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NATIONAL ENERGY AND CLIMATE PLAN OF THE REPUBLIC OF KOSOVO 2025-2030

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Registered offices
Bonn and Eschborn, Germany

GIZ Office Kosovo
Str. Arkitekt Karl Gega No. 38
10000 Pristina, Kosovo
T +383 38 233 002 100

E giz-kosovo-buero@giz.de
I www.giz.de/kosovo

Kosovo Energy Project

German Economic Team

Financed by the Federal Ministry for Economic Affairs and Climate Action, the German Economic Team (GET) advises the governments of Ukraine, Belarus*, Moldova, Kosovo, Armenia, Georgia and Uzbekistan on economic policy matters. Berlin Economics has been commissioned with the implementation of the consultancy.

*Advisory activities in Belarus are currently suspended.

c/o BE Berlin Economics GmbH
Schillerstraße 59 | 10627 Berlin
Tel: +49 30 / 20 61 34 64 0
info@german-economic-team.com
www.german-economic-team.com

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1 GENERAL FRAMEWORK FOR INTEGRATED NATIONAL ENERGY AND CLIMATE PLANS

1.1 Executive summary

I. Political, economic, environmental, and social context of the plan

By signing the Sofia Declaration on the Green Agenda for the Western Balkans as part of the "Berlin Process" in November 2020, the Western Balkan countries have pledged to follow the European Union in its decarbonisation pathway towards a carbon neutral economy by 2050. The adoption of the Decarbonization Roadmap by the Ministerial Council on 30 November 2021 sends an important signal regarding the readiness of the Energy Community contracting parties to join the European Union and other international partners in achieving net zero greenhouse gas emissions by 2050. However, the absence of structured energy transition plans raises uncertainties about the direction and speed that the transition will take in the Western Balkans.

At the last meeting of the Ministerial Council of the Energy Community, held in December 2022, a decision was made to define the goals for 2030 of the Contracting Parties of the Energy Community. In addition to the 2020 targets, which were related to the integration of renewable energy sources in gross final energy consumption and improvement of energy efficiency, a new target was added for 2030, concerning the reduction of greenhouse gas emissions (GHG). All of these targets should be covered in the National Energy and Climate Plans.

In the period 2020-2021, a draft version of the National Energy and Climate Plan for Kosovo was developed. This plan was not adopted as the Energy Community decided to postpone the process of adoption of the NECPs until the goals are adopted at the level of the Energy Community for the year 2030. On the other hand, the Energy Strategy of the Republic of Kosovo 2017 - 2026 was replaced by the new Energy Strategy 2022 - 2031. The latter establishes the directions and key actions for the energy sector's development over the next 10 years. Although the first NECP draft was not adopted, it provides a good basis for establishing the whole process for this version of the NECP. The development of the new NECP for Kosovo is largely based on the established process, although important strategic documents have been adopted in the meantime and incorporated into the NECP. Thus, the results in the final NECP differ from the results of the draft version prepared in 2021.

For the development of the draft version of the NECP in 2021, a national Working Group (WG NECP) was established, led by representatives from both the Ministry of Economy (ME) and the Ministry of Environment and Spatial Planning (MESPI). The working group consisted of six thematic Working Groups (tWG), with representatives from government institutions, responsible for specific areas of focus.

- tWG1 - Decarbonisation / GHG emissions, chaired by MESPI
- tWG2 - Decarbonisation / Renewable Energy, chaired by ME
- tWG3 - Energy Efficiency, chaired by ME
- tWG4 - Energy Security, chaired by ME
- tWG5 - Energy Market, chaired by ME
- tWG6 - Research, Innovation and Competitiveness, chaired by the Ministry of Innovation

On its path of moving forward with the work on the NECP, the ME of Kosovo has requested advice from the German Federal Ministry of Economic Cooperation and Development (BMZ)-funded GIZ module Kosovo Energy Efficiency Project (KEEP), on the conception and planning of the policy plans. This was required to enable at the political level the establishment of the necessary expertise for the implementation and promotion of sustainable EU-compliant energy and climate policies.

For the preparation of the draft version of NECP in 2021, support by the GIZ was granted, with the ultimate objective to strengthen the capacities of national and local actors in Kosovo to enable economic, legislative and technical policy instruments for the planning and implementation of the NECP to effectively implement measures through cross-sectorial and inter-ministerial steering groups.

In contrast to the NECP development process in 2021, in January 2023, by decision of the Government of the Republic of Kosovo, a decision was made to establish only one working group in which 15 institutions proposed their members, namely:

- Ministry of Economy - ME
- Ministry of Environment, Spatial Planning– MESPI
- Office of the Prime Minister
- Ministry of Finance, Work and Transfers
- Economic Chamber of Commerce
- Ministry of Industry, Entrepreneurship and Trade
- University of Prishtina
- Transmission, System and Market Operator
- Energy Regulatory Office
- Ministry of Education, Science and Technology
- Kosovo Energy Corporation
- Ministry of Agriculture, Forestry and Rural Development
- Kosovo Energy Distribution Services - Company
- Institute for Development Policy - NGO
- Balkan Green Foundation – NGO

This stage of the NECP process is again supported by the German government. The support activities are co-implemented by the GIZ Kosovo Energy Project (KEP) II and the German Economic Team (GET), which is financed by the German Ministry of Economic Affairs and Climate Action (BMWK). In the context of this joint German support, GIZ has been in the lead for the draft NECP and the associated stakeholder consultations, with a special focus on the dimensions decarbonization, energy efficiency and research, innovation and competitiveness. GET, on the other hand, has provided support in the form of the modelling activities for the draft NECP and on the drafting related to the dimensions energy security and internal energy market as well as the AFOLU and energy transformation sectors.

Kosovo is not a signatory party to the United Nations Framework Convention on Climate Change (UNFCCC). There is currently no legal basis for drafting Nationally Determined Contributions, no targets set for 2030 and no regular reporting (National Communications on Climate Change and Biennial Update Reports) is undertaken. Although the compilation of a GHG inventory is progressing, legislation defining national systems for policies, measures and projections has not yet been adopted. [The Climate Change Strategy 2018-2027 and the Climate Change Action Plan, 2019-2021](#), have been adopted by the Government while the Law on Climate Change is pending.

II. Strategy relating to the five dimensions of the Energy Union

As part of the NECP preparation, the GIZ and GET experts, together with the ME and MESPI, have organized four workshops during which the main results from the scenario with existing measures (WEM) were presented. In addition, the policy and measures that are envisaged by 2030 were discussed. The analyses conducted for the NECP utilized the LEAP (Low Emissions Analysis Platform) software, with a model specifically developed for Kosovo. While the same tool was used in the previous NECP process between 2020 and 2021, the current model is more comprehensive and robust, providing more detailed insights. Throughout the NECP preparation process, the Policy Guidelines of the Energy Community Secretariat on the development of NECPs, along with other relevant regulations and directives pertaining to the five dimensions of the NECP were followed as guiding principles.

The **decarbonization** dimension of the NECP aims to implement policies and measures across all sectors in order to reduce greenhouse gas (GHG) emissions and increase the share of renewable energy sources in

the overall energy consumption in a sustainable manner. The majority of GHG emissions in the country, around 87%, are generated by the combustion of fossil fuels in the energy sector, particularly in energy transformation, industry, and transportation. Therefore, a key objective is to promote the shift to low-carbon technologies in the energy sector by increasing the use of renewable energy sources in the energy generation mix, implementing energy efficiency measures in all sectors, and gradually phasing out the use of fossil fuels.

The analysis conducted for the current version of the National Energy and Climate Plan (NECP) serves as a fundamental basis, but it does not consider the implementation of carbon pricing. However, some sensitivity analyses were conducted using different carbon prices to show impacts. As a result, it was decided that additional analyses should be carried out, including an assessment of the effects on the Republic of Kosovo of the introduction of a Carbon Border Adjustment Mechanism by the European Union.

In comparison to the previous version of the draft NECP from 2021, the current version of the plan expands the decarbonization dimension to include GHG emissions as well as policies and measures related to non-energy sectors. This ensures a comprehensive approach to address emissions reduction and sustainability across all sectors of the economy.

The **renewable energy sources** are included in the Decarbonisation part.

Energy efficiency first principle is introduced in the NECP as part of the **energy efficiency dimension**, means taking utmost account of cost-efficient energy efficiency measures in shaping energy policy and making relevant investment decisions. The majority of measures within this dimension focus on building renovations aimed at improving energy efficiency. However, there are also measures pertaining to other sectors, such as the transport sector.

With regard to **energy security**, the National Plan is based mainly on the targets and policies contained in the approved Energy Strategy (2022-2031), with its key objectives. In terms of a balance between electricity production and electricity consumption, Kosovo is similar to the other countries of the region. However, the problems Kosovo faces are linked with securing required capacities to cover peak demand, especially in winter, and in meeting the reserve capacity requirement of the power systems. Market liberalization and regional integration are expected to ensure mitigation effects in terms of the supply problem, albeit there being significant challenges to be addressed in order to ensure a sustainable electricity supply.

In the field of the **energy market**, as it is known, the level of power system interconnectivity is one of the basic preconditions for electricity market development and integration. EU Member States aim at the new target of 15% of the peak load to be installed in interconnection capacities by 2030. However, Kosovo, as well as many other small European electric systems, is far above and beyond these targets. It has several times higher interconnection installed capacity than the system peak load. Moreover, Kosovo is among the top three countries in Europe regarding both the ratio between interconnection capacities and installed production capacities, as well as the ratio between interconnection capacities and peak load.

One of the key objectives that Kosovo has in the near future is energy market coupling with Albania and the use of a common power exchange (ALPEX) headquartered in Tirana. With ALPEX in full operation in both markets, along with adequate interconnection capacity between these countries (the 400 kV and the 220 kV overhead line providing 1500 MVA of installed interconnection capacity and 400 MW of NTC, with a possibility to be increased to 600 MW), it is expected that there will be no congestions most of the time, meaning no price difference between Kosovo and Albania. In the timeframe covered by the NECP, as a part of regional initiatives led by the ECS (WB6) once coupled, the markets of Albania and Kosovo are expected to further couple regionally and thus eventually result with negligible wholesale price differentials within the region. An additional argument for this is the high level of installed capacities in the region.

The fifth dimension, **research, innovation and competitiveness**, has also been addressed in the current NECP. Kosovo has arguably the least developed research, innovation and competitiveness system in the region. Law No. 04/I-135 on scientific research activities states that Kosovo should allocate at least €14 million annually for science and innovation. Kosovo does not aim to portray itself as a leader in the development of groundbreaking technologies that facilitate a revolutionary decarbonization of economic activities through this plan. Nevertheless, Kosovo's objective is to establish a research and innovation system capable of identifying

the most suitable technologies that its industries need to implement, staying abreast of technological advancements, and discovering inventive approaches to effectively integrate the most viable technologies.

III. Overview table with key objectives, policies and measures of the plan

In Table 1 the policies and measures proposed in this NECP are shown, while in Table 2 key targets and objectives are provided.

Table 1. Overview table with proposed policies and measures and interaction with EU Energy union five dimensions

		Decarbonization	Efficiency	Energy Security	Internal energy market	R&I&C
Decarbonization	PAM 1: Study on the effects of CBAM and/or a domestic carbon price	👍				👍
	PAM 2: Phasing out one unit of coal TPP Kosovo A	👍				
	PAM 3: Controlled management of solid waste	👍				
	PAM 4: Enhancement of forest resources	👍				
	PAM 5: Protection of forest resources	👍				
	PAM 6: Sustainable and multipurpose use of forest resources	👍				
	PAM 7: Sustainable management of natural resources (land, forests, and water) in agriculture	👍				
	PAM 8: Improved manure management (methods for storage, preparation, and application)	👍				
	PAM 9: Agri-environmental schemes for biodiversity protection	👍				
	PAM 10: Promotion of organic farming	👍				
	PAM 11: Promotion of renewable energy in the electricity sector	👍	👍	👍	👍	
	PAM 12: Feed-in tariffs or Power purchase agreement	👍	👍	👍	👍	
	PAM 13: Feed-in premiums	👍	👍	👍	👍	👍
	PAM 14: Certificates of Origin for RES	👍	👍	👍	👍	👍
	PAM 15: Enabling environment for RES investors	👍	👍	👍	👍	👍
	PAM 16: Self-consumption scheme	👍	👍	👍	👍	
	PAM 17: Solar district heating	👍	👍	👍	👍	
	PAM 18: Development of district heating systems in other municipalities	👍	👍	👍	👍	
Energy efficiency	PAM 19: Energy efficiency obligation scheme	👍	👍	👍		
	PAM 20: National Strategy for Renovation of Buildings	👍	👍	👍		👍
	PAM 21: Renovation of residential buildings	👍	👍	👍		👍
	PAM 22: Renovation of commercial buildings	👍	👍	👍		👍
	PAM 23: Installation of solar thermal collectors in residential sector	👍	👍	👍		
	PAM 24: Nearly Zero Energy Buildings	👍	👍	👍		
	PAM 25: Energy certification of buildings	👍	👍	👍		
	PAM 26: Inspection of heating, cooling and ventilation systems	👍	👍	👍		
	PAM 27: Energy service companies	👍	👍	👍		
	PAM 28: Expansion and improvement of district heating systems of "Termokos" Prishtina and DH Gjakova	👍	👍	👍		
	PAM 29: Renovation of central government buildings	👍	👍	👍		
	PAM 30: Renovation of public buildings	👍	👍	👍		

	PAM 31: Green public procurement	👍	👍	👍		
	PAM 32: Energy audit and management systems	👍	👍	👍		👍
	PAM 33: Consumer information programs	👍	👍	👍		
	PAM 34: Increased use of efficient technologies in the residential sector	👍	👍	👍		👍
	PAM 35: Energy efficiency measures in industry	👍	👍	👍		
	PAM 36: Increased use of the railway	👍	👍	👍		
	PAM 37: Railway electrification	👍	👍	👍		
	PAM 38: Increased share of alternative fueled vehicles	👍	👍	👍		👍
	PAM 39: Vehicle fleet change	👍	👍	👍		
	PAM 40: Modal shift for short distance travel	👍	👍	👍		👍
	PAM 41: Municipal Energy and Climate Action Plans	👍	👍	👍		
	PAM 42: Modernization of networks and reducing network losses	👍	👍	👍		
Energy security	PAM 43: Rehabilitation of TPP Kosovo B		👍	👍	👍	
	PAM 44: Rehabilitation of one to two units in TPP Kosovo A		👍	👍	👍	
	PAM 45: Improvement of cybersecurity in the energy sector			👍		
	PAM 46: Increase amount of vRES capacity that the network is able to handle/integrate	👍		👍		👍
	PAM 47: Installation of battery storage capacity			👍		👍
Internal energy markets	PAM 48: Improve net transfer capacities		👍	👍	👍	
	PAM 49: Roadmap retail market competition		👍	👍	👍	
	PAM 50: Address market concentration		👍	👍	👍	
	PAM 51: Market coupling with Albania			👍	👍	👍
	PAM 52: Couple markets with additional neighbouring countries			👍	👍	
	PAM 53: Joining EU balancing platforms			👍	👍	
	PAM 54: Power to heat	👍		👍	👍	👍
	PAM 55: Full phase out BSA/Financial PSO			👍	👍	
	PAM 56: Consider introducing time-of-use consumer prices to incentivise demand flexibility			👍	👍	
	PAM 57: Consumption-independent support scheme for vulnerable consumers based on improved data and a legal definition			👍	👍	
R&I&C	PAM 58: Building modern research and innovation capacities					👍
	PAM 59: Piloting Power-to-Gas (P2G).	👍	👍	👍	👍	👍
	PAM 60: Education and trainings for skilled workers in the area of sustainable energy technologies	👍				👍
	PAM 61: Establishing industrial alliances to foster innovation	👍				👍

**this measure is not selected by the model as cost effective, but it can contribute to increase the flexibility of the system*

Table 2. Key targets and objectives

	Key objective/target (in year 2030)
Decarbonization (GHG emissions and removals)*	16.3% GHG emissions reduction relative to 2016 level
	8.95 Mt CO ₂ -eq
Decarbonization (Renewable energy)	32% RES share in gross final energy consumption; to achieve this, the following RES shares are needed:
	49.6% in heating and cooling,
	44.8 in electricity,
	3.6% in transport
Energy efficiency	2.7 Mtoe primary energy consumption
	1.8 Mtoe final energy consumption

	Energy Efficiency Obligation 0.8% of the baseline consumption
	Reduction of technical and commercial losses in the distribution network
	Adopting the Building renovation strategy
Energy security	Monitor security of supply by regularly updating Security of Supply statements
	Guarantee operationability and reliability of existing generation capacities
	Ensure cybersecurity standards
	Greater diversification of energy sources
	Reduce import dependency
	Establish a well-functioning flexibility market
Internal energy market	Ensure that the energy transmission infrastructure is positioned to support the decarbonization of the economy
	Increased system flexibility with adequate incentives for market participants
	Further integration in the regional and European market
	Gradual wholesale and retail market liberalization
	Non-discriminatory participation of renewable energy
	Ensure affordability of energy bills and protect vulnerable consumers
Research, innovation and competitiveness	Development of an effective scientific research and innovation system
	Development and training of human capacities for scientific research activities
	Development of scientific research infrastructure
	Internationalization of scientific research activities
	Enhancing the relationship between science, economy, and society
	Achieving scientific research excellence in specific fields

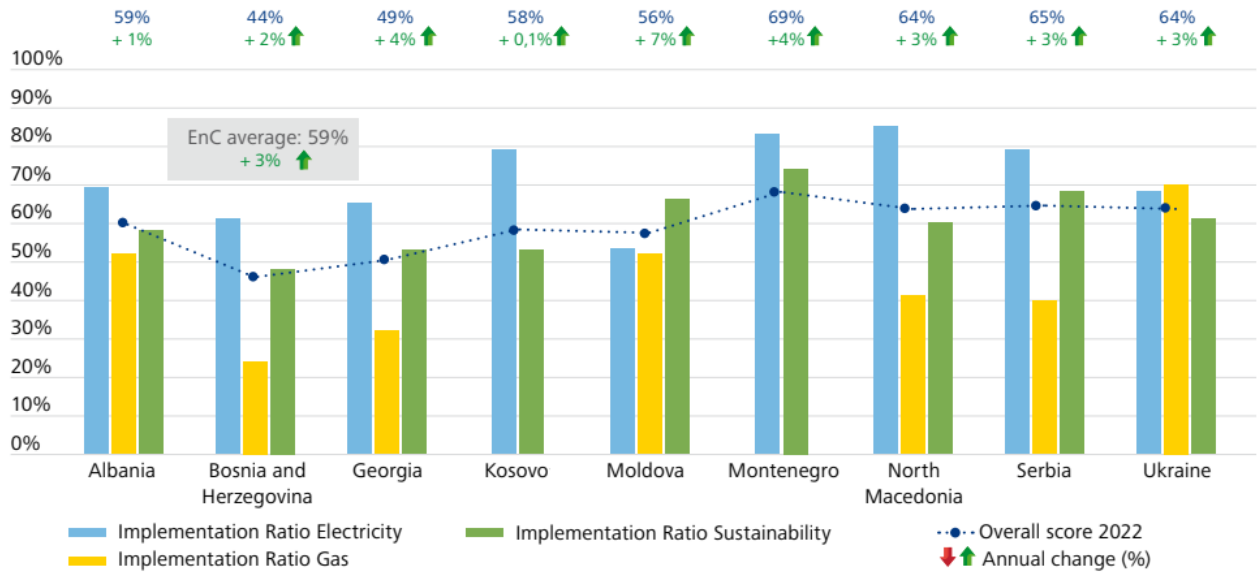
1.2 Overview of current policy situation

I. National and Energy Community energy system and policy context of the national plan

Kosovo is a contracting party to the Energy Community. By signing the agreement on the Energy Community, Kosovo has committed itself to fulfilling certain policies, measures and goals. In the last Progress Report 2022, Kosovo recorded the least progress compared to all the member countries of the Energy Community. In the overall ratings, among the member states of the Western Balkans, Kosovo is in the penultimate place (Bosnia and Herzegovina is last), very close to Albania (Figure 1).

However, Kosovo's comparably slow progress has limited implications at this stage as a large number of legal documents are in the preparation stage, meaning that Kosovo is expected to significantly improve its position in 2023.

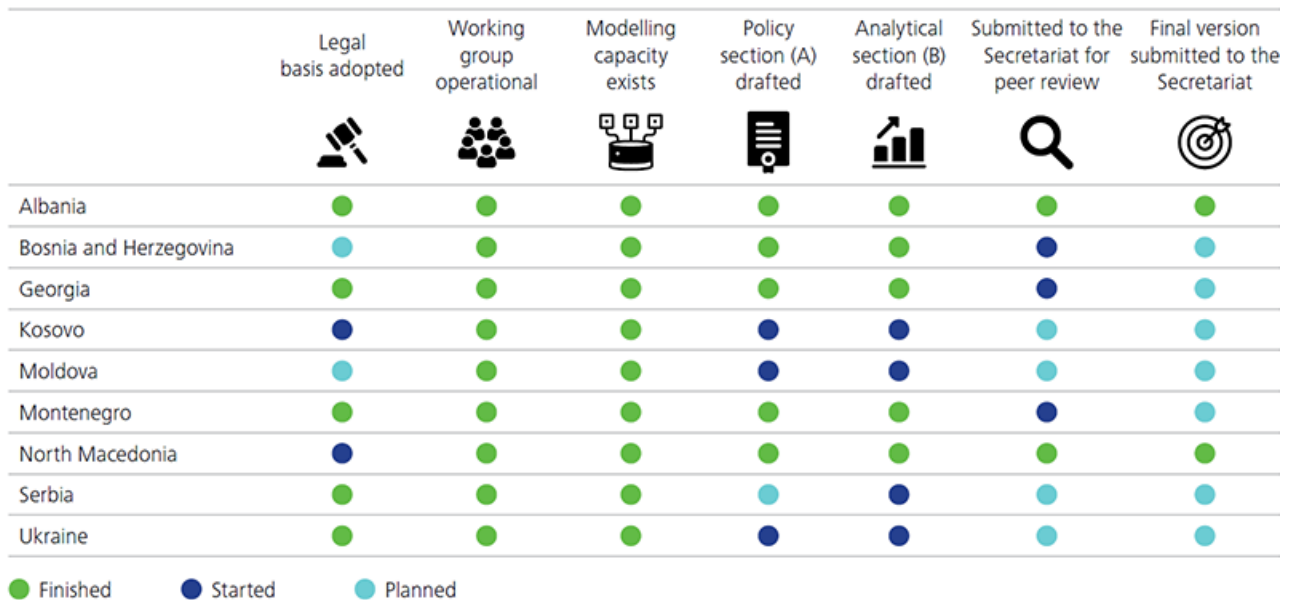
Figure 1. Overview of Implementation Performance by Contracting Parties



Source: Annual Implementation Report Energy Community Secretariat, 2022


The Governance Regulation in the Energy Community requires Contracting Parties to develop integrated National Energy and Climate Plans (NECPs). The NECPs include national objectives and targets and respective policies and measures for all five dimensions of the Energy Union, which are closely related and mutually reinforcing. According to the latest report of Energy Community only two countries have submitted their NECP (Albania and North Macedonia) (Figure 2).

Figure 2. NECP development process



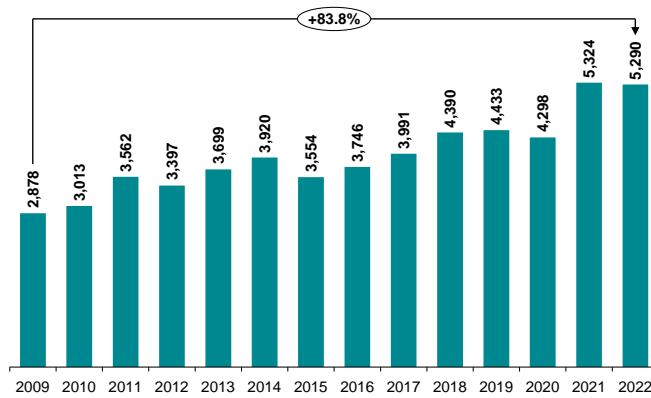
Kosovo has a population of approximately 1.8 million inhabitants. The average monthly gross salary in 2022 was around 521 EUR. With around 21% in 2021, unemployment is significant, but decreased to 16.6% in the first quarter of 2022. Following a recovery surge after the Covid pandemic in 2021 featuring a real GDP growth rate of 10.7% (yoy), economic growth has slowed down in 2022 with 2.7% (yoy) and is projected to stabilize

at around 3.5% in the following years. At the same time, the surge in inflation experienced in 2022 following global price increases for food and energy is expected to ease with a predicted inflation rate of 5.5% for 2023.

 <p>Population of 1,773,971</p>	 <p>Monthly average gross wage 521 EUR (2022)</p>	 <p>Unemployment rate of 16.6% in Quarter 1 2022</p>
 <p>GDP growth of 10.7% in 2021</p>	 <p>Inflation Rate for December 2022 - December 2021, 12.1%</p>	

The gross domestic product per capita in the period 2009-2022 increased by 84% (Figure 3). In 2022 GDP/capita reached 5290 EUR, however, Kosovo is still the lowest of all the countries of the Balkan Peninsula (WB6 and EU countries) when it comes to GDP per capita (Figure 4).

Figure 3. GDP per capita Kosovo (USD/capita)



Source: IWF

Progress has also been achieved in the field of unemployment, which has decreased by 10 percentage points in the 2009-2021 period, but is still high, amounting to about 21% (Figure 5). This also puts Kosovo in the last place of all countries on the Balkan Peninsula (Figure 6). The biggest drop in unemployment in Kosovo was observed just in 2021, following the recovery surge when it was reduced from 26% to 21%, while in the first quarter of 2022 it is additionally reduced by more than 3 percentage points.

Figure 4. GDP per capita WB6 and EU Balkan countries, 2021 (USD/capita)

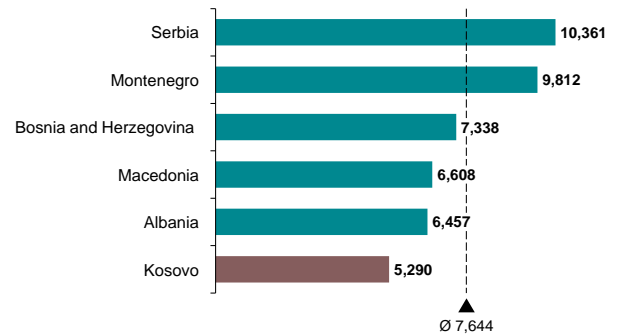
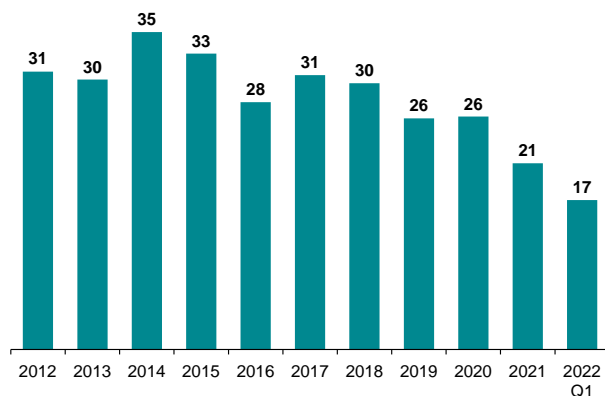
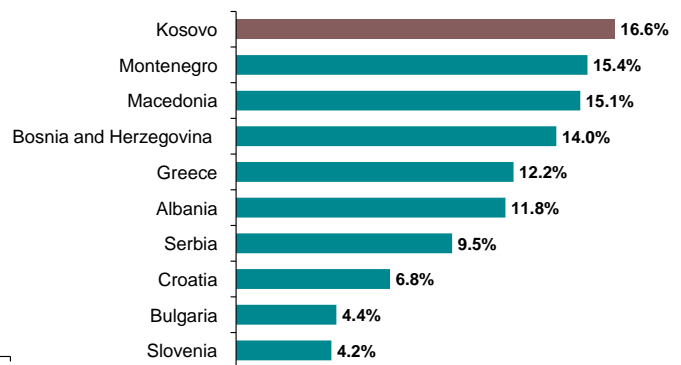


Figure 5 Unemployment rate in Kosovo, 2012 – 2021, %



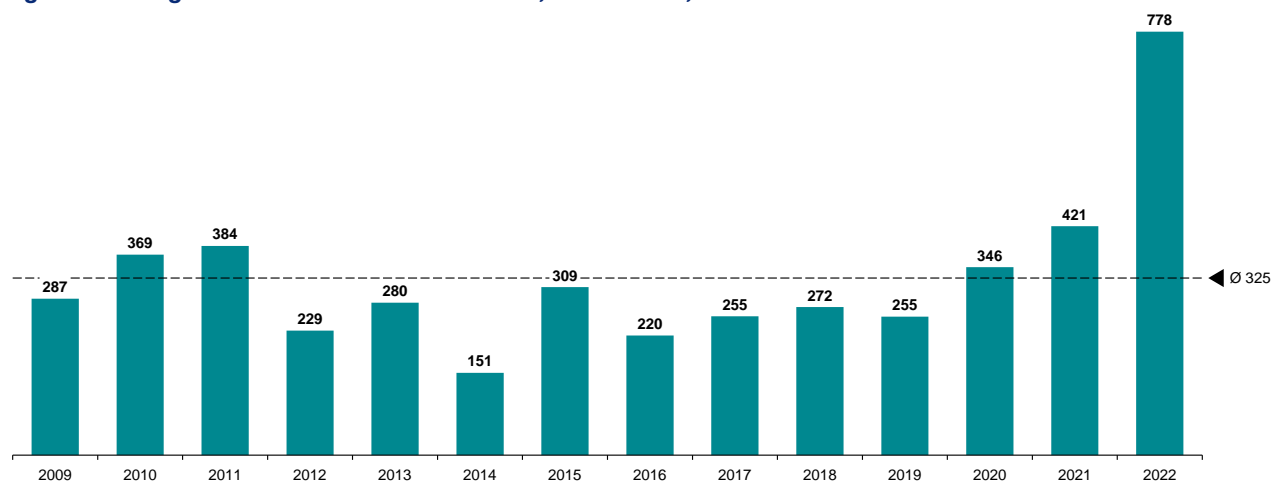
Source: World bank and Kosovo Agency of Statistics, Expert analysis

Figure 6 Unemployment rate WB6 and EU Balkan countries, 2021 %



While Kosovo's growth model has been heavily reliant on remittances to finance domestic consumption in previous years, the country is gradually shifting towards more investment and export-driven growth. As a result of this shift, Kosovo has seen increasing potential in terms of investment attraction, building on advantages such as competitive cost structures and trends relating to nearshoring. As a result, Kosovo reached a peak value of FDI inflows of EUR 778 million in 2022 during the recovery surge. However, looking at total FDI inflows into the Western Balkan economies over the last decade, Kosovo still ranks lowest, attracting only 6% of all FDI inflows in the Western Balkans during the period from 2009-2019¹. This indicates that there is still potential for further realizing Kosovo's potential in terms of investment attraction.

Figure 7. Foreign direct investments in Kosovo, 2009 – 2022, million. EUR



Source: Central Bank of Kosovo

Compared to other countries in Europe, Kosovo has lower emissions (5 tons of CO₂ equivalent) per capita, than the European Union average, but has higher emissions than some of the countries in the region. As for CO₂ emissions per unit of GDP (Gross Domestic Product), Kosovo with 0.5 kg of CO₂ per Euro has higher emissions than the European Union average and than all other countries in the region except Bosnia and Herzegovina.

As to the climate change related policy context, the country is not a signatory party of the United Nations Framework Convention on Climate Change (UNFCCC), so no regular reporting (National Communications on Climate Change and Biennial Update Reports) is undertaken. It is not a party of the Paris Agreement, and as such, there is currently no legal basis for drafting Nationally Determined Contributions. At the national level, the [Strategy on Climate Change \(SCC\) 2019-2028 and the Action Plan on Climate Change \(APCC\) 2019-2021](#), adopted in 2018, is the leading strategic document related to the GHG emissions part of the decarbonisation dimension. The SCC largely capitalizes on the previously developed documents (2016) – [Action Plan for Climate Change Strategy](#) and Report of the Kosovo's Legal Framework in the Climate Sector vis-à-vis Requirements of the EU Climate Legislation.

This SCC has two main components – i) low emission development (GHG emission reduction or mitigation) and ii) adaptation to climate change. The SCC has set five strategic objectives, of which two are for low emission development and three for adaptation to climate change, as follows:

1. Developing Kosovo's capacity to meet its obligations under the UNFCCC Convention and the EU;
2. Decreasing the GHG emissions;
3. Developing mechanisms for disaster risk mitigation and improving the current disaster risk mitigation measures, in the sectors of economic importance that are particularly vulnerable to climate change;
4. Increasing the capacities for adaptation of the natural systems;

¹ OECD Competitiveness in South East Europe 2021.

5. Increasing the capacities of central and local stakeholders to integrate climate change issues and adaptation to development processes.

The Climate Change Action Plan 2019-2021 presents a list of 11 specific objectives and 28 activities/measures expected to be undertaken to reduce greenhouse gases and adapt to climate change by 2021.

The major measures for achieving strategic objectives for low emissions development include:

1. Establishing a National GHG Inventory System and strengthening the reporting capacities
2. Implementing the National Action Plan for Energy Efficiency 2019 - 2021
3. Implementing the National Renewable Energy Action Plan 2011 - 2020
4. Reconstruction and extension of district heating networks
5. Improving the efficiency of existing thermal power plants
6. Introducing concepts of sustainable mobility in Kosovo's cities.

In order to achieve the strategic objectives in the adaptation component, activities/measures are foreseen in the following sectors:

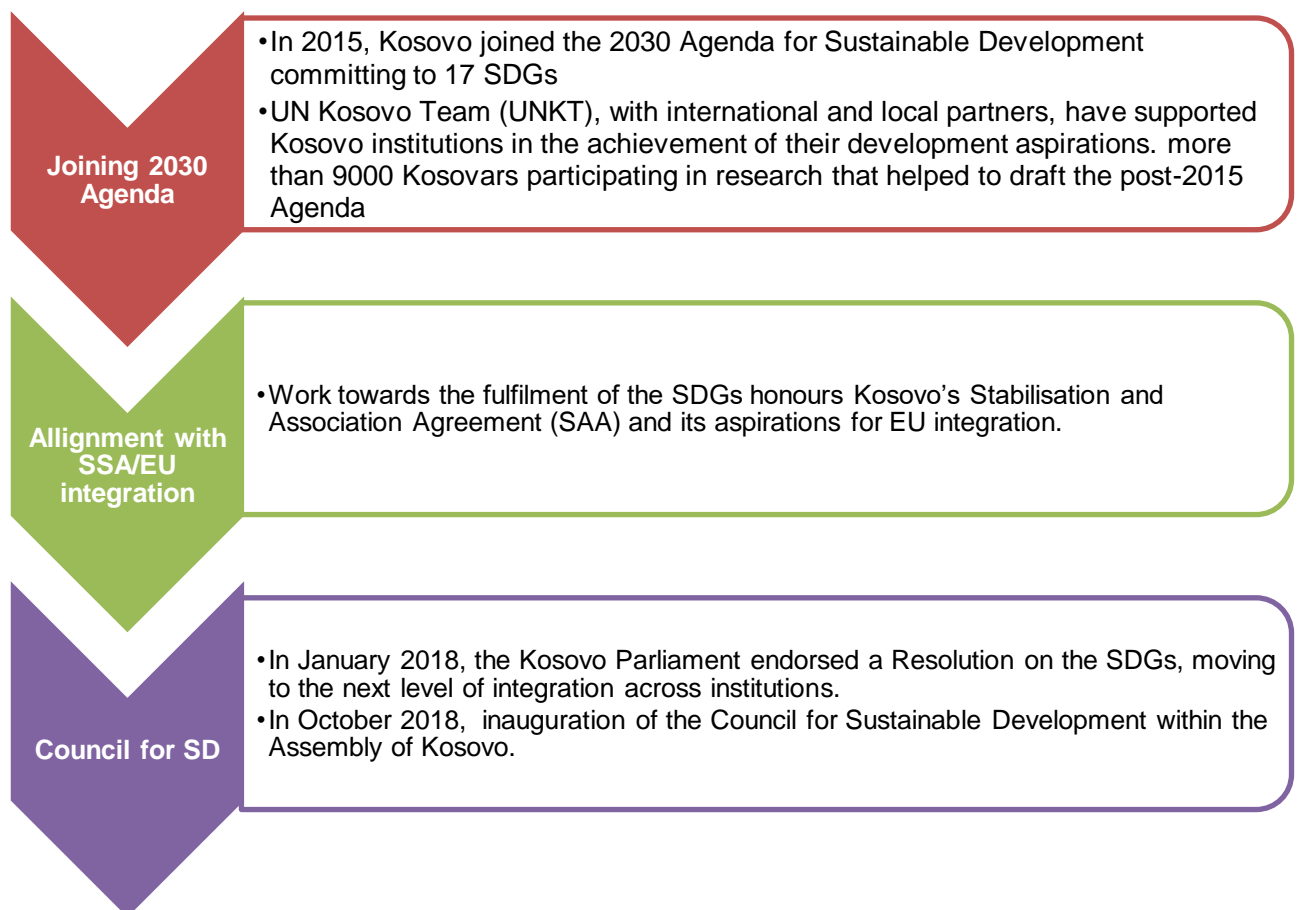
- Flood protection
- Drought, low flow and water scarcity
- Forest and biodiversity management
- Public health
- Information management and exchange
- Capacity building, training and awareness raising
- Finances, cost recovery and risk management
- Cooperation structures

The finances needed for realization of the APCC are estimated at 2,877,600 EUR.

Although not very recent (from 2014), the Assessment of the Current Public Health Vulnerabilities due to Climate Change in Kosovo is relevant and it provides information on potential health implications of climate change and helps to set the baseline data to plan for adaptation measures. At local level, the municipality of Prizren has an exemplary role with its Cross-Sectoral Intervention Plan on Climate Change 2020-2025. In addition to energy and climate change, the national pathway related to Sustainable Development (as depicted in

Figure 8) also serves as a policy framework for the NECP, providing essential contextual information.

Figure 8. National pathway related to Sustainable Development



Source: Own compilation

On the 8th of March 2023, the Energy Strategy of Republic of Kosovo for the period 2022-2031 was adopted by the Kosovo Parliament. The main vision of the Strategy is to achieve a sustainable energy sector integrated into the Pan-European market, ensuring energy security and affordability for citizens. With the adoption of the Strategy, the Government of the Republic of Kosovo is committed to applying a new planning approach to

address the current challenges and to lay the foundation for the future of the country's energy sector, which will increasingly provide security of electricity supply, clean energy, energy efficiency, support for vulnerable groups and more active participation by citizens.

The Strategy envisages that the citizens will be at the heart of the country's energy future by ensuring that they have access to affordable energy, are empowered to participate actively in the sector, including production and self-consumption, and ensuring that the most vulnerable groups in society benefit from schemes dedicated to supporting them (for instance house insulation, installation of solar panels, purchase of efficient household appliances, efficient heating systems, etc.)

Due to the lack of an adequate approach to developing professional capacities and appropriate investments over the last decades, Kosovo's energy sector now faces major challenges, including:

- Dependence on old lignite-based electricity generation capacities, which provide inadequate reliability and flexibility, and are a major source of greenhouse gas (GHG) emissions and local pollution. Currently, the share of renewable energy sources (RES) in the electricity sector is only 6.3%, with RES in the energy sector dominated by biomass-based sources used in heating.
- High energy consumption (and therefore, energy-related expenditure) relative to both the GDP and the population, due a range of factors, including: high network losses and energy-inefficient buildings and outdated technologies used in both residential and commercial sectors (including for space and water heating).
- High reliance on individual household heating systems based on electricity or inefficient coal- or wood-burning equipment gives rise to both significant increases in the need for electricity imports and high GHG emissions and air pollution during the cold months.
- High market concentration at both the wholesale and retail levels.

In the Strategy five strategic objectives are proposed:

1. Improving system resilience
2. Decarbonization and promoting renewable energy
3. Increasing energy efficiency
4. Strengthening regional cooperation and market functioning
5. Protecting and empowering consumers

For each of the above-mentioned objectives separate targets are defined. Each of them is incorporated in this version of NECP. At the end of 2022, the Draft strategy for industrial development and business support 2030 was developed and some of the findings are incorporated in this NECP too.

Despite the aforementioned positive examples, the existing mainstreaming of climate change considerations in other sectoral policies does not ensure full exploitation of the synergetic potential of the relevant sectors. Some important strategic and planning documents are yet to be adopted and cooperation and communication among relevant sectors should be further enhanced or established in order to build synergies, reduce trade-offs, increase efficiency and improve governance among the sectors.

II. Current energy and climate policies and measures relating to the five dimensions of the Energy Union

Dimension 1: Decarbonization

Renewable Energy Sources (RES) represent an important energy source available in Kosovo, with a potential that is still largely untapped. The use of such sources for energy production represents a long-term measure for the implementation of three energy policy objectives of the country, such as: support for the overall economic development; increase of the security of energy supply and protection of environment.

The energy sector laws, especially the Law on Energy, currently treat Renewable Energy Sources (RES) with respect to their promotion, optimization and use, including determination of annual and long-term goals of energy generation from such resources. With a view of supporting and promoting the use of RES, the ex-Ministry of Economic Development drafted a ten-year RES action plan, as a policy document for this important energy sector. In line with the legal obligations, and those deriving from the Energy Community Treaty (ECT)

for 2020, ME has determined the RES goals for the period covering 2011-2020, by taking into consideration the opportunities and potentials of Renewable Energy Sources available in Kosovo. The targets for 2030 are defined by the Ministerial Council of the Energy Community, held in December 2022 and with this NECP, it will be seen how they can be realized.

To achieve the renewable energy targets, the Energy Regulatory Office implements specific regulations aimed at determining the required energy capacities. These regulations also outline the criteria and procedures for the application, as well as the rights and responsibilities of producers of electricity from renewable sources. Furthermore, the Regulatory also encompasses the rights and responsibilities of KOSTT (Kosovo Transmission, System and Market Operator), the financing of the support scheme, and the integration of electricity generated from renewable sources into the system.

As mentioned in the previous chapter, the latest document that was adopted by the Government and by the Assembly of Kosovo is the Energy Strategy. Although it is a strategy for energy development, the decarbonization dimension is covered too, as several strategic objectives of the strategy relate with decarbonization and renewable energy. This strategic objective is addressed by 3 specific objectives:

1. Gradual implementation of carbon pricing,
2. Promoting renewable energy sources in the electricity generation mix,
3. Promoting the use of renewable energy in heating.

Besides the Energy Strategy, in May 2023 the 5th Renewable energy progress report of the Republic of Kosovo 2020-2021 was adopted. In this document a list of policies and measures that are realized in the period 2020-2021 are presented. Most of the measures are still relevant (Table 3).

Table 3. List of policies and measures reported in the 5th Renewable energy progress report of the Republic of Kosovo 2020-2021

Name and reference of the measure	Type of measure*	Expected result**	Targeted group and or activity***	Start and end dates of the measure
1. Law on Energy nr.05/L-081	Regulatory	Promotion, optimization and use, including determination of annual and long-term goals of energy generation from such resources	Investors, end users, public administration	13 July 2016-continuing
2. Law on Electricity nr.05/L-085	Regulatory	Creating Certificate of Origin for RE and cogeneration. Power certified to originate from RE is entitled to priority dispatch under the terms stated in the Grid Code and Market Rules. TSO and DSO are obliged to provide priority to electricity generated from RE power plants and cogeneration	Investors, end users, public administration	21 July 2016-continuing
3. Law on Energy Regulatory nr.05/L-084, article 43	Regulatory	Establishes specific procedures for the authorization of new generating capacities.	Investors, end users, public administration	14 July 2016-continuing
4. Rule on Authorization Procedure for Construction of New Generation Capacities	Regulatory	Describes the procedure for authorization of new generating capacities. The authorization is a right issued by ERO that enables applicants "to commence with construction of generation capacities (...) within specified period of time. The same rule foresees disposition for Prosumers including rights and responsibilities. The procedure was amended to include New Systems for the Transmission and Distribution of Gas, including Interconnectors, Direct Pipelines for Thermal Energy and	Investors, planners,	Reporting period covers the version of 31 March 2017. The rule was amended and approved in November 2022

		Direct Electricity Lines and Direct Pipelines for the Transmission of Natural Gas.		
5. Rule on support scheme	Regulatory	The Rule on Support Scheme aims at supporting the generation of electricity from renewable energy sources, in order to meet the set out Indicative Targets of Renewable Energy Sources.	Investors, planners	March 2017-continuing
6. Decision on Suspension of the Feed-in Tariffs	Regulatory	Decision on suspending the Feed in Tariff Support Scheme from Energy Regulatory Office.	Investors, planners	December 2020
7. Methodology on calculation of the reference price for energy generated from RES	Regulatory	The methodology sets the criteria for determining the reference price for energy generated from renewable energy sources (RES). The applicable reference price will be applied by the Market Operator for the energy sold to the Suppliers. It will also apply to the sale and purchase of energy from RES according to the regulated framework.	Investors, planners	December 2020
8. Law on energy performance	Regulatory	Increase of RES use in new buildings and building undergoing major renovation	Investor, Installers	Draft Law on Energy Performance of Buildings, and its secondary legislation was developed in 2022. In 2023 is under the adoption process.
9. Regulation on Minimum energy performance in buildings	Regulatory	Increase of RES use in new buildings and building undergoing major renovation	Investor, Installers	2022-continuing
10. Agriculture and Rural Development Program Grant support scheme for farmers	Financial support	Sustainability of the sector and work jointly to increase production, establish new processing lines and upgrade farm machineries and equipment, as well as work conditions at the farm level	Farmers	2014-continue
11. Women Entrepreneurs	Financial support	Support women in making necessary investments in energy efficiency measures and modern equipment that will help them grow their business and use green energy	Women Energy Entrepreneurs	2020-continuing
12. Green Economy Financing Facility (Local Banks)	Financial support	Increase of RES capacity with private consumers, SME companies	SME companies, households	2018-continuing
13. Formation of clusters for increased use of biomass (pellets) and solar	Financial support	Formation of clusters dealing with all aspects of producing pellets and deployment of project with solar energy	Producers of pellets, wood equipment producers, installers of solar panel and PV system	2014-continuing

14. MFK	Financial Support and Soft	Support women in energy sector towards career advancement on energy efficiency and renewable energy	Women professionals from a broad range of profiles	2016-finished
15. Customs exemption for components and equipment for RES use	Financial	Increased cost-benefit of RES projects, attracting investment	Investors	2017-continuing
16. VAT exemptions	Financial	Increased cost-benefit of RES projects, attracting investment	Investors	2017-continuing
17. Guideline for Prosumers	Soft	The guideline explains the conditions and criteria for obtaining the status of prosumers	All customers connected in low distribution network	2021-continuing

Source: 5th Renewable energy progress report of the Republic of Kosovo 2020-2021

Dimension 2: Energy efficiency

In addressing the challenges faced in the energy sector as well as the obligations deriving from Energy Community Treaty as well and as a signatory of the Stabilization and Association Agreement, in terms of Energy Efficiency Kosovo has made a considerable progress adopting the following laws:

- Law on Energy No.05/L-081
- Law on Electricity No.05/L-085
- Law on Energy Efficiency No.06/L –079
- Law on Energy Performance of Buildings No. 05/L-101
- Law on Thermal Energy No. 05/L -052

Beside the legislation part, at the beginning of 2023 a draft version of the 5th National Energy Efficiency Action Plan (NEEAP) 2022-2024 was prepared. According to this plan, the target for 2018 has not been achieved. One of the main challenges identified in the Plan is the data availability, but an ambitious data collection goal is made as part of the 4th NEEAP. A list of already implemented measures is presented in the plan for the period 2019-2021 (Table 4), but almost all measures are still in place (please see Chapter 3, Energy efficiency part).

Table 4. Current policies and measures included in the Draft 5th National Energy Efficiency Action Plan

Measure
Measures on the demand side
EE improvement through the implementation of EE measures in the residential sector
Renovation of Central Government Buildings
EE improvement in public institution buildings at the central level (KEEREP project)
EE improvement in public institution buildings and in public lighting at the central level and (MoJ, TSO, MPA)
EE improvement in public institution buildings at the local level (four municipalities, KfW project)
EE improvement in public institution buildings at the local level
EE improvement through the implementation of energy efficiency measures in SMEs
Renovation of commercial buildings
Electrification
New cars
New LCV and HGV
Lighting

Solar thermal collectors
Measures on the supply side
Loss reduction (electricity)
Feed-in tariff
Without feed-in tariff
PV rooftop (Self consumption)

Energy efficiency is also part of the Energy strategy of Kosovo addressed with 2 specific objectives:

1. Improving the energy efficiency of buildings
2. Promotion of efficient cogeneration and efficient district heating systems

Dimension 3: Security of energy supply

In the Energy Strategy of the Republic of Kosovo 2022-2031, the strategic objective of the security of supply is addressed by the following four specific objectives:

1. Enhancing system flexibility
2. Modernization of networks and reduction of network losses
3. Rehabilitation of existing electricity production capacities and investments in new capacities, and
4. Ensuring cybersecurity of the energy sector

As a Contracting Party of the Energy Community Treaty, Kosovo is obliged to regularly adopt the Security of Supply Statements and notify the Secretariat. The Statements describe in particular the diversity of supply, technological security, and geographic origin of imported fuel. The Statements are to be updated every two years. The body responsible for security of supply monitoring in Kosovo is the Energy Regulatory Office.

Refer to dimension Energy Market for further information on the legislative framework.

Dimension 4: Internal Energy Market

Kosovo as a signatory party to the Energy Community Treaty has developed the policies, legal and regulatory framework to ensure the implementation of obligations under the Energy Community Treaty. Primary legislation and regulatory framework are in compliance with the EC third package, but by the end of 2023 or beginning of 2024, four new laws (Law on Energy, Law on Renewable energy, Law on electricity and Law on energy regulator) should be adopted to align with the EC fourth package.

One of the most important measures in the Internal Energy Market dimension that is under implementation is the establishment of an organized electricity market and at the same time merging of the Albania and Kosovo markets. In 2020, KOSTT and the Albanian Transmission System Operator (TSO) established the Albanian Energy Exchange (ALPEX). The Energy Regulatory Office and the Energy Regulatory Entity together with the transmission system operators of both countries KOSTT and TSO on 21 October 2021 in Tirana signed the agreement on the coupling of electricity markets.

Through the agreement, the signatory parties recognize the Albanian Electricity Exchange ALPEX as the only electricity exchange for day ahead and intra-day trading for the commercial areas of both countries. This agreement is also a precondition for subsequent agreements that enable the operation of the joint electricity exchange ALPEX.

The signing of the agreement was realized in the framework of the meeting of the legal working group for defining the activities and agreements that must be implemented in order for the joint energy exchange ALPEX to become operational. On April 11, 2023, started operation (Go Live) in the Albanian trading zone. ALPEX become operational and held its first day-ahead auction. On September 2023 is planned time that ALPEX to start operation (Go Live) for the Kosovo's trading zone, at the same time to be Market Coupled with the Albania trading zone.

Natural Gas

Presently, Kosovo has no gas transmission network, and a single operating connection to the natural gas transmission systems, either the Trans-Adriatic Pipeline (TAP) or liquified natural gas (LNG) terminals in the Aegean or Ionian seas, i.e. through North Macedonia or Albania would require a minimum of 7-9 years of

planning and construction. If an interconnection is built, it would enable the operation of gas-based power generation, and potentially the utilization of natural gas in industry.

