonisation pathway.

Institutional capacity and governance readiness remain key implementation determinants. While Kosovo has established the formal structures required for decarbonisation planning, further strengthening of regulatory, technical, and coordination capacities will be required to ensure effective implementation.

Regional integration further reinforces Kosovo's decarbonisation trajectory. Participation in integrated electricity markets creates both economic incentives and regulatory pressures for decarbonisation, while also providing flexibility resources that enable renewable energy deployment.

Decarbonisation also carries important social and economic implications. The transition away from lignite must be managed in a way that preserves energy affordability, protects vulnerable households, and supports economic diversification.

Taken together, Kosovo's decarbonisation pathway represents a structural transformation of its energy system. This transformation is driven by external regulatory obligations, internal economic considerations, and long-term strategic objectives related to energy security and EU integration. The pace and effectiveness of implementation will determine whether Kosovo achieves its 2030 target and successfully positions itself within the European low-carbon energy system.

8. Policy recommendations

Kosovo's decarbonisation pathway requires coordinated regulatory, institutional, and investment measures implemented within a defined timeframe. The recommendations below are structured into four priority bundles reflecting the core transition pillars identified in the preceding analysis: governance and MRV readiness, power sector decarbonisation, renewable heat and demand reduction, and competitiveness and CBAM alignment. These measures are designed to ensure compliance with the 2030 emissions ceiling while preserving energy security and economic stability.

Bundle A — Governance and MRV Readiness (0–18 months)

Recommendation	Legal / Regulatory Step	Lead Institution(s)	Timeline	Key KPI	Risk Mitigation
Establish national MRV system aligned with Energy Community climate governance	Adopt secondary legislation defining emissions monitoring, reporting, and verification obligations	MESPI, ME	12 months	National MRV system operational	Technical assistance support from Energy Community Secretariat
Establish national emissions registry	Create registry infrastructure for installation-level emissions reporting	MESPI	12–18 months	Registry functional and reporting installations registered	Phased implementation beginning with power sector
Adopt carbon pricing framework law	Draft and adopt framework law enabling carbon pricing mechanisms	ME, Ministry of Finance	18 months	Legal framework adopted	Gradual introduction with pilot phase
Establish inter-institutional climate governance unit	Formalise permanent NECP coordination structure	ME	6 months	Unit operational and staffed	Clear institutional mandate and reporting structure

**Bundle B — Power Sector Decarbonisation and Reliability
(0–36 months)**

Recommendation	Legal / Regulatory Step	Lead Institution(s)	Timeline	Key KPI	Risk Mitigation
Adopt binding Kosovo A phase-out schedule	Government decision defining closure timeline	Government, ME, KEK	12 months	Closure timeline adopted	Align with renewable deployment schedule
Launch annual renewable energy auctions	Implement auction framework under renewable energy law	ME, ERO	Starting within 12 months	Installed renewable capacity increases annually	Transparent auction design
Strengthen grid connection framework	Amend grid code to facilitate renewable integration	ERO, KOSTT	18 months	Increased renewable grid connections	Parallel grid investment
Develop balancing and flexibility markets	Establish regulatory framework for flexibility services	ERO, KOSTT	24–36 months	Flexibility market operational	Regional balancing cooperation

**Bundle C — Renewable Heat and Winter Peak Reduction
(0–36 months)**

<i>Recommendation</i>	<i>Legal / Regulatory Step</i>	<i>Lead Institution(s)</i>	<i>Timeline</i>	<i>Key KPI</i>	<i>Risk Mitigation</i>
Expand district heating coverage	Municipal and national investment programs	ME, Municipalities	36 months	Increase in households connected	Priority targeting high-demand areas
Implement national building renovation program	Adopt building renovation roadmap	ME, MESPI	12–24 months	Reduction in heating electricity demand	Financial support schemes
Introduce heat pump incentive scheme	Adopt subsidy program for efficient heating	ME	18 months	Heat pump adoption rate	Target vulnerable households
Introduce peak demand reduction measures	Regulatory framework for demand-side management	ERO	24 months	Reduced winter peak demand	Consumer awareness programs

Bundle D — Competitiveness and CBAM Alignment (0–24 months)

Recommendation	Legal / Regulatory Step	Lead Institution(s)	Timeline	Key KPI	Risk Mitigation
Conduct national CBAM exposure assessment	Government report identifying exposure sectors	ME	12 months	Assessment completed	Industry consultation
Align carbon pricing with EU framework	Adopt implementation roadmap	ME, Ministry of Finance	24 months	Alignment roadmap adopted	Gradual implementation
Establish industrial decarbonisation support scheme	Develop financial support instruments	ME	24 months	Industrial emissions reduction	Target export sectors
Improve electricity carbon intensity reporting	Integrate emissions reporting into electricity market data	KOSTT, ERO	12 months	Carbon intensity reporting operational	Integration with MRV system

These recommendations reflect a sequenced transition framework. Governance reforms provide the institutional foundation necessary for carbon pricing and emissions monitoring. Power sector measures reduce emissions at their primary source while maintaining system reliability. Heating sector reforms reduce structural demand pressures that reinforce lignite utilisation. Competitiveness measures ensure alignment with European carbon pricing and protect Kosovo's economic position.

Implementation of these measures within the proposed timelines will enable Kosovo to achieve its emissions reduction target, strengthen energy security, and advance integration into the European energy and climate framework in line with the decarbonisation pillar of the Green Agenda!