According to the Strategy of Energy, Kosovo has also the option of utilizing the gas infrastructure planned in Albania (connection to TAP or access to the LNG terminal in Vlora). Gas infrastructure in these countries and Greece offer opportunities for (co-)investment in electricity generating capacities.

Although there is no natural gas infrastructure in Kosovo, the legal framework (Law on Energy, Law on Natural Gas, Law of Energy Regulatory Office) was adopted in line with the Third Package of EU legislation.

The Natural Gas Law No. 05/L-082 establishes the structure and operation of the natural gas sector in Kosovo. It covers various aspects such as market access, conditions, and criteria for engaging in activities related to transmission, storage, distribution, and supply of natural gas. Furthermore, this law aligns with Directive No. 2009/73/EC, which sets out common regulations for the internal natural gas market in Europe, and Regulation No. 715/2009/EC, which outlines the conditions for accessing natural gas transmission networks.

Dimension 5: research, innovation and competitiveness

The research and innovation are covered by the National Science Program 2023-2028 (from December 2022, in public consultation process) while the competitiveness is addressed by the National Development Strategy 2030 pillar related to sustainable economic development, specifically by its first development goal (Building of innovative, circular, and competitive economy). Up to now, the budget allocation for scientific research by all governments of Kosovo has not exceeded 0.1% of the annual budget, although the Law on Scientific Research Activity (No. 04/I-135) stipulates allocation of 0.7%. In the Medium-Term Expenditure Framework for the time period 2021-2025 of the Ministry of Education, Science, Technology and Innovation, there is a scheme "Improving the Research and Innovation Environment", i.e., activities that specifically address science and research challenges with budget allocations for the establishment of a Science Fund, financing the associated status of Kosovo in Horizon Europe and establishing a special fund for co-financing of research projects that are the result of international cooperation and for preparation of international scientific cooperation projects.

III. Key issues of cross-border relevance

The energy market is closely linked to cross-border cooperation. Kosovo's electricity transmission system enables the exchange of electricity with neighbouring countries, and also supports the transit of energy in all directions. In preparing the NECP, it is very important to cooperate with neighbouring countries and to plan the appropriate development of transmission infrastructure that will enable the transmission of electricity and provide conditions for functioning of the energy market with both neighbouring countries and the wider region.

As for Natural Gas, the feasibility study for the Kosovo-North Macedonia interconnection has been completed, the preparation of the master plan for gas in Kosovo and the strategic environmental assessment is in the final stage. Both of these are supported in the framework of the Western Balkans Investment Framework. Kosovo's connection to regional gas pipelines, TAP and IAP, is considered through North Macedonia and/or Albania, so close cooperation with these two neighbouring countries is required in terms of potential plans for natural gas demand and development of the natural gas market.

The Energy Community plays a crucial role in this process, with its advisory function and significant contribution to enhancing communication among member countries. Effective communication is vital to ensure a shared understanding of various aspects related to cross-border projects. The studies conducted and published by the Energy Community, such as Projects of Energy Community Interest (PECI) and Projects of Mutual Interest (PMI), offer comprehensive coverage of all member countries and facilitate a better understanding of the regional situation. PECI and PMI projects foster cross-border cooperation among Energy Community Contracting Parties. PMIs specifically involve collaborations between Energy Community Contracting Parties and European Union Member States and they are different from Projects of Common Interest (PCIs) within the European Union. This list of projects is updated every two years. Projects included in this list can apply for funding through the Western Balkan Investment Framework (WBIF) with the support of a leading International Financial Institution (IFI), such as the European Investment Bank (EIB). Notable projects that have appeared on these lists for Kosovo include only gas projects involving the construction of pipelines to North Macedonia and Albania. It is interesting that in 2022, by the Ministerial Council Decision

2021/11/MC-EnC, amending Decision 2015/09/MC-EnC on the implementation of Regulation (EU) No 347/2013, the adoption of the Energy Community list of energy infrastructural projects every two years was suspended, pending the adoption by the European Union of a new TEN-E Regulation and its subsequent incorporation and adoption in the Energy Community acquis Communautaire, so the latest list is from 2020.

The Energy Community also prepares annual implementation reports on Contracting Parties' progress on compliance with the adapted EU Directives and Regulations. Although much of the EU legislation through EnC has been transposed in the contracting parties to the EnC Treaty, introduction of a carbon price mechanism is still pending. The introduction of this mechanism can significantly affect the situation in the region, and especially in the electricity market.

Meeting the goals outlined in the Energy Strategy (which are fully incorporated in this plan) means building large capacities of renewable energy sources. Renewables will mean introducing uncertainty into the system and balancing that requires cross-border cooperation (already addressed in the EnC study - Development of a roadmap towards a regional balancing cooperation). The Energy Community has prepared a study on the adequacy of the electricity systems of the WB6. The purpose of this report is to perform a forward-looking analysis of the resource adequacy of electricity systems of WB6 in their transition to EU regulation - that is, to assess whether sufficient capacity will be available to guarantee the security of supply. In addition, that study investigates the extent to which the transition to the EU target electricity market model as well as the implementation of attainable EU environmental requirements and the transition to CO2 pricing may make existing plants unprofitable to operate and cause their decommissioning, which could in turn create adequacy issues.

The Energy Community has incorporated cybersecurity into its program to enhance energy and network security. In January 2020, a study on cybersecurity in the energy sector was released. This study offers a comprehensive overview of the organizations responsible for cybersecurity and the relevant legislation applicable to energy, along with conducting threat analysis and risk assessment. Additionally, it provides a set of recommendations, targeting both local and regional levels, to bolster the resilience and security of energy infrastructures. The Energy Community has taken the lead in establishing cooperative mechanisms that facilitate cybersecurity measures. These measures encompass the identification of energy critical infrastructures, the implementation of cybersecurity technical standards in the energy sector, the creation of the Energy Community Information Sharing and Analysis Centre (EnC ISAC), and the development of an extensive platform for cybersecurity education and training called the Cybersecurity Academy. Furthermore, the Energy Community aspires to establish concrete collaborations with the EU cybersecurity agency ENISA, the European Energy ISAC (EE-ISAC), and other cybersecurity entities and associations operating in the energy sector, both in Europe and beyond.

IV. Administrative structure of implementing national energy and climate policies

For development of Kosovo's first NECP version in 2021, the Inter-Ministerial Steering Group was established by the Decision of the Minister of ME with the consent of the Minister of MESPI.

The Inter-Ministerial Steering Group reported to ME Minister and was Co-chaired by MED and MESP. Participating institutions are listed below:

- Ministry of Economy (ME);
- Ministry of Environmental, Spatial Planning and Infrastructure (MESPI);
- Prime Minister's Office;
- Energy Regulatory Office (ERO);
- Ministry of Finance;
- Ministry of European Integration;
- Ministry of Infrastructure;
- Ministry of Agriculture Forestry and Rural Development;
- Ministry of Innovation and Entrepreneurship;
- Association of Kosovo Municipalities;
- Kosovo Agency of Statistics;
- Kosovar Agency for Energy Efficiency;

- Civil Society;
- University of Pristina;
- Economic Kosovo Chamber;
- Ministry of Labor, and Social Issues;
- KOSTT
- Kosovo Energy Corporation (KEK);
- Kosovo Electricity Distribution Company (KEDS);

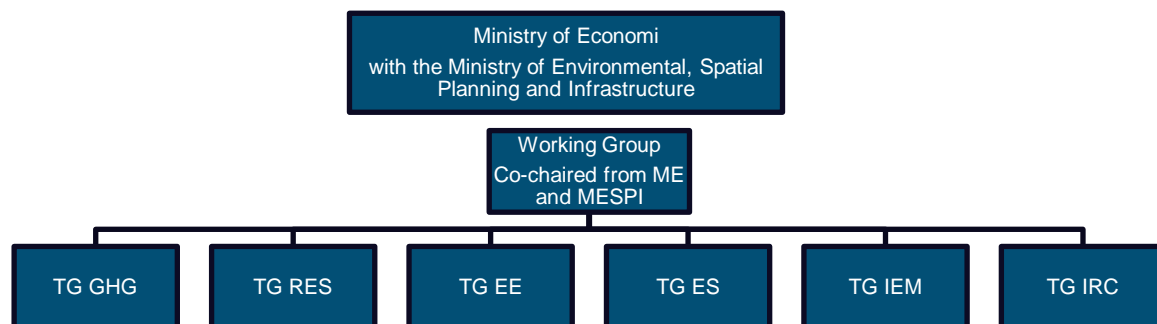
In addition to the list of Inter-Ministerial Steering Group, the key role for reviewing and approving the NECP is with the Government of Kosovo.

Other important stakeholders on development and implementation of NECP are:

- The Independent Commission for Mines and Minerals (ICMM)
- Kosovo Electricity Supply Company (KESCO);
- District Heating Companies;
- Independent Power Producers;
- Licensed Electricity Suppliers;
- Licensed Energy Market Participants;
- Other agencies and organizations.

For technical development of NECP the following organizational diagram with 6 Thematic Groups (TG) was established (Figure 9):

Figure 9. Organizational diagram



As explained above, in contrast to the NECP development process in 2021, in January 2023, by decision of the Government of the Republic of Kosovo, a decision was made to establish only one working group in which 15 institutions proposed their members, namely:

- Ministry of Economy - ME
- Ministry of Environment, Spatial Planning and Infrastructure – MESPI
- Office of the Prime Minister
- Ministry of Finance, Work and Transfers
- Economic Chamber of Commerce
- Ministry of Industry, Entrepreneurship and Trade
- University of Prishtina
- Transmission, System and Market Operator
- Energy Regulatory Office
- Ministry of Education, Science and Technology
- Kosovo Energy Corporation
- Ministry of Agriculture, Forestry and Rural Development
- Kosovo Energy Distribution Services - Company
- Institute for Development of Energy Policy – NGO

- Balkan Green Foundation – NGO

1.3 Consultations and involvement of national and Energy Community entities and their outcome

I. Involvement of the national parliament

In Kosovo's current legislative framework, the role of the Assembly is crucial to the energy sector. Kosovo's Assembly has a mandate to adopt the Energy Strategy, and to approve and amend primary laws. The Assembly is also responsible for monitoring Kosovo's international obligations such as: Energy Community Treaty and Stabilisation Accession Agreement. Furthermore, according to the Law on Electricity, the rights of the shareholder of the Transmission System and Market Operator (KOSTT) will be exercised by the Assembly of Kosovo. Furthermore, the Annual Report of KOSTT is reviewed and approved by the Assembly.

Concerning the NECP, the involvement of the Assembly is expected upon presentation of the draft for review. It is expected that, according to the procedures, the Draft will be discussed by the related committees of the Parliament and then submitted for adoption by the Members.

II. Involvement of local and regional authorities

Ministry of Economy, Ministry of Environment, Spatial Planning and Infrastructure, relevant ministries and other relevant institutions started the preparatory work for the current Draft National Integrated Energy and Climate Plan at the end of 2022. When the draft NECP is completed, the process of consultation as required by law will continue at all regional and local levels. Involvement of the public in all stages of development of NECP is crucial for a successful implementation of the NECP.

III. Consultations of stakeholders, including the social partners, and engagement of civil society and the general public

The general goals and objectives, as well as key policies and measures of the National Energy and Climate Plan are to be communicated with stakeholders through consultation workshops within the framework of drafting the Plan. In March and April 2023, four workshops were organized with stakeholders where the scenario with existing measures (WEM), as well as additional policies and measures (WAM) were discussed. At the beginning of 2023, the stakeholders were consulted about the input data that are used in the LEAP model. The next round of workshops will be organized after the completion of the NECP draft version.

The draft Integrated National Energy and Climate Plan 2025-2030 will be translated into three official languages (Albanian, Serbian and English) and will be submitted to the Energy Community accordingly. The Plan will also be published on the web page of the MESPI and the ME and modified further as per potential requirements and modifications.

IV. Consultations of other contracting parties and Member States of the European Union

The NECP consultations with the other Contracting Parties are realized through the already established bodies and mechanisms for regional cooperation:

- Western Balkan 6, Central and South Eastern Europe energy connectivity (CESEC),
- Ministerial Council of the Energy Community,
- Energy and Climate Committee,
- Energy and Climate Technical Working Group,
- Renewable Energy Coordination Group,
- Energy Efficiency Working Group,
- Environmental Task Force,

- EnC Permanent High-Level Group and

Furthermore, the country participates and contributes to Regional Meetings and Workshops, as well as Regional Exchange events organized by GIZ Open Regional Fund – Energy, Transport and Climate Protection (ORF-ETC), as well as Energy Community Secretariat, in order to facilitate a discussion of modelling approaches, data availability and quality, challenges, best practices, cross-sectoral and regional issues.

V. Iterative process with the Energy community secretariat

ME and MESPI representatives have participated in the work and the meetings of the Energy Community Working Group for drafting the National Energy and Climate Plan 2025-2030. After the consultation with the working group and implementing their comments the draft of the National Energy and Climate Plan will be submitted to the Energy Community and be revised and supplemented subsequently as per potential comments received.

The final draft of the National Energy and Climate Plan 2025-2030 will then be submitted to the Energy Community and be amended as required and as potential comments that will be addressed.

1.4 Regional cooperation in preparing the plan

I. Elements subject to joint or coordinated planning with other Contracting Parties and Member States of the European Union

Elements that are or could be subject to regional cooperation are presented below by dimension.

- 1 Decarbonisation
 - Introduction of carbon pricing,
 - Addressing the impact of the Carbon Border Adjustment Mechanisms (CBAM)
 - Determining which industries should be part of the Emission Trading System (ETS) or will pay carbon tax
 - RES quota exchange,
 - Guarantees of origins exchange, as well as knowledge sharing,
 - Participation in the EnC Renewable Energy Coordination Group,
 - Participation in the EnC Environmental Task Force,
 - Participation in the EnC Energy and Climate Committee.
- 2 Energy efficiency
 - Bilateral and regional energy efficiency projects
 - Participation in the EnC Energy Efficiency Coordination Group,
- 3 Security of supply
 - Gas transmission network with Albania and North Macedonia.
 - Participation in the EnC SoS Coordination Group,
- 4 Internal energy market
 - Market coupling with Albania,
 - Regional electricity market coupling,
 - Participation in SEE CAO,
 - Participation in ENTSO-E,
 - Participation in the CEER.
- 5 Research, innovation and competitiveness
 - Bilateral or multilateral research projects,
 - Horizon Europe
 - Other regional and international funds for research, innovation and competitiveness.

II. Explanation of how regional cooperation is considered in the plan

Being a vital element of stabilization and association – the process guiding the Western Balkans towards EU membership and helping the region to address shared challenges such as energy shortages, pollution, transport infrastructure, cross-border issues and others -, regional cooperation, also within the NECP, is seen as a crucial building block and an important tool for the realization of a number of activities. The NECP encompasses activities which follow the Western Balkan 6 Initiative (Berlin Process) which aims to support the six Contracting Parties of the Energy Community in Southeast Europe in strengthening regional cooperation and driving sustainable growth and jobs.

The regional cooperation will also be realized in the form of knowledge and experience exchange within the Energy Community Energy and Climate Committee and its Technical Working Group, which serve as a platform for cooperation between representatives of ministries and agencies in charge of energy, climate change and environment from the Energy Community Contracting Parties and Observers in the following areas:

- Implementation and alignment of Contracting Parties legislation to the Monitoring Mechanism Regulation (MMR). This includes: establishing GHG emission inventories, developing low-carbon development strategies and improving national systems for reporting on policies and measures and for reporting on projections of anthropogenic greenhouse gas emissions,
- Preparation of integrated national energy and climate plans, implementation of the Energy Community Policy Guidance and Governance Regulation – exchanging best practices and lessons learned.
- Streamlining climate change considerations in other sectoral policies - exchanging best practices and lessons learned.
- Regional cooperation at Energy Community level will also be pivotal for establishing the most appropriate mechanism for carbon pricing, also taking into account the CBAM in preparation by the European Union;
- Ensuring active participation as well as rigorous, streamlined and inclusive discussions of Contracting Parties on energy efficiency, renewables, environment, electricity, gas etc. - assisted by the Energy Efficiency Coordination Group, the Renewable Energy Coordination Group, the Environmental Task Force, the ECRB Electricity Working Group and Gas Working Group and Customers and Retail Markets Working Group).

The NECP may also benefit from the work of the Regional Cooperation Council, contributing to realization of the following two objectives of its power region: (1) The Paris Agreement on Climate Change to keep temperature growth well below 2°C implemented and (2) 2030 energy and climate framework policy targets defined and successfully achieved.

2 NATIONAL OBJECTIVES AND TARGETS

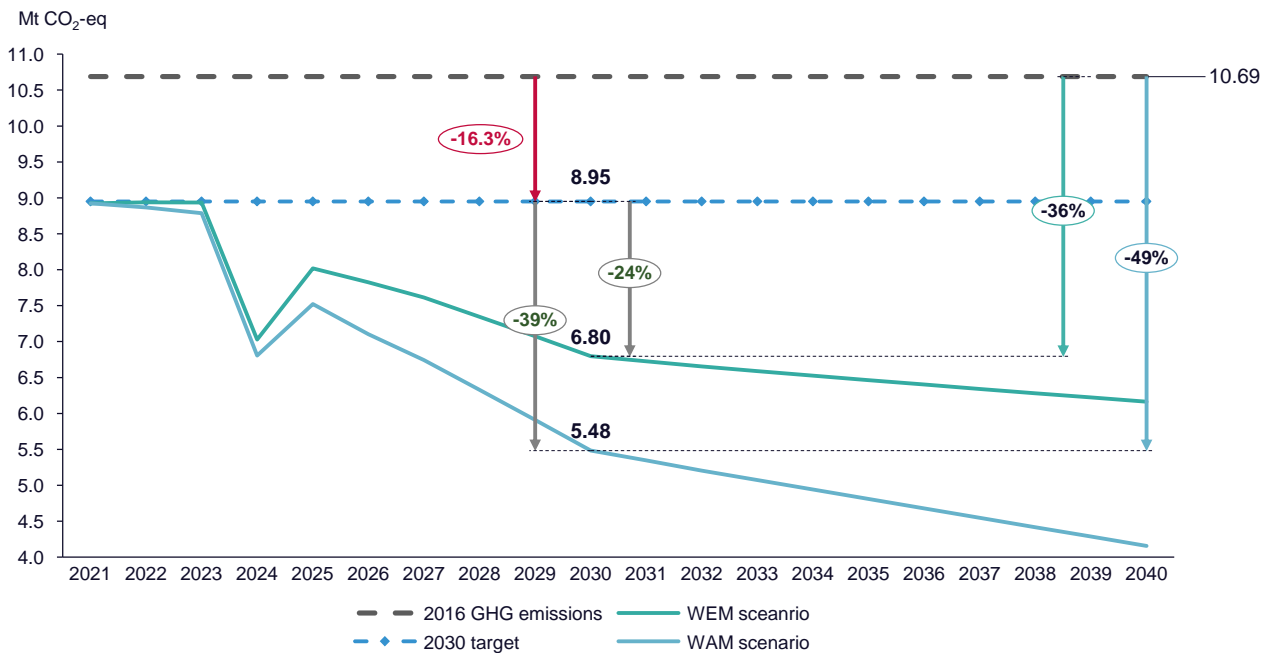
2.1 Dimension decarbonisation

I. GHG emissions and removals

The elements set out in point (a)(1) of Article 4

The Kosovo economy-wide **GHG targets** adopted by the Ministerial Council of the Energy Community for 2030 in absolute terms are 8.95 kt CO₂-eq or a 16.3% reduction compared to 2016 GHG levels. Figure 10 depicts the GHG emissions from the scenario with existing measures (WEM), the scenario with additional measures (WAM), the net GHG emissions in 2016, and the targeted value for net GHG emissions in 2030. In both scenarios presented in this NECP, the 2030 GHG values are lower compared to the already adopted GHG target. The WEM scenario has a 36% reduction of GHG emissions in 2030 compared to the GHG emission level in 2016, while in the WAM scenario the GHG emissions are lower by 49% compared to the 2016 level.

Figure 10. Indicative targets and trajectory for GHG emissions reduction



Source: Results from modelling

Comparing to the target level in 2030, both scenarios over-achieve the target. Relative to the targeted value in 2030, in the WEM scenario the emissions are lower by 24% and in the WAM scenario are lower by 39%. The target covers net emissions including emissions and removals in the LULUCF sector.

- I. Where applicable, other national objectives and targets consistent with the Paris Agreement and the existing long-term strategies. Where applicable for the contribution to the overall Contracting Parties commitment of reducing the GHG emissions, other objectives and targets, including sector targets and adaptation goals, if available

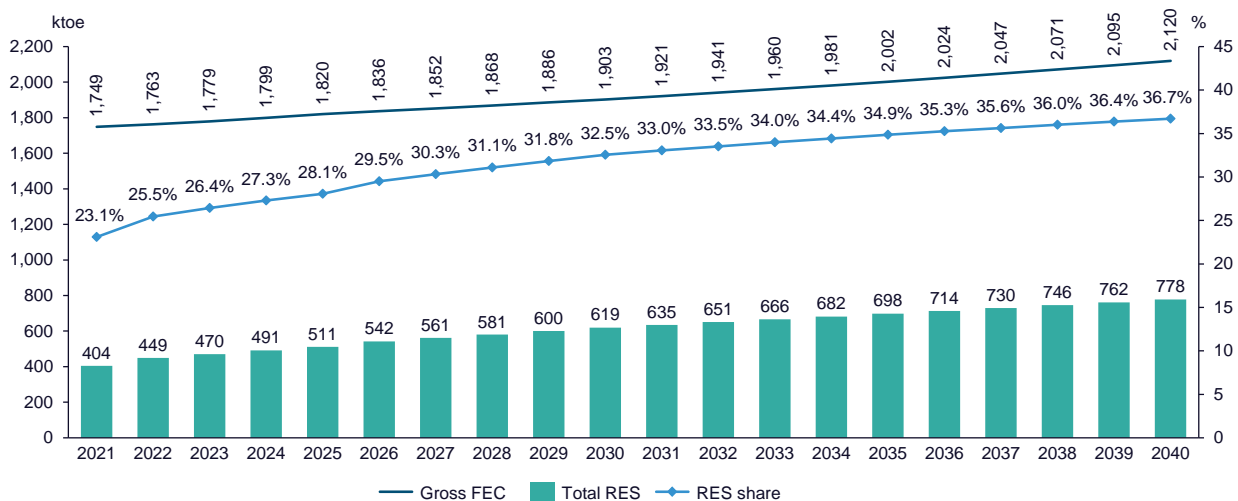
The country is not a signatory party to the United Nations Framework Convention on Climate Change (UNFCCC) and is not a party to the Paris Agreement. There is no Long-term Strategy on Climate Action developed for Kosovo. However, as mentioned in the previous section, on 15 December 2022, the Energy Community Ministerial Council adopted the Decision 2022/02/MC-EnC, where the contracting parties' 2030 energy and climate targets are defined. In the case of Kosovo, the target for net GHG emissions in 2030 is -16.3% relative to the GHG emissions in 2016, or in absolute value, the emissions in 2030 should be 8.95 Mt CO₂-eq.

II. Renewable energy

- I. The elements set out in point (a)(2) of Article 4

In the same Decision 2022/02/MC-EnC of the Energy Community Ministerial Council the share of RES in gross final energy consumption are defined for each Contracting Party. The **target** for Kosovo is set at 32% in 2030. The target RES share in the WAM scenario will be achieved in 2030 (Figure 11).

Figure 11. RES share in gross final energy consumption in the period 2021-2040



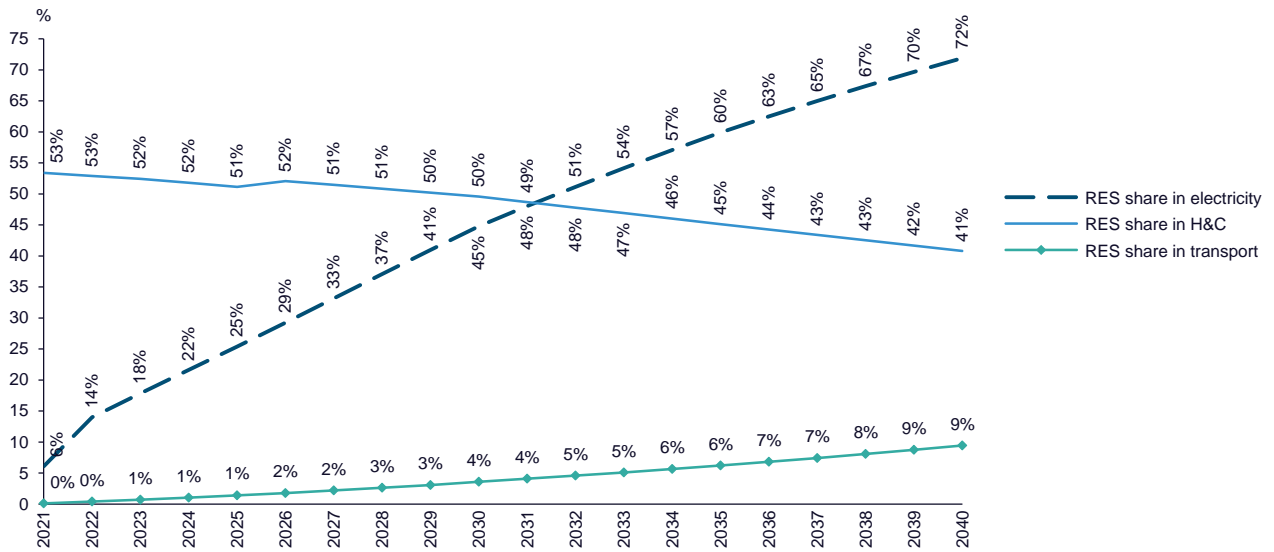
Source: Results from modelling

- II. Estimated trajectories for the sectoral share of renewable energy in final energy consumption from 2021 to 2030 in the electricity, heating and cooling, and transport sector

In 2030, the sectoral RES shares in gross final energy consumption are projected to reach the following values in order to meet the overall target for the RES share in the gross final energy consumption (Figure 12):

- 49.6% in heating and cooling,
- 45% in electricity,
- 3.6% in transport.

Figure 12. Estimated trajectories for the sectoral share of renewable energy in final energy consumption from 2021 to 2030 in the electricity, heating and cooling, and transport sector

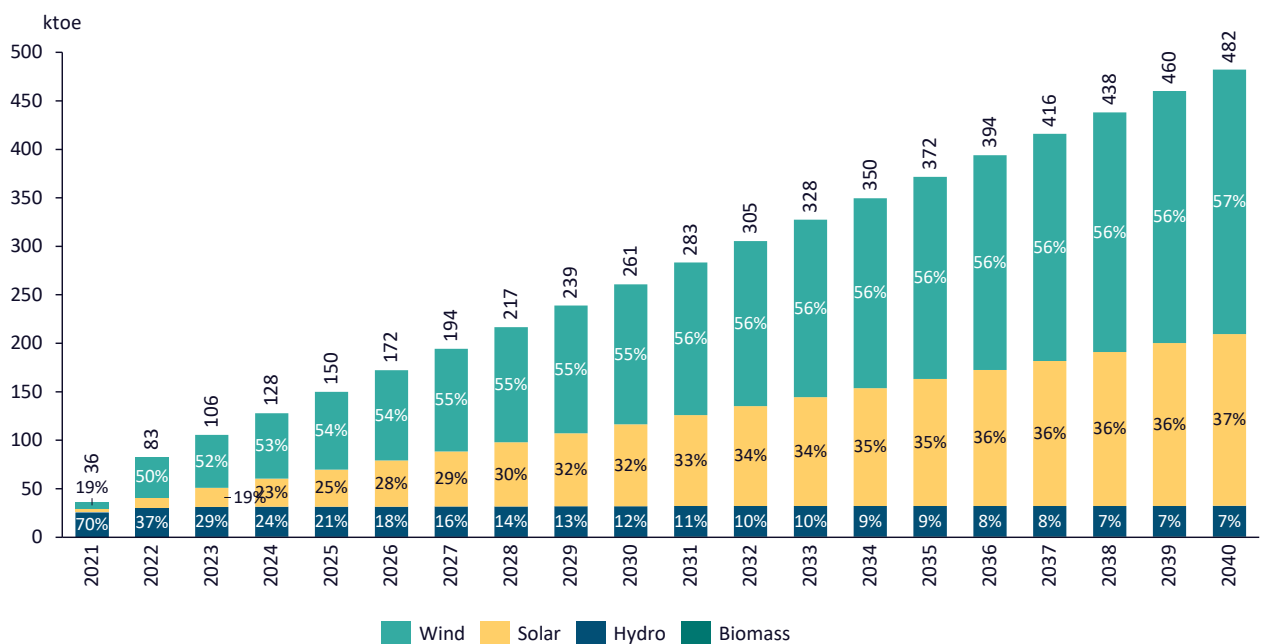


Source: Results from modelling

III. *Estimated trajectories by renewable energy technology that the Contracting Party projects to use to achieve the overall and sectoral trajectories for renewable energy from 2021 to 2030, including expected total gross final energy consumption per technology and sector in Mtoe and total planned installed capacity (divided by new capacity and repowering) per technology and sector in MW*

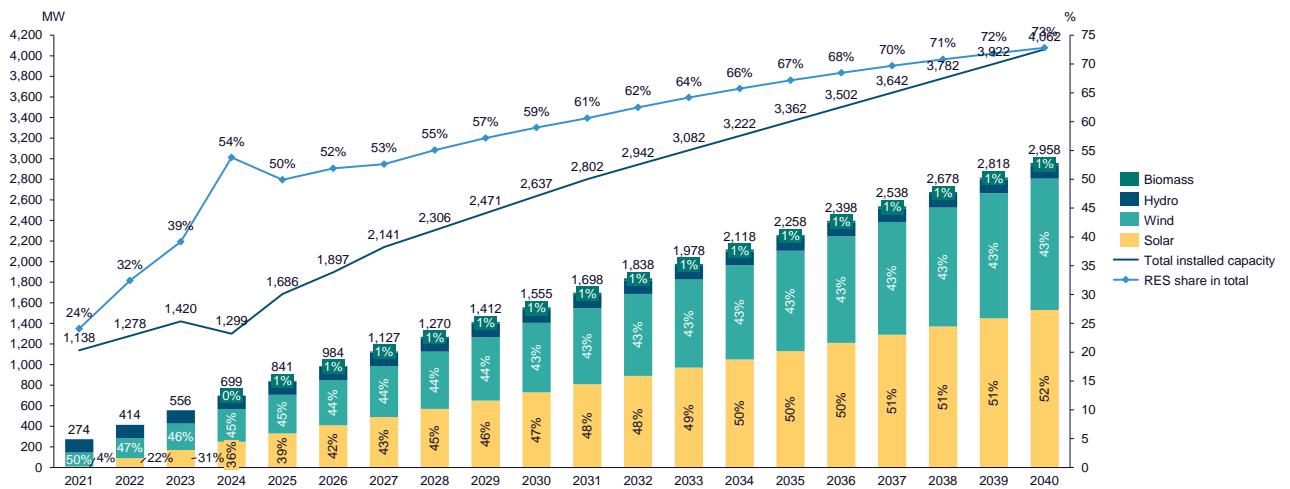
It is projected that in 2030 (WAM) the electricity production from RES will reach 261 ktoe, of which the highest share will be wind with 55%, followed by PV with 32% and hydro with 12% (Figure 13). Regarding the installed capacity for electricity generation, 59% in 2030 will be from RES (Figure 14). It is projected that by 2030 the total installed capacity from PV and wind will be around 1400 MW (PV with 730 MW and wind 670 MW).

Figure 13. Estimated trajectory by RES technology in gross final energy consumption, electricity sector



Source: Results from modelling

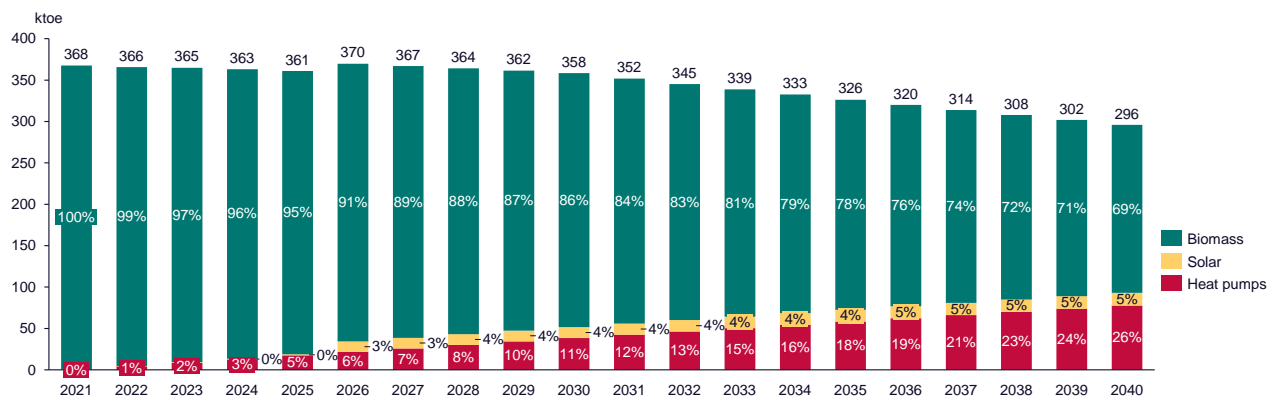
Figure 14. Trajectory of the installed capacity from RES for electricity production, by technology



Source: Results from modelling

Biomass will remain the dominant RES fuel in the heating and cooling sector with a share of 92% in 2030 (Figure 15), which will gradually be reduced to around 80% in 2040. In the analyzed period, the RES energy consumption in the heating and cooling sector is projected to decrease.

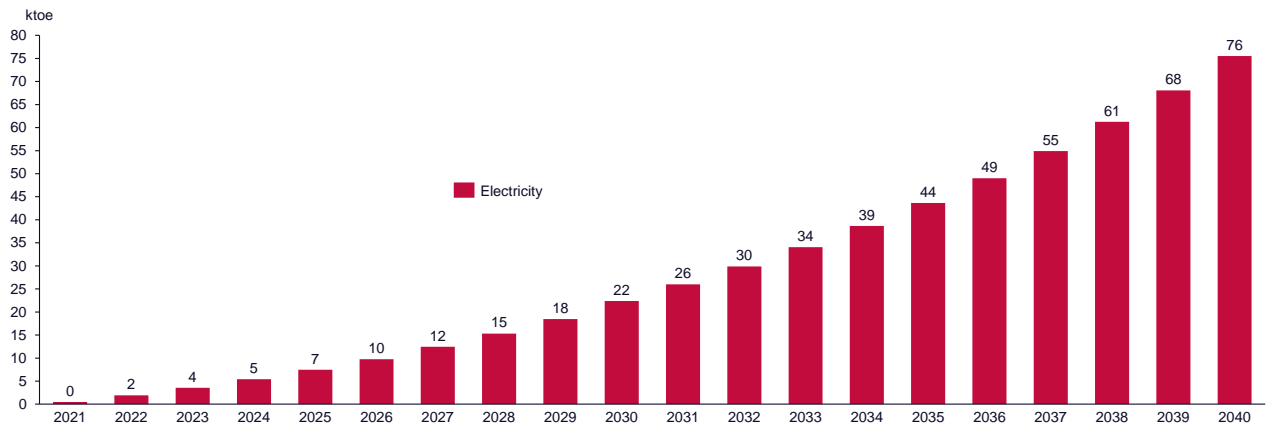
Figure 15. Estimated trajectory by RES technology in gross final energy consumption, heating and cooling sector



Source: Results from modelling

In Kosovo, there is no consumption of biofuels, and it is assumed that additional policies will not support the penetration of these fuels in the transport sector. Nevertheless, despite not reaching the target of 10% renewables in the transport sector by 2030, it is projected that the electricity consumption in the transport sector will increase substantially (Figure 16).

Figure 16. Estimated trajectory by RES technology in gross final energy consumption, transport sector

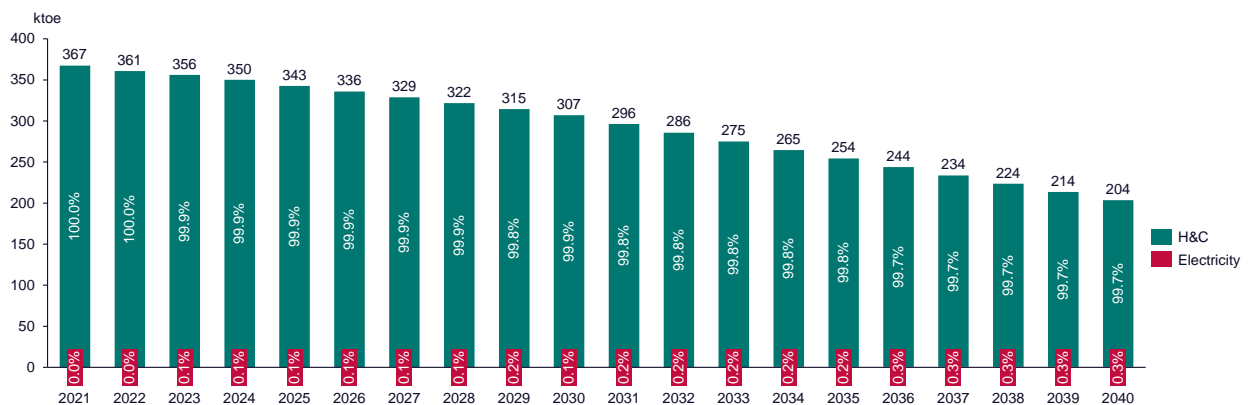


Source: Results from modelling

IV. Estimated trajectories on bioenergy demand, disaggregated between heat, electricity and transport, and on biomass supply by feedstocks and origin (distinguishing between domestic production and imports). For forest biomass, an assessment of its source and impact on the LULUCF sink.

Bearing in mind that the consumption of biofuels is not considered in the proposed scenarios, there is no biomass consumption in the transport sector while the consumption for electricity generation is less than 0.5%. Consequently, almost 100% of the biomass consumption in the energy sector will be used for heating (Figure 17). The largest share can be attributed to fuelwood for residential heating, much of which is currently being illegally extracted from forests. The Government realizes that only sustainable biomass should be used for the transition, as it must not adversely affect ecosystems, soils or the availability of food production. Thus, the aim is an exclusive use of sustainable biomass. Sustainable biomass is currently only available to a limited degree, meaning that it is necessary to boost the sustainability and volume of the available quantities. More efficient and sustainable types of heating, such as heat pumps and more efficient biomass stoves in the WAM scenario, can also reduce pressure from forest biomass extraction. Furthermore, improved forest management and identification of the potential for new ways of producing sustainable biomass with less impact on the environment should be explored, including domestic potential from sustainably managed forests, other biomass sources such as agricultural residues, and sustainably sourced imports from third countries.

Figure 17. Estimated trajectory on biomass demand, disaggregated between heat and electricity

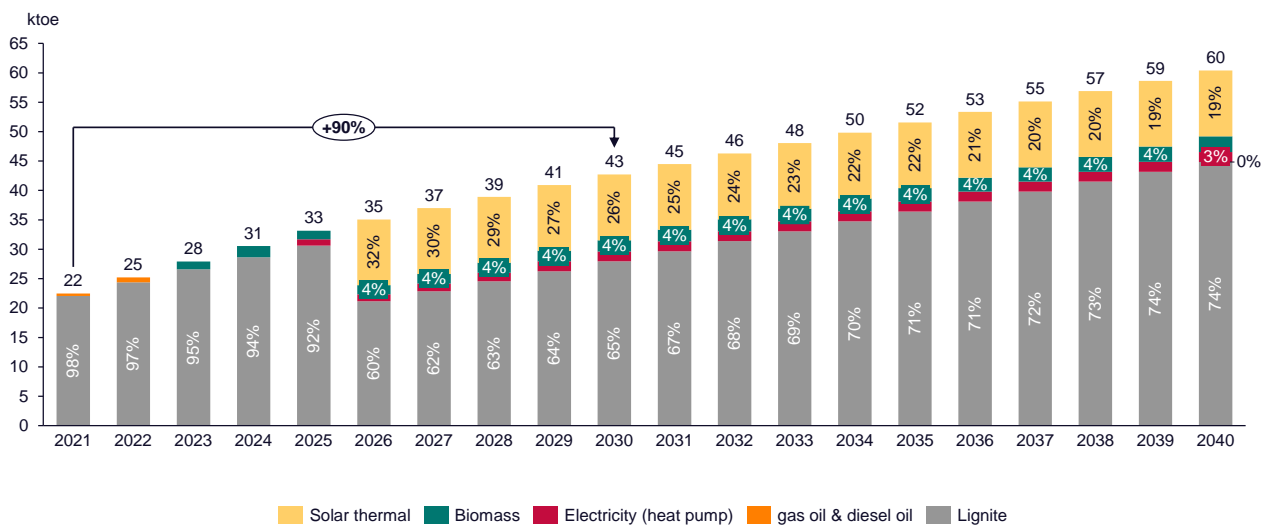


Source: Results from modelling

V. Where applicable, other national trajectories and objectives, including those that are long term or sectoral (e.g. share of renewable energy in district heating, renewable energy use in buildings, renewable energy produced by cities, renewable energy communities and renewables self-consumers, energy recovered from the sludge acquired through the treatment of wastewater)

One of the main **objectives** of this NECP is to increase the utilization of district heating systems. It is projected that the consumption of heat will be almost two times higher in 2030 compared to 2021 levels (Figure 18). This increase of heat consumption expansion of cogeneration in Kosova B, the Solar4Kosova II project (solar thermal district heat), as well as a few smaller projects in Gjakova (utility-scale heat pump, biomass CHP and biomass heat-only boiler).

Figure 18. Increase use of district heating system



Source: Results from modelling

More information about the current policy and measures can be found in “Current potential for the application of high-efficiency cogeneration and efficient district heating and cooling”.

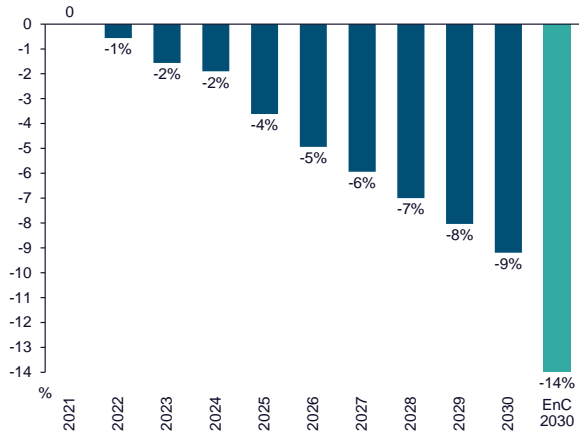
2.2 Dimension energy efficiency

I. The elements set out in point (b) of Article 4

Energy Efficiency in Kosovo, along with the need and effort to ensure sufficient energy from production from existing thermal power plants and other alternative sources, is considered by the Government as an essential component of the strategic and economic planning and the development of Kosovo.

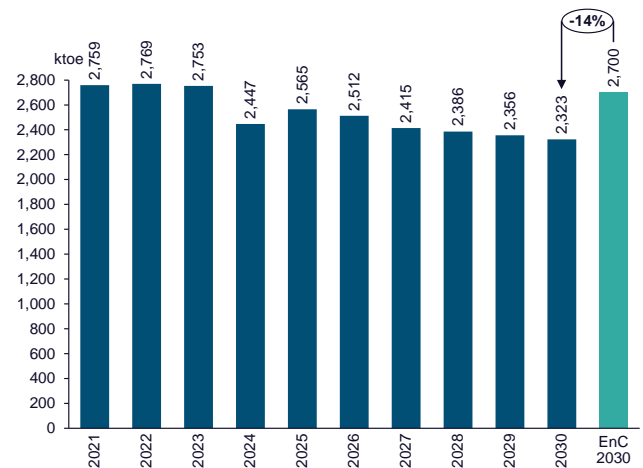
According to the Decision 2022/02/MC-EnC adopted by the Energy Community Ministerial Council, the **target for EE** for Kosovo in relation to the primary energy consumption in 2030 is 2.7 Mtoe (Figure 20), while for the final energy consumption, it is 1.8 Mtoe (Figure 22). The projected primary energy consumption is in line with (in fact, 14% below) the 2030 Energy Community target. The target for the final energy consumption in absolute terms is met as well in the scenario with additional measures (WAM), with projected final energy consumption close to the 2030 Energy Community target.

Figure 19. Primary energy savings, relative to WEM scenario and EnC 2030 target



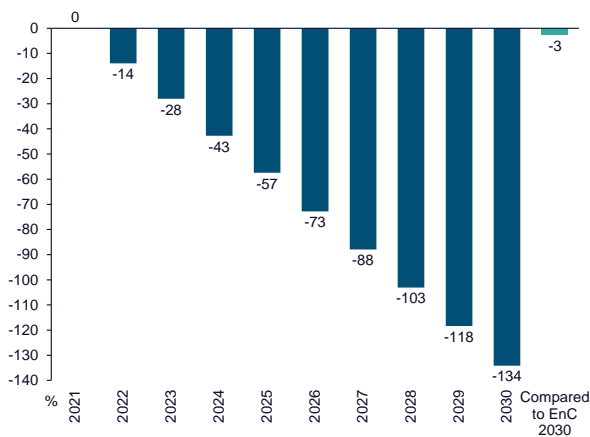
Source: Results from modelling

Figure 20. Primary energy consumption and EnC projections for 2030



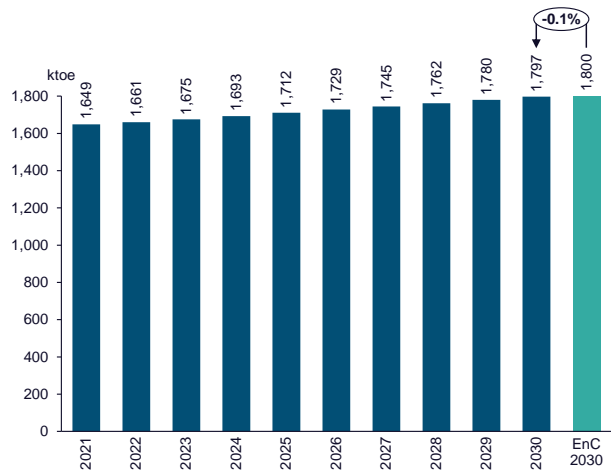
Source: Results from modelling

Figure 21. Final energy savings, relative to WEM scenario and EnC 2030 target



Source: Results from modelling

Figure 22. Final energy consumption and EnC projections for 2030

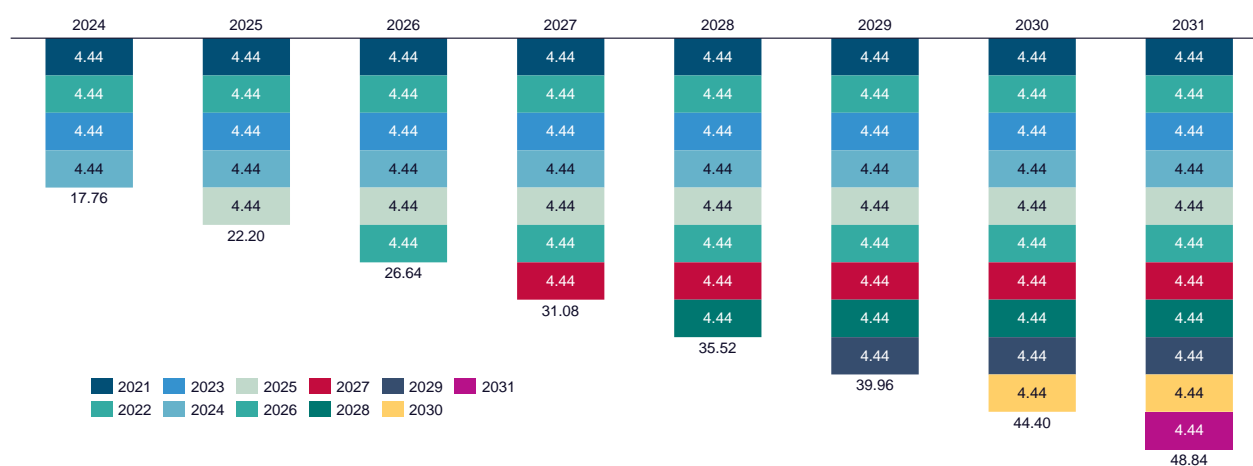


Source: Results from modelling

The Energy Community Ministerial Council decision has proposed new targets for EnC countries, including the Republic of Kosovo. These targets will come into effect in 2024, with a time delay of 5 years compared to EU member states. However, this new approach aims to align the ambitions of EnC countries with those of EU member states. Based on the Energy Strategy, Kosovo aims to achieve cumulative savings by 2031 amounting to 266.4 ktoe (Figure 23).

To calculate the obligatory targets for the Republic of Kosovo, the final energy consumption (FEC) over the past three years is used as a baseline. The average value of FEC from the latest three years is determined, and the annual target is set at 0.8% of this average FEC value. It's important to note that the target includes total final energy consumption, including the transport sector. As a result, the new obligatory savings targets are expected to be significantly higher. This is due to the fact that the baseline will be higher, reflecting the increase in energy consumption, and also because the transport sector, which contributes to approximately 25% to 28% of the overall FEC, cannot be excluded from the targets.

Figure 23. Cumulative energy savings per year for the period 2020-2030



Source: Results from modelling

The EE Law stipulates the establishment of an Energy Efficiency Obligation (EEO) scheme aiming to achieve cumulative energy saving targets over a defined number of years, through a combination of measures supported materially by those energy suppliers who are designated as 'obligated parties' (OPs). EEOs are defined in Article 10 of the EE Law and have the potential to play a significant role in activating and supporting investment in building energy renovation, at least to a certain level.

- II. The indicative milestones for 2030, 2040 and 2050, the domestically established measurable progress indicators, an evidence-based estimate of expected energy savings and wider benefits, and their contributions as included in the roadmaps set out in the long-term renovation strategies for the national stock of residential and non-residential buildings, both public and private, in accordance with Article 2a of Directive 2010/31/EU as adapted and adopted by Ministerial Council Decisions 2010/02/MC-EnC and 2021/14/MC-EnC

According to Article 7 of Law no. 06/L-079 on Energy Efficiency, the draft building renovation strategy (BRS) should be developed by ME. The long-term renovation strategy is already developed, but at the present moment it has not yet been approved by the Government. The realization of the BRS is crucial for achieving the national energy efficiency targets. The **objectives of the draft BRS** are:

- providing a roadmap to a national stock of buildings of high efficiency and quality in Kosovo over the next 20 and 30 years and beyond, achieving a major scaling up of the volume and depth of energy efficiency renovation activity, reducing energy consumption in existing buildings, creating significant new business activity in energy efficiency renovation, and, hence, contributing to national energy and climate policy goals,

- renovation rate of the residential and commercial buildings of 4.5% per year and 1% for public buildings, resulting in combined per year savings of 6.2 ktoe, 13.3 ktoe and 19.2 ktoe for the scenarios 1-3 respectively

Although the draft BRS has not been adopted, the analyses and scenarios contained are used as a basis for the adopted Energy Strategy 2022-2031. In order to be in line with the Energy Strategy and this NECP, the draft BRS would have to be revised accordingly before adoption.

- III. Where applicable, other national objectives, including long-term targets or strategies and sectoral targets, and national objectives in areas such as energy efficiency in the transport sector and with regard to heating and cooling

There is no long-term Strategy on Climate Action developed in Kosovo, but as stated in the Climate Change Strategy of Kosovo, there is large uncertainty of future social and economic development of the country, so it is difficult to set long-term development strategy objectives. Therefore, only qualitative mitigation objectives are set in the Climate change strategy, but there are no quantitative objectives up to 2050.

2.3 Dimension energy security

- I. The elements set out in point (c) of Article 4

The backbone of power generation in Kosovo are two outdated lignite-fired power plants, Kosova A and Kosova B. The power plants' insufficient capacities to cover domestic demand - especially in winter - and in meeting the reserve capacity requirement of the power system puts Kosovo's energy security at risk.

To deal with this and related energy security challenges, the Government of Kosovo has recently approved the **National Energy Strategy 2022-2031**.

The Strategy has set out five strategic objectives, which are:

- **Strategic objective 1:** Improving system resilience
- **Strategic objective 2:** Decarbonization and promoting renewable energy
- **Strategic objective 3:** Increasing energy efficiency
- **Strategic objective 4:** Strengthening regional cooperation and market functioning
- **Strategic objective 5:** Protecting and empowering consumers

To work towards the security of energy supply, the **key objective** of the **National Energy Strategy** is a full decarbonization of the energy sector, with renewable energy sources (RES), mainly wind and solar, as well as energy efficiency as the main pillars of this process. The process of transitioning from fossil-based resources is expected to start immediately, but with a long-term and gradual view until 2050. Fossil energy sources will gradually be replaced with renewable sources, accompanied by the development of flexible units and energy storage facilities which will be necessary to enable the integration of RES into the system.

More concretely, the strategy outlines the goal to increase the share of renewable energy sources in electricity consumption to 35% by 2031 from the 6.3% present in 2021. To achieve this target, the to be developed RES capacities foreseen in the strategy are mainly wind and solar energy sources, but also biomass. Additionally, Kosovo is planning to install at least 170 MW of battery storage capacity in its power system by 2031, which will enable the integration of variable renewable electricity generation and will ensure the ENTSO-E energy reserve requirement is met.

Furthermore, investment in existing lignite-based generation capacities is needed to maintain the security of supply. To that end, the energy strategy foresees the two units of TP Kosovo B to undergo a major overhaul, enabling their operation with optimal technical parameters both in terms of capacity and in meeting the emission levels according to European standards. The rehabilitation is foreseen to take place in two stages, with finalization expected by the end of 2025 and in 2026, respectively.

Additionally, the National Energy Strategy foresees at least one of the Kosovo A units to be refurbished by the end of 2024. A decision on whether to refurbish or phase out a second unit will be made in 2024 at the latest, while the third unit will be permanently closed upon completion of the refurbishment of the other units. The refurbished unit(s) are then planned to be kept as a strategic reserve from 2028 onwards. As is outlined in the Energy Strategy, this would mean that these unit(s) would be available in the crucial higher demand heating season, or during extraordinary occasions such as severe energy crises.

Regarding the power sector, a key objective outlined in the National Energy Strategy also concerns the reduction of technical and commercial losses in the distribution network. While distribution losses have already decreased over the past years (both in absolute and relative terms) current levels are still comparably high. For example, technical losses in 2022 amounted to around 12.21%, with the EU average standing at 6-8%. The overall non-technical (commercial) losses to the general distribution demand in 2022 were about 10.42%, of which 5.85% is unbilled energy in the four northern municipalities of Kosovo. Aggregated (technical and commercial) losses in Kosovo were about 22.64%¹ in 2022. The objective is to reduce technical losses to 9% by 2031.² By reducing distribution losses, the investments made in the distribution system to that end will ensure both the sustainability and quality of electricity supply.

Security of energy supply is also addressed within the legal framework of the existing energy structures. There too, the increased use of renewable energy sources is encouraged as an essential tool to tackle security of supply issues. More specifically, the **Law on Energy** aims to achieve a safe, secure, reliable, and high-quality supply of energy, to provide the conditions for the functioning of energy markets, and to also promote a more efficient use of energy. In addition, the law outlines goals related to increased renewable energy sources and co-generation as well as improved environmental protection during energy activities.

To this end, the **Law on Energy** establishes stipulations allowing for priority dispatch of electricity produced from renewable energy sources and co-generation, which shall be exercised by the distribution and transmission system operators, for as long as no limits are to be imposed for such priority for the purpose of system security as specified by the relevant technical codes and rules.

Additionally, objectives related to market liberalization and regional integration are expected to ensure mitigation effects in terms of the supply problem (see section on Internal Energy Market).

Kosovo made another important step towards diversification efforts by drafting the new **Law on Renewable Energy Sources**, with the plan to be adopted by the end of 2023. The law will aim to promote the increase in the use of energy from renewable sources to ensure a sustainable development in the most cost-efficient manner.

Further, according to the **Law on Energy Regulator**, the Energy Regulatory Office (ERO) is responsible to monitor the security of energy supply. In this aspect, it is also responsible for preparing the Security Supply Statements which Kosovo is obliged to regularly adopt as a contracting party of the Energy Community. The Statements have to address, in particular, topics relating to diversity of supply, technological security, and geographic origin of imported fuel. The Statements should be updated every two years.

Kosovo does not possess either natural gas reserves, gas infrastructure or a gas-related qualified workforce. However, the legal framework for natural gas in Kosovo was adopted in line with the Third Package of EU legislation and approved by the Assembly of Kosovo. The Energy Regulatory Office is entrusted to regulate the natural gas sector.

Until recently, policy objectives were focused on ensuring natural gas supply in Kosovo to help diversification of supply and increase the security of supply. However, given the extremely high prices and the economic and geopolitical uncertainties over gas supply in the aftermath of the war in Ukraine, the current position of the Government is that pursuing domestic gas network infrastructure development would be highly risky and costly. Nevertheless, it should be noted that Kosovo will follow the developments in this regard and explore possibilities; for instance, the option to have co-investment opportunities for gas power plants for baseload

¹ Annual Report 2022 - Energy Regulatory Office

²² In addition, zero commercial losses are targeted according to the Energy Strategy.

and/or system flexibility in Albania, North Macedonia and Greece will be further explored with potential implementation envisaged by 2031.

Regarding the oil sector, Kosovo has no crude oil resources or capacities to process crude oil. Kosovo does also not import crude oil but is a net importer of petroleum products. Nevertheless, the legislation relating to crude oil and petroleum products is in effect, which also regulates the oil reserves, imposing the obligation that all oil products storage and sale points are obliged to have at least 5% reserve of their storage capacity for emergency purposes. In addition, the draft **Law on Compulsory Oil Stocks** has been proposed by the Ministry of Trade and Industry, pending final approval by the Parliament. It is worth mentioning that the first draft of the mentioned law was already proposed in March of 2014, but has not progressed rapidly.

Ensuring cybersecurity standards in the energy sector is also becoming increasingly important for ensuring energy security, especially in light of digitalization trends in the energy sector. However, Kosovo is not a signatory party of the Budapest Convention, which set the legal framework of reference for combating cybercrime, including attacks against information systems. Still, its main provisions have been accommodated in the **Law on Cyber Security**. The Law establishes the principles of cyber security, the institutions responsible and the prevention and combating measures of cybercrime in the country against any threat or attack and establishes the Cyber Security Agency.

In addition, the **National Energy Strategy** also emphasizes the importance of cyber security. To lay the foundation necessary for ensuring that cyber response capabilities in the energy sector are in place, the strategy outlines that a sectoral CERT (Computer Emergency Response Team) for energy shall be established by 2025. In addition, a cybersecurity energy risk management framework shall be developed that will treat cybersecurity threats in the energy sector.

II. National objectives with regard to increasing: the diversification of energy sources and supply from third countries for the purpose of increasing the resilience of regional and national energy systems

As already noted, Kosovo's electricity generation mainly relies on two large lignite-fired thermal power plants (Kosovo A and Kosovo B), which cover around 88% of total electricity production in Kosovo. Nevertheless, through the recently approved **National Energy Strategy**, the country has substantially shifted its approach towards a greater diversification of energy sources. In this regard, the objective is to increase the share of renewable energy sources in electricity consumption to 35% in 2031.

However, to enable an increasing share of renewable capacities, flexibility is fundamental in the electricity sector. At present, only the Frequency Containment Reserve (FCR, primary reserve of 5 MW) capacities are ensured by the power plants in Kosovo. Other ancillary services (+/-25 MW aFRR and +143/-90 MW mFRR) are provided by the Albanian power system.

The interconnectivity of Kosovo with its neighbours is one of the strongest in Europe. In the four countries bordering Kosovo (Albania, Montenegro, North Macedonia and Serbia), the total maximum net import transfer capacity (NTC) was 1,316 MW; the total maximum export NTC was 1,175 MW. Comparing these figures with the total net installed generation capacities, the interconnectivity ratio is above 78%. The EU requirement is 10% for 2020 and 15% by 2030, implying that Kosovo has already met the 2030 targets. However, deepening the cooperation with neighbours, especially with Albania, is fundamental in order to ensure an efficient and market-based operation of these interconnections. Rather than further increasing nominal transmission capacity by constructing new transmission lines, an improved determination and auctioning of existing transfer capacities should be prioritised (see chapter 3.4.2).

In terms of supply from third countries, it is worth noting that Kosovo has an agreement signed between the Kosovo Energy Corporation (KEK) and Albanian Power Corporation (KESH sh.a.). This agreement foresees energy exchange on an "as needed/ as available" basis, meaning that the energy delivered is "stored" and returned back as energy at the time it is needed and is available by either party. As is known, Albania's energy generation almost exclusively comes from the country's hydropower plants.

III. Where applicable, national objectives with regard to reducing energy import dependency from third countries, for the purpose of increasing the resilience of regional and national energy systems

Kosovo is characterized with an electricity demand which varies on a seasonal basis. Amongst others, this is due to the use of electricity for space heating by households, which puts significant pressure for electricity during the heating season resulting in the need for expensive imports of electricity. Moreover, because of the insufficient flexibility of the system to accommodate the demand at different times, an energy surplus is also created, particularly at off-peak times, necessitating export during night-time with significantly lower prices.

Import dependency will continue to pose a problem that needs to be tackled to secure security of supply, despite currently observable reductions in the share of imports in total energy demand. With 11.63% in 2022, the share of imports of the total energy demand was significantly lower compared to the 19.04% observable in 2021, but still significant.

In this regard, the objectives to reduce Kosovo's import dependency are set in the **National Energy Strategy**, with a particular focus on supporting the decarbonization process and the promotion of renewable energy as a means to decrease import dependency, as well as increasing the energy efficiency implementation measures. Equally important, investments in existing baseload capacities are needed to increase the reliability of lignite-based production and reduce import dependency in the most critical years of renewable capacity development.

IV. National objectives with regard to increasing the flexibility of the national energy system, in particular by means of deploying domestic energy sources, demand response and energy storage

Given the outdated thermal power plants and the lack of new generators, Kosovo is faced with lack of a system flexibility capable of adapting to the rapid and deep changes of demand, especially during the high demand at peak times. This creates the need for the import and export of electricity at unfavourably different times. Especially in light of Kosovo's ambitious objectives towards full deployment of renewable energy sources, a more flexible system is becoming increasingly important. Therefore, Kosovo aims to establish a well-functioning flexibility market and incentivize differently.

More specifically, the objectives in regard to system flexibility are outlined in **National Energy Strategy** as follows:

- One short-term step is a fully coupled market with Albania. After the launch of Albanian Power Exchange (ALPEX) on the Day-Ahead Market, its full operationalizing is expected with the implementation on the Day-Ahead Market in Kosovo. In the mid-term, once ALPEX is fully functional, flexibility providers will be integrated into the system and in the longer-term Kosovo is planning to join the common EU balancing platforms (MARI, PICASSO, IGCC).
- Kosovo is planning to install at least 170 MW of battery storage capacity in its power system by 2031. This measure is not only aimed at improving system flexibility and allowing to integrate variable renewable electricity generation, but also to enable the fulfilment of ENTSO-E energy reserve requirements as well as to help reduce electricity imports.
- Other innovative technologies such as seasonal storage will be explored and with an option to be installed by 2031 (depending on their economic viability).
- The current Kosovo-Albania cooperation on ancillary services will be continued and strengthened.
- Dynamic pricing elements for commercial and household customers will be applied, to enable consumers optimize their electricity consumption depending on the variability of electricity supply. This will also help to reduce energy bills and improve the quality of electricity supply.
- The option of installing several smart meters at the customer level will be taken into consideration to the extent that the benefit (in terms of marginal increase in system flexibility) justifies the financial cost.

2.4 Dimension internal energy market

I. Electricity interconnectivity

- I. The level of electricity interconnectivity that the Contracting Party aims for in 2030 in accordance with Article 4(d)(1), with a strategy with the level from 2025 onwards defined in close cooperation with affected Contracting Parties and/or Member States of the European Union, taking into account the 2020 interconnection target and the following indicators of the urgency of action:*

Kosovo's electricity interconnection capacity is several times higher than the EU interconnection target of 15% for 2030 (see Chapter 2.3 ii.). Hence, Kosovo has power system interconnection capacities more than adequate even from a long-term perspective. Given this, Kosovo is not faced with urgency to take actions on this matter.

- II. Price differential in the wholesale market exceeding an indicative threshold of EUR 2/MWh between Member States, regions or bidding zones;*

The Albanian Power Exchange (ALPEX) is an entity established by Kosovo and Albania to conduct a coupled and organized Day-Ahead Market and Intra-Day Ahead Market and to operate as the nominated electricity market operator (NEMO) for Albania and Kosovo. ALPEX has already begun its operation in Albania while Kosovo is currently working to finalize required tasks for market coupling with ALPEX. Following that, the objective is further integration into the regional and European market. With the first milestone of having ALPEX fully operational almost being reached and given the adequate interconnection capacity between both countries, it is expected that most of the time there will be no congestion, meaning no price difference between Kosovo and Albania.

Once coupled with Albania, efforts will be focused to couple markets with additional neighboring countries. In this regard, initial considerations are directed towards the integration of ALPEX with the upcoming North Macedonian day-ahead market as well as Greece. These developments will create a negligible price differential.

Clearly, due to the high level of interconnectivity of Kosovo and the region, wholesale electricity prices are highly dependent on international developments, such as European natural gas prices and EU-ETS allowance prices. Important domestic determinants of electricity prices are the expected gradual wholesale and retail market liberalisation steps, the phase-out of the bulk supply agreement between KEK and KESCO, the extent of market coupling with neighbours, as well as the decision to phase in carbon pricing market liberalisation steps, the phase-out of the bulk supply agreement between KEK and KESCO, the extent of market coupling with neighbours, as well as the decision to phase in carbon pricing. The impact of the latter depends on the chosen price (or allowance quantity) path in Kosovo as well as the degree of coordination with neighbouring countries and the EU.

- III. Nominal transmission capacity of interconnectors below 30 % of peak load;*

Nominal transmission capacity reflects the physical, installed capacity for which the interconnector was designed. It corresponds to the maximum power flow that the cross-border asset can transmit in accordance with the system security criteria.

According to KOSTT's Transmission Development Plan, the nominal transmission capacity is expected to be higher than the peak load, thus not necessitating any further improvements.

The table below shows the peak load high scenario and the total installed capacity.

Table 1. Development of installed interconnection capacity and system peak load in High Scenario

	Year 2020	Year 2025	Year 2031
System peak load in High Scenario (MW)	1249	1531	1590

Total nominal installed interconnection capacity (MW)	5575	5575	5575
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Source: KOSTT, Transmission Development Plan 2023-2032

The type of renewable energy generation connected in the transmission grid is currently coming from wind and hydro power. Current net installed capacities from these types of renewables reaches up to 139 MW for wind power and up to 63 MW for hydropower plants. This is expected to increase given the aim of having an additional 600 MW of wind generated electricity and an additional 700 MW of solar PV generated electricity by 2031. While the installed interconnection capacity, or thermal capacity of transmission lines is around 5600 MW, the maximum net transmission capacity between Kosovo and the region reaches a level of between 1300 MW to a maximum of 1600 MW. Therefore, integration of RES capacities in the transmission grid will require significant planning during the implementation of relevant projects.

II. Energy transmission infrastructure

I. Key electricity and gas transmission infrastructure projects, and, where relevant, modernisation projects, that are necessary for the achievement of objectives and targets under the five dimensions of the Energy Union Strategy

To achieve the strategic objectives of Kosovo's Energy Strategy, it is necessary to ensure continued investments in the development and maintenance of the transmission system. The **Law on Electricity** designates the Transmission and System Operator to prepare a 10-year Transmission Development Plan (TDP), which is then approved by the Energy Regulatory Office. The latest plan developed covers the period 2023-2032, which among others envisages the implementation of projects that are necessary for the achievement of objectives and targets under the five dimensions of the National Energy Strategy. It is critical for KOSTT to implement projects defined in the TDP in order to ensure the stability and reliability of the power system by reducing inefficiencies and bottlenecks in the network and meeting ENTSO-E's technical requirements.

Generally, transmission network development projects, as clarified in the TDP, are divided into five categories:

- Transmission network reinforcements
- Load support/New 110/10(20) kV nodes
- Revitalization of the transmission network
- Supporting projects of the transmission system (management, monitoring, measurement and control),
- Generation support (Connection application)

Of particular importance are the projects under the network reinforcement category given their effects in increasing the network capacities as per the relevant Grid Code requirements.

Table 5. Transmission and Network Reinforcement Projects outlined in the TDP

PROJECT CATEGORY: TRANSMISSION NETWORK REINFORCEMENT - (2023-2032)					
Z		Project title	Technical description	Reason for implementation	Year
1	004	Variable reactor 100MVA, 400 kV in SS Ferizaj 2	- Installation of variable reactor 100MVA in the free field 400 kV C05 in SS Ferizaj 2 - Reactor field 400 kV	Reducing overvoltage level in the transmission network. Regionally coordinated project	Q4-2024
2	006/1	Second 40 MVA transformer in SS 110/10(20) - Klina	TR2 Transformer 110/10(20) kV, 40 MVA - One transformation field 110 kV and 10(20) kV completed	Security of supply consumption of Klina, maintenance and optimization of SS. Increase of transformation capacities	Q2-2026

3	006/3	The second transformer 40 MVA inSS 220/35/10(20) kV Malisheva	<ul style="list-style-type: none"> - transformer 40 MVA, 220/10(20) kV - a transformer field 220 kV and a 10(20) kV. 	<ul style="list-style-type: none"> - Completing the N-1 criterion and increasing the security of Malisheva's consumption supply 	Q2-2026
4	006/4	The second transformer 110/10(20) kV Gjlani 5	<ul style="list-style-type: none"> - Transformer TR2 110/10(20) kV, 40 MVA - A 110 kV and 10(20) kV transformer field completed 	<ul style="list-style-type: none"> - Security of Gjlani's consumption supply; - Criterion N-1 - maintenance optimization of SS. -Increasing the transformative capacities 	Q2-2026
5	007/1	The second transformer 40 MVA inSS 110/10(20) kV Fushë Kosova	<ul style="list-style-type: none"> - transformer 40 MVA, 110//10(20) kV 	<ul style="list-style-type: none"> - Completing the N-1 criterion and increasing the security of the supply of the consumption of Fushe Kosova 	Q2-2026
6	007/2	The second transformer 40 MVA inSS 110/35/10(20)kV Kastriot	<ul style="list-style-type: none"> - The second transformer 40 MVA, 110/35/10(20) kV 	<ul style="list-style-type: none"> - Security of Ferizaj's consumption supply; optimization maintenance of SS. - Increasing transformative capacities 	Q2-2026
7	007/3	Replacement of the transformer in SS 110/10kV Gjakova 1(40MVA)	<ul style="list-style-type: none"> - Transformer TR2, 20MVA, 110/35 kV (v1965) is replaced by 40/40/40MVA, 110/35/10(20) kV (in coordination with KEDS) - A 10(20) kV transformer field 	<ul style="list-style-type: none"> - Security of Gjakova's consumption supply; -Reduction of losses in distribution. 	Q2-2026
8	007/4	Replacement of the transformer in SS 110/10kV Therande(40MVA)	<ul style="list-style-type: none"> - New transformer 40 MVA, 110/10(20) kV replaces transformer TR2:31.5 MVA, 110/10 kV (year 1985) 	<ul style="list-style-type: none"> - Security of Theranda's consumption supply; Completion of criterion N-1 in Transformation. - Reduction of losses in the distribution. 	Q2-2026
9	007/5 dhe 007/6	Transformer replacement in SS Prizreni 1 and Peja 1 (40 MVA)	<ul style="list-style-type: none"> - In Prizren 1, TR1 31.5MVA (year 1975), 110/35kV is replaced by a 40/40/40MVA, 110/35/10(20)kV transformer - In Peja 1, TR1 31.5MVA (year 1985), 110/35kV is replaced by 40/40/40MVA, 110/35/10(20)kV - Two 10(20) kV transformer fields 	<ul style="list-style-type: none"> - The project avoids eventual breakdowns with a high probability of old transformers and enables the fulfillment of the N-1 criterion in transformation even at the 10 kV level. 	Q2-2026
10	007/7	Transformer replacement in SS Ferizaj 1, (40MVA)	<ul style="list-style-type: none"> - Replacement of TR2 31.5MVA (year 1969), 110/35kV with new three-phase transformer 40/40/40MVA, 110/35/10(20)kV - A 10(20) kV transformer field 	<ul style="list-style-type: none"> The project avoids eventual breakdowns with a high probability of the old transformer and enables the fulfillment of the N-1 criterion in transformation at the 10 kV level 	Q2-2026
11	007/8	Replacement of the transformer in SS 110/10kV Deçani (40MVA)	<ul style="list-style-type: none"> - New transformer 40 MVA, 110/10(20) kV replaces transformer TR1:20 MVA 110/10 kV (year 1977), 	<ul style="list-style-type: none"> - The security of supply of consumption of Deçani; - Reduction of losses in distribution. 	Q2-2026

1 2	008/4	New double overhead / cable line and dismantling of the existing line between SS Prizreni 1 and SS Prizreni 2	<ul style="list-style-type: none"> - 4.81 km, double overhead/cable AlSt 240 mm² /1000mm², (dismantling of the existing one and utilization of the route. Also, the current conductor HW 170mm² is used to reinforce the capacity of the line Prizren1-Prizren 3 - A field of 110 kV line in SS Prizren 1 	<ul style="list-style-type: none"> - The construction of the new transmission line enables the fulfillment of the N-1 criterion as well as reduces losses in the network 	Q4-2026
1 3	008/5	New cable line 110 kV SS Prishtina 2- SS Prishtina 4	<ul style="list-style-type: none"> - Two fields of 110 kV lines - Cable line 1000mm², with a length of about 4.85 km 	<ul style="list-style-type: none"> - The project enables the fulfillment of criterion N-1 for the part of the 110 kV network connecting SS Prishtina 2&3 and SS Kosova A 	Q4-2026
1 4	008/6	Revitalization of the 110 kV line: SS Prizreni 1 - SS Prizreni 3	<ul style="list-style-type: none"> - Replacement of the conductor from 150/25mm² to HW 170mm² in the length of 4.69 km from SS Prizren 1 to SS Prizren 3. The conductor is taken from the Prizren1-Prizren 2 Line which is dismantled and converted into a double line. 	<ul style="list-style-type: none"> - Increasing the transmission capacity of the line from 83 MVA to 114 MVA in order to increase the transmission capacity and meet the N-1 criterion. 	Q4-2026
1 5	011	Revitalization and reinforcement of the 110 kV line segment SS Kosova A - SS Bardhi - SS Ilirida	<ul style="list-style-type: none"> - Dismantling of the existing line with a section of 150mm², 30.5 km from SS Kosova A to SS Ilirida (segment with a section of 150mm², year 1958); - Construction of the new double line 29.2km ALSt, 240 mm² and connection with SS Vushtrri 1 - double cable 2.24 km, 1000 mm² from Kosovo A Single cable 2.4 km from the end of the overhead line to SS Ilirida. -4 fields of 110 kV lines (Kosova A, Vushtrri 1 and bypass) 	<ul style="list-style-type: none"> - Increasing the transmission capacity of the line from 83 MVA to 2x114 MVA, reducing power losses, meeting the N-1 safety criterion for the 110 kV network - Increasing security for the storage battery in SS Palaj 	Q1-2027
1 6	012	Transformer replacement in SS Gjakova 1 Gjlani 1 and SS Vitia (40MVA)	<ul style="list-style-type: none"> - In SS Gjakova 1, TR1 20MVA (year 1974) is replaced with a 40MVA, 110/10(20) kV transformer - In SS Gjlani 1, TR1 31.5MVA (year 1974), 110/35kV is replaced by 40/40/40MVA, 110/35/10(20)kV - In SS Vitia, TR1 20MVA (year 1974) is replaced with a 40MVA, 110/35/10(20) kV transformer - Two 10(20) kV transformer fields 	<ul style="list-style-type: none"> - Increasing the security of supply to consumers in Gjakovë, Gjlani and Viti 	Q4-2027
1 7	054	The new interconnection line 110 kV SS Deçani-SS Bajram Curri	<ul style="list-style-type: none"> 19 km of single line 110 kV, 240mm² to the border A 110 kV line field in SS Deçani 	<ul style="list-style-type: none"> Increasing the interconnecting capacities between KOSTT and TSO Optimizing the operation of the AK Control Block 	Q4-2028
1 8	055	Revitalization of the 110 kV line: L127 SS Bibaj - SS Kastriot	<ul style="list-style-type: none"> - Dismantling the part of the existing line with a section of 150mm² from SS Bibaj (Ferizaj 1) to the connection point of SS Kastrioti (Ferizaj 3) with a length of 6.7 km - Construction of a new 6.7 km ALSt line, 240mm² 	<ul style="list-style-type: none"> - Increasing the transmission capacity of the line from 83 MVA to 114 MVA, reducing power losses in the 110 kV network 	Q4-2028

19	056	Revitalization of the 110 kV line: L106 SS Ferizaj 2-SS Sharr	<ul style="list-style-type: none"> -Dismantling the existing line with a section of 150mm², 28.7 km from SS Ferizaj 2 to SS Sharr (section with a section of 150mm², year 1953); - Construction of the new 28.7 km ALÇe line, 240 mm² 	<ul style="list-style-type: none"> - Increasing the transmission capacity of the line from 83 MVA to 114 MVA, reducing power losses in the 110 kV network 	Q4-2029
20	057	Revitalization of the 110 kV line: L110 SS Trepça-SS Vallaq	<ul style="list-style-type: none"> - Revitalization of the 110 kV line with a length of 11.4 km, replacement of the conductor from 150 mm² to 240 mm² 	<ul style="list-style-type: none"> - Reduction of losses in the 110kV network Increasing the transmission capacity of the line from 83 MVA to 114 MVA 	Q4-2030
21	058	Revitalization of the 110 kV line: L116 (155/2) Vallaq-border	<ul style="list-style-type: none"> - Replacement of phase and protective conductors up to the border (18.78 km), year 1958 - Reinforcement of poles and replacement of insulators. - Construction of SS Nashec, 400/110 kV, 1x300MVA, as a continuation of SS Prizreni 2, which comprises two 400 kV line fields and one 400 kV connection field, one 400 kV TR field and one 110 kV TR field. 	<ul style="list-style-type: none"> - Reinforcement of transmission capacities and support of the load in the northern part of Kosovo 	Q4-2031
22	059	SS NASHEC, 400/220/110 kV with interconnection line 400 kV	<ul style="list-style-type: none"> - Expansion of the 110 kV busbars system - Construction of the 400 kV double line, 26 km in length from the cutting point of the 400kV SS Kosova B-SS Koman 	<ul style="list-style-type: none"> Configuration of the 400 kV and 110 kV grid and optimize of active and reactive power flows, reduction of losses, and support of new generation and load. Creating conditions for the second 400 kV interconnection with Albania 	Q4-2032

Regarding natural gas transmission infrastructure, currently there is neither natural gas-based physical infrastructure nor a natural gas market. However, Kosovo has adopted the Law No. 05/L-82 on Natural Gas, which deals with the elements and requirements of the third EU legislation package related to natural gas (Directive No. 2009/73/EC and Regulation No.715/2009/EC). In addition, the relevant Administrative Instruction on the security of supply with natural gas was also adopted.

II. Where applicable, main infrastructure projects envisaged other than Projects of Energy Community Interest (PECI)/ Projects of Mutual Interest (PMIs) (1)

In this regard, the only project to point out is the MCC's Kosovo Compact Pre-feasibility study conducted in 2020, which included a gas infrastructure project.

III. Market integration

I. National objectives related to other aspects of the internal energy market such as increasing system flexibility, in particular related to the promotion of competitively determined electricity prices in line with relevant sectoral law, market integration and coupling, aimed at increasing the tradeable capacity of existing interconnectors, smart grids, aggregation, demand response, storage, distributed generation, mechanisms for dispatching, re-dispatching and curtailment, and real-time price signals, including a timeframe for when the objectives shall be met

In light of the increased level of renewable sources to be employed in electricity generation, increased system flexibility is key to achieve real-time system balancing. At present, only the Frequency Containment Reserve

(FCR, primary reserve of 5 MW) capacities are ensured by the power plants in Kosovo. Other ancillary services (+/-25 MW aFRR and +143/-90 MW mFRR) are provided by the Albanian power system.

In this regard, a battery storage system is expected to be commissioned by 2027-2028 with a capacity of 170 MW to allow balancing of the system and the integration of RES in the electricity system. Duration of its function is foreseen to be 2 hours, and it is planned to secure secondary (aFRR) and tertiary (mFRR) regulation to the System Operator. Additionally, the storage will also be used to shift the peak through the optimal charging and emptying process.

Despite recognizing that increasing competition in the energy wholesale and retail market as a prerequisite for improved market functioning, Kosovo struggles in enabling a competitive wholesale and retail market, which would allow customers to benefit from competitive prices. In this respect, the Energy Regulatory Office approved a Guideline on the Liberalization of the Electricity Market in Kosovo. However, even in the last evaluation of competition in the electricity sector in Kosovo performed by ERO for the period 2020-2021, it became obvious that the wholesale market is mostly based on bilateral contracts. That is, the incumbent producer, KEK, is obliged to offer all its volume to the incumbent supplier, KESCO, under the bulk-supply agreement (BSA), to the extent the supplier requires it to fulfil its universal service obligation.

To enable competition in the wholesale market, tackling the issue of the BSA between generator and supplier, which currently poses the main barrier, is essential. Additionally, the lack of information on the customer profiles is another significant barrier. Similarly, the retail market opening has been postponed for the fourth consecutive year. Medium-voltage customers continue to be supplied by the universal supplier, at regulated prices. However, the regulator must continue with the gradual opening of the retail market to attract new suppliers.

In relation to regional integration, one of the key objectives of Kosovo's **National Energy Strategy** is to strengthen regional cooperation and market functioning. Of particular importance is market integration with Albania based on the full functioning of ALPEX (expected during 2023): From December 2020, operation as an independent Regulatory Area within Continental Europe within the Albania-Kosovo (AK) block has started. The next milestones in this respect include the operationalization of the joint Albanian Power Exchange (ALPEX) both on the day-ahead and intraday market and enhancing joint system planning. To further enhance regional trade, the Energy Strategy also outlines plans to build new interconnectors between Kosovo and Albania by the end of the decade. Additionally, the wider regional market integration, i.e. joining the pan-European market area is envisaged by 2031.

II. Where applicable, national objectives related to the non-discriminatory participation of renewable energy, demand response and storage, including via aggregation, in all energy markets, including a timeframe for when the objectives are to be met

The **Law on Energy** provides the basis for non-discriminatory participation of renewable energy with clear provisions in terms of access to and operation of the grid for electricity from renewable sources and co-generation, including priority in the dispatching of the electricity produced from renewable energy sources. However, while the law creates a legal basis to address non-discriminatory participation of renewable energy, the relevant provisions of the Law also need to be imposed in practice.

III. Where applicable, national objectives with regard to ensuring that consumers participate in the energy system and benefit from self-generation and new technologies, including smart meters;

The **National Energy Strategy** envisages a dynamic increase of renewable energy sources, mainly from wind and solar, supported by renewable auctions, public investment and active participation of prosumers in this process. In addition, the strategy aims at promoting renewable self-consumers (prosumers) and renewable energy communities, whose deployment will be encouraged by an improved legal and regulatory framework and administrative procedures, as well as the introduction of various support schemes. The objective is to reach a minimum of 100 MW of prosumers' capacity by 2031 with an intermediate target of 30 MW by 2025. The installation of smart meters at the consumer level is also outlined as an option to be considered in the National Energy Strategy.

IV. National objectives with regard to ensuring electricity system adequacy, as well as for the flexibility of the energy system with regard to renewable energy production, including a timeframe for when the objectives are to be met

With its first key objective, the **National Energy Strategy** envisages that security of supply will be ensured by guaranteeing the unified functioning of the electricity system. This requires adequately sized capacities for supply and reserves, reliability, flexibility, and efficiency of generation units, network elements and integrated markets.

In relation to system adequacy, Kosovo has sufficient capacities of the interconnection network for its transferred flows of necessary imports as well as flows of potential exports according to KOSTT's generation adequacy plan 2019-2028. If compared to the generation adequacy values, the interconnection capacities have and will have a sufficient margin of safety.

In relation to generation adequacy, KOSTT's Generation Adequacy Plan 2019-2028 underlines that given the current circumstances prevailing in the energy sector in Kosovo sufficient security of energy supply is not guaranteed. Challenges are mainly related to insufficient generation capacities to cover the peak and to provide the necessary reserves of the system for regulating power.

V. Where applicable, national objectives to protect energy consumers and improve the competitiveness of the retail energy sector

Kosovo's **National Energy Strategy** puts a large emphasis on citizens in terms of affordability of energy bills and protecting vulnerable consumers. In this regard, protecting and empowering consumers, which is set as the fifth objective of the Strategy, envisages to be achieved through a number of measures. Examples include introducing a new and improved price-support scheme for vulnerable consumers by 2024 and to further advance it to a means-tested scheme linked to the reformed social assistance scheme by 2031. In addition, the strategy outlines pathways to introduce at least two new energy-related schemes for vulnerable consumers (e.g. energy efficiency, heating solutions, solar panels, etc.) by 2024, and to develop four new schemes by 2031.

As already noted in the section on competitively determined prices, the retail market in Kosovo has not yet been opened. During the last attempt to do so, retail market opening failed due to the lack of a decision-making quorum on the regulator's board. KESCO continues to supply electricity to medium-voltage customers at regulated prices.

In 2017, ERO issued a Guideline on the Liberalization of the Electricity Market in Kosovo, which, among others, defines specific dates for a gradual price de-regulation. Customers connected at 220 kV were the first to enter the deregulated market, followed by customers at 110 kV (April 2017), 35kV and 10kV (April 2018). Moreover, the guideline clearly states that all final customers are entitled to electricity supply at competitive market rates.

Additionally, ERO has also approved several rules to enable competition in the retail market, such as the Supplier Switching Rule, the Rule on Determination of Revenues for the Universal Service Supplier or the Rule on the Supplier of Last Resort. Despite this, the latest deadline (31 March 2021) aiming to deregulate prices for customers connected at 35kV and 10kV, who fulfil the criteria of yearly revenues over 10 million euros and more than 50 employees, was postponed indefinitely. Consequently, ERO requested KESCO to continue supplying customers at 35kV and 10 kV under the Universal Supply Service, citing the impact of the Covid pandemic on companies' finances as a justification.

In conclusion, Kosovo currently has regulated prices, which are set by ERO, for all household and non-household customers, except for customers connected to the TSO network (220 kV and 110 kV). Customers billed with regulated tariffs are connected to voltage levels of 35kV, 10kV, and 0.4kV, while customers connected to 220kV and 110kV lines are supplied at unregulated prices (i.e. market prices). Currently only 3 customers are subject to de-regulated prices, one customer connected at 220 kV and 2 at 110 kV. These customers are also supplied by the incumbent supplier, KESCO.

IV. Energy poverty

- I. Where applicable, national objectives with regard to energy poverty, including a timeframe for when the objectives are to be met*

The issue of protecting consumers in need is addressed in Article 49 of the **Law on Electricity**. In accordance with the obligations set therein, the Government of Kosovo initiated the establishment of an inter-institutional working group at the beginning of 2019 with the goal to draft a government program for mitigating the adverse effects of energy tariff increases.

However, Kosovo still lacks a legal definition of energy poverty, as well as a plan on how to address energy poverty. Also, a lack of data on energy poverty and vulnerable consumers makes it hard to quantify the extent of the problem of energy poverty in Kosovo. Tackling these gaps is key on the way forward, especially since planned energy sector investments in Kosovo may, along with energy market opening, market coupling and competition, lead to severe future energy price increases.

Additionally, the most recent European energy crisis highlighted the need for a comprehensive vulnerable consumer protection scheme. Kosovo's existing support scheme provides direct financial support (electricity bill reduction) to two relatively small categories of citizens which are identified as vulnerable electricity consumers, namely Social Assistance Scheme recipients and recipients of war-related benefits. However, when using these restrictive beneficiary selection criteria, many citizens who may be at risk of energy poverty remain unprotected. In addition, a subsidy was offered by the Government of Kosovo to decrease the impact of price increases which had to be, in the absence of a comprehensive register of vulnerable customers, applied as a blanket subsidy to all customers through electricity tariffs.

2.5 Dimension research, innovation and competitiveness

- I. National objectives and funding targets for public and, where available, private research and innovation, including, where appropriate, a timeframe for when the objectives are to be met*

The role of research and innovation in Kosovo has been recognized as key in developing solutions to the issues relating to security of supply, reliability and affordability of energy supply, and identifying the most appropriate measures in integrating renewables and increasing energy efficiency to ensure climate-friendly economic activity and sustainable economic growth. Kosovo has implemented regulations and laws,¹ which are in line with various EC Directives² and Regulations,³ in order to establish the framework that fosters research and innovation activities, which in turn will improve the national and international competitiveness of domestic industries. Additionally, a number of administrative instructions aiming to support innovative ideas (start-up) with positive economic impact and competitiveness⁴ have been employed.

At the highest strategic level, the dimension of research, innovation and competitiveness is reflected in two of the four pillars (key development priorities) of the **Draft National Development Strategy 2030 (NDS 2030)** from May 2022. The first one is the pillar of sustainable economic development where this dimension is tackled

¹ - Law No. 04/L-135 on Scientific Research Activities

- Law No. 05/L-039 on Amending and Supplementing the Law No. 04/L-029 on Patents

- Law No. 05/L-117 on Accreditation

- Law No. 06/L-019 on Standardization

- LAW No. 06/L-049 on Scientific Innovation and Transfer of Knowledge and Technology

² 98/44/EC; 2004/48/EC

³ (EC) No.469/2009; (EC) No.1610/96; (EC) No.816/2006; (EC) No.765/2008; (EU) 1025/2012

⁴ - Administrative Instruction (MIE) No.01/2018 on Allocation of Financial Means from the Economic Category of Subsidies and Transfers

- Administrative Instruction (MTI) No. 03/2016 on the Distribution of Financial Means from Economic Categories of Subventions and Transfers

through the development goal for innovative, circular, and competitive economy and its eight strategic objectives. The other NDS 2030 pillar which implicitly addresses the dimension of research, innovation and competitiveness is the pillar of equal human development and its development goal for accessible and quality education.

More specifically, the dimension of research and innovation is covered by the **National Science Program 2023-2028** (from December 2022, in public consultation process), which was drafted based on the Law on Scientific Research Activities no. 04/L-135 article 38, National Science Program. It takes as a starting point the previous science program, the orientation and challenges faced in the implementation of this program, as well as the National Development Strategy 2030 and other development strategies of the country, the region and Europe, to enhance the standards achieved in recent years.

The **key objective** of the Science Program 2023-2028 is the human capacity building and the infrastructure upgrades in Kosovo, which have a direct impact on economic development and increasing the participation of Kosovo institutions and researchers in the European Research Area (ERA) and increasing participation in Horizon Europe projects. Therefore, the key ERA principles, such as 1) Research and innovation ethics, 2) Gender equality, inclusion, and equal opportunities for all, and 3) Social responsibility are **also the basic guiding principles** of the National Science Program 2023-2028.

Furthermore, the National Science Program 2023-2028 contains **six strategic objectives for priority areas**, which address key problems and are focused on the development of the research and innovation system in Kosovo:

Objective 1: Development of an effective scientific research and innovation system

The priority of this objective is the development of a stable and supportive environment for scientific research and innovation in Kosovo, supported by a functional legal infrastructure and the advancement of culture for credible scientific research in academic, scientific, and economic institutions, including the strategy and programs for gender equality.

Objective 2: Development and training of human capacities for scientific research activities

This objective focuses on the development of human capacities for research and innovation, as well as the development of doctoral programs with the inclusion of all groups.

Objective 3: Development of scientific research infrastructure

This objective aims to significantly increase the capacities of modern infrastructure that enables more competitive access to Horizon Europe programs and other SR&I international programs (EURO HPC, European Open Science Cloud, etc.). This will be achieved with substantial government investments as well as through partnerships with complementary institutions in the region and Europe.

Objective 4: Internationalization of scientific research activities

The internationalization of scientific research activity as the objective of this program can be achieved through a) networking of the institutions of the Republic of Kosovo under the programs Horizon Europe, COST, and the Regional Cooperation Council; b) mobility programs; c) supporting joint projects with leading global scientific institutions and d) publishing and promoting scientific output in journals and international scientific forums.

Objective 5: Enhancing relationship between science, economy, and society

This objective focuses on the creation of a network of cooperation between scientific researchers, industry and society, as well as the creation of a sustainable financial fund that will support public and private research institutions that demonstrate competitive performance with EU countries.

Objective 6. Achieving scientific research excellence in specific fields

This objective has as its primary goal the establishment of the State Interdisciplinary Institute for Science & Technology as well as the establishment and advancement of centres of scientific excellence, whose performance will be evaluated according to international criteria.

For each objective, a series of measures have been identified, the fulfilment of which requires the engagement of all factors responsible for implementation.

The National Science Program 2023-2028 also sets **priority areas** on the basis of the previous national science program, the current strategies of the country's development in certain sectors, such as the National Development Strategy 2030 and the quantitative analysis report¹ of the preliminary priority areas in the framework of the preparation of the Smart Specializations Strategy. The priority areas include:

- Health;
- Society - education, culture, economy and humanities and social sciences;
- Natural resources, energy, environment and climate change;
- Agricultural production (food and bioeconomy)
- Two horizontal cross-cutting areas (Green Deal and Digitization).

The priority areas are also comparable to the priorities of the Horizon Europe program. The adaptation of the priority areas of the country to those of the EU countries will enable the increase of the participation of the country's scientists in scientific projects within the Horizon and at the same time will help to adapt the country's legal framework to EU legislation. This last step also serves to prepare the country to more easily fulfil part of the conditions to apply for membership within the EU. Therefore, based on the arguments given above, four priority areas were proposed.

Most relevant for the NECP is the **priority area of Natural resources, energy, environment and climate change**. Addressing firstly the challenges in relation to energy, natural resources and the environment offers many opportunities for conducting scientific research in Kosovo. The steps that are proposed to be undertaken in scientific research and innovation within the NSP should have as a result the expected impacts in the following areas.

- Efficient use of natural resources
- Decarbonization
- Continuous monitoring of the environment
- New materials for advanced energy, robotic, and sensor systems
- Environmental sustainability of industrial and transport systems

With reference to funding targets, according to the Law on Scientific Research Activity, **the budget for financing scientific research is set at 0.7% of the annual budget**, but until now the budget allocated for science by all governments of Kosovo has not exceeded the value of 0.1% of the total budget.² These values are much smaller than the number of funds allocated at the level of the EU countries. But on the other hand, even the scientific research institutions themselves in Kosovo have shown a limited ability to absorb this reduced budget.³ Moreover, the distribution of this budget is also characterized by non-transparency and complicated procedures for application, and often as a result there was a demotivation of the academic staff to apply for grants for scientific projects.⁴

An intensification of cooperation between the Kosovar private and public universities with many European institutions and organizations, among others the European Research Council, European Research Infrastructures, and Joint Research Centre, is a cornerstone in modernizing scientific research activities in Kosovo and in attracting EU financing. First steps have been taken in placing the National Contact Points for Horizon 2020 in Kosovo in providing guidance, practical information and assistance on all aspects of participation in this program. In the meanwhile, Kosovo has become a full member of Horizon 2020 in 2019.

¹ JRC, Report on the quantitative analysis of preliminary priority areas in the framework of the preparation of the Smart Specialization Strategy of the Republic of Kosovo, 2022

² EC, Progress Report for Kosovo, [Kosovo Report 2021 \(europa.eu\)](https://ec.europa.eu/euro-pressroom/content/kosovo-report-2021), October 2022;

³ HERAS, Mapping the Research and Innovation System in Kosovo, 2019.

https://www.heraskosovo.org/publications/Koncept_dokument_Hartezimi_i_Sistemit_te_Kerkimit_dhe_Inovacionit_ne_Kosove.pdf

⁴ HERAS, Status quo of Research and Innovation development in Kosovo: Thoughts for Kosovo's future R&I", a roundtable and workshop organised by HERAS Kosovo, https://www.heraskosovo.org/publications/Policy_Briefing_Paper.pdf, 2020

Especially interesting are the contact persons in Kosovo for research projects with respect to (1) secure, clean and efficient energy, (2) smart, green and integrated transport, (3) climate action, environment, resource efficiency and raw materials, and (4) sustainable agriculture, bio-economy, and biotechnology. This is a very good opportunity for the Government of Kosovo to push forward research and innovation activities.

Kosovo's private and public universities will have the possibility of utilizing the opportunities coming from the new European Union program "Developing Horizon Europe" to find finance for research projects that address issues that are in line with its mission area on:

- Adaptation to climate change including societal transformation, and
- Climate-neutral and smart cities.

However, interviews with some of the National Contact Points for Horizon 2020 in Kosovo which were conducted while developing the first draft of NECP, evidenced a number of difficulties that Kosovo's universities and research institutes are facing in participating in Horizon 2020 and other EU research projects. The lack of expertise of Kosovar researchers and lack of infrastructure for basic research were pointed out as the biggest obstacle in starting joint projects and consortiums with European researchers. Additionally, Kosovo's universities are failing to establish an incentive-based mechanism in encouraging professors and young researchers to start any form of cooperation with European universities and research institutes. The interviewees also went on to argue that Kosovar professors are obliged to teach up to four different subjects within up to 20 hours per week in a semester. A combination of these factors is hindering Kosovo's universities to increase research activities.

Still, Kosovo has already taken some initial steps in this direction. For example, the University of Prishtina, supported by the USAID Transformational Leadership Program - Scholarships and Partnerships and Arizona State University as a key US partner, has inaugurated the Centre for Energy and Sustainability (CES). The CES is a centre for all-inclusive transdisciplinary research and trainings aiming to address the local and global challenges of sustainability. Under the umbrella of CES the certificatory program in "Renewable Energy and Sustainability" has been implemented. This program offers courses and trainings from different fields organized by various faculties to some of the most current challenges in the world – climate change, energy sustainability, and environmental protection. The graduates of the program receive a university certificate, besides their BA or MA diploma. In addition, Kosovo's universities, such as University of Prishtina (UP), University for Business and Technology (UBT), and American University in Kosovo (AUK), are successfully using the opportunities offered by different EU funds in building capacities, and modernizing and restructuring various bachelor, master and PhD programs aiming to align them with market needs. For example, UBT in cooperation with the Erasmus+ has developed a bachelor program in "Energy Engineering" and another master program in "Electrical Energy and Energy Markets".

A cooperation between the Kosovar and German Government has made possible the inauguration of the Innovation and Training Park Prizren, which will pave the way for innovation, business and skills development, and serve a source of innovative and successful ideas.

- II. Where available, national 2050 objectives related to the promotion of clean energy technologies and, where appropriate, national objectives, including long-term targets (2050) for deployment of low-carbon technologies, including for decarbonising energy and carbon-intensive industrial sectors and, where applicable, for related carbon transport and storage infrastructure

By signing the Sofia Declaration on the Green Agenda for the Western Balkans as part of the "Berlin Process", Kosovo pledged to follow the European Union in its decarbonization path towards a carbon neutral economy by 2050. Also, through the Energy Community and its Decarbonization Roadmap, Kosovo has demonstrated readiness to join the European Union and other international partners in achieving net zero greenhouse gas emissions by 2050. Specific long-term technological and sectoral plans and targets are yet to be adopted.

- III. Where applicable, national objectives with regard to competitiveness

As analysed in the draft National Development Strategy 2030, over the last decade, Kosovo has shown a good performance in terms of economic growth. However, this growth has not shown to be sustainable, as it has not been accompanied by an increase in employment, nor has it supported the expansion of the manufacturing base. The structure of the country's economy, being based for a long time mainly on consumption driven by remittances and low-return infrastructure investments, as well as low value-added economic activities, does not promise sustainable development in the long run. Moreover, the endemic development problems of the country, such as the high level of unemployment, cannot be significantly addressed with this structure.

In order to address these challenges, the National Development Strategy 2030 adopts the **building of an innovative, circular, and competitive economy** as the first **development goal** of its pillar related to sustainable economic development. By 2030 Kosovo aims to create a conducive business environment and play an active role in developing a competitive economy towards value-added manufacturing and service activities. Innovation, as an important determinant of competitiveness, together with the circular economy as a model for sustainable development, will be awarded special attention in the new economic trajectory. Kosovo's economic transformation will be based on competitive, innovative and green enterprises. As overall demand is limited due to the small domestic market, the aim is to enable a greater presence of Kosovo enterprises in international markets.

The respective **impact indicators with their baseline and 2026 and 2030 targets** are presented in Table 6.

Table 6. Impact indicators for NDS 2030 development goal of building an innovative, circular, and competitive economy

Impact Indicator	Baseline	Target 2026	Target 2030
GDP per capita (EUR)	3,772 (2020)	>30%	>50%
Exports of goods and services (% of GDP)	21.6%	35%	45%
CO ₂ emissions per unit of GDP (kg CO ₂ /EUR)	0.4707	0.3025	0.1867

This development goal is further articulated through the following **strategic objectives**:

1. Build a fair, adaptable and competitive business environment
2. Acceleration of digital transformation and innovation in SMEs and startups
3. Development of industry towards products and services with higher added value
4. Mobilization of industry towards the circular economy
5. Internationalization of enterprises and reduction of excessive dependence on imports
6. Increase export-oriented investments
7. Improve productivity and sustainability in agriculture
8. Build lasting links between farmers, processors and retailers

All these strategic objectives are associated with indicators for measuring their performance and corresponding targets for 2026 and 2030.

Kosovo has a big chance to reindustrialize the whole economy by the decarbonization of the energy, agriculture and mobility sector and use this as an opportunity for growth and employment. Energy transition is one of the key challenges, since energy is an input factor in other industries. As a result, well-studied energy

transition policies should be carefully implemented, because any inefficiency in energy transition is translated to higher inefficiencies in other energy intensive industries. Thus, a coordination of energy policies with other national policies will ensure that energy intensive industries will not face higher energy costs, because of high renewable subsidies and/or carbon pricing, which will hamper their competitiveness. At the same time, security of energy supply will ensure that firms do not need any more to invest in backup supply (e.g., aggregators), which will turn this into a competitive advantage.

A close coordination of climate and energy policies is also necessary to ensure affordable and security of energy supply. A modern and efficient energy infrastructure in terms of new generation, transmission and distribution capacities will lower power costs and eliminate unplanned power interruptions. Introduction of competition through market liberalization in electricity retail market will eliminate existing monopolies and make a downward pressure on electricity prices, but at the same time together with the new interconnection line to Albania will increase the security of electricity supply. Above 90% of electricity comes from coal power plants. Therefore, energy and climate policies will make sure that short-term goals are not ignored when heading toward the optimal carbon neutral electricity generation mix. At the same time, energy-efficiency measures aiming to reduce the industrial energy intensity will lead to lower energy demand and thus to lower energy costs and higher security of supply.

3 POLICIES AND MEASURES

3.1 Dimension decarbonisation

I. GHG emissions and removals

- I. *Policies and measures to achieve the economy-wide covering all key emitting sectors and sectors for the enhancement of removals, with an outlook to the long-term vision and goal to become a low emission economy and achieving a balance between emissions and removals in accordance with the Paris Agreement*

The policies and measures (PaMs) have an impact on the GHG emissions and removals, and are based on the data and information provided in several strategic documents, like the Energy Strategy 2022-2031, the Integrated Waste Management Strategy 2021-2030 and Action Plan 2021-2030, the Policy and Strategy on Forestry Development 2022-2030, the Strategy for Agriculture and Rural Development 2022-2028, and the Climate Change Strategy 2017-2028, as well as the workshops organized in March/April 2023.

PAM 1: Study on the effects of CBAM and/or a domestic carbon price

Short description and objective: As an Energy Community Contracting Party, as well as the signatory of the Sofia Declaration on the Green Agenda for the Western Balkans, Kosovo should enable the introduction of a carbon price system that will align Kosovo with the EU's Emissions Trading System (ETS). The underlying components for effectively operating ETS include transposition of the EU regulation related to monitoring, reporting, accreditation, and verification of greenhouse gas emissions, as well as establishing the institutional and technical infrastructure and a governance system.

This measure aims to conduct a study that will analyze the impacts of CBAM, as well as a future domestic carbon price on the country's economy. The study results should serve as a basis for decision-making regarding the carbon pricing mechanism implementation.

Sector/type	Energy, Industry/Legislative, Regulatory
Status of implementation	Planned
Quantitative effects	n/a
Investments	n/a
Responsible institution	ME, MESPI
Progress indicators	n/a
Relation with other dimensions	Research, innovation and competitiveness

PAM 2: Phasing out one unit of coal TPP Kosovo A

Short description and objective: The Energy Strategy 2022-2031 foresees phasing out of one or two units of the coal thermal power plant Kosovo A, with an objective for decarbonization and promoting renewable energy. This measure considers that one of the units of Kosovo A, with a net installed capacity of 116 MW, will be decommissioned by 2031.

Sector/type	Technical
Status of implementation	Planned
Quantitative effects	n/a
Investments	n/a
Responsible institution	ME, KEK
Progress indicators	Phasing-out of 116 MW of coal-based power generation capacities
Relation with other dimensions	/

PAM 3: Controlled management of solid waste

Short description and objective: The Integrated Waste Management Strategy 2021-2030 and Action Plan 2021-2030 envisage increasing the percentage of municipal solid waste (MSW) collected and managed in controlled facilities. The aim is to establish a network of integrated waste management facilities that will increase the share of the MSW managed in controlled facilities from the baseline of 40% (in 2018) to 60% by 2023, 80% by 2027, and 100% by 2030. The assumptions also include a linear increase in the solid waste recycling rate from 5% to 60% in 2032.

Sector/type	Waste/technical
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	9.9 Mil. EUR (for 2023)
Responsible institution	MESPI, ME, MF
Progress indicators	Share of waste collected
Relation with other dimensions	/

PAM 4: Enhancement of forest resources

Short description and objective: One of the objectives of the Strategy on Forestry Development 2022-2030 is the enhancement of Kosovo's forests, specifically through the stewardship of the entire public forest area with management plans and implementation of silviculture measures.

The measure considers the following actions:

- Alignment of the forestry sector legislation with the EU Acquis;
- Ensure that forest areas are covered by long-term management plans,
- Pilot the set-up of multi-purpose integrated forest management plans in five sites,
- Setting inventories for forestry areas,
- Regulation of titled holders and owners of public forests and their registration in the cadaster,
- Identification and registration of usurpations of forests and forest lands, as well as legal property disputes,
- Registration of forest lands by function,
- Increase (expansion) of forest areas.

In particular, the latter measure is expected to lead to an increase of forest area by 1% in 2024 and 3% in 2030, from the baseline value of 481000 ha of forests.

An additional contribution to enhance Kosovo's forest resources can be achieved through increasing biomass and net primary productivity by further enhancing forest management, including (climate) adapted selection of trees. Improved forest management will translate into an increase in the capacity of forests to sequester carbon dioxide.

Sector/type	Forestry / Regulatory; Financial
Status of implementation	Under implementation/Planned
Quantitative effects	Increase in forest area by 3% in 2030. Biomass Increment by 2030: 3.22 m3/ha (WEM) to 3.54 m3/ha (WAM)
Investments	1.39 Mil. EUR (in 2024) planned for increase in forest area, additional investment needs TBD
Responsible institution	MAFRD, KFA, MPMS, PPP, donors, and community
Progress indicators	Forest area, increment of biomass
Relation with other dimensions	/

PAM 5: Protection of forest resources

Short description and objective: Protecting forests from the increasing occurrence of forest fires can make a valuable contribution to the protection of forest resources. The Strategy on Forestry Development 2022 – 2030 also explicitly outlines forest fire protection measures as a means for preserving forest resources.

For decreasing the area affected by forest fires, the following additional measures are planned:

- Enhanced education on the prevention of forest fires,
- Investments into forest fire protection infrastructure,

	<ul style="list-style-type: none"> • Fire-adapted forest management as well as enhanced forest management
Sector/type	Forestry / Regulatory
Status of implementation	Under implementation/Planned
Quantitative effects	Reduction of area affected by forest fires from 2653 ha (baseline) to 2000 ha (WEM) and 1000 ha (WAM)
Investments	n/a
Responsible institution	MAFRD, KFA, MESTI, JICA, Donors
Progress indicators	Area affected by forest fires
Relation with other dimensions	/

PAM 6: Sustainable and multipurpose use of forest resources

Short description and objective: Based on the objectives of the Strategy on Forestry Development 2022-2030, this measure considers the following actions: Simplification of technical and administrative procedures for forest use; Regulation of the long-term logging permits issuing; Definition of national sustainable forest management criteria and indicators; Capacity building of NWFP collectors and operators; Defining potential areas for ecotourism and digitalizing and marking ecotourism paths.

The following results are expected to be achieved with this measure:

- Implementation of long-term management plans
- Management of forests according to European sustainable management criteria and indicators
- Sustainable development of ecotourism

Sector/type	Forestry / Regulatory; Financial
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	0.22 Mil. EUR (in 2024)
Responsible institution	MAFRD, KFA, MESTI, Donors
Progress indicators	Forest area and forest volume
Relation with other dimensions	/

PAM 7: Sustainable management of natural resources (land, forests, and water) in agriculture

Short description and objective: To reduce GHG emissions from agriculture, sustainably managing natural resources in this sector by introducing good agricultural and environmental practices is key. The following measures are contributing to this goal:

- Reduction of climate damaging and yield decreasing crop fires by incentivizing farmers to save agricultural residues and potentially use crop stubble as an energy source or in livestock feeding instead
- Foster sustainable intensification through yield increase by applying higher nitrogen levels, up to the point at which doing so decreases GHG emissions per ton of grain produced, through subsidizing mineral fertilizers and support the usage of manure as natural fertilizer
- Improve agricultural residue management as an important C storage, initiating research projects and measuring technology to keep a side-specific balance given that crop residues also generate N₂O
- Decrease of the number of ruminants (cattle, sheep, goats) which cause high GHG emissions through CH₄ emissions from enteric fermentation
- Sustainable intensification of livestock production to decrease currently high amounts of GHG per kilo of animal produce, through e.g. concentrated feed, shorter life cycles and animal health protection, keeping in mind trade offs with animal health

Sector/type	Agriculture / Regulatory; Financial
Status of implementation	Planned
Quantitative effects	Reduction of crop fires by 50% by 2030 Increase of mineral fertilizer use from 43.66 kg N/ha to 100 kg N/ha (WEM) and 150 kg N/ha (WAM) by 2030

	20% less crop residues by 2030 10% less livestock by 2030 25% less CH ₄ by 2030
Investments	n/a
Responsible institution	MAFRD & ADA
Progress indicators	Amount of crop fires, mineral fertilizer use, crop residues, livestock, emissions from enteric fermentation
Relation with other dimensions	/

PAM 8: Improved manure management (methods for storage, preparation, and application)

Short description and objective: To decrease GHG emissions from agriculture it needs to be ensured that manure is stored in a climate friendly manner and applied to agricultural land in the right quantities and at appropriate times. To achieve this, farmers must be advised and purchase the appropriate technology. Subsidies for climate-adapted manure management technology would constitute an efficient approach.

Sector/type	Agriculture / Regulatory; Financial
Status of implementation	Planned
Quantitative effects	20% higher share of daily spread MMS and 20% higher share of anaerobic lagoons
Investments	n/a
Responsible institution	MAFRD & ADA
Progress indicators	Share of daily spread MMS and share of anaerobic lagoons
Relation with other dimensions	/

PAM 9: Agri-environmental schemes for biodiversity protection

Short description and objective: One of the objectives of the Strategy for Agriculture and Rural Development 2022-2028 is biodiversity protection, improvement of ecosystem services, and conservation of habitats and landscapes/nature. Therefore, this measure focuses on actions like extensive pasture management for high biodiversity lands in areas with proven biodiversity values, such as protected areas, as well as the preparation of guidelines for farmers and pasture users to use and manage value-added pastures.

Sector/type	Agriculture / Regulatory; Financial
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	0.5 Mil. EUR
Responsible institution	MAFRD / Advisory Services
Progress indicators	n/a
Relation with other dimensions	/

PAM 10: Promotion of organic farming

Short description and objective: The Strategy for Agriculture and Rural Development 2022-2028 sets the development of businesses in rural areas and the increase of employment and social infrastructure as one of the specific objectives, aiming to improve societal requirements for food and health, including safe, nutritious, and sustainable food, reduction of food waste, and animal welfare. Therefore, this measure envisages an introduction of subsidies/compensation for farmers who follow the rules of organic farming, as their production is usually lower against the ban on chemical fertilizers and pesticides.

Sector/type	Agriculture / Regulatory; Financial
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	0.4 Mil. EUR (2021-2024)

Responsible institution	MAFRD & ADA
Progress indicators	n/a
Relation with other dimensions	/

II. Where relevant, regional cooperation in this area

Regional cooperation within the EnC is most important for the introduction of a CO₂ price and a regionally coordinated just transition process.

III. Without prejudice to the applicability of State aid rules, financing measures, including Union support and the use of Union funds, in this area at national level, where applicable

Not applicable.

II. Renewable energy

I. Policies and measures to achieve the national contribution to the 2030 Energy Community target for renewable energy and trajectories as referred to in point (a)(2) Article 4, and, where applicable or available, the elements referred to in point 2.1.2 of this Annex, including sector- and technology-specific measures (1)

PAM 11: Promotion of renewable energy in the electricity sector	
Short description and objective: This measure will contribute to increasing the production from domestic energy sources and the share of RES while decreasing GHG emissions, local pollution, and primary energy consumption. According to Energy Strategy 2022-2031, 1600 MW of RES capacity should be installed in the system by 2031. The underlying steps towards the promotion of RES include:	
<ul style="list-style-type: none"> - Revision of the legislative framework, including adopting the Law on RES and developing the secondary legislation in relation to this Law. - Developing instructions on support instruments, such as auctions for renewable electricity capacities. - Establishment of units for the development of RES capacities. 	
The targeted 1600 MW of total installed capacity is envisioned to be achieved with around 700 MW of additional solar PV (of which at least 100 MW will be prosumers), around 600 MW additional capacity of wind energy, and around 20 MW installed capacity of biomass.	
Besides the targeted capacity of the Energy Strategy, a further additional 100 MW of prosumers are considered under this measure for the scenario with additional measures (WAM).	
There is an ongoing project to develop a 100 MW solar PV power plant at KEK (to be financed by the EIB).	
Sector/type	Energy/regulatory, technical
Status of implementation	Under implementation/Planned
Quantitative effects	WEM: 1600 MW total installed RES capacity in 2031 WAM: 1700 MW total installed RES capacity in 2031(+ 100 MW of additional capacity in prosumers)
Investments	EUR 900 mn <u>excl.</u> prosumer investments (agg. until 2030) WEM: EUR 997 mn <u>incl.</u> prosumer investments (agg. until 2030) WAM: EUR 1,096 mn <u>incl.</u> prosumer investments (agg. until 2030)
Responsible institution	ME, donors
Progress indicators	Installed capacity (MW); Primary energy savings (ktoe)
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market

The utilization of RES should be encouraged in other sectors, like industry and agriculture, where, for example, the service buildings (or other options) can be used to install renewable energy technologies, which will contribute to supplying a share of their consumption.

- II. Where relevant, specific measures for regional cooperation, as well as, as an option, the estimated excess production of energy from renewable sources which could be transferred Contracting Parties and/or Member States of the European Union in order to achieve the national contribution and trajectories referred to in point 2.1.2
- III. Specific measures on financial support, where applicable, including Union support and the use of Union funds, for the promotion of the production and use of energy from renewable sources in electricity, heating and cooling, and transport

PAM 12: Feed-in tariffs or Power purchase agreement

Short description and objective: The Feed-in tariff scheme is already established in Kosovo, and it is expected to continue providing this economic support until preparations are required to establish premiums with auctions that would be applied for the period up to 2030.

The Regulator shall approve the Power Purchase Agreements upon consultation with third parties. The ERO may instruct the Market Operator at any moment before signing the Power Purchase Agreements so it can make the changes in the draft models as it deems necessary.

At the end of 2020, ERO adopted Decision 1321_2020, which terminates the application of the Support Scheme with Feed-in Tariffs for support of new projects for the construction of new generation capacities for electricity production from Renewable Energy Sources (RES) for the targets 2021-2030. This Decision also terminates the admission of applications for obtaining the authorization for the construction of new generating capacities, to be handled with a Feed-in tariff from RES from the date of its entry into force.

Sector/type	Energy/regulatory
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	n/a
Responsible institution	ERO, ME, Market operator
Progress indicators	Installed capacity with feed-in tariff support (MW); Primary energy savings (ktoe)
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market

PAM 13: Feed-in premiums

Short description and objective: Generally, auctions and tendering schemes are supposed to be a cost-efficient way to deploy RES due to the competition between different actors, locations, and technologies. Photovoltaic and wind farms can play an essential role during this phase, with a reduced risk of high electricity prices. Within the framework of a Feed-in premium (FIP) scheme, the electricity produced from RES is sold on the electricity spot market, and the RES producers receive a premium on top of the market price of their electricity production. FIP can either be fixed or sliding. The Sliding FIP is calculated continuously, considering the difference between the market prices and a predefined reference tariff. Finally, FIP can be differentiated according to various RES technologies, sizes, and locations.

According to the Energy Strategy, a tendering procedure for constructing a 100 MW solar power plant on state land has been announced in 2023. The experience from the first auction will be used to develop the Secondary legislation on the Law on RES, which will enable organizing other action rounds for wind, PV, and other RES technologies.

Sector/type	Energy/regulatory
Status of implementation	Under implementation
Quantitative effects	At least 100 MW new capacity by 2025
Investments	included in PAM 12
Responsible institution	ERO, ME, Market operator
Progress indicators	Installed capacity with feed-in premium support (MW); Primary energy savings (ktoe)
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market, Research, innovation and competitiveness

PAM 14: Certificates of Origin for RES

Short description and objective: A Guarantee of origin (GO) is an electronic document proving to final consumers that a specific quantity of electricity was produced from renewable energy sources. ERO adopted a Rule for the Establishment of a System of Certificate of Origin for electricity generated from RES, waste incineration plants, and

combined-heat-power plants in 2010. The register of Certificates is still not in place. Up to now, ERO has not received any application for issuance of a Certificate of Origin.

The National Energy Strategy recognizes the need for establishing a system for renewable energy certification (at the national and regional level) that will ensure an electronic issuing, transferring, and canceling of Guarantees of origin. Therefore, the ERO Rule should be updated to establish an electronic mechanism for issuing Certificates of origin.

The Energy Community Secretariat implements a project to create an electronic system for guarantees of origin in Albania, Bosnia and Herzegovina, Georgia, Kosovo, North Macedonia, Moldova, Montenegro, and Ukraine.

Sector/type	Energy/regulatory
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	n/a
Responsible institution	ERO
Progress indicators	Number of certificates of origin issued
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market, Research, innovation and competitiveness

IV. Where applicable, the assessment of the support for electricity from renewable sources that Contracting Parties are to carry out pursuant to Article 6(4) of Directive (EU) 2018/2001, as adapted and adopted by Ministerial Council Decisions 2021/14/MC-EnC and 2022/02/MCEnC

The following measures are supporting the electricity production from RES: Feed-in tariffs (PAM 13) , Feed-in premiums (PAM 14) and Certificates of Origin for RES (PAM 15) are measures for support of the electricity production from RES.

V. Specific measures to introduce one or more contact points, streamline administrative procedures, provide information and training, and facilitate the uptake of power purchase agreements

PAM 15: Enabling environment for RES investors

Short description and objective: The following steps are envisioned in order to facilitate the RES investment procedures:

- TSO and DSO to apply legal and regulatory obligations which will ensure priority on dispatching electricity produced from RES;
- Secure sustainability of the Renewable Energy Fund;
- Apply simplified authorization procedures for small RES projects;
- Take measures to start utilizing services of One Stop Shops for RES investors;
- Review and adapt the self-consumption regulatory framework, based on the fourth EU energy package (Clean Energy for all Europeans);
- Create the environment, conditions and propose incentives for participation of RES in the energy market;
- Review and adapt new schemes for RES development such as: Auction, Feed-in premium, Quota obligations / Green certificates, Financing mechanisms and Tax incentives;
- Start the implementation of issuing green certificates for RES;
- Create an environment for higher participation of prosumers in the market;
- Develop a legal and regulatory framework for demand side response and storage regulation.

Sector/type	Energy/regulatory
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	n/a
Responsible institution	KOSTT, KEDS, MES
Progress indicators	RES installed capacity (MW)
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market, Research, innovation and competitiveness

VI. Summary of the policies and measures under the enabling framework Member States have to put in place pursuant to Article 21(6) and Article 22(5) of Directive (EU) 2018/2001 to promote and facilitate the development of self-consumption and renewable energy communities.

PAM 16: Self-consumption scheme

Short description and objective: The Energy Community Secretariat has published guidelines for a more sustainable implementation of RES support schemes, recommending best practices in areas such as: Legal and regulatory frameworks; technology and capacity criteria; Self-generation commercial consumption schemes; Energy surplus treatment; Network costs; VAT and other taxes and fees; Resolving imbalances; Network Connection etc. ERO has approved the Rule on Support Scheme for Generators of Renewable Energy Sources, which supports customers who want to become producers of electricity from Renewable Energy Sources for their own use. Based on the rule in force, all consumers are entitled to build production capacity based on the capacity allowed by DSO, but this capacity cannot be greater than 100 kW.

The Support Scheme for Self-Consumption provides that:

- Suppliers receive all the produced electricity and send all the electricity consumed by the prosumers, within a billing period.
- Suppliers calculate the Balance of prosumers of the billing period, according to which the monthly bill is prepared.
- If the Balance of prosumers is positive, then the prosumer is credited with energy (kWh) in the next billing period.
- Any positive unpaid balance sheet in the last billing period of the calendar year resumes from zero without compensation from the Supplier.
- If the Balance of the prosumer is negative, then the Supplier bills the prosumer for the value of the self-generation balance:

In 2019, 2020 and 2021, 0.51, 0.98 and 1.9 MW of solar power were constructed

Sector/type	Energy/regulatory and technical
Status of implementation	Under implementation/Planned
Quantitative effects	WEM: 10 MW by 2024 and 90 MW by 2030 WAM: 180 MW by 2030
Investments	WEM: EUR 96 mn (agg. until 2030) WAM: EUR 195 mn (agg. until 2030)
Responsible institution	ERO, ME
Progress indicators	Installed capacity of self-generating consumers (MW); Primary energy savings (ktoe)
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market

VII. Assessment of the necessity to build new infrastructure for district heating and cooling produced from renewable sources

PAM 11: Solar district heating

Short description and objective: District heating systems and the way of heat production becomes more and more interesting for Kosovo. The construction of biomass boilers and CHP are not the only RES source of energy that is going to be used in Kosovo. The project to use solar collectors for thermal energy production combined with seasonal heat storage (Solar4Kosovo II) has been initiated in the context of efforts to address the district heating system expansion and environmental issues of DH Termokos – Prishtina. This project maps Kosovo as the first country in the region that will use this kind of technology in district heating systems. The project will enable the connection of 38,000 new consumers. A doubling of capacities is proposed for the scenario with additional measures (WAM).

Sector/type	Energy/technical
Status of implementation	Under implementation/Planned
Quantitative effects	WEM: 50 MW _{th} / WAM: 100 MW _{th} installed capacity, ca. 65 GWh _{th} (WEM) / 130 GWh _{th} (WAM) annual generation
Investments	A total of EUR 60 mn is foreseen for both the project realization and the feasibility study, at least partially financed by donors (WEM). For WAM, EUR 121 mn are estimated due to doubling of capacities.
Responsible institution	“Termokos” Prishtina
Progress indicators	Solar collectors installed in Termokos (MW); Final energy savings (ktoe); Primary energy savings (ktoe); renewable share in District Heat
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market

PAM 12: Feasibility study for the development of district heating systems in other municipalities

In October 2021, the Feasibility Study for new district heating systems started for eight municipalities of Kosovo. This study will analyze the economic and technical justification for developing thermal energy systems based on renewable energy sources in the following cities in Kosovo - Peja, Prizren, Gjilan, Ferizaj, Mitrovica, Drenas, Obiliq, and Zvecan.

If the identified opportunities would be implemented, this project will significantly reduce the use of electricity for heating, which will positively impact Kosovo's energy stability in the first place. The project will also positively affect environmental protection and contribute to achieving the targets for energy efficiency and share of renewable energy sources. The solutions of the DH systems will be designed depending on the study's results. The contribution of these projects to energy savings will be possible to estimate after the finalization of the study, but will impact both primary and final energy savings.

The project is conducted within the WBIF platform, where the leading financial institution is the European Investment Bank.

Sector/type	Energy/technical
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	A total of 1.9 Mil. EUR (2022 – 2023), financed by donors.
Responsible institution	ME, PMO, Municipalities, MESPI, MFLT
Progress indicators	Final energy savings (ktoe); Primary energy savings (ktoe), renewable share in District Heat
Relation with other dimensions	Energy efficiency, Energy security, Internal energy market

VIII. Where applicable, specific measures on the promotion of the use of energy from biomass, especially for new biomass mobilisation taking into account:

- *biomass availability, including sustainable biomass: both domestic potential and imports from third countries*

An excellent example of promoting the use of energy from biomass is the recently constructed state-of-the-art combined heat and power plant in Gjakova, operating entirely on biomass from forest waste, which replaced the old heavy-fuel oil-fired production plant.

- *other biomass uses by other sectors (agriculture and forest-based sectors); as well as measures for the sustainability of biomass production and use*

Currently, a large share of residential heating in Kosovo relies on forest biomass extracted, mostly illegally, from forests. The government acknowledges that biomass use should be based on sustainable production and proposes a series of measures to address this issue. First, fuelwood extraction should be reduced through the introduction of more efficient and sustainable technologies such as heat pumps and more efficient biomass stoves. Second, improved forest management such as implementation of long-term management plans shall reduce illegal forest biomass extraction and improve the sustainability of biomass production.

3.2 Dimension energy efficiency

- I. Energy efficiency obligation schemes and alternative policy measures under Articles 7a and 7b and Article 20(6) of Directive 2012/27/EU as adapted and adopted by Ministerial Council Decisions 2015/08/ MC-EnC, 2021/14/MC-EnC and 2022/02/MC-EnC, and to be prepared in accordance with Annex III to this Regulation

PAM 13: Energy efficiency obligation scheme	
Short description and objective: As described in the Chapter 2, the EE Law stipulates the establishment of an Energy Efficiency Obligation (EEO) scheme aiming to achieve a cumulative energy savings' target over a defined number of years, through a combination of measures supported financially by those energy suppliers who are designated as 'obligated parties' (OPs). Under the current provisions, the overall new annual energy savings each year should be up to 0.7% of the annual energy sales to final customers of all energy forms, by volume (energy consumption in transport may be excluded from this calculation). Article 10 (2) lists obliged parties - electricity and/or thermal energy system operators or retail energy sales companies and/ or liquid energy fuel distributors to retailers and/or direct supplying fuels to final consumers operating in Kosovo. The Government shall define who shall contribute to the achievement of the energy efficiency obligation targets.	
Sector/type	All sectors (excl. transport and part of the industry according to Annex I of the Directive 2003/87/EC)
Status of implementation	<p>Under implementation</p> <p>Article 10 (12) stipulates that the Government shall approve secondary legislation defining at least:</p> <ul style="list-style-type: none"> - the percentage of the cumulative target to be achieved through alternative measures and the percentage to be allocated to obligating parties; - the list of obligated parties along with the cumulative target allocated to each obligated party; - the selection of obligated parties will be based on transparent and nondiscriminatory criteria including the volume of energy handled by each obligated party; - the obligations of the obligated parties regarding reporting and facilitation of control, measurement and verification by ME; - the procedures under which an obligated party can buy-out partly or fully its obligation by transferring the corresponding amount at a flat rate per ktoe defined by the Government to the KEEF; - manner of control, measurement, verification and reporting by ME; - actions and procedures to be undertaken by the responsible Ministries to ensure that the obligated parties compensate the KEEF for energy savings that were not archived.
Quantitative effects	2030 final energy saving of ktoe 266.4 (p.a.)
Investments	~17 mill. EUR
Responsible institution	<ul style="list-style-type: none"> - The ME is responsible for submitting proposals regarding such policy measures, while the ME in close cooperation with the Ministry of Finance and the Ministry for Industry, Entrepreneurship and Tradewill submit the proposed list of measures to the Government for approval. - According to the Article 10 (10) and (11): - ME shall develop a three (3) year plan on the implementation of the EEOS and submit it to ME. The plan can be revised every year as required. ME shall administer the EEOS, establish a control, reporting, measurement and verification system and report to the ME. - ME, in collaboration with the Ministry of Finance and Ministry of Trade and Industry shall be responsible for the appropriate operation of the EEOS.
Progress indicators	Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

- II. Long-term renovation strategy to support the renovation of the national stock of residential and non-residential buildings, both public and private (2), including policies, measures and actions to stimulate cost-effective deep renovation and policies and actions to target the worst performing segments of the national building stock, in accordance with Article 2a of Directive 2010/31/EU as adapted and adopted by Ministerial Council Decisions 2010/02/MC-EnC, and 2021/14/MCEnC

PAM 14: National Strategy for Renovation of Buildings

Short description and objective: Law No. 06/L-079 of the Republic of Kosovo, on Energy Efficiency, transposes the elements of the EED. According to that law, the draft building renovation strategy (BRS) should be developed by the Ministry responsible for the energy sector, i.e. ME. This long-term strategy will mobilize investment in the renovation of the national building stock and will be prepared in accordance with the requirements of Article 7 of the Law on Energy Efficiency (EED Article 4). It will address the following thematic elements:

- Overview of Kosovo's national building stock and its 'baseline' energy characteristics segmented into residential, commercial, and public sectors.
- Analysis of key elements of the building energy renovation program.
- Analysis of barriers to mobilizing building energy renovation investment and activity, consisting of legal/regulatory, institutional, fiscal/economic, financial, technical and informational barriers.
- Policies and measures to tackle these barriers and stimulate cost-effective integrated building renovation, consisting of regulatory, institutional, technical, financial and promotional actions.
- A long-term perspective to guide investment decisions by individuals, the construction of industrial and financial institutions over the period 2021-2050.
- Evaluation of the projected energy savings and wider benefits based on computational and model data.

Sector/type	Energy/regulatory, technical
Status of implementation	Under development with international assistance by the European Bank for Reconstruction and Development (EBRD) under the REEP Plus program
Quantitative effects	See savings for the respective building classes below
Investments	See investment costs for the respective building classes below
Responsible institution	ME
Progress indicators	Strategy developed Final energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

PAM 15: Renovation of residential buildings

Short description and objective: The measure considers retrofitting the existing residential buildings including windows replacement, initiated by the owners and/or supported by commercial banks and funds. This measure will provide issuing of certificates for energy performance of buildings as a prerequisite for putting the reconstructions into operation.

According to the Draft BRS, residential buildings account for 247680 buildings, with a total area of 34.42 million m², which represents 73% of the total building stock. The target is to renovate 1.1% (WEM) and 1.2% (WAM) of the total area of residential buildings (excluding apartments) per year.

Sector/type	Energy/ technical
Status of implementation	Under implementation/Planned
Quantitative effects	WEM: 2021-2023: 2.95 ktoe; 2024-2040: 2.79 ktoe / WAM: 4.26 ktoe per annum
Investments	WEM: EUR 33.63 mn p.a. (2021-2023) and EUR 31.79 mn p.a. (2024-2040) WAM: EUR 48.65 mn p.a.
Responsible institution	ME, Energy efficiency fund
Progress indicators	% of renovated residential building area; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

PAM 16: Renovation of commercial buildings

Short description and objective: The measure considers retrofitting existing commercial buildings including windows replacement, initiated by the owners and/or supported by commercial banks and funds. This measure will provide issuing of certificates for energy performance of buildings, as a prerequisite for putting the reconstructions into operation.

According to the Draft BRS, commercial buildings include for 50,452 buildings, with a total area of 9.41 million m², which represents 20% of the total building stock. The target is to renovate 0.3% (WEM) and 1% (WAM) of the total area of commercial buildings.

Sector/type	Energy/ technical
Status of implementation	Under implementation/Planned
Quantitative effects	Annual Savings: WEM: 2021-2023: 0.49 ktoe; 2024-2040: 0.47 ktoe / WAM: 2.5 ktoe
Investments	WEM: EUR 15.60 mn p.a. (2021-2023) and EUR 14.74 mn p.a. (2024-2040) / WAM: EUR 78.97 mn p.a.
Responsible institution	ME, Energy efficiency fund
Progress indicators	% of renovated commercial building area; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

PAM 17: Installation of solar thermal collectors in the residential sector

Short description and objective: The aim of the measure is the reduction of energy costs and improvement of the efficiency of the system for hot water preparation.

The targeted technology is the hot water electric heater, one of the biggest energy consumers, significantly impacting bills. Solar thermal collectors are one of the best options for replacing these electric heaters. The lower investment cost for installing solar thermal collectors is essential because it can reduce consumer bills for hot water. These systems also provide energy savings and can satisfy at least 50% of the demand annually, depending on the hot water needs. Furthermore, solar thermal collectors can be combined with electricity and district heating systems. The measures assume the installation of 417 solar thermal systems each year (WAM), from 2024 to 2040.

Sector/type	Energy/ technical
Status of implementation	Under implementation/Planned
Quantitative effects	Annual Savings: WEM: 2021-2023: 0.208 ktoe; 2024-2040: 0.197 ktoe; WAM: 2021-2023: 0.208 ktoe; 2024-2040: 0.32 ktoe.
Investments	WEM: EUR 2.42 mn p.a. (2021-2023) and EUR 2.28 mn p.a. (2024-2040) / WAM: EUR 2.42 mn p.a. (2021-2023) and EUR 3.74 mn p.a. (2024-2040)
Responsible institution	ME, Energy efficiency fund
Progress indicators	Number of solar thermal system installed; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

PAM 18: Nearly Zero Energy Buildings

Short description and objective: The National Plan for Nearly Zero Energy Buildings (NZEB) is an obligation according to the Law on Energy Performance of Buildings No. 05/L-101 (Law on EPB) and defines a zero-energy building (ZEB) as: "a building with very high energy performance." The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. The provisions of the Law on Energy Performance of Buildings have transposed the requirements for nearly zero-energy buildings contained in Directive 2010/31/EU. The target is to have 150 NZEB in 2031 (WEM) and to renovate 0.3% of total floor area (ex. AB) per annum in WAM.

Sector/type	Energy/regulatory, technical
Status of implementation	Under implementation/Planned <ul style="list-style-type: none"> - The draft National Plan for Increasing the number of NZEB has been finalized in English by the GFA Consulting Group Company, funded by the EU Office project in Kosovo, and the same final draft was sent to the Energy Community Secretariat for comments, and positive feedback was received. It is up to the MESPI, together with the ME/KSA, to find the method and the way to reinforce it as a separate document or as an integral part of the NEEAP. At the same time, work is being done on the finalization of the draft in Albanian.
Quantitative effects	WEM: 150 NZEB in 2031; WAM: 1.2 ktoe final energy savings p.a.

Investments	WEM: ~60 mill. EUR; WAM: n/a
Responsible institution	MESPI, together with the ME/KSA
Progress indicators	% of renovated residential building area; Number of Nearly Zero Energy Buildings
Relation with other dimensions	Decarbonization, Energy security

PAM 19: Energy certification of buildings

Short description and objective: Energy performance certification of buildings will be mandatory for buildings that are sold or leased and when a building is constructed, renovated or reconstructed. Energy Certification Procedures are defined through Regulation MESP No. 03/18 on the Procedure of Energy Performance Certification of Buildings. The Regulation aims at determining the procedures for Energy Performance Certification of Buildings by taking into account the methodology of calculation, energy assessor, certification, monitoring and implementation. Certification procedure according to the regulation should meet the requirements for the general framework for the energy certification of the building. The scope of the regulation also defines authorization requirements and payment for Energy Performance Certificate (EPC), licensing of independent assessors, independent expertise and requirements for training, certification and inspection procedures, CPE independent control system as well as monitoring the process of issuing and using CPEs. The CPE will be valid for a period of ten (10) years.

Sector/type	Energy/regulatory, technical
Status of implementation	Under implementation <ul style="list-style-type: none"> - Regulation MESPI No.03/18 of The Procedures on Energy Performance Certification of Building adopted on 10.12.2018 - GIZ KEEP Project has supported the training of trainers on energy audits in buildings (24 trainers trained) and public street lighting (7 trainers trained, same trainers are included in the number 24 above) in the period 22.10.2018 – 09.11.2018, and the training of trainers in industry (13 trainers) in the period 26.11.2018 – 14.12.2018.
Quantitative effects	Final energy savings of 0.25 ktoe in the 2021-2023 period, and 0.24 ktoe in the 2024-2040 period
Investments	0.26 mill EUR (by 2025)
Responsible institution	ME, AKEE
Progress indicators	Number of energy certificates
Relation with other dimensions	Decarbonization, Energy security

PAM 20: Inspection of heating, cooling and ventilation systems

Short description and objective: Law No. 05/L-101 on Energy Performance stipulates that building owners must order inspections of all heating systems with boilers of an effective rated output for space heating greater than 100 kW as well as air-conditioning systems with an effective rated output of more than 12 kW at regular intervals. On the other hand, for alternatives to inspections of heating systems with boilers below 100 kW, the Ministry of Environment and Spatial Planning will implement alternative measures to provide users with advice on the replacement of the boiler system, other modifications in the heating systems and other alternative solutions to assess boilers' efficiency and adequate size.

The inspection covers all accessible parts of the system, including, heating systems, heat generator, control system and revolving pump (s).

The process for inspecting heating systems and air conditioning systems is regulated by MESPI Regulation 01/2018, which defines the rules of inspection and whose purpose is to identify patent shortcomings through the foreseen steps, report on the overall situation and recommend cost-effective improvements.

Sector/type	Energy/regulatory
Status of implementation	Under implementation <ul style="list-style-type: none"> - Regulation MESPI No. 01/2018 for Inspection of Heating and Air-Conditioning System has been adopted on 16.02.2018.
Quantitative effects	n/a
Investments	n/a
Responsible institution	ME, AKEE
Progress indicators	Number of inspections realized
Relation with other dimensions	Decarbonization, Energy security

III. Description of policy and measures to promote energy services in the public sector and measures to remove regulatory and non-regulatory barriers that impede the uptake of energy performance contracting and other energy efficiency service models

PAM 21: Energy Service Companies (ESCO)	
Short description and objective: The Energy Service Companies (ESCO) is one of the mechanisms through which the implementation of energy efficiency projects in Kosovo can be increased.	
Sector/type	Energy/regulatory, technical
Status of implementation	<p>Under implementation</p> <p>Article 15 (3) of the Law stipulates that the ME (KEEA) shall publish on its website:</p> <ul style="list-style-type: none"> - best practices for energy performance contracting, guidelines, sample contracts, including clauses to be included in such contracts to guarantee energy savings and end-consumer rights; - the list of registered energy service providers that must be regularly updated; - any available financial instruments, incentives, grants and loans to support energy efficiency service projects. <ul style="list-style-type: none"> • In addition, the Article 15 (5) of the EE Law stipulates that the ME, shall identify the regulatory and non-regulatory barriers that impede the uptake of energy performance contracting and other energy efficiency service models both for the public and private sectors. The Ministry shall propose to the Government of Kosovo to adopt the necessary secondary legislation aiming at removing these barriers and enable energy performance contracting, both in the private and the public sector. • REEP + has supported a study on the assessment of obstacles to the implementation of ESCO projects in Kosovo, which should now be followed by relevant amendments in the legislation.
Quantitative effects	2021-2023: 0.043 ktoe, 2024-2040: 0.04 ktoe per annum
Investments	0.09 mill EUR (in 2024)
Responsible institution	ME
Progress indicators	Number of ESCO projects
Relation with other dimensions	Decarbonization, Energy security

- IV. Other planned policies, measures and programmes to achieve the indicative national energy efficiency contributions for 2030 as well as other objectives referred to in point 2.2 (for example measures to promote the exemplary role of public buildings and energy-efficient public procurement, measures to promote energy audits and energy management systems (2), consumer information and training measures (3), and other measures to promote energy efficiency (4))

PAM 22: Improvement and expansion of district heating systems of “Termokos” Prishtina and DH Gjakova

Short description and objective: Improvement of the district heating systems of Prishtina and Gjakova will increase the efficiency of the systems and will allow a lot of households and commercial buildings to make a fuel switch for heating, from electricity and biomass to DH. This will increase the overall efficiency of the energy system.

Following the financial agreement between the German Government and the Government of Kosovo for financial support under the Program for the energy sector VIII and IX – in May 2021 the project for rehabilitation and expansion of the network of DH Termokos started. This project, led by the German Development Bank (KfW), is in the preparatory phase and contains these main components:

- Rehabilitation of the distribution network of DH Termokos with a route of 6.5 km
- Expansion of the network with new segments with a total length of 16.15 km track
- Rehabilitation and modernization of 235 existing substations
- Installation of 320 new substations in almost all neighborhoods of the city - where the network expansion and densification is expected;
- Construction of heat storage tank with a capacity of 800 m³.
- Improvement of the pressure maintenance system in the primary network, including the installation of new pumps, and the remote control system - SCADA.

The realization of the measures from the 10-year Development Plan of DH Termokos (2022-2031) is another step envisaged for working towards the improvement of the DH system.

At the end of 2021, a project for rehabilitation of the district heating system and the improvement of the system performance of the district heating system of Gjakova has started. This project contains 4 main components:

- Rehabilitation of the distribution network and substations: it is planned to replace about 9.7 km of pipeline,
- Rehabilitation of 342 thermal substations including installation of pressure/temperature/flow control equipment (instruments) and measuring equipment.
- Rehabilitation of the internal network (secondary network) and 14 thermal substations of the Gjakova Regional Hospital; and
- Connection of 13 new facilities to the district heating system – mainly public, including the installation of new substations;

The aim is also to increase the number of consumers connected to both DH systems.

Sector/type	Energy/technical
Status of implementation	<p>Under implementation</p> <p>In April 2021, the European Commission Project IPA 2015 was completed. The aim was rehabilitation of the network and substations, as well as expansion of the network and new substations. Within this project the following components were realized:</p> <ul style="list-style-type: none"> - Rehabilitation of the distribution network (replacement of old pipelines with new pre-insulated pipes) - 6.5 km pipeline. - Rehabilitation of 121 thermal substations of residential, commercial and institutional buildings The rehabilitation also includes the installation of control valves of differential pressure. - Expansion of the network (in total: 3.96 km total length of tracks and 7.92 km of new pipeline, respectively. - 51 new thermal substations
Quantitative effects	24560 connected consumers in 2025, and 38240 in 2031 (together DH Termokos and DH Gjakova)
Investments	A total of 47 Mil. EUR is foreseen for promoting and expanding existing DH systems in Kosovo, financed by donors and the respective municipalities.
Responsible institution	“Termokos” Prishtina
Progress indicators	% of network losses; Number of consumers connected to DH Termokos and DH Gjakova; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

PAM 23: Renovation of central government buildings

Short description and objective: The renovation of central government buildings is an important step towards achieving a more sustainable and energy-efficient public sector. This can help reduce energy consumption, lower greenhouse gas emissions, and save money on energy bills over the long term.

Article 8 (7) of the Law on EE stipulates that the Ministry responsible for management of public buildings, shall prepare and make publicly available an inventory of central government institution buildings. This inventory must at least contain the following data:

- the floor area in m²;
- the energy performance of each building or relevant energy data.

Article 8 (8) provides that the ME shall, prepare and submit secondary legislation on a three (3) year plan for renovation of central government buildings to the Government for approval.

To demonstrate the exemplary role of the public bodies in energy performance of buildings, each year the Government of the Republic of Kosovo shall renovate one percent (1%) of the total floor area of heated and/or cooled buildings owned and occupied by the central government institutions to meet at least the minimum energy performance requirements in accordance with the Law on Energy Performance of buildings.

Sector/type	Energy/regulatory, technical
Status of implementation	Under implementation/Planned <ul style="list-style-type: none"> - According to the Draft BRS, the category of public buildings includes 1028 buildings, while the central government building inventory only includes 385 buildings with a total area of 881694 m². The target is to renovate 1% of the total area of central government buildings per year.
Quantitative effects	Yearly savings of 0.12 in the period 2022-2024 and 0.36 ktoe in the period 2024-2031, on annual basis renovation rate 1% in period 2021-2024, 3% in period onwards.
Investments	WEM/WAM: EUR 1.69 mn p.a. (2021-2023) and EUR 5.04 mn p.a. (2024-2040)
Responsible institution	ME, Energy efficiency fund
Progress indicators	% of renovated central government building area; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

PAM 24: Renovation of public buildings

Short description and objective: As in the case of the central government, local authorities must demonstrate an exemplary role. There is no specific obligation in the Law on energy efficiency for the municipalities, but the following is stipulated in Article (8): "The Government of Kosovo shall encourage other public bodies not belonging to the government institutions of central level, as defined in paragraph 1.2. of Article 3 of this Law, including regional and local level bodies, as well as other bodies governed by public Law, to implement plans for renovation of buildings owned and occupied by them, following the exemplary role of the government institutions of central level, buildings, as laid down in paragraphs 1. and 2. of this Article."

So far, many schools have **been** retrofitted as part of the activities of the Energy efficiency fund. With the support of the EE fund, the retrofitting of the remaining schools and other buildings at the local level is envisaged.

Sector/type	Energy/regulatory, technical
Status of implementation	Under implementation
Quantitative effects	Annual Savings: 2021-2023: 0.331 ktoe; 2024-2040: 0.313 ktoe
Investments	WEM/WAM: EUR 5.15 mn p.a. (2021-2023) and EUR 4.86 mn p.a. (2024-2040)
Responsible institution	Municipalities, MLGA, ME, MEST
Progress indicators	% of renovated public building area; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

PAM 25: Green public procurement

Short description and objective: Not all new technologies have the highest energy efficiency standard, so the best one should be found. The public sector has a big problem with the selection of the most efficient technology because the price is the criteria that participates with highest share in the final decision. Green public procurement can help the public sector to save money in the long term. This is because environmentally friendly products and services can be more energy-efficient and cost-effective over their lifecycle. In addition, green public procurement can help reduce waste disposal costs and avoid the cost of environmental damage. The public sector has a responsibility to lead by example and promote sustainable practices. Green public procurement can help demonstrate the commitment of public sector organizations to sustainability and can inspire other organizations to follow suit.

Article 9 of the EE Law stipulates that Central and local administration authorities, as well as all other public authorities or entities that apply the Law on Public Procurements and/or the KEEF, shall purchase only products, services, and buildings with high energy-efficiency performance. When tendering service contracts with significant energy content, authorities and bodies referred to above shall assess the possibility of concluding long-term energy performance contracts that provide long-term energy savings. The above-mentioned principle shall also apply to private legal persons in the event of contracting procurements of works, supplies or services financed and or subsidized at least fifty percent (50%) by public funds or through KEEF financial support.

Sector/type	Energy/regulatory, technical
Status of implementation	Under implementation - Administrative Instruction on Energy efficiency requirements for purchasing products, services and buildings by central government is adopted
Quantitative effects	n/a
Investments	n/a
Responsible institution	ME, bodies at central governmental level
Progress indicators	Number of "green" procurement realized; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

PAM 26: Energy audit and management systems

Short description and objective: Article 11 (2) and (3) of the Law on EE stipulates that enterprises that are not SMEs are subject to an energy audit carried out in an independent and cost-effective manner by registered energy auditors or a team of auditors as required, and at least every three (3) years from the date of the previous energy audit. The enterprises are encouraged to establish an energy and/or environmental management system certified by an independent body according to the relevant European or International Standards. In this event, those enterprises shall be exempted from the requirement to conduct an energy audit, provided that the management system concerned includes an energy audit based on the minimum criteria.

The Ministry of Economy should publish a list of large enterprises which are subject to a mandatory energy audits and define the minimum requirements to be fulfilled by those enterprises regarding energy management procedures and the reporting requirements.

Sector/type	Buildings and Industry /regulatory, technical
Status of implementation	Under implementation - In 2021, 114 energy auditors were trained and certified by the Center for Sustainable Energy, operating within the University of Prishtina - In 2022, 48 energy auditors were trained and certified by the Center for Sustainable Energy, operating within the University of Prishtina
Quantitative effects	n/a
Investments	n/a
Responsible institution	Article 12 (2) stipulates that ME shall be responsible for managing the entire energy auditing scheme that will be designed by secondary legislation on energy auditors and energy auditing approved by the Minister. The regulation on the system of energy efficiency professionals and the minimum energy audit criteria is being finalized by the ME Department of Energy.
Progress indicators	Number of audits; Number of installed energy management systems; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

PAM 27: Consumer information programs

Short description and objective: One of the primary benefits of energy efficiency consumer information programs is that they help consumers to save money on their energy bills. This is done by providing information on how to use energy more efficiently so consumers can reduce their energy consumption and hence are able to save money on their utility bills. Overall, energy efficiency consumer information programs are a critical tool for promoting sustainable energy use and reducing energy costs, emissions, and other negative environmental impacts. Article 14 (1) of the Law on EE stipulates that the ME shall undertake appropriate actions to promote and facilitate an efficient use of energy by small energy customers, including domestic customers.

Sector/type	Energy/technical
Status of implementation	Under implementation <ul style="list-style-type: none"> - The ME has conducted promotional campaigns on energy efficiency and renewable energy sources during 2016-2018. These promotional campaigns aimed to raise the awareness of all categories of energy consumers, by reflecting on the importance of using energy-saving measures and renewable energy sources. - The campaigns have involved placement of billboards and broadcasting promotional ads on LED monitors in different cities of Kosovo and in different areas, depending on the target sector. In 2016, the campaign focused on the industry sector, emphasizing the importance of energy efficiency measures and renewable energy sources in the sector. In 2017, the focus was on the importance of EE and RES measures in the service sector (public and private), whereas in 2018 the focus was on the transport sector (public and private). - In 2022 two calls for or subsidizing efficient economic heating equipment for citizens have been announced,
Quantitative effects	n/a
Investments	~0.17 mill. EUR (by 2025)
Responsible institution	ME
Progress indicators	Number of campaigns realized
Relation with other dimensions	Decarbonization, Energy security

PAM 28: Increased use of efficient technologies in the residential sector

Short description and objective: More efficient heating technologies will contribute to energy savings, reduce outdoor and indoor air pollution, increase share of RES and better living comfort.

In 2022, ME realized two calls for subsidizing efficient heating equipment for citizens, in the amount of 6 million euros. The equipment that is subsidized includes:

- For wood, pellets, and briquettes stoves, the support is up to 70% of the investment value or up to 1,200 euros.
- For heat pumps, the support is up to 30 percent or up to 2,500 euros,
- For efficient air-conditioners 40 percent of the value or up to 400 euros is subsidized and
- For individual efficient biomass stoves, 90 percent or 560 euros (for families in social schemes) and 70 percent or 435 euros for others are subsidized.

Financial subsidies should be extended to increase the share of efficient technologies in the residential sector. This measure will enable the replacement of the inefficient biomass stoves (with efficiency of around 50%) and individual electric heaters with more efficient technologies like heat pumps (with efficiency of 250%) or efficient biomass stoves (with efficiency of 85%).

To achieve the energy efficiency targets, the promotion of the efficient technologies on the demand side is crucial.

Sector/type	Energy/ technical
Status of implementation	Planned
Quantitative effects	~Cumulative final energy savings by 2030: 85 ktoe
Investments	Heat pumps: EUR 5.94 mn p.a. (2021-2023) and EUR 5.65 mn p.a. (2024-2040) More efficient biomass stoves: EUR 1.02 mn p.a. (2021-2023) and EUR 1.00 mn p.a. (2024-2040)
Responsible institution	MED, municipalities
Progress indicators	Number of consumers connected to district heating systems
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

PAM 29: Energy efficiency measures in industry

Short description and objective: Based on the recommendation from the energy management system, a lot of different measures can be implemented. Something that is important is that the realization of these measures is costless. The economy of Kosovo is growing together with the industry, especially small and medium enterprises (SMEs), so new technologies can be introduced from the very beginning.

The underlying actions for energy efficiency in industry include:

- List of large enterprises which are subject to a mandatory energy audit to be published
- Regulation on minimum criteria for energy audits including those carried out as part of energy management systems
- Program to inform about the benefits of energy management and encourage SMEs to undergo energy audits
- Subsidy of SMEs for the purchase of production processing machines

Other possible actions could be development of a feasibility study for EE investments in the sector of housing and SMEs or providing subsidies for SMEs for purchasing production processing machines.

Sector/type	Energy/regulatory, technical
Status of implementation	Under implementation
Quantitative effects	Energy savings up to 0.043 ktoe p.a. in the 2021-2023 period, energy savings of 0.04 ktoe p.a. in the 2024-2040 period
Investments	n/a
Responsible institution	ME, SMEs
Progress indicators	Number of energy audits of large enterprises conducted
Relation with other dimensions	Decarbonization, Energy security

PAM 30: Increase the use of the railway

Short description and objective: Rail transport is more efficient than road transport as it uses less energy per passenger or ton than road transport. However, at the moment, that is not the case in Kosovo. The number of passengers and tons have been reduced significantly in the last ten years, while the energy consumption is almost at the same level. The country's rail system is in a poor condition, with serious structural constraints that limit the traffic to 30-70 km/h.

Increasing the number of passengers and tonnes will increase energy efficiency, reduce pollution and potentially increase the share of RES in transport.

At the end of 2022, work started on the rail section from FusheKosova to Mitrovica. This is the project's third phase, which covers the refurbishment of 35 km of track and the upgrade of five railway stations. Once the phase is finished, Kosovo will be connected with Serbia and North Macedonia with a fast railway (100 km/h).

Sector/type	Energy/technical
Status of implementation	Under implementation/Planned
Quantitative effects	Return the number of passengers and tons to the level of 2013 (367 thousand passengers and 49.0 mtkm) 4.3 ktoe of energy savings by 2030 in the WEM Scenario, 4.9 ktoe in WAM.
Investments	Pending action plan of the Multimodal transport strategy (165 mill EUR. (40 mill EUR loan from EBRD, 42 mill EUR loan from EIB and 83 mill. EUR grant from WBIF))
Responsible institution	Infrakos
Progress indicators	Number of passengers; Number of tonnes; Final energy saved (ktoe)
Relation with other dimensions	Decarbonization, Energy security

PAM 31: Railway electrification

Short description and objective: The Energy Strategy includes the planned development of the electrification of the railway in Kosovo, which will reduce fuel consumption, and GHG emissions. Currently, there is no electrified railway line in the country. Therefore, the electrification should be realized gradually by increasing the share of electric trains to 14.6% in 2030 and 20% in 2040 (WEM), and to 25% in 2030 and 40% in 2040 (WAM).

Sector/type	Energy/technical
Status of implementation	Under implementation/Planned
Quantitative effects	0.4 (1.4) ktoe of energy savings by 2030 (2040) in WAM compared to WEM

Investments	Pending action plan of the Multimodal transport strategy
Responsible institution	Infrakos/Trainkos
Progress indicators	Consumption of electricity in rail transport. Final energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

PAM 32: Increased share of alternative fueled vehicles

Short description and objective: The Multimodal Transport Strategy 2022-2030 recognized that promoting cleaner vehicles to reduce GHG emissions is one of the pillars for more sustainable transport. It is necessary to make transport more sustainable to achieve the goals set in the European Green Deal, Green Agenda, and Paris Agreement. According to the Transport Strategy, the promotion of cleaner transport encompasses three aspects: 1. Monitoring emissions and introducing more stringent emission standards, 2. Setting the legal basis through adopting the alternative fuel infrastructure directive and setting up national policy frameworks for building a network of alternative fuel infrastructure (e.g., e-charging stations), and 3. Boosting the uptake of zero-emission vehicles. The aim of the strategy is to gradually increase the share of vehicles that use alternative fuels (hybrid, electric, hydrogen) to 10% by 2030. It is additionally assumed that alternative fueled vehicles will reach a share of 20% by 2040. Moreover, as a result of an additional e-charging stations' deployment, it is estimated that in by 2030 2% of the passenger cars in Kosovo will be electric and 5% Hybrid-gasoline, while the remaining 3% will be divided between PHEV-gasoline, Hybrid-diesel, and PHEV-diesel cars.

Sector/type	Energy/technical
Status of implementation	Under implementation/Planned
Quantitative effects	30 ktoe of energy savings by 2030 in WEM ¹ , additional 0.4 ktoe by 2030 in WAM
Investments	Pending action plan of the Multimodal transport strategy
Responsible institution	Private investors
Progress indicators	Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

PAM 33: Vehicle fleet change

Short description and objective: There are several reasons why new vehicles are better than old ones, and one of the most important for this document is their efficiency. The other reasons are safety, reliability, performance, and new technologies available on the market. The number of vehicles in Kosovo has been increasing in the last ten years (2012-2022) with an average annual growth rate of around 9.5%², so this is an excellent opportunity for the state to allow the import of as many new vehicles as possible.

The adopted Law on Vehicles No. 05/L-032 prohibits the import of cars older than ten years and cars that do not meet the Euro 4 standard.

However, considering the transport sector's impact on the final energy consumption and GHG emission, an analysis should be made to amend the Law on vehicles to prohibit the import of cars older than eight years.

The Multimodal Transport Strategy 2023 -2030 also envisaged increasing the share of EURO V or higher lorries for light commercial vehicles, heavy duty vehicles (N2 and N3) and buses (M2 and M3). A good example is the 24 new buses for public transport (EURO VI), obtained with the support of EBRD.

Another possible analysis is to explore the possibility of subsidizing the use of vehicles that use alternative fuels.

Sector/type	Energy/technical
Status of implementation	Under implementation
Quantitative effects	n/a
Investments	Pending action plan of the Multimodal transport strategy (~600 mill. EUR)
Responsible institution	Infrakos, private investors
Progress indicators	Number of passengers; Number of tonnes; Final energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security

¹ Energy savings calculated comparing WEM results to a Scenario with constant fuel shares until 2030

² <https://askdata.rks-gov.net/pxweb/en/ASKdata/>

PAM 34: Modal shift for short distance travel	
Short description and objective: By substituting less efficient vehicles, using bikes and electric scooters for short distances can reduce the final energy consumption in the transport sector. This measure could include various actions that would encourage eco-friendly mobility, such as the construction of bicycle lanes, development of wide and well-lighted pedestrian areas and cycling lanes, widening the sidewalks, and removing barriers from the sidewalks.	
Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	7 ktoe of final energy savings by 2030 (WAM)
Investments	~1 mill. EUR (depending on the length)
Responsible institution	MESPI and municipalities
Progress indicators	Number of bikes/scooters purchased; Final energy savings (ktoe); Primary energy savings (ktoe)
Relation with other dimensions	Decarbonization, Energy security, Research, innovation and competitiveness

- V. Where applicable, a description of policies and measures to promote the role of local renewable energy communities in contributing to the implementation of policies and measures in points i, ii, iii and iv

PAM 35: Municipal Energy and Climate Action Plans	
Short description and objective: According to Article 6 (1) of the Law on EE, starting from 28 February 2019 and every three (3) years, municipalities shall prepare Municipal Energy Efficiency Action Plans that shall include proposed energy efficiency policy and energy efficiency improvement measures covering all sectors operating at the municipal level, including municipal buildings. Municipal Energy Efficiency Action Plans are being developed for all the 38 municipalities in Kosovo and will be completed during 2019. This activity is supported by the Support to Implementation of the 3rd Energy Package with a Focus on Energy Efficiency and Renewable Resources Project, funded by the EU, and by the Kosovo Energy Efficiency Project (KEEP), funded by the German Government and implemented by the GIZ. The development of municipal EEAPs will enable municipalities to apply with the Kosovo Energy Efficiency Fund and other donors in order to implement the EE measures and reduce energy consumption. In the future, these plans will be replaced with Municipal Energy and Climate Action Plans.	
Sector/type	Energy/regulatory
Status of implementation	Under implementation <ul style="list-style-type: none"> - Currently, in out of 38 municipalities in Kosovo, 22 MEEPs have been adopted by the respective municipal assemblies, and 7 are in the procedure for adoption. - GIZ KEP has already supported 6 Kosovo municipalities to draft pilot Municipal Energy and Climate Action Plans. - GIZ ORF - ETC will support two Kosovo municipalities to develop Sustainable Energy and Climate Action Plans. - Joint approach will be agreed upon with Kosovo stakeholders (central and local level).
Quantitative effects	n/a
Investments	n/a
Responsible institution	Municipalities, ME
Progress indicators	Number of action plans submitted
Relation with other dimensions	Decarbonization, Energy security

VI. Description of measures to develop measures to utilise energy efficiency potentials of gas and electricity infrastructure

PAM 36: Modernization of networks and reducing network losses	
Short description and objective: The ERO has developed efficient secondary legislation which regulates all aspects of energy infrastructure improvements and overall energy efficiency exploitation. The Regulator approves the 5-year investment plan of the Distribution Network which aims to improve security of supply, reducing the level of network losses.	
Sector/type	Energy/technical
Status of implementation	<p>Under implementation</p> <ul style="list-style-type: none"> - To enable the security of electricity supply, support the increase of load, integration of renewable sources, network expansion and strengthening and the increase of the quality of supply, ERO during the periodic review for the regulatory period 2018-2022 has allowed capital investments of about 131 million euros for the DSO. From the allowed value for the 5-year tariff period, 22 million euros were planned to be realized in 2021, while the DSO has reported that it has realized 22.57 million euros or the rate of realization of capital investments is 10% higher. Investment projects for 2021 in DSO include investments in medium and low voltage networks, investments in digitalization and modernization of the network, investments in SCADA, smart meters, etc. Through investment projects, the DSO aims to achieve key objectives such as reduction of technical and commercial losses, reliable and better energy supply and increasing existing capacities, integrating RES and modernizing the network. - The 5-year investment plan (2023-2027) was adopted according to which the total investment of 122 million euros, will allow technical losses to reach 11.48% from 12.21%, in 2022, or 0.73 pp lower and commercial losses to reach 1.82% from 4.47%.
Quantitative effects	9% technical losses in distribution network by 2031
Investments	The budget of the National Energy Strategy foresees a total budget of around 127.12 Mil. EUR for network modernization and working towards reducing network losses, financed by KEDS and KOSTT and to be spent between 2022 and 2025.
Responsible institution	KEDS
Progress indicators	% of losses in the distribution network
Relation with other dimensions	Decarbonization, Energy security

VII. Regional cooperation in this area, where applicable

Regional cooperation for most of the measures is foreseen through the EnC.

VIII. Funding measures, including EU support and other donors in this area at the national level

The required investments are given in the tables for each measure if there is information about it.

3.3 Dimension energy security

I. Policies and measures related to the elements set out in point 2.3

PAM 37: Rehabilitation of TPP Kosovo B	
Objective: Maintaining security of supply by improving availability and extending life expectancy; reducing emissions according to EU directives.	
Description: The National Energy Strategy and the associated Implementation Plan foresee a refurbishment of two units of the power plant Kosovo B. The refurbishment of the Kosovo B1 and B2 units will be carried out in two stages. By the end of 2025, and 2026 respectively, both units will operate in a more efficient, reliable mode, meeting mandatory emission standards of the Industrial Emission Directive. Following the rehabilitation, the annual production is expected to increase to a net capacity of 544 MW.	
Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	Net capacity of 544 MW (two times 272 MW)
Investments	The budget planning of the National Energy Strategy foresees a total of 178 Mil. EUR to be spent on the refurbishment of each of the two units of Kosovo B (Kosovo B1 and B2) in 2023 - 2025. Part of these resources will be provided by KEK while another part will be covered by an EU grant. The grant money will be used to cover expenses for electro filters and denox.
Responsible institution	KEK
Progress indicators	Dust, NOx and SO2 emission reduction
Relation with other dimensions	Decarbonisation, Energy Efficiency

PAM 38: Rehabilitation of one to two units in TPP Kosovo A	
Objective: Maintaining security of supply by improving availability and extending life expectancy; reducing emissions according to EU directives.	
Description: According to the National Energy Strategy and the associated Implementation Plan, it is foreseen that at least one, maximum two of the three units of Kosovo A will undergo a refurbishment process. The refurbished A unit(s) would operate in a strategic reserve mode from 2028 onwards, meaning these unit(s) would be available in the crucial higher demand heating season, or during extraordinary occasions such as the recent energy crisis. The third operating A unit will be permanently closed once the refurbishment of the other lignite unit(s) has been completed.	
Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	Net capacity of (one or two times) 195 MW
Investments	The budget planning of the National Energy Strategy foresees 120 Mil. EUR to be allocated to the refurbishment of Kosovo A in 2023-2024, financed by KEK.
Responsible institution	KEK
Progress indicators	Dust, NOx and SO2 emission reduction
Relation with other dimensions	Decarbonisation, Energy Efficiency

PAM 39: Improvement of cybersecurity in the energy sector

Objective: Ensure cybersecurity in the energy sector to ensure reliable market operation, especially when working towards electricity market liberalization.

Description: Put in place cyber response capabilities (identify, detect, respond and recover) in the energy sector by laying the legal basis in the form of a Law on Security and Information Systems (including Secondary Legislation) and through establishing an Energy sectorial Computer Emergency Response Team (eCERT) in Kosovo.

Sector/type	Energy/technical (not modelled)
Status of implementation	Planned
Quantitative effects	/
Investments	The budget planning of the National Energy Strategy foresees a total of 1.69 Mil. EUR for strengthening cybersecurity in the energy sector, to be spent between 2022 and 2024 and financed through the Kosovo Budget and Donors.
Responsible institution	MIA, ME, ERO, KOSTT
Progress indicators	Cyber response capabilities in place.
Relation with other dimensions	/

PAM 40: Increase amount of vRES capacity that the network is able to handle/integrate

Objective: To secure energy security and achieve better market integration, Kosovo is increasingly shifting its efforts towards deployment of renewable energy sources in the energy sector, which requires necessary modernization works of electrical grids to accommodate large variable generation capacities.

Description: Increase the amount of variable renewable (vRES) capacity the system would be able to integrate/handle to 2000 MW of RES-based energy as aimed at by 2031 and 500 MW as an intermediate step in 2024.

Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	Increase of vRES capacity that the network is able to handle/integrate to 2000 MW by 2031
Investments	The budget of the National Energy Strategy foresees a total budget of around 127.12 Mil. EUR for network modernization and working towards reducing network losses, financed by KEDS and KOSTT and to be spent between 2022 and 2025.
Responsible institution	ME
Progress indicators	Amount of vRES capacity that the network is able to handle/integrate
Relation with other dimensions	Decarbonisation, Energy Efficiency

PAM 41: Installation of battery storage capacity

Objective: Kosovo's energy system requires an increased level of flexible regulation capacity in the domestic market, which will also help improve the system resilience and to reduce electricity imports but also to fulfil ENTSO-E energy reserve requirements.

Description: Installation of at least 170 MW of battery storage capacity in Kosovo's power system.

Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	170 MW of battery storage installed by 2031
Investments	As part of a donor project (Millennium Challenge Corporation (MCC)) that encompasses 181.9 Mil. EUR, investments in the purchase and installation of battery storage is foreseen.
Responsible institution	MCC, ME, KOSTT
Progress indicators	Installed MW of Battery Storage
Relation with other dimensions	Decarbonisation, Energy Efficiency

II. Regional cooperation in this area

To secure long-term security of supply, the Government of Kosovo envisages increasing regional cooperation in this area. Especially, the Government is committed to increase joint energy system planning with the

Republic of Albania. More specifically, developments in the region and globally will be followed closely, and (co-)investment in gas power plants for baseload and/or system flexibility in Albania, North Macedonia and Greece will be explored with the intention of implementation by 2031.

With a natural gas power plant outside Kosovo, where power will be purchased under a long-term power purchase agreement and complementary planned energy efficiency measures, Kosovo plans to reduce the country's net imports, thereby contributing to security of energy supply.

III. Where applicable, financing measures in this area at national level

The budget and source of finance for each of the proposed policies and measures, where available, are included in the tables.

3.4 Dimension internal energy market

I. Electricity infrastructure

I. Policies and measures to achieve the targeted level of interconnectivity as set out in point (d) of Article 4

As described above, the level of electricity interconnectivity in Kosovo is several times higher than the target of 15%, implying no specific need for additional policies or measures to increase the interconnectivity level.

II. Regional cooperation in this area

Although, the interconnectivity level is above the EU target, KOSTT will continue the regional cooperation with other transmission system operators through ENTSO-E (European Network of Transmission System Operators), and by implementing necessary arrangement for Kosovo's participation in ALPEX on the day-ahead and intraday markets.

III. Where applicable, financing measures in this area at national level

Not Applicable.

II. 3.4.2. Energy transmission infrastructure

I. Policies and measures related to the elements set out in point 2.4.2, including, where applicable, specific measures to enable the delivery of Projects of Energy Community Interest (PECI) or Projects of Mutual Interest (PMI) and other key infrastructure projects

PAM 42: Improve net transfer capacities

Objective: Improving net transfer capacities is important in terms of strengthening regional cooperation and market integration, which in turn contributes to enhancing energy security.

Description: Improve determination and tendering of cross-border transmission capacities. Ideally, introduce flow-based market coupling (joint determination of transmission capacities with electricity market clearing). Target 2024: Minimum of 28-30% of nominal capacity each direction, Target 2031: 70% of nominal capacity in 2031 in each direction

Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	29-30% of nominal capacity each direction (2024), 70% of nominal capacity in each direction (2031)
Investments	- NA
Responsible institution	ME
Progress indicators	Determined maximum Net Transfer Capacity (NTC) and offered NTC and/or introduction of a flow-based market coupling mechanism
Relation with other dimensions	Energy security, Decarbonisation

PAM 43: Roadmap retail market competition

Objective: Increasing competition in the energy retail markets to improve the market functioning by creating a competitive and efficient market model which is in line with the core principles of a free market.

Prepare roadmap for retail market competition.

Sector/type	Regulatory
Status of implementation	Planned
Quantitative effects	/
Investments	/
Responsible institution	ME
Progress indicators	Roadmap prepared.
Relation with other dimensions	Energy security

PAM 44: Address market concentration	
Objective: Address the currently very high level of market concentration at both wholesale and retail levels prevailing in Kosovo.	
Description: Analyse current market structure and existing legal and regulatory barriers to entry of new market participants and adopt the most adequate measures by 2024.	
Sector/type	Research
Status of implementation	Planned
Quantitative effects	/
Investments	/
Responsible institution	ME
Progress indicators	Analysis conducted
Relation with other dimensions	Energy security

II. Regional cooperation in this area

As a member of the Energy Community, Kosovo is committed to implement all obligations under the Treaty, which are crucial to integration into the EU's internal energy markets and to achieve the strategic goals to create a free and competitive energy market.

The current most significant step in the field of cooperation in the electricity market is a full functioning of a common power exchange with Albania (ALPEX) both on the day-ahead and intraday markets. The first step has already been taken, as ALPEX has started its operation in Albania. The next expected step after market opening in Kosovo is the coupling of ALPEX with North Macedonia. Currently, market coupling with Serbia or Montenegro is unlikely for political reasons. Future coupling of Kosovo with Greece can be achieved through ALPEX and the Albanian TSO, since Kosovo has no border with Greece (or any other EU countries).

Regarding other regional market activities, in 2020, Kosovo and North Macedonia through their respective Transmission and System Operators signed an operational agreement to organize auctions for the allocation of interconnection capacities, creating the conditions for more efficient electricity trade between market participants from these two countries. SEE CAO will conduct auctions on behalf of both operators. Further, from November to December 2020, KOSTT signed MoUs with all neighbouring TSOs except that of Serbia, defining NTCs and capacity allocations. KOSTT also signed operational agreements defining rules for coordination between KOSTT and neighbouring TSOs.

The longer-term target is to join the European couplings, the Single Day-Ahead Coupling (SDAC) and the Single Intraday Coupling (SIDC), by 2031 at the latest, which will help ensure economically optimal utilization of the cross-border grid capacity, and through that contribute to more effective market functioning. This will also enable lower energy prices to ensure affordability, and also provide a level playing field and correct market signals to investors, thus increasing the share of renewable energy sources in the system.

III. Where applicable, financing measures in this area at national level

The budget and source of finance for each of the proposed policy and measure, where available, are included in the tables.

III. Market integration

I. Policies and measures related to the elements set out in point 2.4.3

PAM 45: Market coupling with Albania

Objective: Ensure cost-effectiveness for implementing the RES targets and enhance system flexibility through regional market integration.

Description: Day ahead market opened and coupled with Albania by 2023 (and potentially intraday, balancing markets in the following years) as a first step towards joining the pan-European market area in 2031.

Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	/
Investments	The budget of the National Energy Strategy foresees a total of 2.56 Mil. EUR to be spent on both day ahead and intraday market coupling with Albania through the ALPEX power exchange in 2023 and 2024.
Responsible institution	ME, ALPEX
Progress indicators	Market segment coupled with Albania
Relation with other dimensions	Energy security

PAM 46: Couple markets with additional neighbouring countries

Objective: Ensure cost-effectiveness for implementing the RES targets and enhance system flexibility through regional market integration.

Description: Consider the integration of ALPEX with upcoming North Macedonian day-ahead market and Greece.

Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	/
Investments	The Energy Strategy foresees 0.25 Mil. EUR to be spent in 2024 for a feasibility study on regional/European market coupling (SDAC, SIDC), financed by donors.
Responsible institution	ME
Progress indicators	Market coupled with additional countries in the region
Relation with other dimensions	Energy security

PAM 47: Joining EU balancing platforms

Objective: Reducing balancing costs through integration with wider European balancing markets.

Description: Joining the common EU Balancing platforms (MARI, PICASSO, IGCC) in the long term.

Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	/
Investments	/
Responsible institution	ME
Progress indicators	Number of market platforms joined
Relation with other dimensions	Energy security

- II. *Measures to increase the flexibility of the energy system with regard to renewable energy production such as smart grids, aggregation, demand response, storage, distributed generation, mechanisms for dispatching, re-dispatching and curtailment, real-time price signals, including the roll-out of intraday market coupling and cross-border balancing markets.*

PAM 48: Power to heat	
Objective: Given the high ambitions of Kosovo to expand RES capacities in general and solar PV capacities in particular, explore economic case for storing excess generation via power-to-heat (PtH).	
Description: Conduct feasibility study and/or pilot project for PtH to absorb excess RES generation.	
Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	
Investments	- NA
Responsible institution	ME
Progress indicators	Feasibility study conducted / pilot project implemented
Relation with other dimensions	Decarbonisation, Energy security, Energy Efficiency

- III. *Where applicable, measures to ensure the non-discriminatory participation of renewable energy, demand response and storage, including via aggregation, in all energy markets*

As already noted in chapter 2.4.3., Kosovo has the legal and regulatory framework in place to ensure the non-discriminatory participation of renewable energy. However, there is a need to continue taking required measures in terms of proper planning and development of transmission and distribution infrastructure to enable and guarantee the connection and operation of new RES capacities, as well as in treating with priority and a on non-discriminatory basis the applications for connection of new RES capacities. Such measures can be implemented using available internal resources and capacities along with international support from donors and relevant institutions.

Furthermore, the bulk supply agreement (BSA) between KEK and KESCO is a barrier to entry for other market participants, including but not limited to renewable energy, demand response and storage. Its phase out is a necessary precondition for non-discriminatory market participation, as well as effective market integration with neighbouring countries and the EU.

PAM 49: Full phase out BSA/Financial PSO	
Objective: Increasing competition in the energy retail markets to improve the market functioning by creating a competitive and efficient market model which is in line with the core principles of a free market.	
Description: Full phase out bulk supply agreement (KEK-KESCO) and introduce financial PSO, potentially with tenders for contracts-for-difference (CfD).	
Sector/type	Regulatory
Status of implementation	Planned
Quantitative effects	/
Investments	To work towards a phase out of the BSA and towards removing other barriers for effective market functioning, the budget of the National Energy Strategy foresees a total of around 167,390 EUR provided by the Kosovo Budget and Donors and to be spent between 2023 and 2025. The funds are foreseen for the drafting and adoption of the relevant laws and for conducting studies on barriers to a competitive electricity market and on the most suitable method of phase-out of BSA.
Responsible institution	ME
Progress indicators	BSA phase out
Relation with other dimensions	/

IV. Policies and measures to protect consumers, especially vulnerable and, where applicable, energy poor consumers, and to improve the competitiveness and contestability of the retail energy market

Kosovo's policies and measures to protect consumers are well addressed in the current energy laws and regulations. Those stipulations encompass all aspects related to the right for connection, appointment of the supplier of last resort, fair and non-discriminatory treatment in the supply of energy by suppliers, the right to change the supplier with simplified procedures, guaranteed supply, universal supply service, and so forth.

See also 3.4.4.

V. Description of measures to enable and develop demand response, including those addressing tariffs to support dynamic pricing

PAM 50: Consider introducing time-of-use consumer prices to incentivise demand flexibility	
Objective: Incentivize demand flexibility.	
Description: Dynamic time-of-use tariffs could incentivise consumers to shift electricity demand to times when renewable generation is abundant, the network is less congested and/or prices are low. It could enable smart charging of electric vehicles, flexible operation of heat pumps, electric and gas-fired backup heaters, as well as flexible operation of industrial consumers. Installation of smart meters would be required to allow for time-of-use billing.	
Sector/type	Energy/technical
Status of implementation	Planned
Quantitative effects	
Investments	N/A
Responsible institution	ME
Progress indicators	Number of dynamic time-of-use tariffs offered. Reduction of peak demand (shift of electricity demand by households and/or industry)
Relation with other dimensions	Decarbonisation, Energy security

IV. Energy poverty

I. Where applicable, policies and measures to achieve the objectives set out in point 2.4.4

Where applicable, policies and measures to achieve the objectives set out in point 2.4.4

To achieve the energy poverty objective, one measure has been identified, as outlined in the table below. While there is not yet a clear definition of energy poverty or related data that could serve to quantify the extend of the problem in Kosovo, it shall be underlined, that the poverty level as such is already very high in Kosovo, and so is the number of energy customers in need. Therefore, there is an obvious need for preparation of a program to protect these vulnerable customers with clear defined measures, activities and funds, based on improved data collection and a legal definition of vulnerable consumers.

PAM 51: Consumption-independent support scheme for vulnerable consumers based on improved data and a legal definition	
Objective: Ensuring that the most vulnerable groups in society benefit from schemes dedicated to supporting them.	
Prepare policy design for a consumption-independent support scheme of vulnerable consumers with adequate targeting and coverage based on 1) improved data collection on energy poverty and vulnerable consumers 2) introducing a legal definition of vulnerable consumers	
Sector/type	Regulatory, research
Status of implementation	Planned
Quantitative effects	/
Investments	/
Responsible institution	MFLT, ME
Progress indicators	Policy design initiated, policy in place
Relation with other dimensions	Energy security

3.5 Dimension research, innovation and competitiveness

Over the last twelve years, the Government of Kosovo has been implementing various laws and regulations that will raise research and innovation activities. In addition, all the laws and regulations are fully in line with various European directives and regulations that address the same topics. As mentioned above, Kosovo will establish and strengthen healthy relationships between and within governmental bodies, universities and businesses. This will enable goal-oriented research in shaping the future of industrial development through research transfer.

I. Policies and measures related to the elements set out in point 2.5

The Government of Kosovo will proceed in creating suitable conditions in terms of a supportive regulatory framework in order to increase the intensity of energy and climate research activities, which in turn will enable a successful introduction of smart policies and innovative energy technologies. This will be the first step in research transfer and market preparation of innovative ideas through special support measures enabling a future sustainable, reliable and affordable energy supply. This is something that especially Kosovo needs, because of its difficulties to manage finding the best response in ensuring security of supply since 1999. The quality of research on climate, energy, and mobility will determine the success of the Kosovo's policies towards decarbonization, security of energy supply, energy efficiency, integration of renewable energies, and other related energy and climate issues.

However, it is reasonable to talk about research, innovation and competitiveness in energy and climate related topics only after Kosovo has succeeded in setting up the basic infrastructure and human capital in doing reliable and valuable research, showcasing of successful operation of an advanced energy technology/practice in national conditions, creating a skilful workforce to install and operate energy efficiency and renewable energy technologies, as well as creating industry alliances and connecting them to research efforts (industry driven research). Hence, the respective policies and measures for research, innovation and competitiveness include:

PAM 52: Building modern research and innovation capacities

The Government of Kosovo will address these issues by authorising various ministries and governmental bodies to undertake the needed steps to foster energy and climate research, innovation and competitiveness:

- The Ministry of Economic Development and the Ministry of Education, Science, Technology, and Innovation will **introduce the Energy and Climate Research Program (ECRP)**. The aim of the ECRP is to increase the capacities of Kosovo's public and private universities in conducting research projects related to different topics in energy, climate, mobility, and sustainable growth. The ECRP will be designed to exclusively support projects that will be implemented by Kosovo's universities in cooperation with any European university or research institute.
- The Ministry of Education, Science, Technology, and Innovation together with public and private universities will **set up joint research centres (JRC) in energy, environment, mobility and other climate related topics**. All JRCs will be equipped with modern infrastructure. In addition, they will have to cooperate intensively with other governmental and industrial stakeholders, such as Ministry of Economic Development, Ministry of Infrastructure and Environment, KEK (Kosovo Energy Corporation), KOSTT (Transmission System and Market Operator), KEDS (Kosovo Electricity Distribution System), Trainkos (the operator of railways in Kosovo), ERO (Energy Regulatory Office), and many other players from the industry. This cooperation enables selecting the most important research topics that will be conducted by JRCs with the central aim of helping all stakeholders to find the best innovative answers to their questions. This will help stakeholders to improve the culture of evidence-based decision-making processes.
- The Ministry of Education, Science, Technology, and Innovation will **introduce a corresponding program to modernize universities' bachelor and master programs that touch energy and climate issues** in order to conform with the national needs. The reformed programs will be designed together with other governmental and industrial stakeholders. All universities' teaching programs that touch one or another dimension of the NECP will have to cooperate intensively with JRCs in facilitating knowledge and

technological transfer. Many Kosovo's universities³ have been effectively getting funds from EU programs, such as TEMPUS, Erasmus and FP7, in implementing various projects aiming at developing and reforming programs and capacities. The introduction of projects of this nature makes sure that Kosovo will not suffer in the future from the lack of human capital to effectively dealing with energy transition, integration of renewables, new market designs, integration of electric vehicles, and many other open issues that will appear in decarbonizing the entire economic activity.

- The Ministry of Foreign Affairs together with Kosovo's Embassies and Consular Offices will **collect the contact data of the diaspora working at well-known world universities, research institutes and development departments of private companies**. Diaspora is recognized as the first address to build bridges between Kosovo's and European universities and to make sure that the ECRP and the JRCs will be successful programs. At the same time, diaspora has been recognized as the easiest and fastest way to gain access to EU research funds, like ERC, Horizon2020, Developing Horizon Europe, Erasmus+, etc.
- Within the framework of the ECRP, the Ministry of Education, Science, Technology, and Innovation will **support particular faculties and departments of Kosovo's public universities to increase the number of professors and young researchers exclusively dealing with national important issues in energy, environment, climate, mobility, and sustainable growth**. The focus will be on introducing a reform in reorganizing teaching activities of Kosovo's universities aiming to encourage professors to increase research activities. Professors focused on a particular research topic will have the opportunity to teach the same topic. This will increase both the quality of teaching and research activities at the Kosovo's universities.
- A **close coordination with the national contact persons of Horizon Europe** and other EU programs, which support research activities that cross the borders, will enable to identify calls with respect to energy, climate, mobility, agriculture, waste management, water management. This helps Kosovo to address different industrial needs, for example, identifying feasible electricity generation mix that ensures reliable and affordable power supply.
- Kosovo will **establish the "Kosovo Open Data Centre" (KODC)**, which will be responsible for gathering and managing the data of almost all economic sectors and of social activity in Kosovo. Private policy issues will be of particular importance. The data will be publicly available. KODC is responsible to develop the infrastructure needed to collect the data at the most granular level. Kosovo's open access data policy opens the gates for Kosovo's and international researchers to use this data and conduct scientific research projects with a high industrial policy relevance.

Only after Kosovo's universities, and research institutes manage to start setting up modern research infrastructure, and acquire state-of-the-art research methods, research activities in Kosovo will cover the following energy and climate policy priorities:

Energy security

Development of smart policies and innovative solutions to ensure energy security of supply through combining various decentralized renewable technologies. At the same time, the external (environmental) effects of renewable energies will be properly managed. Research activities will address the problem of instable electricity supply because of the lack of capacities on the whole chain of electricity supply (i.e. electricity generation, transmission and distribution):

- a) Researchers, together with various governmental bodies and industry partners, (e.g., KEK, KOSTT, and KEDS) and other stakeholders from civic society will research the **appropriate mix of generation technologies**. This should ensure: (1) a reduction of the usage of coal for electricity and heating purposes, and replace it with renewable energy sources, and (2) a reliable and affordable power supply.
- b) **Integration of renewable energies, especially wind and solar**, increases the intermittency on the power system. Exploration of innovative solutions and experiences from other countries is of particular importance in identifying additional power system costs (e.g., re-dispatching, balancing services) that may arise by increasing the share of intermittent renewable energies.

³ The most successful universities are University of Prishtina, University for Business and Technology, and American University in Kosovo

- c) The Hydrometeorological Institute of Kosovo in cooperation with KOSTT, KEDS, and other renewable energy producers will launch a joint project to build modern capacities that will provide **reliable and accurate day-ahead and intra-day forecasting of the volatile feed-in of electricity from wind and solar power plants**. This without a doubt helps reducing the costs of electricity supply through an efficient planning of the utilization of power capacities along the whole supply chain.
- d) In line with the Climate Change Strategy 2019-2028, research will help to get a broad picture about **water capacities** in Kosovo and explore which strategic investments are needed to eliminate all water deficiencies. This will open the door for big projects aiming to simultaneously increase Kosovo's drink water, irrigation and energy capacities by investing in additional water storage reservoirs within river basins. This increases Kosovo's reserve electricity generation capacities with high flexibility, which can be activated faster and in shorter periods to eliminate potential blackouts and power system imbalances when needed. This increases the choice of the transmission system operator to manage efficiently large fluctuations of power feed-in especially from intermittent renewable energies. All possible environmental, social and economic effects will be quantified to enable a transparent and evidence-based decision-making process. Therefore, a multi-sectoral and multi-dimensional analysis is required.

Internal market

Exploring the best combination of different energy, climate, and regulatory policies in designing power markets to foster innovations, reducing energy prices, and improve the competitive edge will contribute towards eliminating existing monopolies in electricity generation and retailing by increasing the number of producers using different climate neutral technologies, and the number of retailers leading to a higher market efficiency and lower power prices. Therefore, various governmental bodies, including ERO, together with universities will put the emphasis on research activities that help identifying suitable energy, climate, and regulatory policy measures to animate an open energy market, where firms will have higher incentives to enter the market and offer innovative products and services.

- a) Firms will be encouraged through appropriate policies to invest in environmentally friendly energy technologies helping Kosovo to ensure **reliable and affordable power supply** by, first, increasing generation capacities and, second, reducing the monopoly power of the incumbent.
- b) New firms will be stimulated to enter the electricity retail market. This enables consumers to choose their supplier. It is also necessary to encourage consumers to switch to new suppliers. This will increase the competition pressure, which in turn increases the market efficiency. Therefore, research will be done to **find answers under which market conditions new firms enter the market and, at the same time, consumers switch their electricity supplier**.
- c) Regulatory policies will ensure that natural monopolies (i.e., transmission and distribution operators) will follow national goals in ensuring reliable and affordable power supply. New regulatory measures will be on the focus of research studies aiming to find suitable policies in increasing investment in both transmission and distribution in terms of grid extension and modernization to reduce power outages as well as commercial and technical losses. **New regulatory policies in terms of innovative network tariffs** will be assessed within the next two years to encourage **digitalization and employment of smart meters**. This ensures that Kosovo will utilize the potential of **demand response and demand management** in a near future.
- d) The problem of uncontrolled urbanization is still increasing the costs of network operators (especially distribution). Interviews with stakeholders from the construction sector show that most of new collective and business buildings are also conceptualized to use electricity for heating purposes. There are four emerging problems because of this: (1) increasing of instability of voltage feed; (2) unplanned investment to upgrade the grid; (3) increasing demand in an overloaded power grid; and (4) higher network losses. Therefore, studies will have to use historical data for recognizing electricity demand patterns in different network nodes. This helps the distribution system operator to gain valuable knowledge about the time and space distribution of the load on the electricity grid, network losses and other related issues. All associated costs must be quantified in monetary terms to make visible the costs of unplanned urbanization for the whole society. To conduct a study of this scope, a large number of stakeholders, including KEDS, KOSTT, ERO, responsible ministries, universities, construction associations, and civic society, will have to cooperate. Eventually, Kosovo will be able to implement **well-coordinated spatial planning, urbanization, and regulatory policies in facilitating suitable and efficient solutions for uncontrolled urbanization**. This integral approach enables the

development of an efficient, easier, planned and productive grid management, which in turn reflects in lower electricity prices for consumers.

Decarbonization

In the development of strategies and innovative solutions with respect to environmental protection, mobility, water management, waste management, forestry management, and agriculture, a particular emphasis will be put on identifying innovative ideas to (1) reduce pollution; (2) bring new technologies in revitalization of forest covers and forest, (3) improve agriculture, water, and forest management in reaching climate goals and encouraging tourism.

- a) With respect to mobility and infrastructure, Kosovo has been pursuing the objective of improving the quality and building new infrastructure. The fourth pillar of the National Development Strategy is mainly focused on the importance of **modernization of the railway infrastructure**. The work in modernizing the international railway line, Line 10 (length 148 km) from Fushë Kosovë to North Macedonia (southern line) and from Fushë Kosovë to Serbia (northern line) has started. This will significantly increase the quality of rail services for both passenger and freight transport. The potential of this project in improving the carbon footprint of the region in the transport sector is very large.
- b) Studies will be conducted in a spirit of a **pilot project to identify all opportunities in maximizing the utilization of modernized segments of the railway infrastructure**. In a pilot project, researchers, by means of a very comprehensive study, will help providing solutions which ancillary (municipal and regional) services with a special emphasize on public transport should be developed so that commuters (students and workers) from Ferizaj to Prishtinë⁴ and vice versa will decide to use rail transport, rather than buses and cars. This study will deliver optimization solutions for commuting routes via public transport subject to maximizing public welfare and minimizing pollution. What is more important, by using modern research methods, this study will deliver an in-depth analysis of other dimensions of commuter decision, like for which combination of ticket prices and fuel prices people will decide to switch to rail transport. Conducting a study of this nature requires a close coordination between researchers of various universities and topics, municipalities of Ferizaj and Prishtinë, Trainkos, and other public and private stakeholders.
- c) The design of public transport will be on the loupe of research. The architecture of cities unfortunately is not supporting a smooth development of public transport. Therefore, research activities will be focused on finding **innovative ideas that enable an efficient, productive, and climate neutral development of public transport**. The introduction of tramways is very cost-intensive and time-consuming. Therefore, experiences from different cities across the globe have shown that the usage of cableways is a good alternative.
- d) Kosovo will review the laws with respect to registering old and new cars imported from abroad. The large number of old cars and trucks in the traffic is increasing not only the number of accidents, but also worsening the carbon footprint of the transport sector. Therefore, the revised law will make sure to put the **right incentives in importing cars and trucks** that will help Kosovo to have a safer traffic and at the same time lower greenhouse gases.
- e) Within the next 2 years, Kosovo will conduct studies to analyse the **potential of developing bike routes** helping people to ride to work instead of driving the car or using public transport. This improves not only the carbon footprint of Kosovo, but also has additional positive side effects on the health and financial situation of bikers. The Government of Kosovo will encourage people to use the opportunities that the Innovation and Training Park Prizren and Innovation Centre of Kosovo offers to develop innovative business ideas that push people to use more bikes to commute short distances.
- f) In line with the Climate Change Strategy 2019-2028, research activities will be focused on coming up with **best innovative and customized solutions that pave the way to climate change adaptation measures**, such as:
 - efficient usage of scarce water resources
 - adapting building codes to future climate conditions and extreme weather events – a coordination with energy efficiency measures is needed,
 - building flood defences and raising the levels of dykes,
 - developing drought-tolerant crops,

⁴ Prishtina and Ferizaj are the biggest towns of Kosovo in terms of GDP contribution.

- choosing tree species and forestry practices less vulnerable to storms and fires,
 - setting aside land corridors to help species migrate.
- g) Comprehensive studies will be undertaken in order to provide a good outline about the **best feasible options to ensuring reliable, affordable, and sustainable electricity and heating supply**. This requires an in-depth analysis of all possible technologies that Kosovo needs to employ in the future toward decarbonization of the power sector – responsible for the lion share of emissions.
- h) Kosovo will eventually bring into the discussion the **introduction of carbon pricing**. A large number of stakeholders from academia, civic society, industries, and government will be encouraged to research:
- which industries will most likely be affected,
 - the optimal carbon price level,
 - the necessity to introduce a price floor if an emission trading scheme (ETS) in the spirit of a cap-and-trade system is an option,
 - estimate its short- and long-term effectiveness in terms of emission reduction,
 - for which purposes will the collected funds be employed,
 - the price inflation on energy and other carbon intensive industries,
 - the risk of carbon leakage,
 - the economic and social development effects.

Energy efficiency

Energy efficiency in Kosovo is recognized as a key in ensuring lower bills for industry and households, low greenhouse gas emissions and increased security of supply. There is a large potential to increase energy efficiency, since the building sector in Kosovo consumes twice as much energy per square metres as the EU average.

- a) The Government of Kosovo will immediately support **studies to obtain information about the average age of most of household energy intensive appliances**. Demographical data of households will be collected as well. Studies of this nature support the Government of Kosovo to introduce policies designed to not only increase energy efficiency, but also decrease energy poverty.
- b) At the same time, the Government of Kosovo will support **studies to get information about the average age and energy intensity of machines and other production facilities employed in production processes in various industries**. These studies will help the Government of Kosovo to design different climate policy programs to facilitating the industrial sectors to modernize their factories in terms of better insulations and new machines. This will decrease the emissions of greenhouse gases as well as increase, productivity, efficiency, and thus the competitiveness of domestic industries.
- c) Implementation of **innovative policies that pave the way for efficient management of energy efficiency investment** and encourage both the private and public sector to engage in reducing energy intensity.
- d) Researchers together with a large number of firms will be engaged in conducting **studies in identifying innovative and energy efficient construction materials**. This should enable the development of thermal insulation building systems with higher thermal performance.

Renewable energy

Kosovo will be engaged in supporting the development of innovative energy systems and implementation of incentive-based mechanism to foster the integration of intermittent and non-intermittent renewable energies. This will pave the way out of coal energy production. The focus will be on integrating information and communication technologies in power systems to identify innovative technologies enabling an efficient short-term cohabitation of coal and intermittent renewable energies in terms of effective management of system imbalances. Moreover, the potential of integration of smart metering, demand-side management, and demand response will be of particular importance.

- a) Digitalization of the power system will ensure integration of digital equipment that facilitate **very efficient and smart management of the power system**. For example, smart meters enable Kosovo's households and industrial customers to pay different prices depending on the time when they consume. This encourages introduction of measures enabling demand response and demand side management. Research activities will help quantifying the elasticity of electricity demand to see the potential of

demand response. This facilitates network operators to introduce not only an effective and efficient imbalance management, but also a better match of electricity demand and supply and increase in energy efficiency. The result is an environmentally friendly energy management where customers pay low prices and enjoy security of supply.

- b) The geographical dispersion of **decentralized renewable energy sources** will be thoroughly analysed in order to better control capital expenditures for network extensions. Therefore, it is of particular importance to find the best locations for investment in additional renewable energy capacities by considering both the transmission and distribution capacity limitations.

The size of the energy market does not promise that foreign investors will have high interest investing in Kosovo. Therefore, Kosovo will encourage research activities to **identify specific projects that might be interesting for diaspora investors**. This will also be a good opportunity to get the knowhow and to channel the increasing financial potential of diaspora. Another valuable opportunity comes after the high voltage interconnection line with Albania starts working, where the governments of both countries will use the chance to develop joint projects in integrating larger amounts of renewable energies.

PAM 53: Piloting Power-to-Gas (P2G).

Owing to increased discussions about P2G's place in future energy systems and technology advancements, a pilot project for alternative feedstock and fuels in industry is in consideration. The idea is to install an electrolyser to produce hydrogen which will be further used in industry as a feedstock (e.g., fertilizers production) or as fuel for high temperature industrial processes.

PAM 54: Education and trainings for skilled workers in the area of sustainable energy technologies

This umbrella PAM includes targeted measures for promoting education of skilled workers for buildings renovation, district heat installation, PV and heat pumps installation etc.

PAM 55: Establishing industrial alliances to foster innovation

The Government of Kosovo will support networking of enterprises in similar industrial alliances. This will help strengthen the connections between industries, creation of new enterprises supported by existing ones and innovation through connection with research efforts. The ECRP will also intensify a healthy collaboration between universities and industrial alliances. This will empower the identification of the best possible opportunities in modernizing industries toward decarbonization. A close cooperation between various governmental bodies, universities, and businesses will pave the way for technology and knowledge transfer for fostering innovative ideas, which in turn will strengthen the national and international competitiveness of domestic industries.

II. Where applicable, cooperation with other Contracting Parties and/or Member States of the European Union in this area

Fortunately, there are no language barriers with Albanian and North Macedonian universities and research institutes, which makes any form of cooperation very easy. Kosovo will initiate joint projects to exploit this potential in order to reduce the costs of climate and energy policies. Kosovo is highly encouraged to develop the ECRP together with Albania and North Macedonia, where universities of the three countries with governmental and industrial stakeholders jointly conduct research studies in exploring innovative solutions related to local and regional energy and climate issues.

In addition, there is a large potential to develop joint university bachelor, master and PhD programs with respect to energy and environmental issues. Kosovo is very interested and motivated to present these regional initiatives to Albanian and North Macedonian authorities. This helps all participating countries to share the costs of developing these joint programs.

III. Where applicable, financing measures in this area at national level

An innovation support scheme will be established to increase investment incentives of SMEs in scientific research and development. This scheme is planned to be part of the Employment and Development Fund. In addition, Kosovo will also introduce tax exemptions for purchase of new technology and encourage connection with research institutions abroad. This is relevant for **PAM 55: Establishing industrial alliances to foster innovation**. The other PAMs from this sector could be fully or partially supported through Horizon Europe, Bilateral research cooperation agreements, IPA III (thematic priorities: "Green agenda and sustainable

connectivity” and “Competitiveness and inclusive growth”), WB Investment Fund (Flagship 4 – Renewable energy, Flagship 5 – Transition from coal, Flagship 6 – Renovation wave, as well as Flagship 9 – Investing in the competitiveness of the private sector, German EUKI program, and others.

4 CURRENT SITUATION AND PROJECTIONS WITH EXISTING POLICIES AND MEASURES

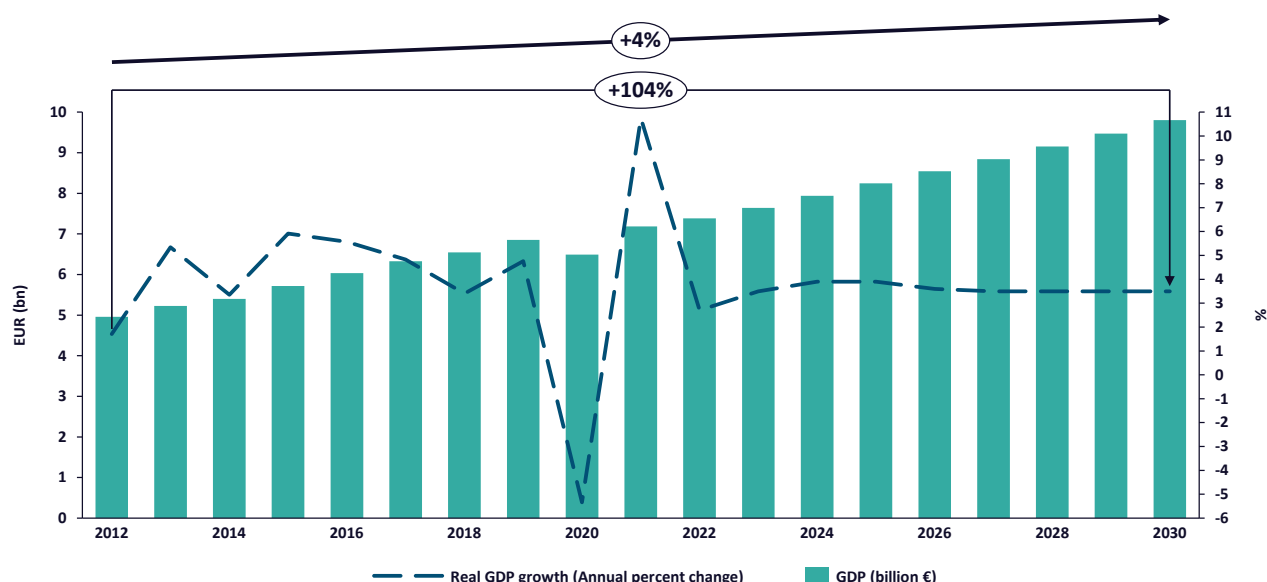
4.1 Projected evolution of main exogenous factors influencing energy system and GHG emission developments

The modelling work and analysis is underpinned by the most relevant data inputs to project future developments of the energy system as well as GHG emissions. The following sections provide the key data indicators and assumptions used.

I. Macroeconomic forecasts (GDP and population growth)

The macroeconomic drivers underpinning the analysis and modelling are taken from the most up-to-date projections and estimates. Real Gross Domestic Product (GDP) is one of the most important indicators, given the strong link between GDP and energy demand. The data used was retrieved from the International Monetary Fund's last available World Economic Outlook from April 2023, using both historical data and projections, including expected real growth rates until 2028 and constant assumed growth rates thereafter.¹ All data is expressed in real terms with the base being in 2016 Euros.² In 2021, Kosovo's GDP amounted to EUR 7.2 bn with a 10.7% real growth rate stemming from the sharp recovery following declines in 2020 caused by the global COVID-19 pandemic. Projected real GDP growth after 2023 remains above 3.5% annually until 2028 and is assumed to grow by a constant rate of 3.5% annually thereafter until 2040. The expectation of continuous growth means that by 2030, Kosovo's GDP is over 36% higher than in 2021, reaching over EUR 9.8 bn. The growth assumption until 2040 is of continuous real GDP growth of 3.5% annually, leading to a GDP of EUR 13.83 bn by 2040 (Figure 24).

Figure 24. Real GDP and Real GDP Growth 2012-2030



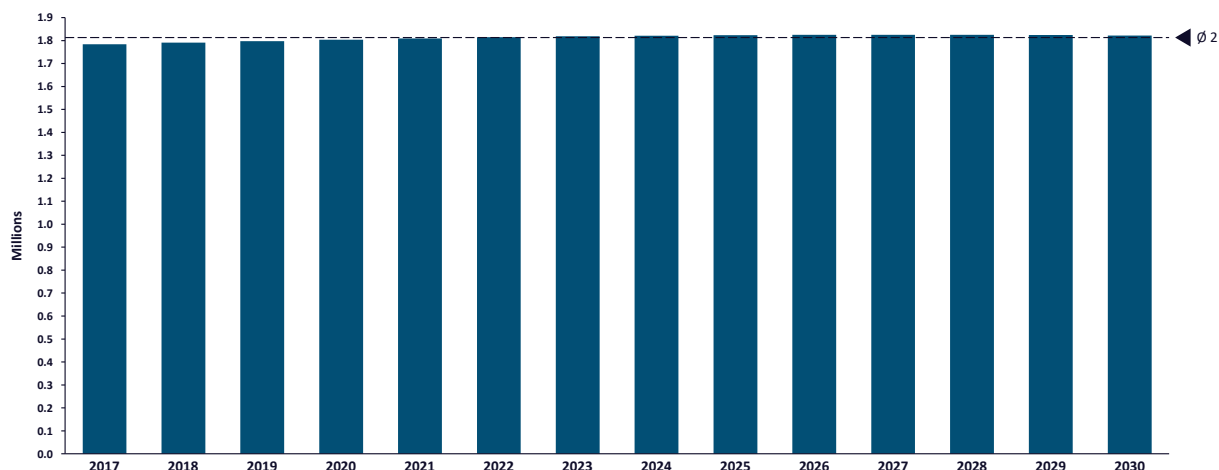
Source: IMF World Economic Outlook April 2023, own calculations

¹ IMF WEO 2023

² This applies to all monetary values used in the analysis.

The population variable and growth rates are also fundamental as they exert significant influence on the rate of energy consumption in an economy. The analysis and modelling consider not only the total population size, but also the number of households and inhabitants per household. In 2021, Kosovo had 1.81 million inhabitants (Figure 25) in roughly 373,000 households – an average rate of 4.85 inhabitants per household. Data taken from the Kosovo Statistical Agency’s “Kosovo Population Projection” was used, selecting the Medium Variant projection, which forecasts a 0.66% increase between 2021 and 2030, with a population of 1.82 million by 2030.³ Between 2030 and 2040, a compound annual growth rate of 0.074% was used in the modelling, reflecting the relative constancy of Kosovo’s predicted population size, leading to a total population count of over 1.83 million inhabitants by 2040.

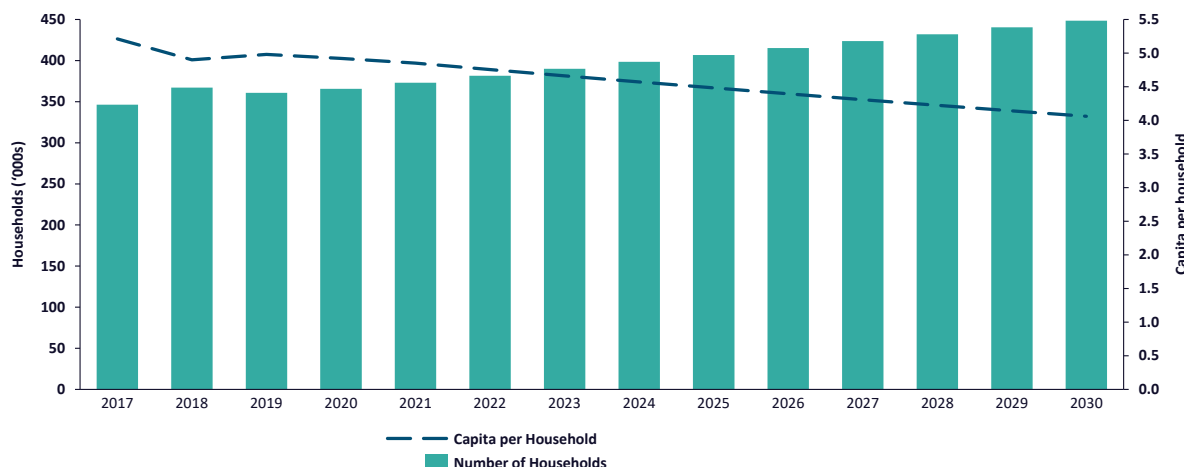
Figure 25. Population 2017-2030



Source: Kosovo Population Projection, own calculations

Concurrently, the number of households in Kosovo is expected to increase, resulting in a lower number of inhabitants per household. In 2021, there were over 373,000 households with an average rate of 4.85 inhabitants per household. By 2030, there is the expectation of over 448,000 households with an average rate of 4.06 inhabitants per household. This indicates a 20.2% increase in the number households, while the number of inhabitants per household decreases by approximately 16.3%. This trend continues thereafter until 2040, with the expected number of households standing at over 498,000 with an average inhabitant rate of 3.7 per household by 2040 (Figure 26).

Figure 26. Number of households and inhabitants per household 2017-2030



Source: Kosovo Statistical Agency, Kosovo Population Projection, own calculations

³ Kosovo Agency of Statistics - <https://askdata.rks-gov.net/pxweb/en/ASKdata/>

II. Sectoral changes expected to impact the energy system and GHG emissions

Apart from macroeconomic developments and changes in the population structure, different structural changes affect the energy system and emissions on a sectoral level. The most important effects are presented below by sector.

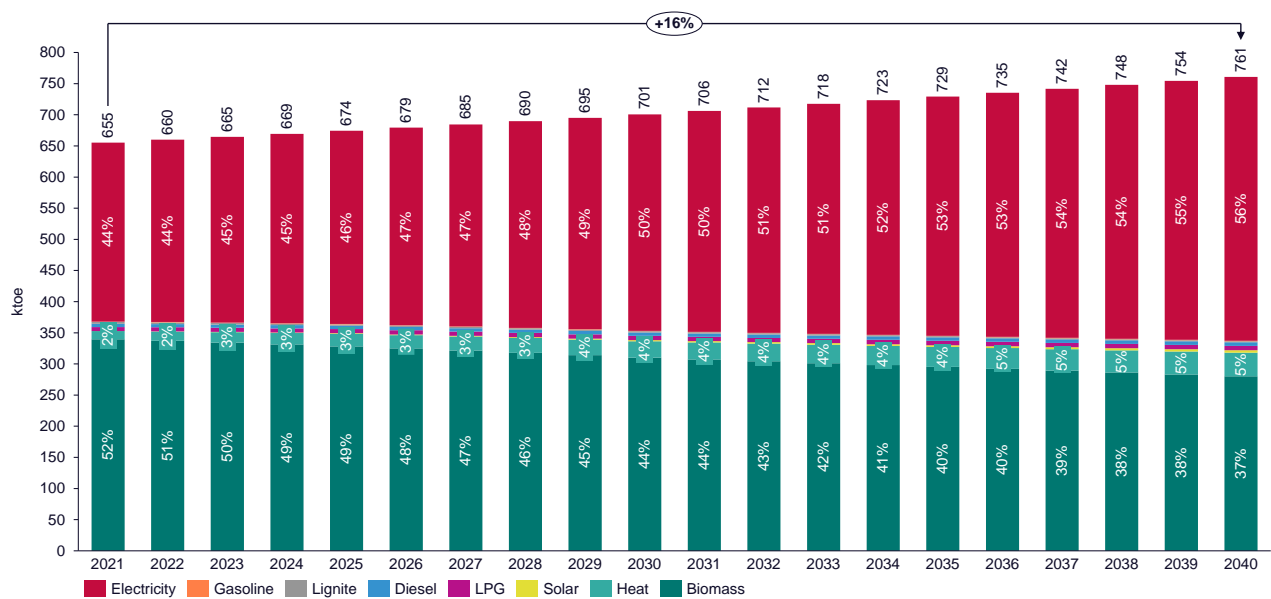
Residential sector

The residential sector is the largest energy consumer in Kosovo. According to Eurostat (2021), this sector was responsible for 57.6% of total electricity consumption in 2021.⁴

In the WEM Scenario, the electricity demand in the residential sector is projected to increase by 16% in the 2021-2040 period (Figure 27). This trend can be attributed to the increasing urbanisation of households: The decline in the number of rural households will gradually reduce the total consumption of biomass for space heating, mostly being replaced with electricity.⁵ Additionally, the expansion of district heat systems in Pristina and Gjakova will increase the share of district heat in the household sector.

Accordingly, the share of biomass in the energy consumption of the residential sector decreases significantly from 52% to 37% between 2021-2040, while the share of electricity increases from 44% to 56% over the same period. A smaller increase is expected for district heat, which share is estimated at 5% in 2040 up from 2% in 2021. The remaining fuels remain relatively constant over time.

Figure 27. Residential Fuel Shares



Source: own calculations

The energy consumption trajectory of the residential sector is based on 2015-2020 historical trends adjusted downwards to reflect changes in demography, economy, and construction standards and to account for the impact of Near Zero Energy Buildings (NZEB)⁶. Additionally, the WEM scenario incorporates energy savings envisioned by the adopted Energy Strategy of the Republic of Kosovo (2022-2031). The energy savings are the result of measures such as the improvement of insulation and glazing in about 1% of single-family houses, terraced houses and multi-family buildings per year, as well as the construction of a small number of NZEB. Moreover, the Energy Strategy envisages the installation of solar thermal collectors, development of an Energy Service Companies (ESCO) market and the development of a building's energy certification scheme.

⁴ <https://ec.europa.eu/eurostat/web/energy/data/energy-balances>.

⁵ 60% rural share in 2021, 57% in 2030 and 53% in 2040, following KAS projections.

⁶ Economic Consulting Associates Limited (2020) - Draft Building Renovation Strategy.

In the model it is projected that the total floor area in the residential sector will increase by 1.2% per annum. The share in floor area by building type in 2021 are depicted below.

Table 7. Share in floor area of total building stock by type of building in 2021

Single Family Houses	Terraced Houses	Multi-Family Homes	Apartment Buildings
52%	6%	6%	36%

Source: Draft Buildings Renovation Strategy 7

The energy demand in the residential sector is broken down in different end-uses, which are projected to grow heterogeneously in the WEM scenario. The annual need for space heating in the residential sector is much higher than the annual need for cooling/air conditioning. However, at the present moment, cooling is not a common practice in Kosovo, especially in the residential sector. In fact, according to Eurostat (2021), space heating consumed twenty times more energy than space cooling and air conditioning in 2021. Nevertheless, due to climate change-driven average atmospheric temperature increases and increasing affordability of cooling appliances, it is projected that space cooling will become a more widespread practice within the analysed timeframe.

The high share of space heating in relation to cooling for the base year largely stems from the high need for heating throughout the year. The following table reports heating degree days (HDD) and cooling degree days (CDD) for Pristina, which are related to the severity of the respective winter and summer outdoor temperatures. Commonly, this is measured in cumulative annual 'degree days' of outdoor temperature deficit or surplus relative to a 'base temperature' level and are used to infer demand for heating and cooling.

Table 8. HDD and CDD 5-years average (2018-2022) Pristina International Airport Weather Station

Reference temperature	HDD	CDD
15.5°C	2226	790
18°C	2855	502
21°C	3719	270

Source: www.degreedays.net

Services sector

The services sector consists out of the public and commercial sector building stock. Together, these two accounted for about 6% of total energy consumption in 2021.

Similar to the residential model, the energy consumption trajectory in the service sector reflects a combination of demographic and growth factors and takes into account baseline renovation estimates and higher construction standards for new buildings in the future.

The renovation rates for the service sector are based on bottom-up estimates for savings from renovation per square meter as indicated in the Energy Strategy.⁸ It is projected that about 0.3% of floor area will be renovated annually in the commercial sector. The public building stock will be renovated at around 0.8% per annum. Additionally, 1% and 3% of the total floor area of Central Government Buildings will be renovated in 2021-2023 and 2024 onwards, respectively, as per Article 5 of the Energy Efficiency Directive. The total floor area is projected to increase at a different rate for each subsector, i.e., 1.4% annually for the commercial and 0.5% annually for the public sector, and thereby is assumed to grow in line with baseline energy consumption trends for these sectors as outlined in the draft building renovations strategy.

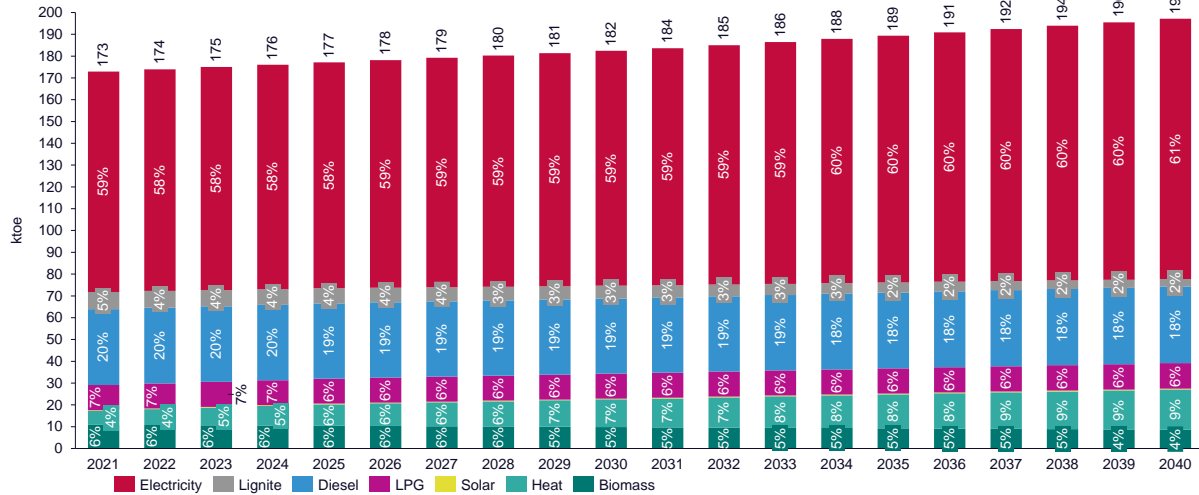
Overall, the savings in the services sector derive from renovation (insulation and glazing of windows) and additional measures such as the introduction of an ESCO market, Energy Performance Certificates as well as special renovation for Central Government buildings as outlined in the Energy Strategy.

⁷ Ibid.

⁸ Energy Strategy of the Republic of Kosovo 2022-2031.

In the WEM scenario for the service sector, the fuel share of electricity is expected to increase from 59% in 2021 to 61% in 2040, while the share of biomass decreases from 6% to 2% in the same period (Figure 28). More pronounced than in the residential sector, the share of district heat increases, from 4% to 9% while the remaining fuel shares remain again relatively stable.

Figure 28. Service Sector Fuel Shares



Source: own calculations

Industry

The industrial sector is an important economic sector, energy consumer and emitter in Kosovo. In 2021 industrial gross value added (GVA) accounted for 28.97% of total GVA (Figure 29) and is projected to increase by 31.18% in real terms in the 2021-2030 period (Figure 30). Industrial subsectors are projected to grow heterogeneously according to the trends observed in the past ten-year period (2012-2021).

Figure 29. GVA % per sector (2021)

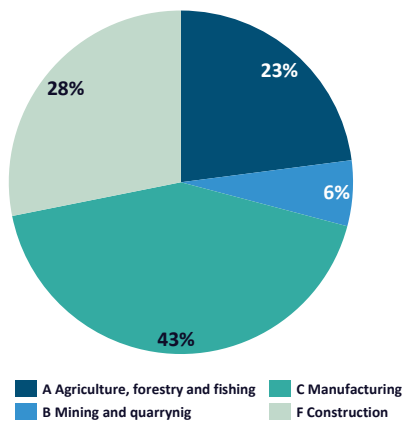
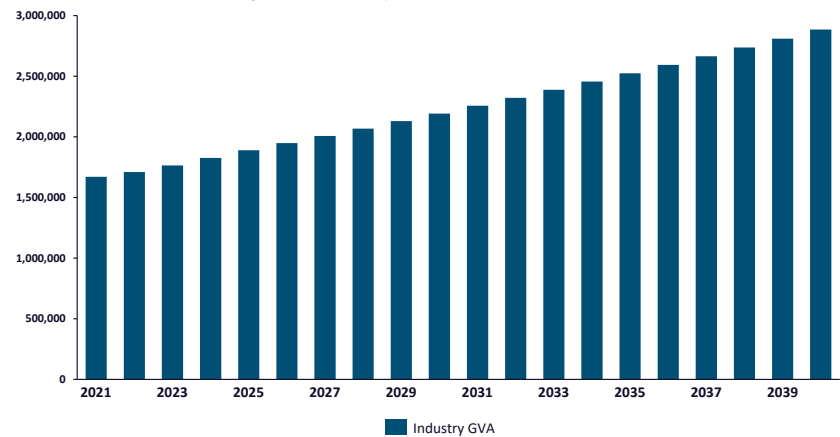


Figure 30. Projected Industrial GVA (2021-2030)



Source: Kosovo agency of Statistics and own calculations.

In the model, GVA is coupled with sectoral energy demand and emission levels. Therefore, it is projected that emission and energy levels will increase in the future. Nevertheless, the growth in energy consumption will be partially dampened by energy efficiency increases in the sector, which amount to 0.7% per year. The assumption of energy efficiency increases is based on the historical trends observed in the European Union which are then adjusted downwards to reflect the efficiency improvements observed in Kosovo in recent years.⁹

⁹ Brizard (2019). *Projections of energy consumption and energy savings potential in Kosovo to 2030*.

Industrial Processes and Product Use

Industrial processes are another non-negligible source of greenhouse gas emissions in Kosovo. Emissions in this category are not directly attributable to the energy consumption of the industrial sector but result from different chemical and physical processes which occur in industrial activities.

Emissions from industrial processes are directly tied to the GVA of the respective subsector. Non-energy emissions from cement calcination and lime production are linked with economic activity levels of the non-metallic industry and non-energy emissions in the ferro-nickel production are coupled with the GVA of the iron and steel industry.

Emissions from these sectors are projected to increase due to growing activity levels. The largest source of emissions in the industrial processes category is cement production, which accounts for about 90% of total emissions of industrial processes in the base year. Non-energy emissions from the use of paraffins, lubricants, solvents, aerosols, refrigerators and air conditioners belong to the product use category. In the model, lubricants, paraffins and solvents emission levels are tied to the GVA of the manufacturing sector. Additionally, emissions from aerosols, refrigerators and air conditioners are projected to increase with the growing number of households. To reflect the Kigali amendments to the Montreal protocol, Hydrofluorocarbons (HFCs) emissions from aerosols and refrigerators are projected to stay constant from 2024 onwards.

Transport

Increasing activity levels in the transport sector are the main cause of the rise in emissions and energy consumption, both in the passenger and freight segments. In the model, activity levels of passenger and freight transport are tied to demographic variables and the increase GDP, respectively. Additionally, an important parameter that is projected to affect energy demand and emissions is the light duty vehicles (LDVs) ownership rate, which represents the number of cars per capita. The growth rate of 4.8% per year in the period between 2021-2030 is projected to have a significant impact on energy demand in the passenger transport branch. After 2030, the car ownership rate is projected to grow annually by 3%.

The main transport mode in the passenger transport segment are LDVs (Figure 31), while only a minor share is covered by other road transport modes such as buses, vans and motorcycles. Despite increasing activity levels of railway passenger transport, this transport mode only covers a minor share of transport demand. The chart below displays the development by mode split in the passenger transport sector in the 2021-2030 period.

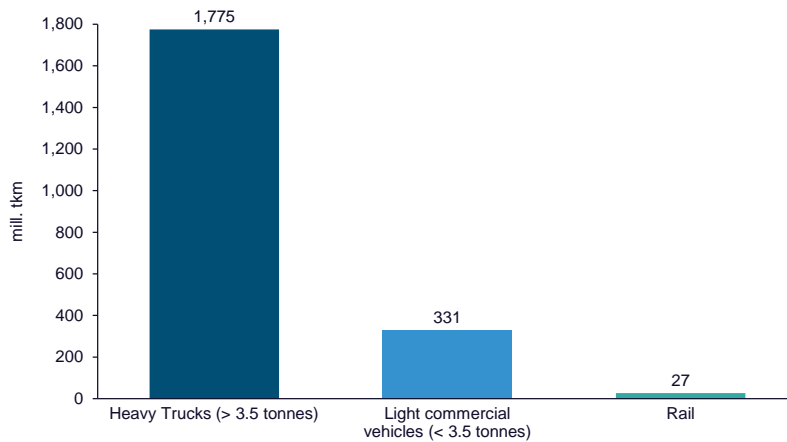
Figure 31. Passenger km by mode (bill. pkm)



Source: own calculations

The majority of freight transport demand is met by road transport (Figure 32), and – similarly as for the passenger transport sector - only a marginal share is covered by railway transport. In the road transport, heavy trucks are the main transport mode.

Figure 32. Freight transport tonnes-kilometres by mode



Source: own calculations

The recently approved Multimodal Transport Strategy (2023-2030) aims to develop a sustainable and integrated transport system in the country. Through the adoption of the alternative fuel infrastructure Directive 2014/94/EU and the setup of national policy frameworks to expand the network infrastructure, it is projected that in 2030 the share of alternative fuel vehicles (hybrid, electric) will reach 10%. Moreover, according to the approved strategy, sustainability in the sector should be achieved with more stringent emissions' standards in the buses, vans, light commercial vehicles, and heavy trucks categories.

Additionally, the shift to more efficient transport modes is expected to have a major impact on energy consumption and emissions' levels. For instance, Trainkos, the national railway company, in addition to increasing electrification in the railway network by 2030, plans to expand passenger traffic, forecasting an increase to 500,000 commuting passengers by train per year in 2030.

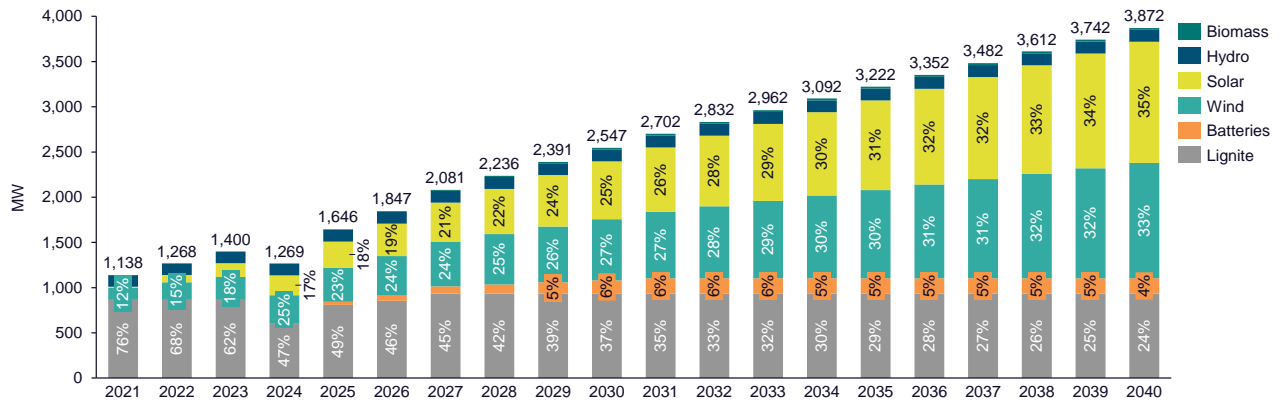
Energy transformation

Given increasing economic growth, structural changes in demographics and policy drivers, electricity and district heat demand in the country is expected to increase. Electricity demand is projected to grow by 20.35% in the 2021-2030 period and by 45.91% in the 2021-2040 period. District heat demand is expected to increase by 96.54% in the 2021-2030 period and by 185.5% in the 2021-2040 period.

The Energy Strategy of the Republic of Kosovo (2022-2031) envisages an ambitious expansion plan for renewable power and district heating generation, as well as a revitalisation of the majority of the country's outdated lignite power generation assets to meet increasing domestic electricity and heat demand.

Availability of Kosovo's lignite generation units follows the provided plans for decommissioning and retrofits by its operator KEK. Two units of Kosovo A are assumed to be retrofitted and placed in strategic reserve by 2028. In addition to currently existing capacities, the expansion of RES generation capacities and battery storage follows the plans outlined in Kosovo's Energy Strategy until 2031. Capacity expansion for solar PV and wind from 2031 until 2040 is extrapolated from the projected speed of expansion up to 2031. No further additions for other generation and storage capacities between 2031 and 2040 are assumed in the WEM scenario (Figure 33).

Figure 33. Installed electricity generation capacities (projection)



Source: Energy Strategy, ERO, KEK, DH Gjakova, own calculations; Note: For lignite units, available capacities (including strategic reserves) are shown, based on the provided schedule for unit retrofits. Retrofits of units B1 and B2 are assumed to take place in the middle of the respective year.

Gradual reductions in distribution grid losses through grid modernisation follow the targets of the Energy Strategy. Maximum net-transfer capacities (NTC) are based on projections by the Energy Community (2021)¹⁰, ENTSO-E’s Ten-Year Network Development Plan (TYNDP 2022)¹¹ and ENTSO-E’s system needs study.¹² Electricity demand and installed capacities for other countries are also obtained from TYNDP 2022.¹³ Expansion of the two district heat systems in Pristina and Gjakova are based on provided information from the respective operators. There are no other relevant energy transformation processes in Kosovo as the country does not possess any operating oil refineries or other types of energy conversion facilities.

Figure 34. Map of the European integrated power and heat model



Source: own illustration

¹⁰ Energy Community Secretariat (2021). *Electricity Interconnection Targets in the Energy Community Contracting Parties*.

¹¹ <https://2022.entsos-tyndp-scenarios.eu/download/>

¹² <https://eepublicdownloads.blob.core.windows.net/public-cdn-container/tyndp-documents/TYNDP2022/public/system-needs-report.pdf>

¹³ Missing information for Moldova and Ukraine is imputed from draft Energy Strategies of those countries and expert assessment.

Kosovo's energy transformation sector is modelled in a custom-built sector-coupled techno-economic dispatch optimisation model based on the open-source energy systems modelling framework Calliope.¹⁴ The model represents supply and demand for district heat and electricity in all continental European countries¹⁵ including Great Britain and Ireland. The map on Figure 34 shows a map of the countries included in the model with Kosovo highlighted in orange.

Modelling Kosovo's energy supply and transformation as part of the integrated European energy system allows to accurately represent trade flows and policy interactions with neighbouring countries as well as the European Union. The introduction of the Carbon Border Adjustment Mechanism (CBAM) in the European Union is projected to affect carbon-intensive electricity exports from the Western Balkans region, which is reflected in the model as a surcharge on electricity exports to the EU, calibrated to each country's average emission intensity and priced at projected EU-ETS allowance prices reduced by the CBAM factor due to the gradual phase-in of the EU policy. Emissions within the European Union are priced at full projected EU-ETS allowance prices.

The model jointly optimises the dispatch of electricity and heat generation across the continent, allowing for an analysis of the interactions between power and heat systems via cogeneration as well as utility-scale heat pumps.

Agriculture

Similarly to the industrial sector, energy consumption and emission levels in the agricultural and forestry sectors are tied to economic activity. Basing on growth trends observed in the previous 10 years (2012-2021), it is projected that agricultural GVA will increase by 26.54% in 2030 with a consequent rise of energy demand and emissions in the branch. In the model it is assumed that technological progress and innovation in the sector will lead to an annual increase in energy efficiency of 0.7%, partially counterbalancing the effects of an increasing energy demand in the sector.

On the other hand, non-energy emissions in the agricultural sector are mainly driven by trends related to livestock and farm structure, such as farm size and abandonment. It is projected that some agricultural land will be lost to built-up land, but these areas only cover a small area, and thus are negligible for emission accounting. The soon to be implemented land tax for not using cropland will counteract abandonment and facilitate increases in average farm size. The stated objective of this policy is zero abandonment. Following these developments, a consolidation of agricultural holdings towards larger average farm sizes and higher agricultural efficiency can be expected in the next years.

According to sectoral experts, most pastures will continue to be used in the future, although the intensity of grazing (animals per unit of area) will decrease. Some more marginal pastures will probably be abandoned due to the expected lower number of sheep by 2030.

However, pasture abandonment will probably have marginal effects on carbon stocks because most of these lands are natural grasslands that are at higher altitudes, poor soils, and in remote areas. Therefore, abandoned pastures will not provide promising options for afforestation or carbon sequestration in other pools.

There are plans to increase livestock production with additional substantial government investments. Small dairy producers, that is, those with five cows or less, are projected to disappear largely by 2030. As a result of the higher efficiency, particularly in dairy production, the intensity of emissions (i.e. GHG emissions per unit of produce) will decrease.

¹⁴ Pfenninger, S., & Pickering, B. (2018). Calliope: a multi-scale energy systems modelling framework. *Journal of Open Source Software*, 3(29), 825.

¹⁵ Excluding the Russian Federation and Belarus.

Table 9. Livestock development in the agriculture sector

Livestock categories (1000 heads)	2021	2030
Cattle (1000 heads)	261	235
Of which dairy cows	134	121
Pigs (1000 heads)	45	41
Sheep/goats (1000 heads)	242	218
Of which breeding ewes/goats	181	163
Horses, donkeys and mules (1000 heads)	1,8	1,6
Poultry (1000 heads)	2,8	2,5

Source: Statistical Agency of Kosovo and own calculations

Additionally, larger farms are more prone to manure storage. In crop production, larger farms will apply higher amounts of fertiliser per hectare, and hence have larger emissions.

Table 10. Development of nitrogen input in the agriculture sector

Year	2021	2030
Nitrogen input from application of synthetic fertilisers	11,657	26,695
Nitrogen input from application of manure (kt N/yr)	13,294	11,768
Nitrogen in crop residues returned to soils (kt N/yr)	8,387	8,387

Source: National Energy and Climate Plan (NECP) of the Republic of Kosovo: The AFOLU sector¹⁶

Higher digitalisation and precision farming will foster efficiency gains (and probably reduce fertiliser emissions per unit of fertiliser application). However, the productivity of the agricultural sector remains low compared to neighbouring Serbia and EU countries. This is mainly due to outdated and inadequate machinery, lack of agricultural knowledge and skills, and poor quality of agricultural inputs.¹⁷

LULUCF

Currently, the LULUCF sector is a small GHG sink in Kosovo given the sequestering properties of the forestry sector. This sink is further increased following a decreasing trend in firewood removal as well as a trend of increasing CO₂ sequestration in forest biomass.

These trends are mainly driven by ambitions from the Forestry Strategy reflected in the modelling of the WEM scenario: The strategy states the goal of reducing illegal logging by 70% until 2030 and of increasing the forest area by 3% between 2022 and 2030. Afforestation, on the other hand, will probably not be important because few non-forested and unused areas are suitable for growing forests.

Waste

In the model, the waste sector is divided in the following subcategories: solid waste, urban water treatment and discharge, incineration, and open burning of waste. No data for emissions from biological treatment of waste was available and the sector was thus not included in the analysis.

The underpinning variable shaping emissions projections in the solid waste sector is waste per capita. Building on historical trends observed in the 2012-2021 period, it is projected that more waste will be generated by households in the future. It is estimated that every person in the country generated 270 Kg of solid waste in 2021 on average, and the figure is projected to increase to 438 Kg in 2030. With some saturation in the growth rate, the figure is projected to reach 555 Kg in 2040. A fundamental target of the Kosovo Integrated Waste Management Strategy (2021-2030) and associated Action Plan (2021-2023) is to increase the amount of

¹⁶ Müller et al. (2023) - National Energy and Climate Plan (NECP) of the Republic of Kosovo: The AFOLU sector

¹⁷ MAFRD 2021. Strategy for Agriculture and Rural Development 2022-2028. Pristina: Ministry of Agriculture, Forestry and Rural Development.

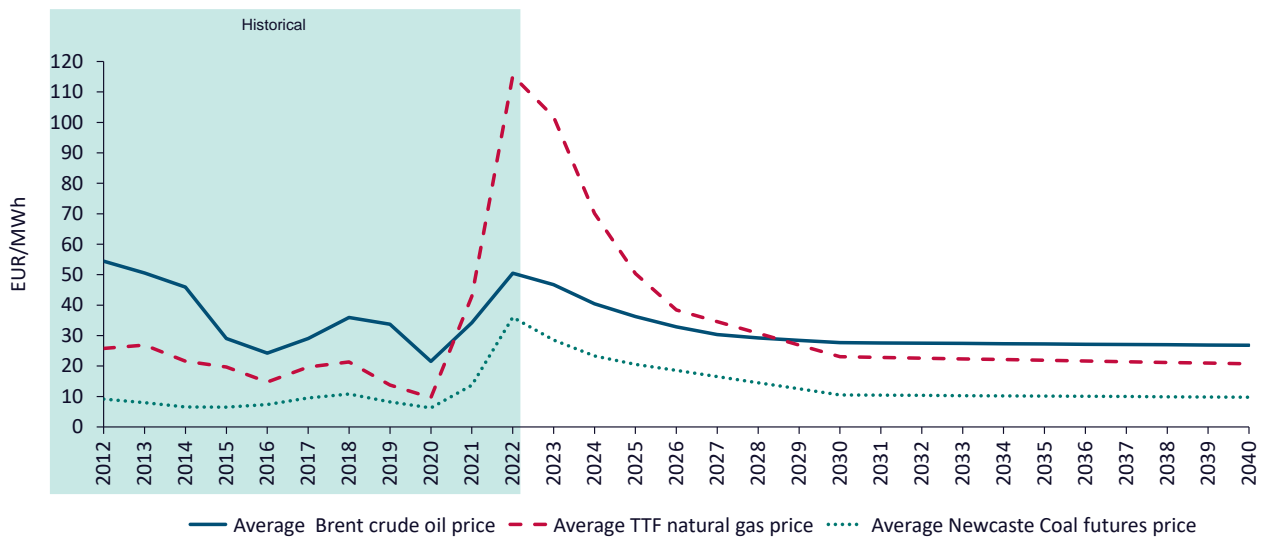
waste being landfilled in controlled facilities (including sanitary landfill, and/or thermal and/or biological and materials recovery/recycling facilities). According to the target, it is planned that in 2030 all the solid waste will be disposed in controlled facilities. Additionally, the analysis assumes that by 2032, 60% of waste will be recycled. Emissions from urban water treatment/discharge and incineration/open burning of waste are coupled with population increase.

III. Global energy trends, international fossil fuel prices, EU ETS carbon price

The global energy system is undergoing structural changes as the world is slowly but continuously moving towards a system characterized by an increased share of renewable energy carriers as well as by the rapid adoption of new technologies.

Due to supply and demand mismatches as well as the Russian invasion of Ukraine, global energy markets of recent years have been in turmoil, resulting in a high degree of volatility, in particular in international gas markets. High prices are however seen as short and mid-term phenomena and are expected to stabilise in the long term, although significant uncertainties apply. The model projects that coal, gas and oil prices will stabilise around 10 EUR/MWh for coal, 20 EUR/MWh for natural gas and 27 EUR/MWh for crude oil (Figure 35).

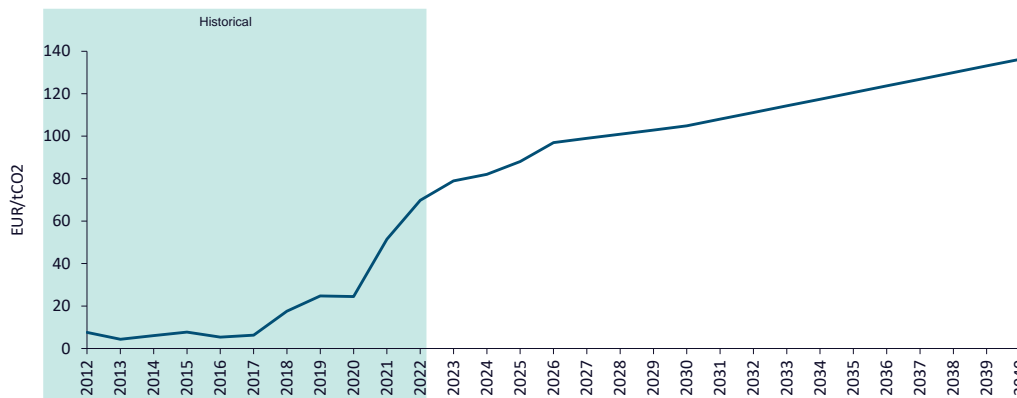
Figure 35. Historical and assumed fuel import prices (after 2022: projections)



Source: investing.com, statista.com and Umweltbundesamt

EU-ETS allowance prices per ton of CO₂ remained relatively low and stable for many years after the launching of the scheme. Since 2020 however, EU-ETS prices increased rapidly and are expected to continue growing steadily, reaching 105 EUR/t in 2030 and 136 EUR/t in 2040 (Figure 36).

Figure 36. Historical and projected EU-ETS



Source: investing.com and Umweltbundesamt

IV. Technology cost developments

The electricity and heat system model uses financial costs for: i) the cost of construction of new capacity and revitalisation of existing capacity (CAPEX per MW installed capacity), fixed annual operational and maintenance costs (Fixed OPEX per MW installed capacity) and variable operational and maintenance costs (Variable OPEX per MWh generated). In addition, the model takes into consideration wholesale fuel costs and EU-ETS allowance costs (see previous section), technical parameters, including the efficiencies of each technology, and where relevant minimum-load and ramping constraints. The technological cost data is sourced from a variety of sources, prioritizing directly obtained information from Kosovar stakeholders (including KEK, Termokos and DH Gjakova) and complementing this with industry benchmarks obtained from the European Union's Joint Research Centre.¹⁸

Planned retrofits, upgrades and maintenance for Kosova A and B are due to take place between 2024 and 2026. For Kosova A units 3 and 4, the available installed capacity is expected to increase from 116 MW to 195 MW, respectively, at a total cost of EUR 120 million, while for Kosova B, Units 1 and 2 are expected to increase in available capacity from 258 to 272 MW, respectively, at a total cost of EUR 191 million.¹⁹ The table below summarizes the CAPEX, Fixed and Variable OPEX for Kosovo A and B. All monetary units there are expressed in 2016-EUR.

Table 11. Kosovo A and B retrofit (CAPEX) as well as operational and maintenance costs by 2030

Unit	CAPEX / MW installed	Fixed OPEX / MWh installed	Variable OPEX / MWh of electricity	Electrical efficiency (%)
Kosovo A	286,138	31,446	2.9	34%
Kosovo B	326,507	31,446	2.9	40%

Source: Ministry of Economy, KEK, EU JRC

Note: Electrical efficiency refers to projection after retrofits.

The same cost categories are also used for other technologies, including hydropower, solar PV, wind power, biomass and lithium-ion battery storage. These costs are shown in the table below.

Table 12. Other technology costs by 2030

Unit	CAPEX / MW installed	Fixed OPEX / MWh installed	Variable OPEX / MWh of electricity generated	Electrical efficiency (%)
Solar PV (utility-scale)	563,619	10,145	0.1	100%
Solar PV (rooftop)	1,115,937	n.a.	n.a.	100%
Onshore Wind	982,729	21,620	0.5	100%
Li-ion Battery Storage	651,879	16,297	0.0	92%
Biomass (fluidised bed)	3,827,791	81,113	8.6	34%
Hydropower Run of River	2,424,670	21,822	0.9	100%
Hydropower Reservoir	3,152,071	28,894	0.9	100%

Source: EU JRC, USAID

Finally, significant additions are also expected in terms of the district heat sector, with additions of several technologies in Pristina and Gjakova between 2021 and 2030. These technologies and costs, where available, are displayed in the table below.

¹⁸ Mantzos, Leonidas; Wiesenthal, Tobias; Neuwahl, Frederik; Rózsai, Máté (2019): POTEnCIA Central-2018 scenario. European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/3182c195-a1fc-46cf-8e7d-44063d9483d8>

¹⁹ Announced costs are expressed in 2021-EUR as outlined in the Energy Strategy. Costs entail lifetime extension, renovation and upgrades, as well as filter retrofits. Values for net installed capacities are obtained from KEK.

Table 13. District heat technology costs by 2030 (without assets existing by 2021)

Unit	CAPEX / MW _{th} installed	Fixed OPEX / MW _{th} installed	Variable OPEX / MW _{th} of heat generated	Thermal efficiency (%)	Electrical efficiency (%)
Solar 4 Kosova II	1,032,830	n.a.	n.a.	100%	n.a.
Gjakova biomass CHP	2,885,170	72,934	5.0	85%	85%
Gjakova heat pump	858,043	n.a.	n.a.	400%	n.a.
Gjakova biomass heat-only boiler (new)	858,043	n.a.	n.a.	87%	n.a.

Source: Ministry of Economy, Termokos, District Heat Gjakova

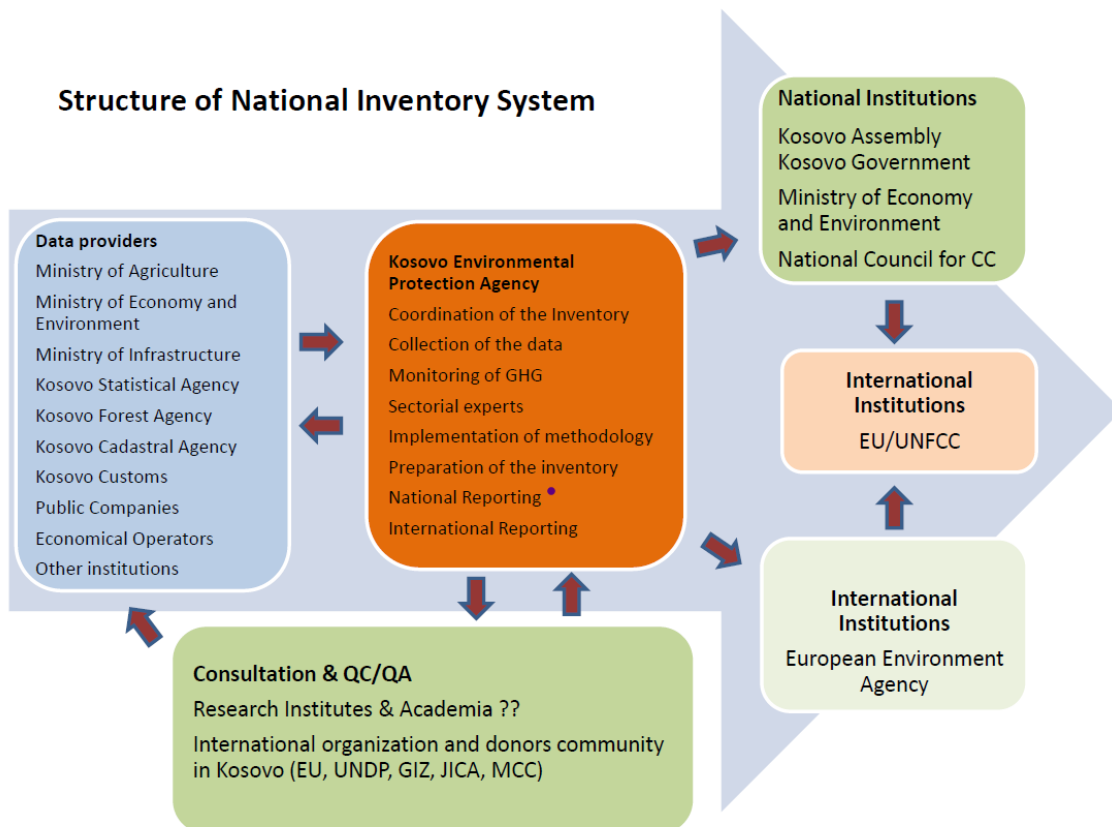
4.2 Dimension Decarbonisation

I. GHG emissions and removals

I. Trends in current GHG emissions and removals across the economy and different sectors

National GHG Inventory process is institutionalized (Figure 37) and produces well developed and robust National GHG Inventory. The designated institution for GHG Inventory management is the Kosovo Environmental Protection Agency (KEPA), which is part of the MESPI. The agency must collect and report the information on GHG emissions to the national institutions (the Government and responsible ministries) and the international institutions, i.e., the European Environmental Agency. The information on GHG emissions is also updated annually and reported as part of the environmental indicators.

Figure 37. Structure of the Kosovo National GHG Inventory System



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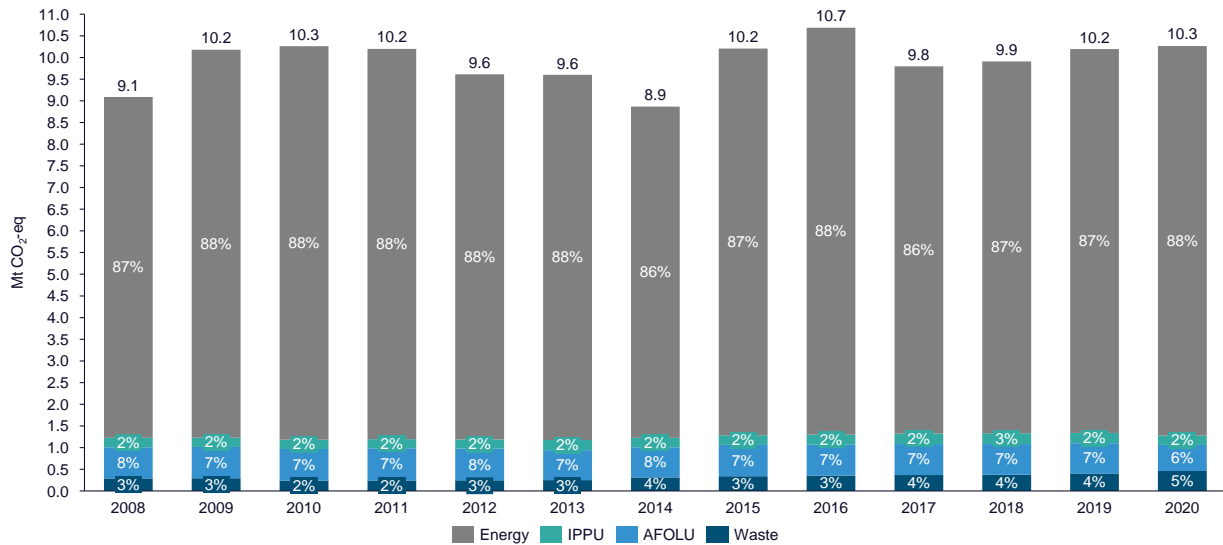
Source: Kosovo GHG Inventory System, presentation by Afrim Berisha, KEPA, Webinar "GHG reduction and long-term decarbonisation strategies - State in Kosovo and experiences from Croatia, North Macedonia and Czech Republic", UNDP Climate Promise Project, 03.12.2020

The GHG emissions and removals are estimated in line with the IPCC 2006 Guidelines, grouped under four main sectors: energy, industrial processes and product use (IPPU), agriculture, forestry and other land use (AFOLU), and waste. At a sectoral level, the emissions' estimates are disaggregated by categories and subcategories, using various available data sources. The main data suppliers are the central institutions such as: Agency of Statistics, Forestry Agency, Cadastral Agency, Kosovo Customs, etc., as well as from various operators and public companies.

The latest national GHG Inventory includes consistent emissions estimates for the period 2008 – 2020. As Figure 38 suggests, the lowest emission levels were observed in 2014 (8868 Gg CO₂-eq) and the highest one in 2016 (10687 Gg CO₂-eq). Additionally, only a moderate variation between the years can be observed. Emissions in the country depend largely on energy demand and the activities of the transformation sector, which is alone responsible for 88% of the national emissions in 2020 (Figure 38). Specifically for the energy sector, the GHG emissions are calculated for the period 2000-2020, as part of the information reported to

European Environmental Agency (EEA), using the common reporting format (CRF) tables. The national GHG emissions are estimated by applying Tier 1 method, i.e., using the default emissions factors for fuels provided in the 2006 IPCC Guidelines on the National GHG Inventories.

Figure 38. Trend of total GHG emissions in Kosovo, 2008-2020 (Mt CO₂-eq)

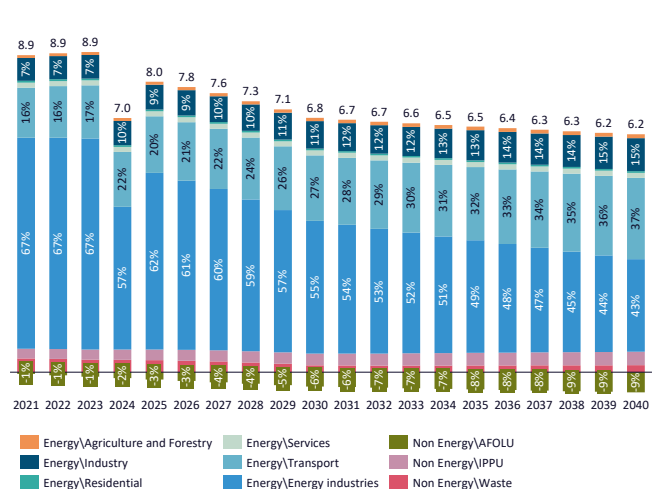
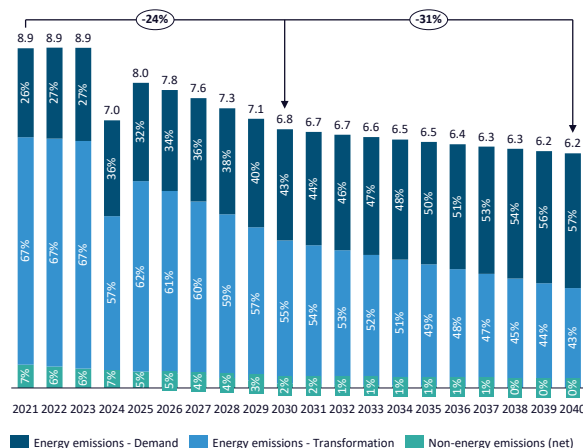


Source: Reports on GHG emissions in Kosovo for period 2008 – 2013 and 2014 – 2019, and data proved by KEPA

Figure 39 and 40 illustrate the projections of sectoral emissions with existing national, Energy Community and European Union policies and measures in the 2021-2040 period. The indicative projections of the WEM scenario show that until 2034 the transformation sector is the largest emitter in the economy. However, its share is projected to gradually decrease to around 43% in 2040. In this year, it is projected that 57% of emissions will stem from the demand sector. Additionally, Figure 39 reveals that the total GHG emissions are projected to decrease by 24% in 2030 or 31% in 2040 compared to 2021. The energy and transport sectors are projected to be the dominant sources of greenhouse gas emissions, jointly contributing to approximately 80% of total emissions. However, while the weight of emissions from the industrial sector is projected to decrease, the weight of transport sector emissions in total are expected to gradually increase from 16% in 2021 to 27% in 2030 and 37% in 2040, (Figure 40). The projections for the AFOLU sector, show that the sinks will increase to 407 Gg CO₂-eq in 2030, and to 573 Gg CO₂-eq in 2040.

Figure 39. Trend of total GHG emissions in the WEM scenario by main sectors, 2021 - 2040 (Mt CO₂-eq)

Figure 40. GHG emissions in Kosovo by categories, 2021 - 2040 (Mt CO₂-eq)



Source: own modelling results

Source: own modelling results

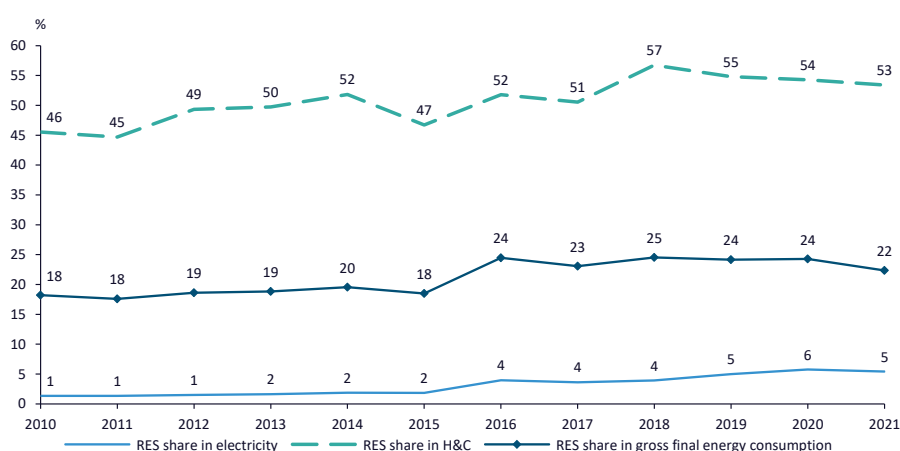
I. Renewable energy

I. Current share of renewable energy in gross final energy consumption and in different sectors (heating and cooling, electricity and transport) as well as per technology in each of these sectors

The overall share of renewable sources in gross final energy consumption in Kosovo in 2021 was 22.4%, or almost four percentage points higher compared to 2015. Fuelwood consumption largely influences the share of RES in the overall energy mix of Kosovo, as can be seen from the RES share in heating and cooling, which in 2021 was 53.4% (Figure 41). The contribution of solar thermal is still small but advancing moderately, while other forms of renewable heating and cooling are very modest.

Regarding the shares by sectors, the RES share in gross electricity production achieved 5% in 2021, or three percentage points higher compared to 2015. Biofuels are not reported in Kosovo and there is no electricity consumed in the transport sector in the 2010-2021 period. Therefore, the share of RES in the transport sector is zero in the past years.

Figure 41. RES share in gross final energy consumption, electricity and heating and cooling consumption

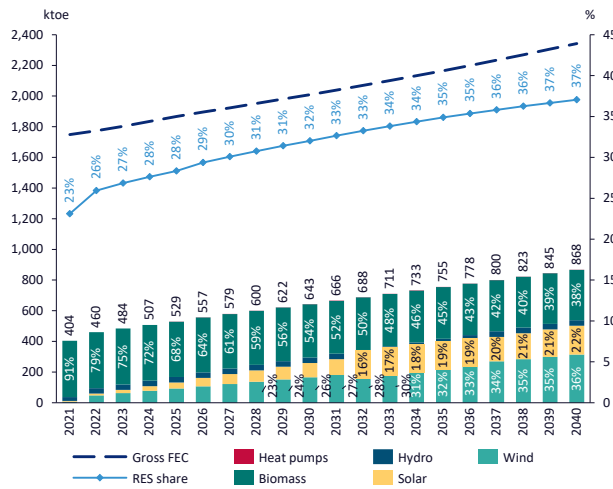


Source: Eurostat, SHARES detailed results (2021 data)

II. Indicative projections of development with existing policies for the year 2030 (with an outlook to the year 2040)

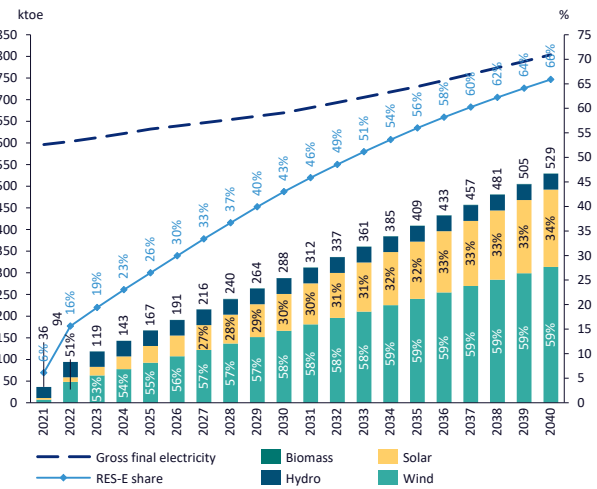
By implementing the existing policies and measures, the RES share in gross final energy consumption will reach 32% in 2030 and progress to 37% in 2040, showing an increase of 9 and 14 percentage points, respectively, compared to 2021 (Figure 42). Concerning the sectoral RES shares, it is projected that in 2030 the RES share in electricity will be 43% and will further increase to 66% in 2040, which is 37 percentage points (in 2030) and 60 percentage points (in 2040) higher compared to the 2021 level, respectively (Figure 43). This would be in line with the strategic objective for investment RES technologies to reach a total capacity of 1600 MW by 2031. The biomass consumption in the heating and cooling sector is projected to decrease gradually, while the use of solar energy to increase significantly (from 0.4 ktoe in 2021 to 2.2 ktoe in 2030 and 4.2 ktoe in 2040), although with small contribution to the RES share in H&C energy consumption. Still, the RES share in this sector will decrease by four percentage points in 2030 and 10 percentage points in 2040, owing to the growth of energy consumption in this sector (Figure 44). The RES share of transport is projected to include only renewable electricity consumption, which will gradually increase over the planning period (Figure 45).

Figure 42. RES share in gross final energy consumption in the period up to 2040



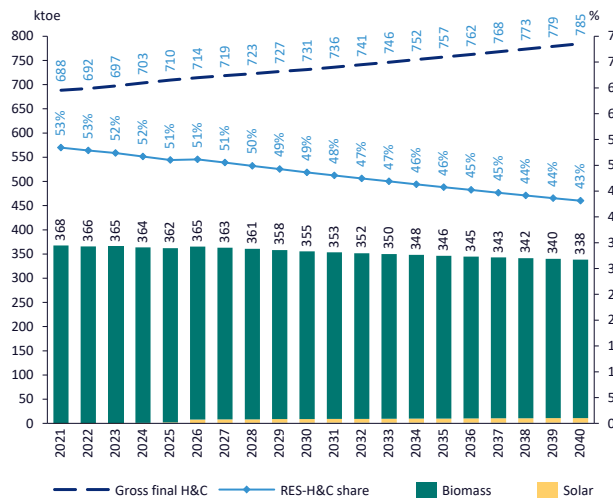
Source: own modelling results

Figure 43. RES share in gross electricity consumption in the period up to 2040



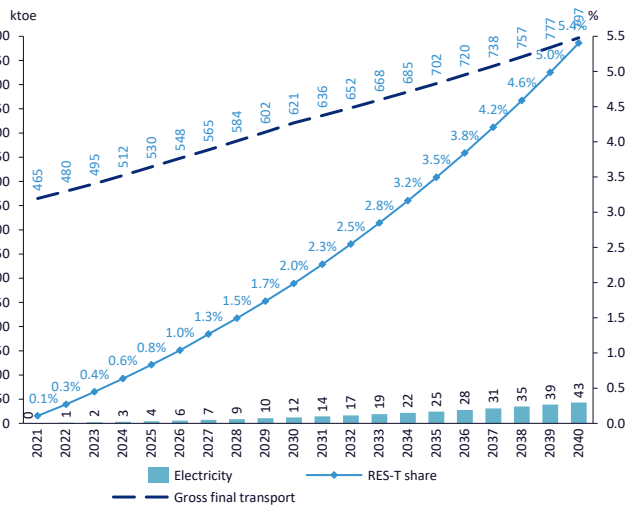
Source: own modelling results

Figure 44. RES share in gross final energy consumption for H&C in the period up to 2040



Source: own modelling results

Figure 45. RES share in final energy consumption in transport in the period up to 2040



Source: own modelling results

Note: The Gross final energy consumption for H&C does not include electricity consumption (in all sectors) and energy consumption in transport sector

4.3 Dimension Energy efficiency

I. Current primary and final energy consumption in the economy and per sector (including industry, residential, service and transport)

The primary energy consumption in Kosovo includes use of coal, oil products (gasoline, diesel, fuel oil, kerosene, and liquefied petroleum gas - LPG), biomass, hydro power, wind, and solar energy. Electricity is treated as a primary energy form only in terms of import and export. This approach is based on the Eurostat methodology for energy balances. The primary energy consumption in the period 2013 - 2021 increased by 25%, reaching 2,888 ktoe in 2021 (Figure 46), of which nearly 97% are coal (54%), oil products (30%) and biomass (13%) (Figure 47). At the same time, the final energy consumption is increased by 42% (Figure 48). The households sector remains to be dominant on the demand side (40% in 2021), followed by the transport sector (28%) and industry (20%) (Figure 49).

Figure 46. Overview of primary energy consumptions by fuels 2013-2021

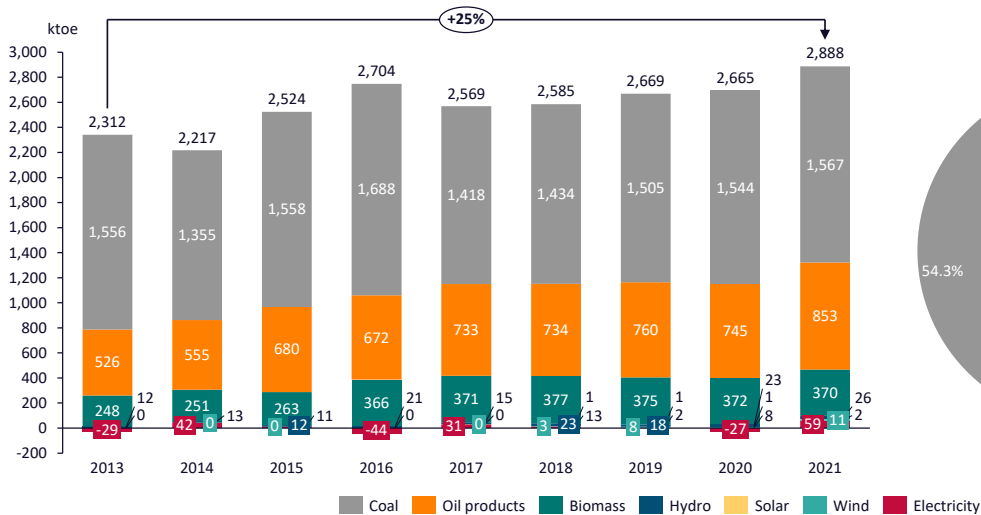
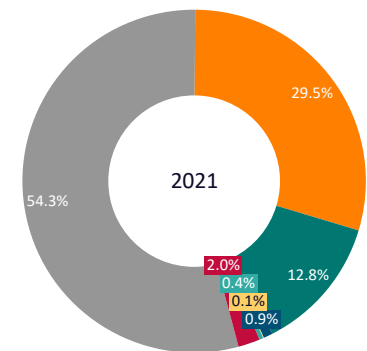


Figure 47. Share by fuels in the primary energy consumption, 2021



Source: Eurostat

Figure 48. Overview of final energy consumption by sectors, 2013-2021

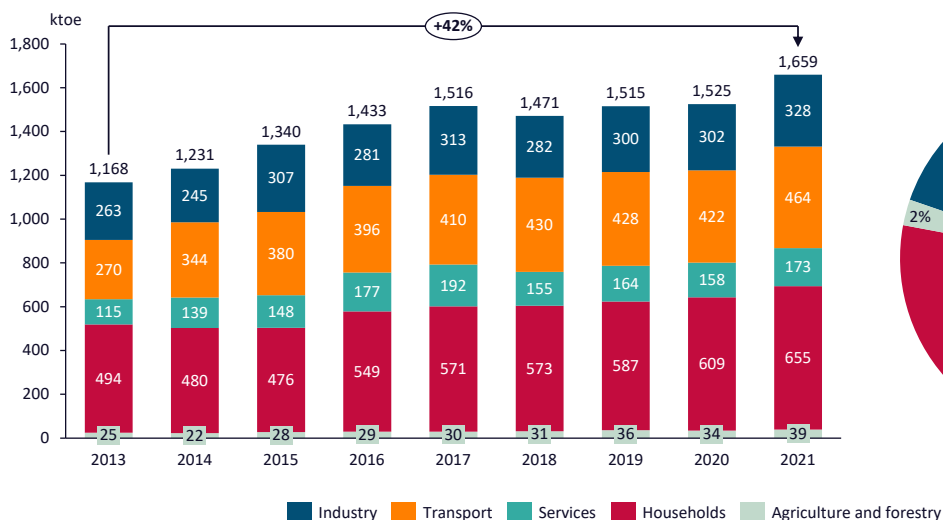
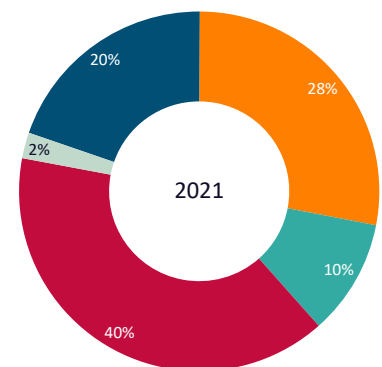


Figure 49. Share by fuels in the final energy consumption, 2021



Source: Eurostat

II. Current potential for the application of high-efficiency cogeneration and efficient district heating and cooling

The District Heating (DH) systems in Kosovo are limited to only four municipalities (Prishtina, Gjakova, Mitrovica and Zvecan). According to the Annual report for 2021 of the Energy Regulatory Office, currently, the operating capacity of district heating systems of Kosovo includes:

- DH Termokos in Prishtina, consisted of two district heating plants (120 MW_{th}, and 14 MW_{th}, - University Clinical Center) and one CHP (140 MW_{th} energy extraction station in units B1 and B2 of TPP Kosova B).
- DH Gjakova in Gjakova, consisted of one biomass district heating plant (11 MW_{th}) and one biomass CHP (4 MW_{th}).

During the heating season 2020-2021, the entire heat demand of the district heating system of Prishtina was provided by the CHP in TPP Kosova B, while the DH Gjakova operated only in the testing periods.

Regarding the potential for application of high-efficiency cogeneration and efficient district heating, the ongoing activity is the feasibility study for DH systems in eight municipalities (Peja, Prizren, Gjilan, Ferizaj, Mitrovica, Drenas, Obiliq, and Zvecan) which will analyze the economic-financial and technical feasibility of DH system based on RES (e.g., biomass, geothermal, solar heat pump).

Another measure is the diversification of the existing DH system of Prishtina by including at least 50 MW_{th} solar-based heating technology by 2025.

The development plan of DH Termokos for the period 2021-2040 (Table 14), shows that the heated area is planned to increase for about 40%, and at the same time to increase the annual heat demand by 21% by 2040 compared to 2021.

Table 14. Projections for energy consumption and heated surface area of DH Termokos, 2021-2040

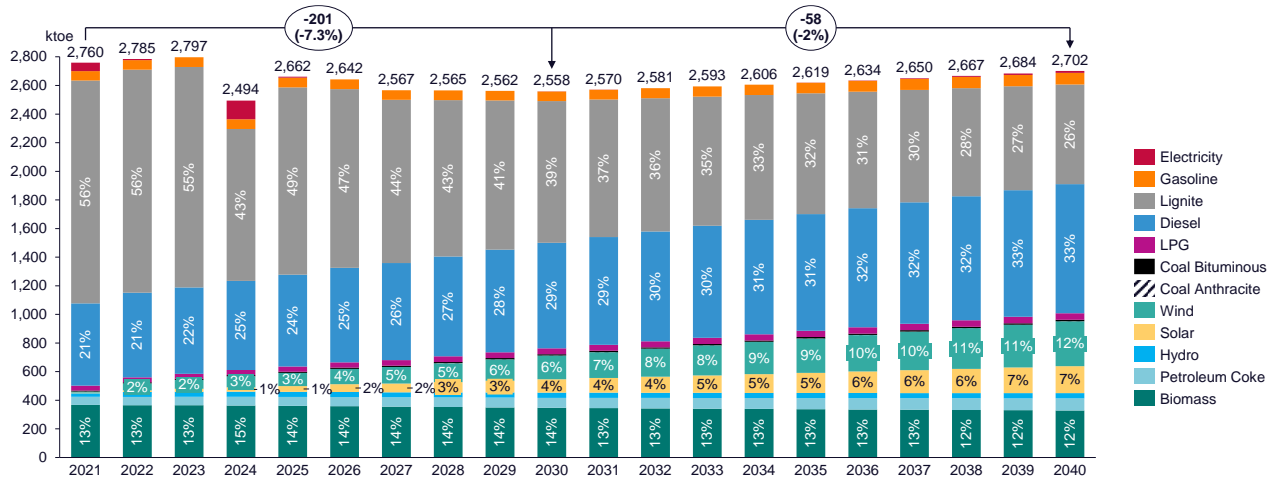
	Systemwide total demand & peak load		Residential buildings		Public and commercial buildings		Total
	Total annual heat demand (GWh)	Annual peak load (MW in hour with highest demand)	Number of consumers (households) connected to DH	Heated area (square metres) connected to DH	Number of consumers connected to DH	Heated area (square metres) connected to DH	Total heated area (square metres) connected to DH
2021	296	102	14,249	865,367	1,542	596,689	1,462,056
2025	356	130	23,229	1,626,006	6,969	696,860	2,322,865
2030	455	220	28,629	2,004,006	8,589	858,860	2,862,865
2035	555	240	30,919	2,164,326	9,276	927,568	3,091,894
2040	655	280	35,000	2,450,017	10,500	1,050,007	3,500,024

Source: DH Termokos JSC

III. Projections considering existing energy efficiency policies, measures and programmes as described in point 1.2.(ii) for primary and final energy consumption for each sector at least until 2040 (including for the year 2030)

The primary energy consumption in the WEM scenario is projected to reach 2,558 ktoe in 2030 and 2,702 ktoe in 2040, representing a 7.3% and 2% reduction relative to the 2021 level (Figure 50). As the most dominant fuel in 2021, with a 56% share, coal consumption will decrease its share to 26% of the total primary energy in 2040. On the contrary, diesel consumption will gradually increase over time, reaching 33% of total primary energy consumption in 2040, which is 12 percentage points higher compared to its share in 2021. The share of biomass will remain nearly the same, although, in absolute value, it will gradually decrease over time. A significant increase in renewable energy sources utilization is noticeable, reaching 12% of the total primary energy consumption in 2040 in the case of wind energy and 7% in the case of solar energy use.

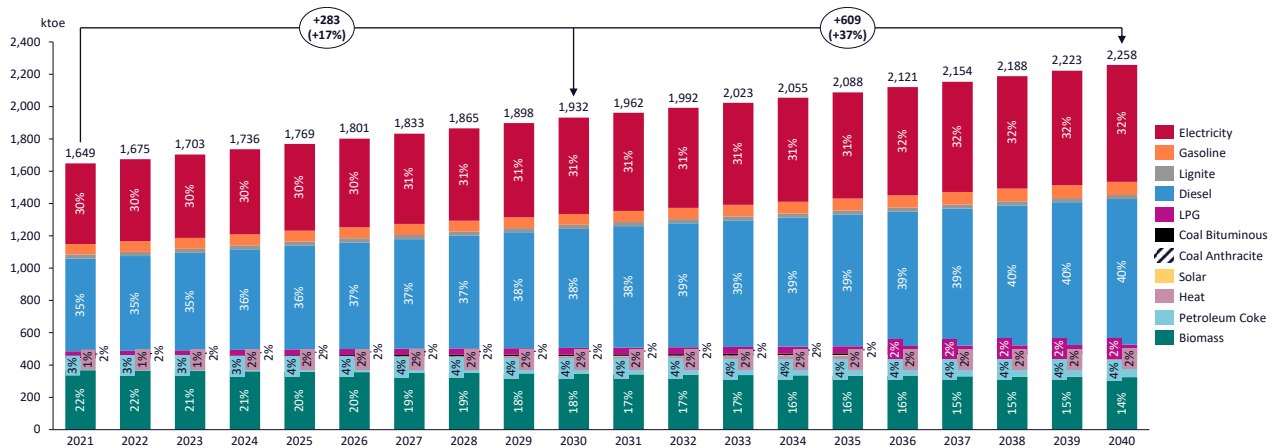
Figure 50. Primary energy consumption by fuels, 2021-2040 (ktoe), WEM scenario



Source: own modelling results

The projections of the final energy consumption show a gradual increase reaching the value of 1,932 ktoe in 2030 and 2,258 in 2040, corresponding to an increase of 17% by 2030 and 37% by 2040 relative to the 2021 level (Figure 51). Regarding the share of the fuels in the total final energy consumption, the diesel share is projected to increase by five percentage points in 2040, and electricity share by two percentage points, while biomass share will decrease by eight percentage points. The share of other fuels will remain at relatively the same level.

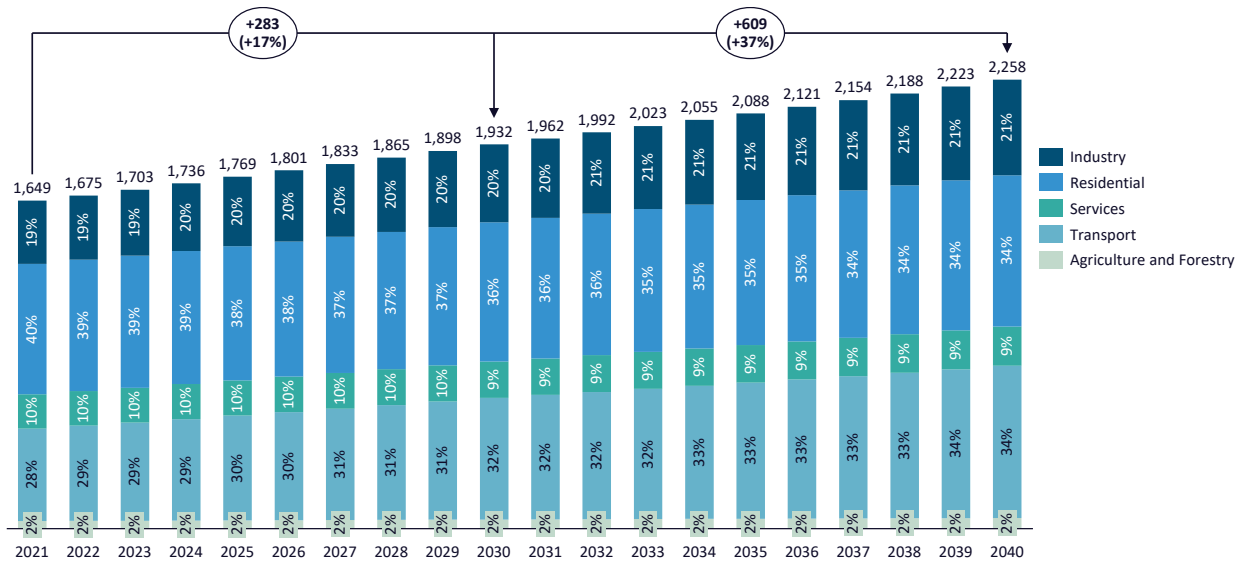
Figure 51. Final energy consumption by fuels, 2021-2040 (ktoe), WEM scenario



Source: own modelling results

Regarding the share of the sectors in the final energy consumption, the highest increase is projected in the transport sector, followed by the industry sector. In contrast, the households and service sectors will decrease their share (Figure 52)

Figure 52. Final energy consumption by sectors, 2021 - 2040 (ktoe), WEM scenario



Source: own modelling results

IV. Cost-optimal levels of minimum energy performance requirements resulting from national calculations, in accordance with Article 5 of Directive 2010/31/EU

Minimum energy performance requirements of buildings are determined by cost-optimal method in accordance with Article 5 of Directive 2010/31/EU on the energy performance of buildings in 2013 and 2014, for residential buildings (single-family and multi-apartment) and non-residential buildings (offices, educational buildings, wholesale and retail trade buildings, hospitals, hotels, restaurants and sport halls).

The ongoing process for revision of the Law on Energy Performance of Buildings, and subsequently the adoption of secondary legislation regarding the Energy Performance of Buildings, is expected to be finalized during 2023.

The Ministry of Environment and Spatial Planning of Kosovo has published a *Guideline on application and assessment of Minimum Energy Performance Requirements of buildings* and a *Typology and Energy Performance of Residential Buildings in the Republic of Kosovo*.

4.4 Dimension energy security

I. Current energy mix, domestic energy resources, import dependency, including relevant risks

Kosovo is a large producer and consumer of lignite and solid biofuels but overall remains a significant net importer of energy. In 2021, the country produced 1591 ktoe of lignite and 308 ktoe of solid biofuels. Biofuels are mainly used for residential heating in the form of firewood. Lignite is dominating Kosovo's electricity generation with over 93% of electricity generation in 2021. The high reliance on its outdated lignite plants poses a supply risk which should be addressed through diversification, especially, by increasing domestic renewable generation as well as through retrofits of the remaining lignite units.

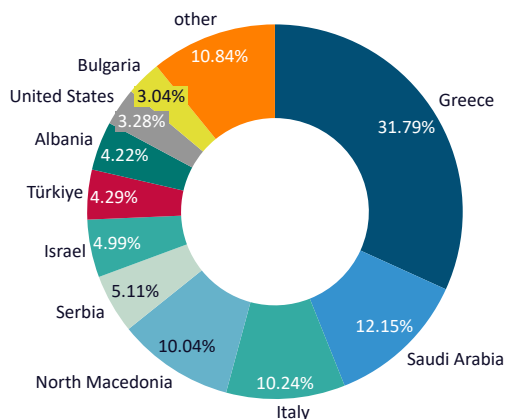
Electricity imports are also posing a burden on the country. In 2021, Kosovo imported 59 ktoe, or about 10% of gross final consumption of electricity (net imports) due to high demand during the heating season and unplanned outages of some lignite units. Electricity import dependency mainly carries a financial risk, as has been demonstrated by the import price burden in 2021 and 2022 in the context of extraordinarily high European electricity prices. Almost half (48%) of Kosovo's physical electricity imports in 2021 came from Serbia alone and another 27% were supplied from Albania. Since the Serbian TSO has currently not determined a value for the available interconnection capacity and the Serbian regulatory authority has failed to ensure the TSO's compliance with its obligations, there is currently no commercially available transmission capacity with the northern neighbour.²⁰ This affects electricity trade of Kosovo and the region at large, further increasing the cost of electricity imports.

Lacking domestic refining capacity, Kosovo is fully dependent on the import of petroleum products such as gas oil and diesel oil (608 ktoe in 2021) as well as motor gasoline (66 ktoe in 2021). Other net import products include bitumen (59 ktoe in 2021) and solid biofuels (60 ktoe in 2021). Net imports of all petroleum products in 2021 totalled 833 ktoe. Net imports of all energy carriers reached 918 ktoe in 2021, or roughly 32% of total energy supply.

The EU is a significant supplier for some of Kosovo's most important energy products. In 2021, the EU27 supplied 49% of gas oil and diesel oil imports, 22% of motor gasoline and liquefied petroleum gases, 44% of all imported petroleum coke and 40% of all imported bitumen. Most important supplier countries for gas oil and diesel are Greece (32%), Saudi Arabia (18%) and Italy (14%). For motor gasoline, the top three suppliers were Serbia (35%), Greece (31%) and Romania (11%).

In general, Kosovo's petroleum product imports are relatively diversified (see below), and suppliers can be switched due to the global nature of petroleum product trade. Thus, petroleum product imports do not pose a particularly high energy security risk.

Figure 53. Petroleum product imports by country of origin (2021)



Source: Eurostat

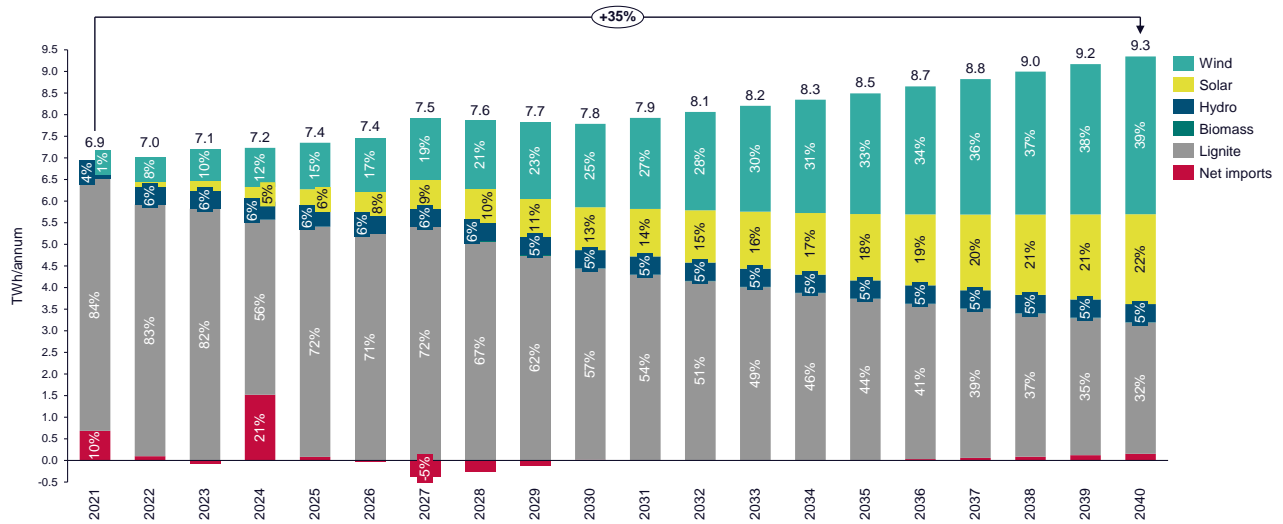
²⁰ <https://www.energy-community.org/news/Energy-Community-News/2023/03/01a.html>.

II. Projections of development with existing policies and measures at least until 2040 (including for the year 2030)

Due to the country's ambitious plans for renewable energy expansion, solar and wind are projected to make up a progressively increasing share of the electricity mix (Figure 54). In 2030 (2040), solar could make up 12.7% (22.2%) and wind 24.8% (39.1%) of gross final electricity consumption, while the share of lignite drops to 56.8% (32.5%).

Net imports of electricity would peak in 2024 (with 21%) due to lower availability of the country's lignite units during retrofit works. Naturally, this depends on the exact timing of retrofits. Retrofits and related downtimes should be well managed to avoid excessive import dependency during those years. During the second half of the 2020s, net exports (up to 5% of gross generation) are projected as lignite units sequentially come back online after retrofits and the EU's CBAM is not phased in yet at significant levels. During the 2030s, relatively even trade balances for electricity are projected with marginally growing net imports until the end of the decade.

Figure 54. Electricity mix in gross final consumption by source (after 2021: projections)

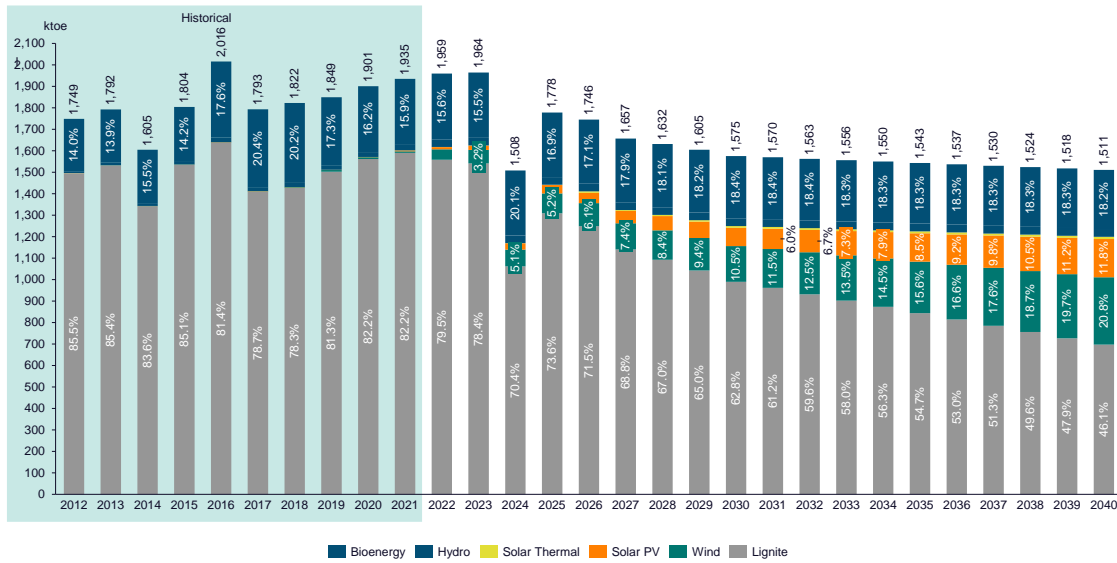


Source: Eurostat, own projections and modelling

Domestic lignite production is projected to fall to 990 ktoe by 2030 and further down to 697 ktoe in 2040 (

Figure 55), in line with declining lignite-powered electricity generation. Bioenergy production (mainly composed of forest firewood extraction) is expected to gradually fall to 290 ktoe in 2030 and 276 ktoe in 2040, largely due to demographic changes, i.e., urbanisation and migration out of rural areas. Solar PV and wind energy production is projected to reach 85 and 151 ktoe in 2030 and 179 and 299 ktoe in 2040, respectively.

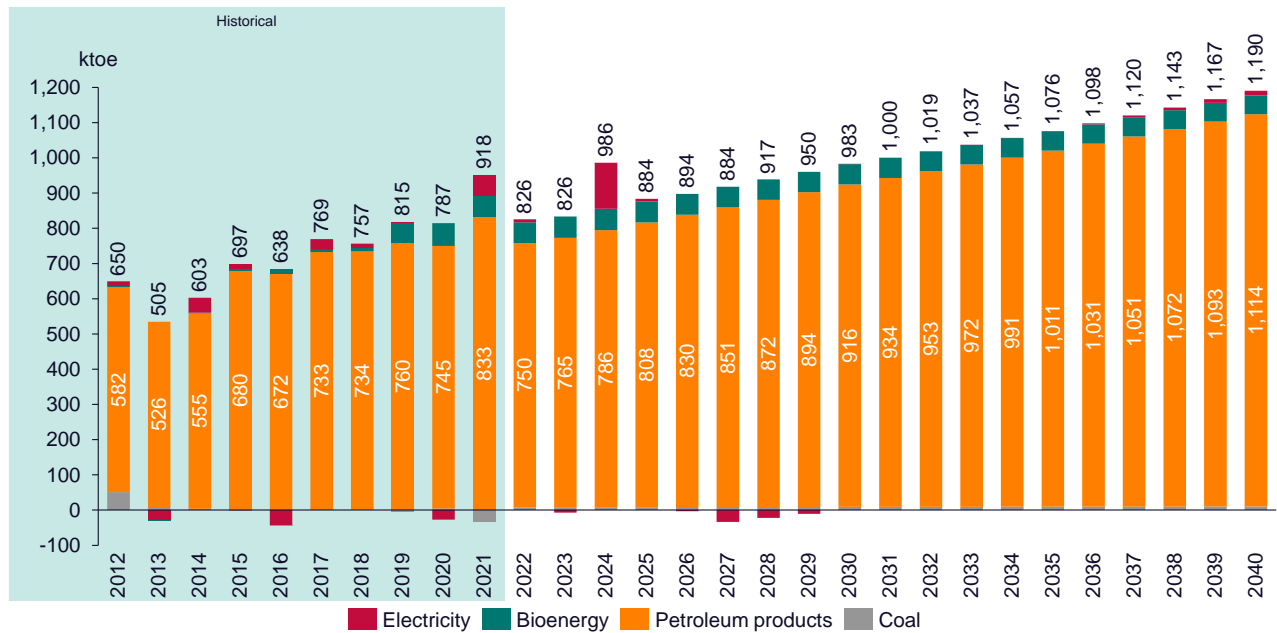
Figure 55. Domestic energy production by source (after 2021: projections)



Source: Eurostat, own projections and modelling

Imports of petroleum products are set to increase to 916 ktoe in 2030 and 1114 ktoe in 2040 (Figure 56), mainly driven by road transport fuels for passenger cars and trucks. At the same time, coal imports (anthracite, other bituminous coal and lignite) are projected to reach 9 ktoe in 2030 and 10 ktoe in 2040. Bioenergy imports are projected to amount to 57 ktoe and 53 ktoe in 2040.

Figure 56. Net imports by energy carriers (after 2021: projections)



Source: Eurostat, own projections and modelling

4.5 Dimension internal energy market

I. Electricity interconnectivity

I. Current interconnection level and main interconnectors

Kosovo's transmission network is well connected to the regional and European system through interconnection lines (Figure 57) with:

- Albania, Macedonia, Montenegro, and Serbia: one 400 kV line
- Albania and Serbia: one 220 kV line
- Serbia: two 110 kV lines

More specifically, the following interconnection lines are currently operational:

400 kV:

- SS Kosovo B - SS Koman (Albania)
- SS Kosovo B - SS Nish (Serbia)
- SS Peja 3 - SS Ribarevina (Montenegro)
- SS Ferizaj 2 - SS Shkupi 5 (North Macedonia)

220 kV:

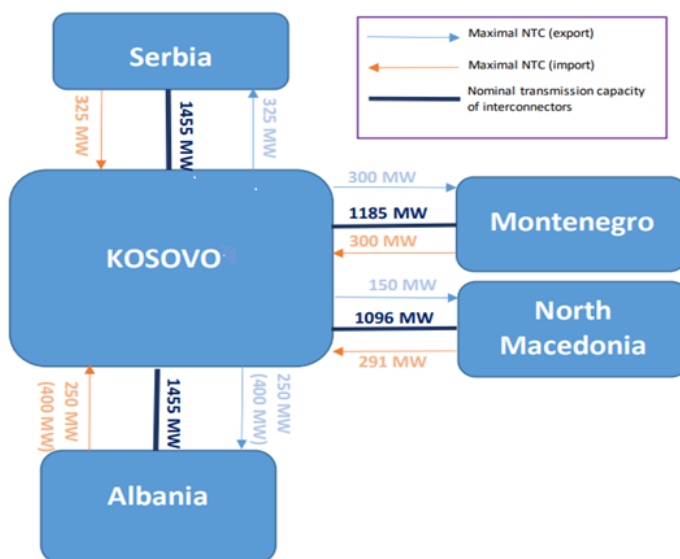
- SS Prizreni 2 - SS Fierza (Albania)
- SS Podujeva - SS Krushevc (Serbia)

110 kV:

- SS Vallaq - SS Novi Pazar (Serbia)
- SS Berivojce - SS Bujanovc (Serbia)

As already outlined above, Kosovo is among the top three countries in Europe in terms of both the ratio between interconnection capacities and installed generation capacities, as well as the ratio between interconnection capacities and peak load. The total Net Interconnection Transmission Capacity of Kosovo with neighbouring countries can reach up to a maximum 1,600 MW with current prevailing capacity at the level of around 1300 MW.

Figure 57. Nominal transmission capacity of the interconnectors at KOS borders and max. NTC values

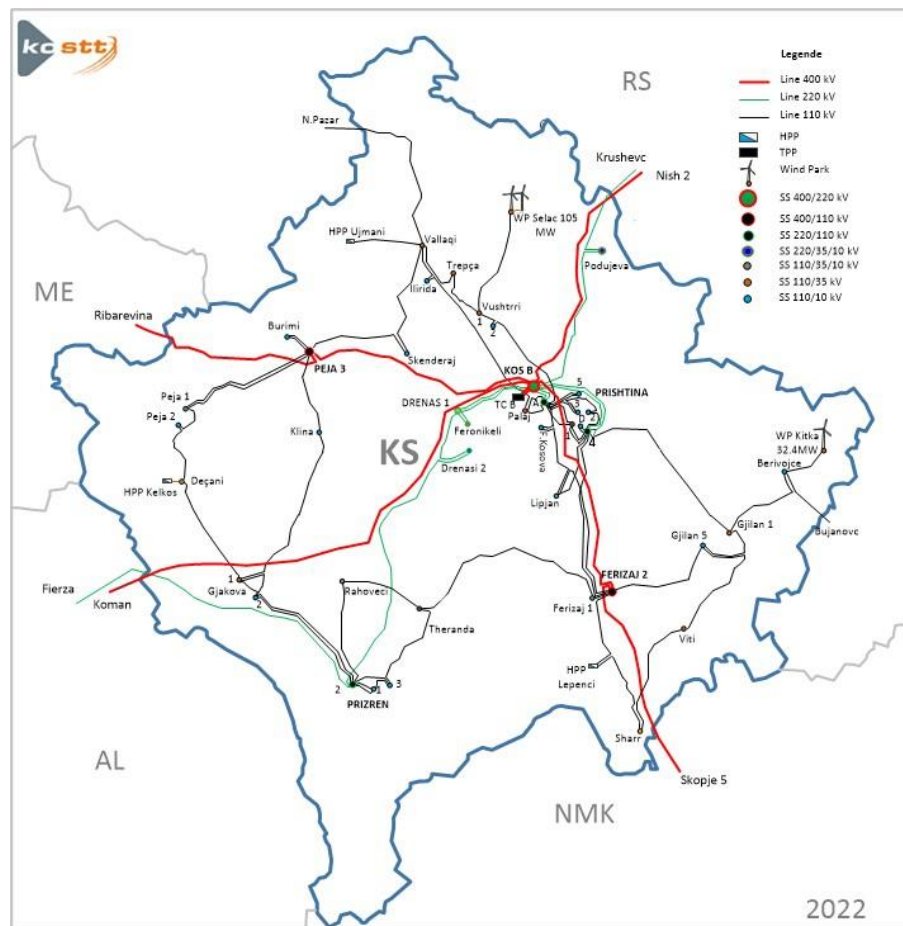


Kosovo's Transmission System Operator (KOSTT) is a member of the Coordinated Auction Office in South East Europe (SEE CAO) and has delegated the auctioning of cross-border physical transmission rights to this body. SEE CAO did not begin allocating capacity for Kosovo's borders until December 14, 2020. On this date, the connection agreement between KOSTT and TSOs from continental Europe entered into force, marking KOSTT's first day of operations as an ENTSO-E control area within the same control block as Albania's TSO (OST). Allocation at the borders between Kosovo and Albania and Kosovo and North Macedonia is performed by KOSTT, while allocation between Kosovo and Montenegro is performed by CGES (MNE TSO). There is currently no agreement with the Serbian TSO for capacity allocation in place, as the Serbian TSO has not determined a value for the available interconnection capacity and the Serbian regulatory authority has failed to ensure the TSO's compliance with its obligations in this respect.²¹

Electricity transit in Kosovo during 2022 amounted to 2,475 GWh or 26.1% compared to the annual domestic electricity demand.

The geographical extension of Kosovo's Transmission System according to the current situation (2022) is shown in Figure 58:

Figure 58. Kosovo Transmission Map



Source: KOSTT

II. Projections of interconnector expansion requirements (including for the year 2030)

Given the current interconnection capacities, which are more than sufficient to meet 2030 targets, no further expansion is foreseen until 2030.

²¹ <https://www.energy-community.org/news/Energy-Community-News/2023/03/01a.html>.

However, Kosovo's ambitions for regional market integration require an enhancement and strengthening of interconnection capacities. In this regard, KOSTT has prepared a 10-year Transmission Development Plan, which identifies medium and long-term infrastructure projects along with planned investment costs.

II. Energy transmission infrastructure

I. Key characteristics of the existing transmission infrastructure for electricity and gas

Kosovo's power system possesses a well-developed transmission network that has been built over the last six decades. The transmission network voltage levels consist of 400 kV, 220 kV and 110 kV lines that are owned and managed by KOSTT, which is thus also responsible for the overall operation, maintenance and development. The current network meets the local transmission needs as well as the N-1 criterion for the entire high voltage level.

The current transmission network (2022) consists of 1430.1 km of lines, including:

- 279.5 km at 400 kV voltage level;
- 238.5 km at 220 kV voltage level, and
- 912.1 km at 110 kV voltage level

The installed transformer capacity is currently 6,608 MVA.

Kosovo currently has no gas transportation infrastructure in place.

II. Projections of network expansion requirements at least until 2040 (including for the year 2030)

As mentioned previously, the Transmission Development Plan (TDP) is the key document which sets out the plans for medium and long-term transmission infrastructure projects (see Chapter 2.4.2). The plan is developed by KOSTT and approved by ERO.

The current plan covers the period 2023-2032. This 10-year plan outlines projects that are needed to ensure a reliable and secure operation of the transmission system and most importantly, to support the energy market integration processes as well as the integration of energy from renewable sources.

Given the complexity the planning process is associated with, the plan has been divided into two periods. The first period covers the initial 2023-2027 timespan, which at the same time is viewed as crucial in terms of the implementation of projects that give rise to the long-term network developments. The second period covers the years 2028-2032, which includes indicative optional projects related to the achievement of required technical standards tailored to supporting the electricity market. As such, this category of projects may be subject to changes depending on the processes that take place in the energy sector in Kosovo and the wider region. Generally, this relates to the development of generation and load as well as power flows expected to occur in the next decade in the regional network.

The transmission network development projects set out in the plan are divided into five categories:

- Transmission network reinforcements
- Load support/New 110/10(20) kV nodes
- Revitalization of the transmission network
- Supporting projects of the transmission system (management, monitoring, measurement and control),
- Generation support (Connection application).

In relation to projections of gas network expansion requirements, as already highlighted in previous sections, Kosovo has no gas transmission network. However, the plans for potential future connection into the gas transmission systems are briefly explained in the **Energy Strategy of the Republic of Kosovo 2022-2031** (short: Energy Strategy). As the strategy outlines, a single operating connection to the natural gas transmission systems, either the Trans-Adriatic Pipeline (TAP) or liquefied natural gas (LNG) terminals in the Aegean or Ionian seas, i.e. through North Macedonia or Albania, would require a minimum of 7-9 years. If an interconnection is built, this would enable the operation of gas-based power generation, and potentially the utilization of natural gas in industry.

In the strategy, the option of utilizing the gas infrastructure planned in Albania (connection to TAP or access to the LNG terminal in Vlora) is also considered. In this regard, developments in the region and globally will be followed closely, and (co-) investment in gas power plants for baseload and/or system flexibility in Albania, North Macedonia and Greece will be explored with the possibility of implementation by 2031.

III. Electricity and gas markets, energy prices

I. Current situation of electricity and gas markets, including energy prices

In 2016, the **Law on Energy**, the **Law on Electricity** and the **Law on the Energy Regulator**, were adopted. This package of laws allowed, among others, for a gradual opening of the energy market. Prior to that, Kosovo's energy sector had already witnessed major reforms which initially began with the establishment of an independent Energy Regulatory Office (ERO) in 2004, followed with the unbundling of the vertically integrated state-owned Kosovo Energy Corporation (KEK). KEK had overseen electricity production, transmission, distribution, and supply of electricity. In 2006, the unbundling process led to the creation of the Transmission System Operator (TSO), namely KOSTT which also serves as the Market Operator (MO). KOSTT and KEK remain publicly owned. The unbundling process continued with the privatization of KEK's Distribution and Supply services in 2013. Distribution and Supply went through legal unbundling in 2015 establishing the DSO (KEDS) and the incumbent supplier (KESCO). This process opened the way to the establishment of seven other suppliers.

Currently there are eight licensed suppliers in Kosovo, however, with only one being active (KESCO). In 2020 and 2021, KESCO functioned as the Public Service Supplier, Supplier of Last Resort and as the sole active supplier in the deregulated market. Thus, KESCO has a 100% share of the retail electricity market in Kosovo, for household and industrial consumers. No customers have used the right of switching their supplier in either segment of the retail market. For the time being, based on the analysed indicators, both the wholesale and retail electricity markets show a lack of competition and a high market concentration.

The wholesale electricity market is currently structured around bilateral contracts. Day-ahead and intraday markets are not yet established in Kosovo. Electricity is imported from day-ahead or intra-day regional markets with bilateral contracts. Energy generated by KEK is sold with priority to the Universal Service Supplier. During the process of unbundling and privatization, a Bulk Supply Agreement (BSA) was signed between KEK and the incumbent supplier KEDS (later legally unbundled to KEDS and KESCO).

Since 2017, generation prices in Kosovo are deregulated and are set through bilateral contracts. In 2019, HPP Ujmani started offering their production through competitive procedures.

Electricity consumer prices depend on the category of customers, the voltage level to which customers are connected and the use of electricity at different tariffs according to the season and time in which energy is consumed. Accordingly, the selling price also varies by districts depending on the concentration of commercial/industrial activities that use electricity in certain periods. This average selling price (without VAT) is shown in the figure below, derived from the latest report published by ERO for the year 2022.

According to ERO's latest 2022 Annual Report, the average price for households was 6.14 EUR-ct/kWh (2016 prices: 5.27 EUR-ct/kWh), while the average energy price for non-household consumers was 9.27 EUR-ct/kWh (2016 prices: 7.62 EUR-ct/kWh) (Figure 59). It should be noted that at the end of March 2023, the Board of ERO approved new tariffs, which are 15.4% higher for all categories of regulated consumers.

In addition, the Figure 60 shows the household and non-household electricity prices for the last ten years.

Figure 59. Average selling price of electricity without VAT

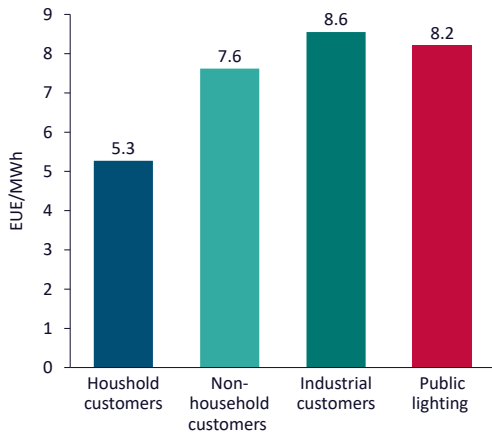
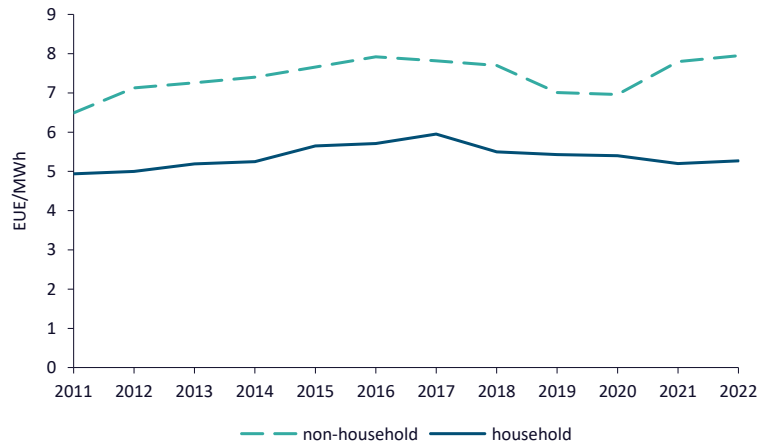


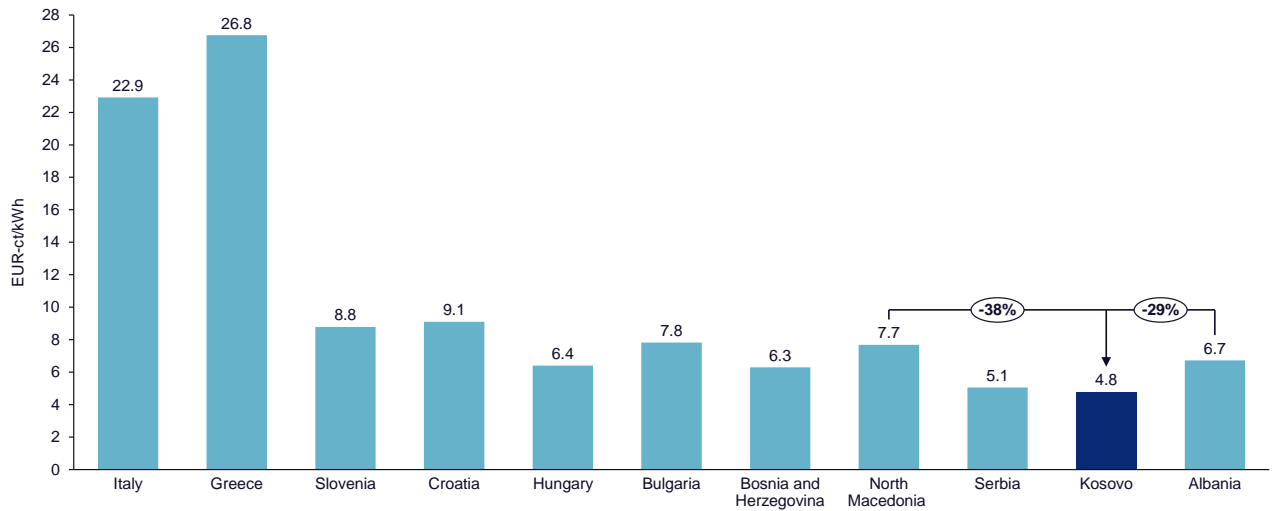
Figure 60. Average household and non-household electricity price 2011 - 2022



Source: ERO Annual Report 2022, Note: Numbers deflated to 2016 prices

Compared to the countries of the region and based on data released by Eurostat for the first half of 2022, Kosovo has the lowest average price without VAT for family consumers. This can be seen in the Figure 61 displaying Eurostat data categorized according to household consumption between 2500-5000 kWh/year, for the first six months of 2022 for selected countries:

Figure 61. Average electricity prices (excl. VAT) for household customers (first half of 2022)



Source: Eurostat, ERO Annual Report, Note: consumption band with: 2,500 kWh < consumption < 5,000 kWh, Note: Numbers deflated to 2016 prices

The tariff structure in 2022 for all regulated consumers is presented below. The new structure according to the latest increase as per the ERO’s decision at the end of March 2023 has not been released at the time of writing.

Table 15. Tariff structure for end consumers in 2022

Tariff group	Voltage level supply	Tariff element	Unit	Time of day	Tariff
1	35 kV	Customer fixed tariff	€/costumer/month		9.60
		Engaged power	€/kW/month		5.02
		Active energy (P), of which	€/kWh	High tariff	4.22
			€/kWh	Low tariff	2.71
		Reactive energy (Q)	€/kVArh		0.57
2	10 kV	Customer fixed tariff	€/ costumer/month		3.96
		Engaged power	€/kW		4.32
		Active energy (P), of which	€/kWh	High tariff	4.92
			€/kWh	Low tariff	3.17
		Reactive energy (Q)	€/kVArh		0.57
3	0.4 kV Category I (customers with reactive energy)	Customer fixed tariff	€/ costumer/month		2.21
		Engaged power	€/kW		2.55
		Active energy (P), of which	€/kWh	High tariff	5.74
			€/kWh	Low tariff	4.26
		Reactive energy (Q)	€/kVArh		0.58
4	0.4kV Category II	Customer fixed tariff	€/ costumer/month		2.55
		Active energy (P), of which	€/kWh	Single tariff	7.58
		Active energy (P), of which	€/kWh	High tariff	9.19
			€/kWh	Low tariff	4.55
5	0.4kV tariff meter 2 (household)	Customer fixed tariff	€/ costumer/month		1.49
		0-800kWh (First block)	€/kWh	High tariff	5.79
			€/kWh	Low tariff	2.48
		>800kWh (Second block)	€/kWh	High tariff	10.74
€/kWh	Low tariff		5.06		
6	0.4kV tariff meter (household)	Customer fixed tariff	€/ costumer/month		1.49
		0-800 (First block)	€/kWh	Low tariff	4.56
		>800 (Second block)	€/kWh	Single tariff	8.64
7	0.4kV (household without meter)	Evaluated consumption:			
		Customer fixed tariff	€/ costumer/month		1.49
		Active energy (P), of which	€/kWh	Average tariff	5.80
8	Public lighting	Customer fixed tariff	€/ costumer/month		2.75
		Active energy (P), of which	€/kWh	Single tariff	7.93

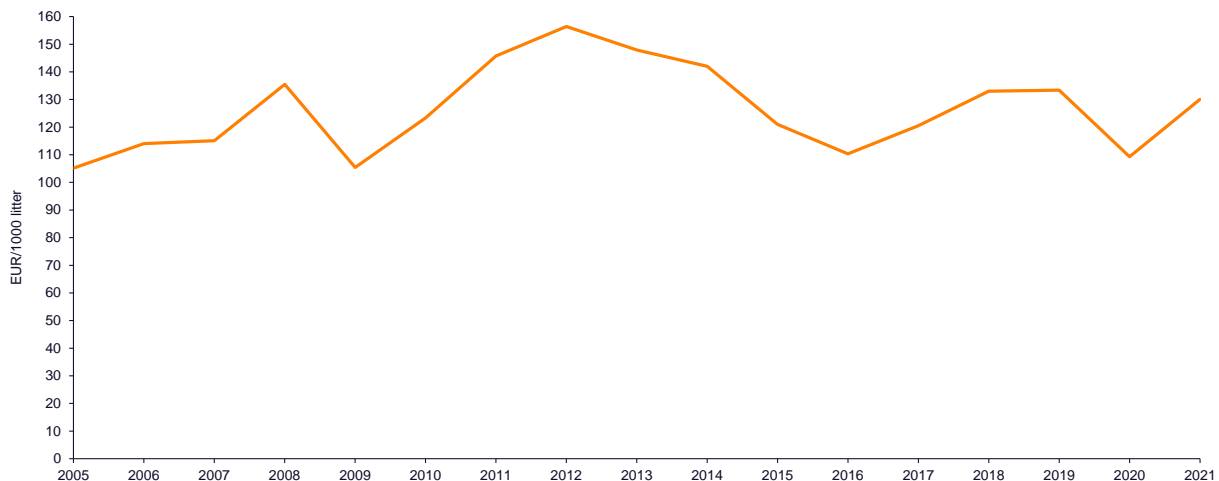
The high tariff (day) is applied from 07:00 - 22:00 during the period October 1 to March 31

The high tariff (day) is applied from 08:00 - 23:00 during the period April 1 to September 30

The customer is charged with reactive energy above the permitted one, which corresponds to $\cos(\phi) < 0.95$

Source: ERO Annual Report 2022, Note: Numbers deflated to 2016 prices

Information on other energy prices in the country is sparse. Thus, only retail prices for diesel oil are available, as displayed below.

Figure 62. Annual prices for diesel oil (2005-2021)

Source: KAS, *Statistical Yearbook 2022*, Note: Numbers deflated to 2016 prices

II. Projections of development with existing policies and measures at least until 2040 (including for the year 2030)

Given the high level of interconnectivity of Kosovo and the region, wholesale electricity prices are highly dependent on international developments. Other key factors determining future electricity prices are the phase-out of the existing BSA between incumbent power producer KEK and supplier KESCO, as well as the potential future introduction of carbon pricing in Kosovo and/or in the region.

Although Kosovo has no natural gas imports, the price increase of gas has impacted and will continue to impact Kosovo through its effect on electricity import prices. Additionally, Kosovo has the option to join the future regional gas network or to (co-)invest in gas-based generating capacities abroad. Therefore, natural gas price developments will be followed closely. Another factor to consider is the EU-ETS allowance price level (see 4.1 ii.), which also affects EU power market prices and thus Kosovar import prices. While not included in the presented scenarios, the introduction of domestic and/or regional carbon prices would also greatly impact Kosovar power prices considering its continued reliance on lignite-powered generation.

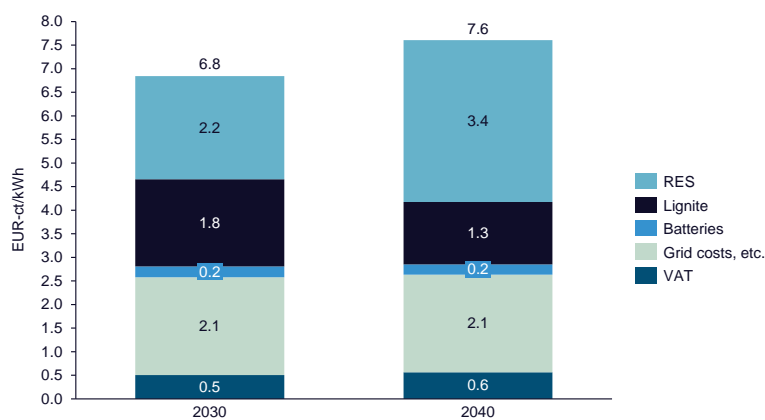
Finally, current retail prices are largely determined by the arrangement of a BSA between the lignite plant operator KEK and supplier KESCO. The agreement has been signed in 2013 as a result of the privatization transaction following the unbundling of the vertically integrated state-owned utility KEK. The BSA allows KESCO to buy all of the electricity produced by KEK. In fact, the BSA states that KEK may sell the electricity, which is not requested by KESCO to other purchasers, but only after this electricity is first offered to KESCO to supply electricity for customers. The main reason behind the BSA was to provide the customers with affordable electricity and to protect them from regional market prices as well as to secure a steady supply for the newly privatized distribution and supply company. On the other hand, as the generation prices in Kosovo are de jure deregulated, this would allow KEK to exercise high market power if it was not for the obligation arising from the BSA to offer all electricity produced to KESCO before taking any such actions. Furthermore, as KEK is publicly owned with the Government exercising shareholder rights, end-user prices are always considered when negotiating wholesale prices. Because of the negative effect on the markets, bulk supply agreements between incumbent generators and suppliers are generally required to be terminated according to Energy Community acquis. In this regard, it is foreseen in the Energy Strategy to gradually phase out the BSA to enable and strengthen the regional electricity market development. These anticipated changes and the kick-off of a liberalised retail market might increase future household electricity prices as KEK will be able to pass on costs such as for lignite plant retrofits or potential future carbon prices on to consumers.

As mentioned previously, Kosovo has large electricity interconnection capacities with its neighbours. Thus, these are rarely used to the full extent even with higher future renewable penetration. For the year 2030, we project average utilisation rates of 21%, 27%, 22% and 8% for the interconnections with Albania, North Macedonia, Montenegro, and Serbia, respectively.

Concerning electricity prices, the Energy Strategy projects price levels of around 79-82 EUR/MWh (2016 prices: 73.5 – 76.3 EUR/MWh) for between 2026 and 2031. However, while the modelling results for the Energy Strategy contain a carbon price which gradually converges to EU-ETS allowance price levels, the calculations presented here do not include a price on carbon emissions in the Western Balkans region. Hence, without domestic and/or regional carbon pricing, we project wholesale electricity prices of around 40 EUR/MWh by 2030 (45-50 EUR/MWh by 2040). Adding grid costs as well as other fees and taxes, we project cost-covering electricity retail prices of about 6.4 EUR-ct per kWh by 2030 and 7.2 EUR-ct per kWh by 2040 (incl. VAT).²² A breakdown of cost components can be seen in the

Figure 63. Lignite, renewables (RES) and battery costs jointly make up the projected wholesale market price, with grid costs and other fees and taxes (incl. VAT) added yielding the estimated cost-covering retail price. However, these estimates are highly sensitive to domestic/regional as well as European carbon prices, developments of natural gas and other fuel prices, as well as the degree of market liberalisation and integration in the region. Other retail fuel prices cannot be reliably estimated due to a lack of data.

Figure 63 Estimated cost-covering electricity retail price (2030 and 2040)



Source: Own calculations and modelling, Note: Numbers in 2016 prices

²² Own price projections are all in 2016 prices.

4.6 Dimension research, innovation and competitiveness

- I. Current situation of the low-carbon-technologies sector and, to the extent possible, its position on the global market (that analysis is to be carried out at regional or global level)

Kosovo having many problems of different natures with this plan is not pretending to become a leader in developing ground-breaking technologies that enable a revolutionary decarbonization of economic activity. However, what Kosovo is expecting from this plan is to set up a research and innovation system that is capable to identify the best technologies that Kosovo's industries need to employ, follow technological trends and find innovative ways to manage the adoption of the best feasible technologies. At the same time, Kosovo, as a small country, is expecting from its future research and innovation system to support the creation of a flexible economic system that will achieve full employment and converge with bigger steps toward developed societies.

The implementation of ECRP enables Kosovo to conduct research studies by domestic universities and research institutes with state-of-the-art methods. Establishing a broad range of various research institutes facilitated with modern research infrastructure makes possible conducting multi-dimensional research studies. The Government of Kosovo and international organizations helping Kosovo to increase its capacities will have the opportunity to get research studies with local cost, without a need to contact international universities, research institutes and consulting firms.

Kosovo's researchers will be able to address various climate and energy related research questions with the aim of offering evidence-based solutions for policy makers and industrial partners. Research topics of Kosovo's universities will cover the most important areas in energy and climate related issues.

Kosovo's universities will deliver studies that are related to the following areas:

- Decarbonization of the power system,
- Integration of renewable energies in the Kosovo's power system,
- Identification of best policies to support integration of renewable energies in the most effective and efficient way,
- Quantification of direct and indirect costs of integration of renewables,
- Delivering reliable short- and long-term forecasts of intermittent renewable power generation,
- Grid extensions and modernisation to cope with and foster energy transition that makes possible an efficient grid balancing,
- Integration and utilization of smart meters as the first step toward smart grids,
- Development of drink water, irrigation and energy capacities,
- Identification of possibilities to decrease pollution from coal power generation – carbon capture technologies,
- Increasing the utilization of existing power generation capacities,
- Identification of possibilities to increase CHP generation capacities,
- Identification of reliable, affordable and climate neutral technologies that solve all problems relating to heating,
- Cohabitation of conventional and renewable energies,
- Identification of feasible generation technology mixes that ensure reliable and affordable power supply in the pre and post coal era,
- Identification of possibilities for coal exploitation in the post coal era,
- Increasing energy efficiency awareness,
- Identification of productivity improvements in domestic industries through energy efficiency measures,
- Proposing policy measures that increase energy efficiency, which at the same time increase social equality and improve living conditions for children and, thus, leading to better schooling scores,
- Development of railway infrastructure,
- Development of cycling infrastructure.

II. Current level of public and, where available, private research and innovation spending on low-carbon-technologies, current number of patents, and current number of researchers

According to the Law on Scientific Research Activity, the budget for financing scientific research is set at 0.7% of the annual budget, but until now the budget allocated for science by all governments of Kosovo has not exceeded the share of 0.1%. There are no data about spending for research and innovation activities from businesses.

Based on the data of Ministry of Education, Science, Technology and Innovation, there is currently a budget framework, respectively MTEF - Medium-Term Expenditure Framework for the time period 2021-2025 in a financial value of €371,683,035. In the framework of this budget planning, in addition to other activities that are dominated by financial support, there is also the scheme "Improving the Research and Innovation Environment", i.e. activities that specifically address science and research challenges with budget allocations to:

- Establish the Science Fund, foreseen in the amount of € 16,500,000 for the period 2021-2025;
- Finance the associated status of Kosovo in Horizon Europe, in the amount of € 5,000,000 for the period 2021-2025;
- Establish a special fund for the co-financing of research projects that are the result of international cooperation and for the preparation of international scientific cooperation projects in the amount of € 2,200,000 for the period 2021-2025.

Number of researchers and number of patents are included as indicators to monitor the implementation of National Science Program (draft of December 2022).

III. Breakdown of current price elements that make up the main three price components (energy, network, taxes/levies)

Please see the explanation in the previous part "Current situation of electricity and gas markets, including energy prices" regarding the breakdown of price by the main three components.

IV. Description of energy subsidies, including for fossil fuels

In Kosovo there are investments in RES that are supported with Feed-in tariffs. The Rule on Support Scheme for renewable energy generators determines the maximum size of a single acceptable project for a scheme such as:

- 3 MW for PV,
- 14 MW for biomass,
- 35 MW for the wind and
- 10 MW for hydro

Currently, the feed-in tariff is the only Support Scheme that uses financial incentives to achieve RES targets. The criteria for obtaining this support exclude other types of financial incentives that will be used simultaneously for the same project. There are currently no incentives for tax deductions or import costs for renewable energy sources for electricity generation.

The following table shows the feed-in tariffs for electricity production of RES by technology (Table 16).

Table 16. Feed-in tariffs of RES by technology

RES technology	EUR/MWh
Wind	85.00
PV	136.40
Small Hydro	67.47
Biomass	71.30

Source: Annual report 2021, ERO

Implementation of the Support Scheme of the Feed-in Tariff is made possible through the RES Fund managed by the Market Operator. It is expected to continue the provision of economic support but with feed-in premium mechanism and tender for the first auction of 100 MW solar is already published.

5 ASSESSMENT OF IMPACTS OF PLANNED POLICIES AND MEASURES WITH EXISTING POLICIES AND MEASURES

5.1 Impacts of planned policies and measures described in section 3 on energy system and GHG emissions and removals, including comparison to projections with existing policies and measures (as described in section 4).

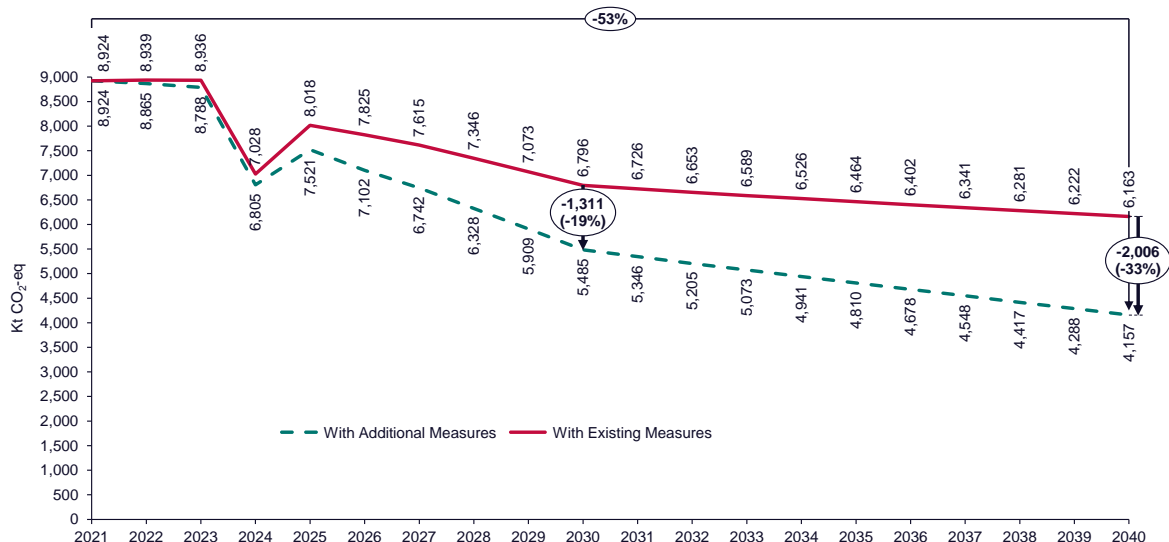
This chapter outlines the impacts of the planned policies and measures included in the scenario with additional measures (WAM) on the energy system and GHG emissions, also including a comparison to projections for the scenario with existing policies and measures (WEM). In the WAM scenario, both additional measures and more ambitious versions of WEM measures are foreseen, as outlined in more detail in chapter 3.

- I. Projections of the development of the energy system and GHG emissions and removals as well as the impact of the implementation of Directive 2001/80/EC as adapted and adopted by Ministerial Council Decision 2013/05/MC-EnC, amended by Decision 2015/07/MC-EnC and Directive 2010/75/EU as adapted and adopted by Ministerial Council Decision 2013/06/MC-EnC, amended by Decision 2015/06/MC-EnC, with particular regard to limited lifetime derogation.

Dimension Decarbonisation

In the WAM scenario it is projected that Kosovo will reduce its GHG emissions by 49% in 2030, compared to 2016 levels. In fact, according to the projections in the WAM scenario, it is estimated that emissions in the country will decrease to 5,484 ktCO₂-eq in 2030 (Figure 64). Compared to the WEM levels, this corresponds to 1,311 ktCO₂eq or 19% emissions abatement in 2030, while in 2040 the emissions abatement are around 2000 ktCO₂-eq.

Figure 64. GHG emissions (At Point of Emissions) – Comparison between WAM and WEM scenarios



Source: own calculations and modelling

The steep inflection in the GHG curve starting in 2023 until 2025 in the two scenarios is caused by the temporary unavailability of some lignite blocks during retrofit works. Despite initial alignment, the descending emissions' trajectories of both the WEM and WAM scenarios are projected to diverge progressively until 2040. Compared to WEM levels, the greatest emissions reduction is projected to happen in electricity generation and a lot of sinks are projected in the AFOLU sectors. Additional policies and measures in these sectors are projected to abate 638.6 and 615.8 ktCO₂eq of emissions, respectively (Figure 65).

Figure 65. GHG emissions (At Point of Emissions) – WAM scenario by Sector and differences with WEM Scenario

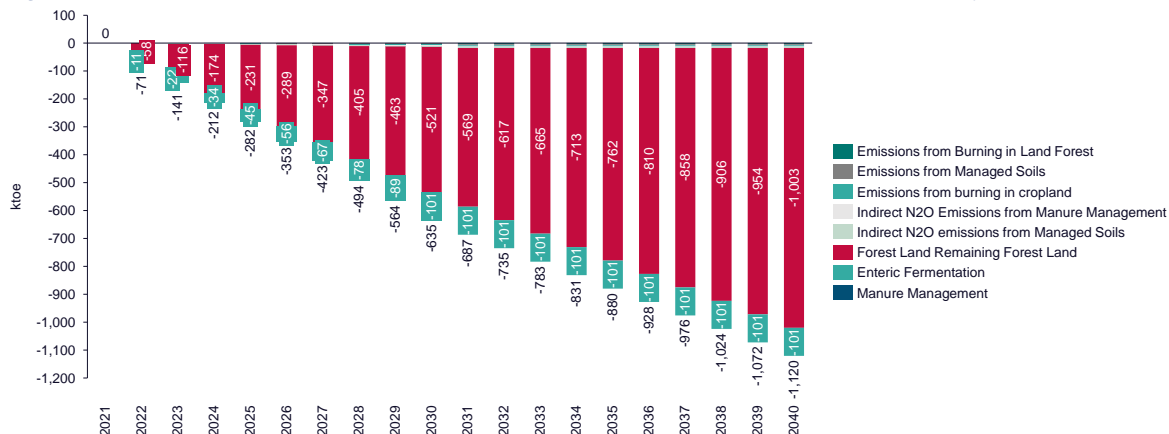


Source: own calculations and modelling

In 2030, in the WAM scenario, with a sequestration of 1045 ktCO₂eq (Figure 65), the AFOLU sector is projected to become a significant carbon sink. The agricultural sector is a net positive emitter, the forestry and other land-use sector (FOLU) a net-negative one. Compared to the WEM scenario, this represents an increase of 638 ktCO₂eq absorption capacity in the same year.

The replacement of biomass stoves with more efficient ones and the substitution with heat pumps have a substantial impact in terms of carbon emissions' removal. In the WAM scenario it is estimated that these measures will lead to a 20% reduction of wood extraction for heating purposes. Additionally, emissions' mitigation in the WAM scenario will be achieved by increasing the net primary productivity of forest biomass by 10% compared to the WEM Scenario. Overall, the FOLU sector is projected to absorb 520.6 ktCO₂eq of emissions in 2030 (Figure 66). Moreover, the reduction in livestock by 20% in the WAM scenario is projected to lead to a reduction in emissions by around 100 ktCO₂eq in 2030. Other measures impacting aggregated sources and non-CO₂ emissions in the agricultural sector lead to a 17.42 ktCO₂eq GHG emissions reduction in 2030.

Figure 66. GHG Emissions differences between WAM and WEM - AFOLU Sector (100-years GWP)

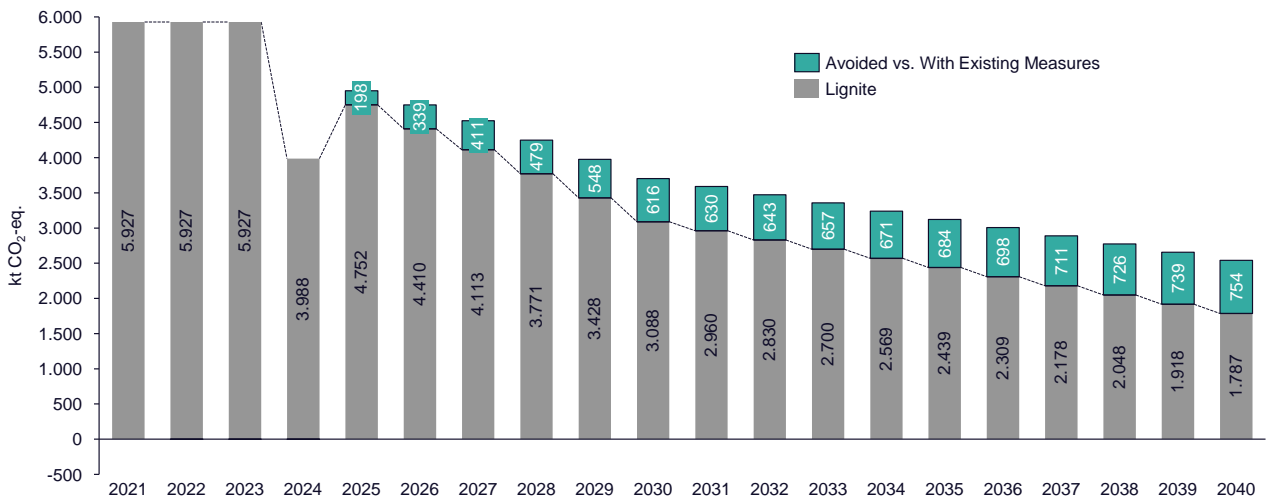


Source: own calculations and modelling

From the electricity generation and district heating side, a major share of emissions reduction stems from the decrease in the use of lignite in thermal power plants. In general, the decline in fossil generation in the WAM scenario has to be attributed to a lower electricity demand and to a faster RES uptake compared to the WEM scenario.

This proves the positive synergies between the energy efficiency and decarbonisation dimensions. In 2030, the avoided GHG emissions due to lowered lignite consumption in the WAM scenario amount to 616 ktCO₂eq (Figure 67).

Figure 67. Avoided GHG emissions (CO₂eq) in Electricity Generation in the WAM scenario compared to the WEM scenario

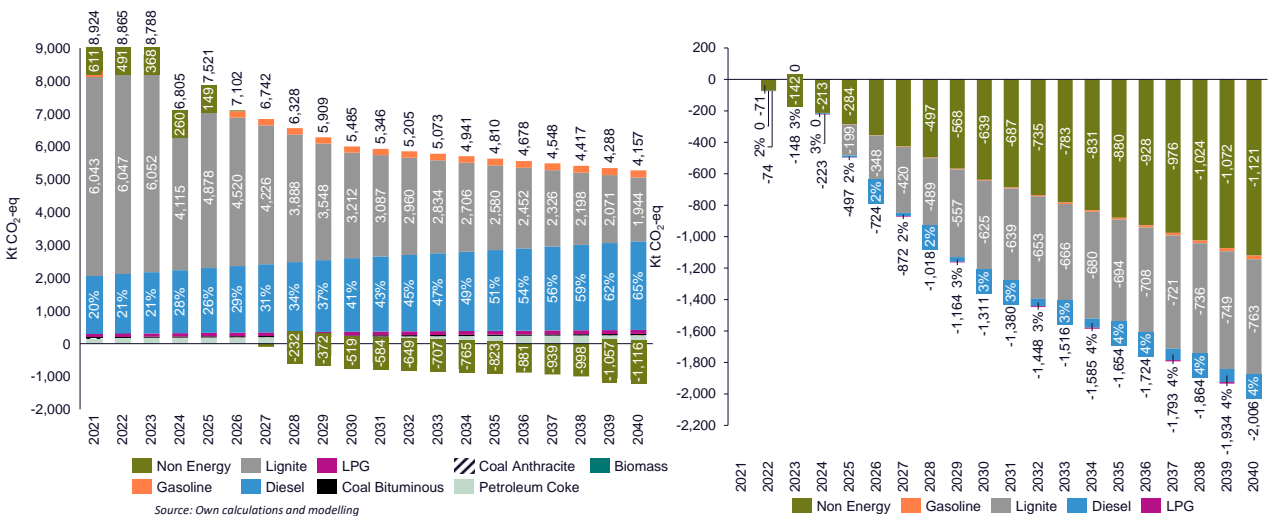


Source: own calculation scenario modelling

In contrast to the reduction of emissions originating from lignite and the non-energy sector, it is possible to still note a significant increase in diesel emissions in the period up to 2040. In that year, the share of emission from diesel consumption (mainly in the transport sector), are projected to amount to 65% of total net emissions (Figure 68).

The measures in the transport sector are able to reduce the emissions from this sector only by 3.2% in 2040.

Figure 68. GHG emissions (At Point of Emissions) – WAM scenario by Fuel and Differences with WEM



Source: own calculations and modelling

Renewable Energy

The overall share of renewable energy in gross final consumption in the WAM scenario reaches 32.5% in 2030 and 37% in 2040. In absolute terms, gross final renewable energy consumption is almost the same in the WEM and WAM scenario (Figure 69).

Figure 69. RES share in gross final energy consumption– Comparison between WAM and WEM scenarios



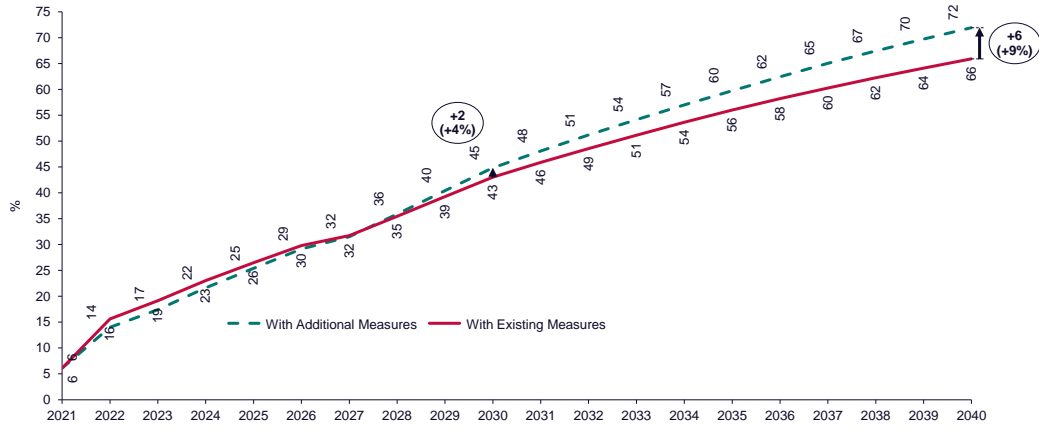
Source: own calculations and modelling

While the WAM scenario features higher shares of renewables in gross final electricity consumption (45.1% in 2030 and 72.4% in 2040; WEM: 43.1% in 2030 and 66% in 2040,

Figure 70), the share of renewable energy in heating and cooling in WAM in 2040 is close to the level as in the WEM (

Figure 71), dropping below WEM in the second half of the 2030s due to a steeper reduction of forest biomass consumption. This can be attributed to the additional energy efficiency policies in the residential sector, in particular the rollout of heat pumps and more efficient biomass stoves.

Figure 70: RES share in gross final electricity consumption



Source: own calculations and modelling

Figure 71. Share of renewable energy in heating and cooling

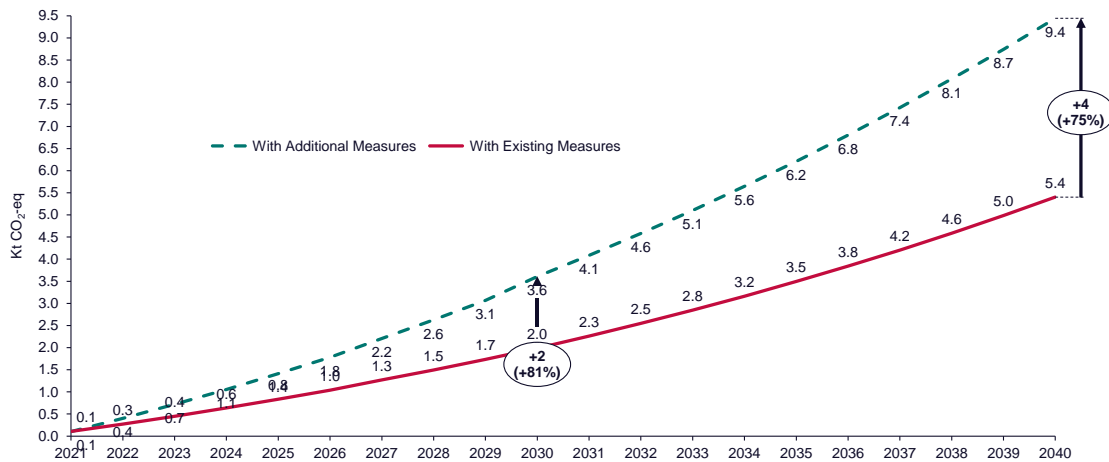


Source: own calculations and modelling

In transport, a higher share of renewable energy is reached in WAM in 2040 of 9.4% (

Figure 72) due to a higher share of battery-electric vehicles, a modal shift to rail transport, as well as a higher rate of rail electrification.

Figure 72: Share of renewable energy in the transport sector

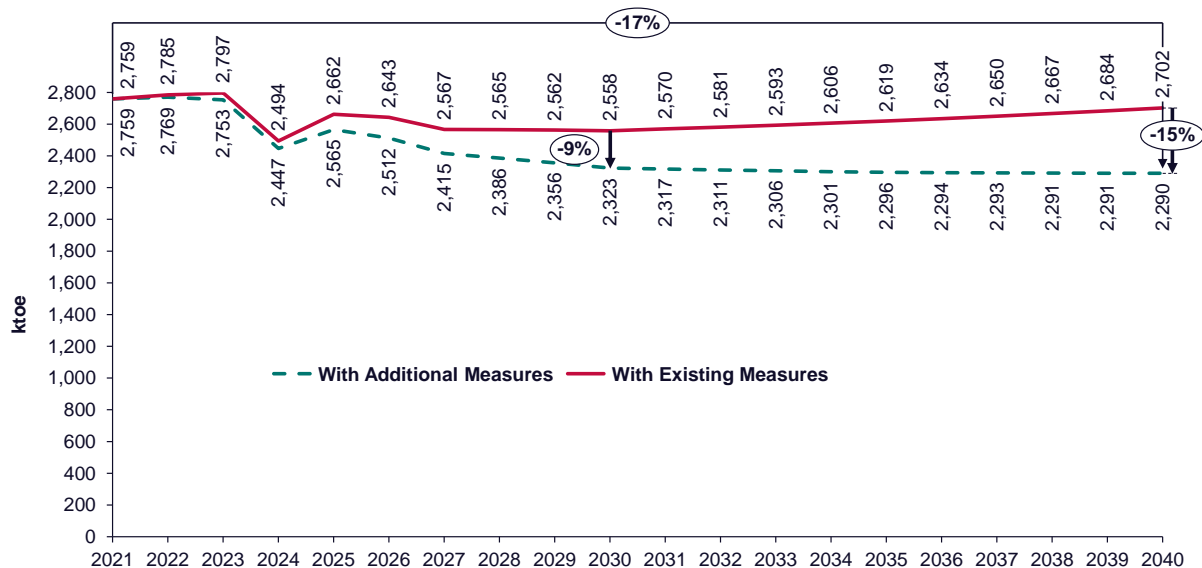


Source: own calculations and modelling

Dimension Energy Efficiency

Primary energy consumption (PEC) in the WAM Scenario is reduced by 9% in 2030 compared to the WEM scenario, while in 2040 by additional five percentage points (Figure 73). The PEC pattern resembles the trajectory of GHG emissions outlined in the previous section. The high correlation between the trajectories demonstrates the high emission intensity of electricity generation in the initial years. It also highlights the strong interlinkages between the energy efficiency and decarbonisation dimensions in the Kosovar energy system.

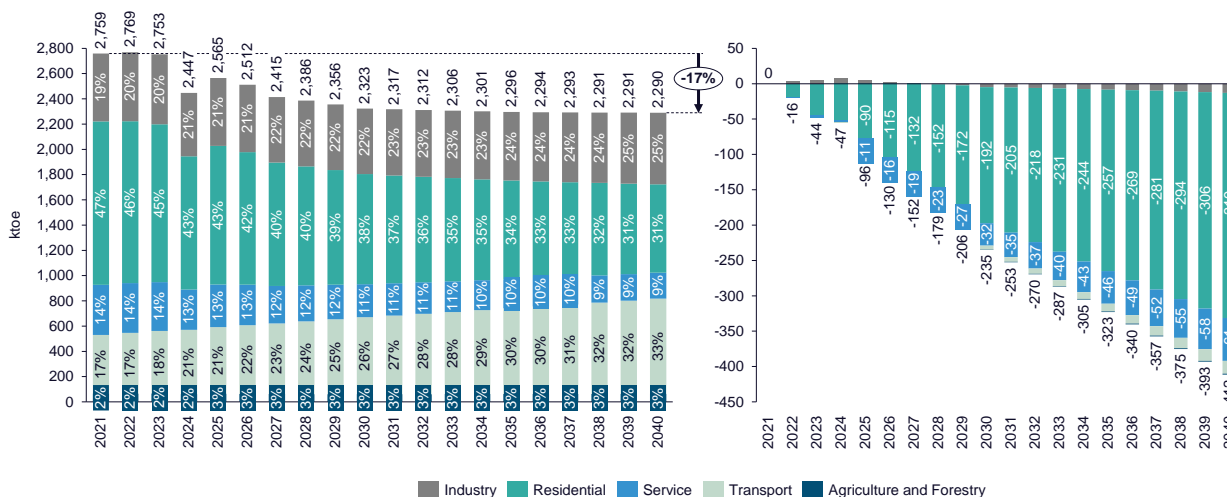
Figure 73. Primary Energy Consumption, comparison between WAM and WEM scenarios



Source: own calculations and modelling

According to WAM projections, PEC will reach the value of 2,323 ktOE in 2030, meeting the Clean Energy Package energy efficiency target of 2,700 ktOE (Figure 74). In the WAM scenario, the primary energy consumption decreases by 1.81% per year, while in WEM scenario, with an average decrease per year of 0.74%, the reduction is milder. The divergence in trajectories leads to a 9.1% lower PEC value in 2030 compared to the WEM scenario. Additionally, the graphs suggest that, in contrast to an increasing PEC projection in the WEM scenario, PEC in WAM is forecasted to shrink after 2030. The analysis of the graph on the right-hand side underscores that PEC savings (WAM compared to WEM), when allocated entirely to demand sectors, are for the greatest part achieved in the residential and service sectors. Some savings in PEC are also achieved in the transport sector.

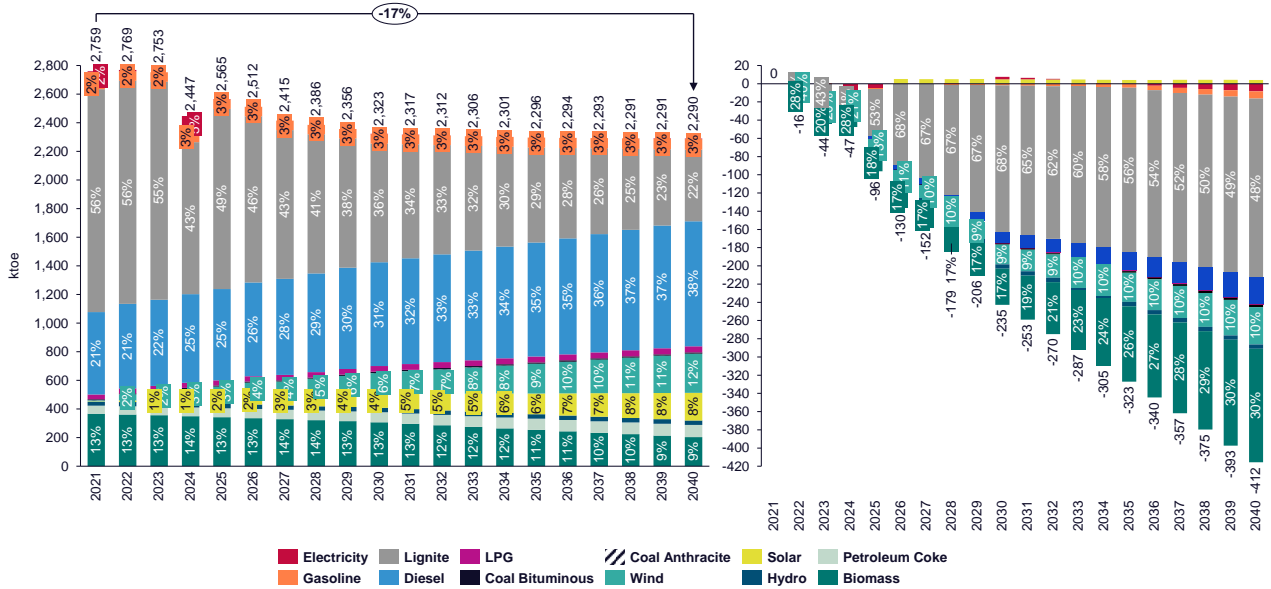
Figure 74. Primary Energy Consumption by sector in the WAM scenario, differences between WAM and WEM



Source: own calculations and modelling

The PEC savings in WAM in the aforementioned sectors stem mostly from the decrease in lignite and biomass consumption (Figure 75). The decrease in lignite has to be mainly attributed to the reduction of electricity demand, as will be explained in more detail in the analysis below, dedicated to final energy consumption. In addition, the graphs show an increase in primary energy consumption of diesel fuel resulting from the increase in transport demand.

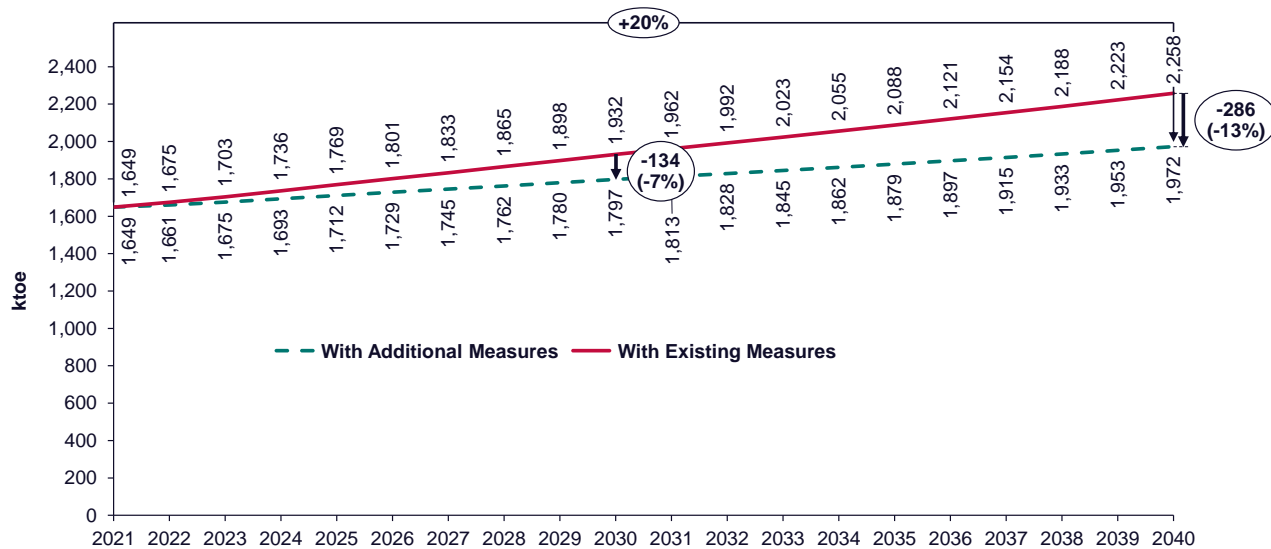
Figure 75. Primary Energy Consumption, differences between WAM and WEM scenarios by Fuel



Source: own calculations and modelling

Compared to the WEM scenario, it is projected that additional measures in the energy efficiency domain will lead to 134 ktoe of FEC savings by 2030 (Figure 76). As a result, FEC in the WAM scenario is expected to be 7% lower in 2030 compared to the WEM scenario. Moreover, in contrast to the WEM Scenario, the WAM trajectory is expected to meet the energy efficiency target of 1.8 Mtoe in 2030.

Figure 76. Final Energy Consumption – Comparison between WEM and WAM scenarios



Source: own calculations and modelling

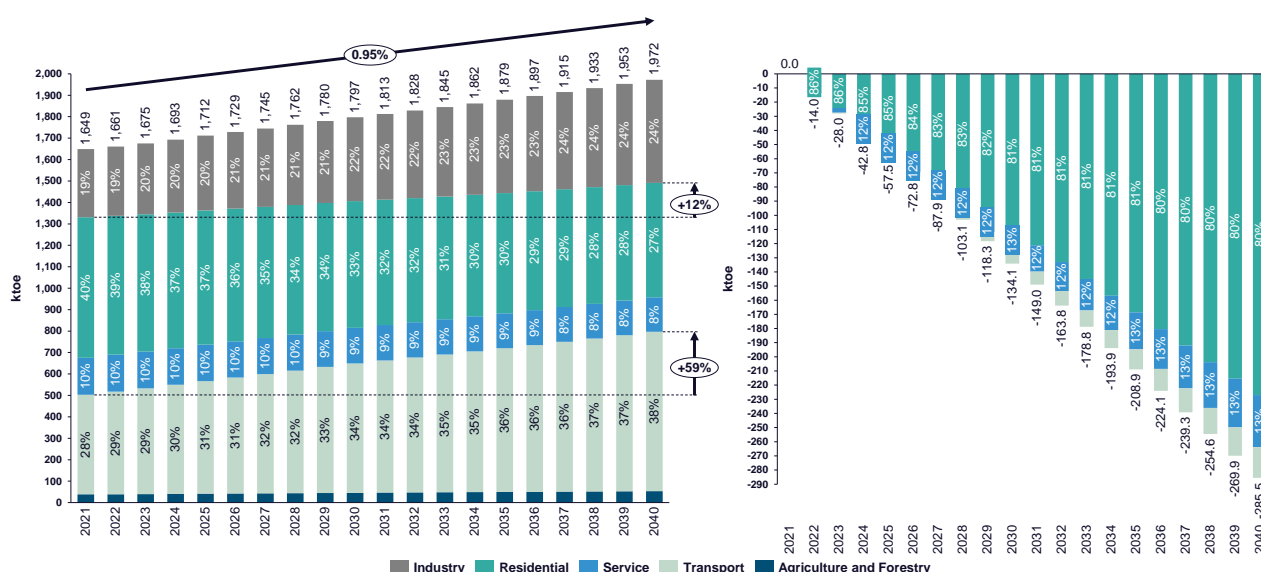
FEC is projected to grow on average by 0.95% per year in the 2021-2030 period and to reach the value of 1797.5 ktoe in 2030 (Figure 77). This translates into a 9% increase compared to 2021 levels.

Overall, positive growth in final energy demand in the period 2021-2040 can be observed in the residential, industry, agriculture and forestry sectors. Despite energy-saving measures in the transport branch, FEC in this sector is projected to grow by 30% over the 2021-2030 period. This can be attributed to the increasing

demand for transport throughout the analysed timeframe. The additional efficiency measures implemented in the WAM scenario are not sufficient to counterbalance the raising consumption in the transport sector but lead to a less steep increase.

In contrast, because of energy efficiency measures, the final energy consumption in the residential and service sectors is projected to decrease by 9.77% and 4.19% in 2030 compared to 2021, respectively. Figure 77 (right) gives an overview of the energy savings achieved in each of these sectors in the WAM scenario, resulting from the mix of additional policies and measures. As the chart suggests, the greatest share of energy savings is achieved in the residential sector, followed by the service and transport sectors. The 109.1 ktoe of energy savings in the residential sector in 2030 (Figure 77 (right)) are a result of a policy mix summarized in Table 17, which also displays the cumulative savings achieved by these measures by 2030.

Figure 77. Final Energy Consumption WAM Scenario by Sector, differences between WAM and WEM scenarios by Fuel



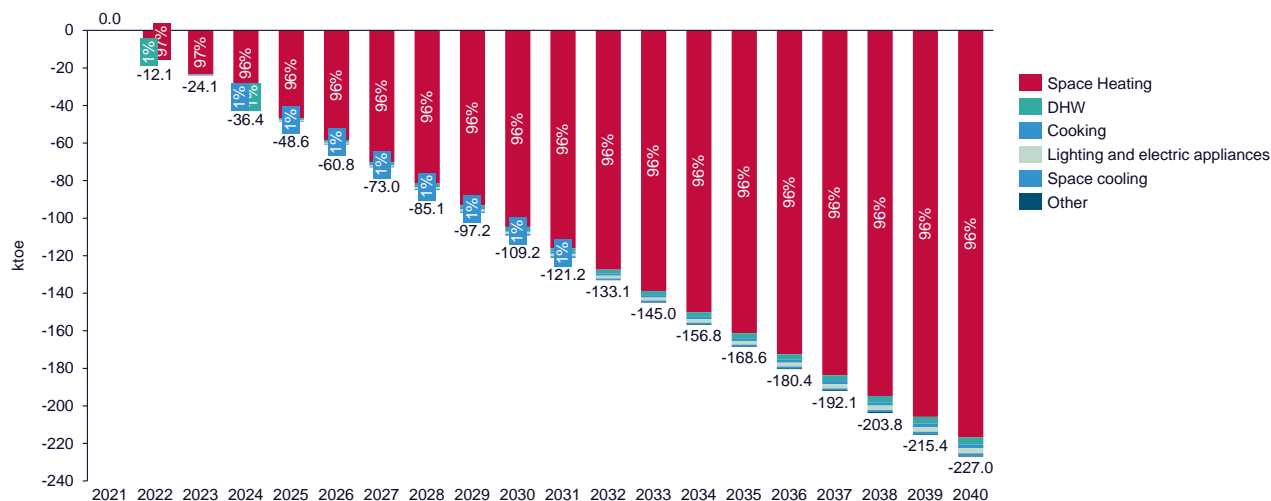
Source: own calculations and modelling

Table 17. Policy and measures implemented in the residential sector and projected savings

Policy Measure	Cumulative savings 2030 (ktoe)
Introduction of heat pumps	60.4
More efficient biomass stoves	24.4
Deeper renovation of 1.2% of the residential building (excl. AB) stock per annum	12.9
NZEB in 0.3% of the building stock (excl. AB) per annum	10.5
Installation of additional solar thermal collectors	0.8
Total	109.1

The policy measures are projected to reduce energy demand, in particular in the space heating sector and lead to energy savings of 104.6 ktoe in this end-use by 2030 (Figure 78).

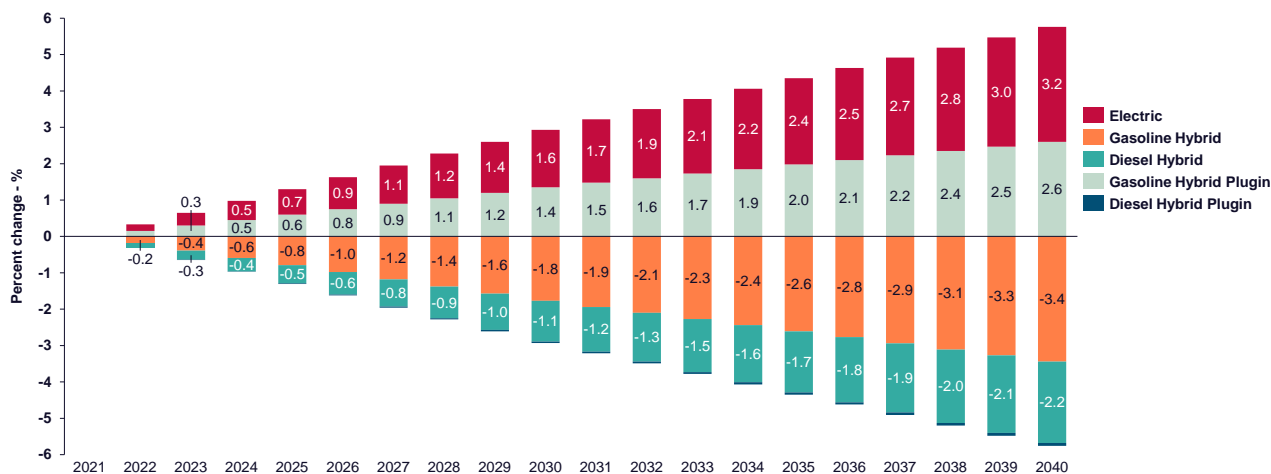
Figure 78. Differences in Final Energy Consumption by End-Uses of the Residential Sector between WAM and WEM scenarios



Source: own calculations and modelling

Savings in the transport sector arise from the road to rail modal shift, in both passenger and freight transport, from the increase of sustainable modes in the passenger transport and from the change in fuel shares in the vehicle fleet. In the WAM scenario, it is assumed that there will be more energy-efficient electric and gasoline-hybrid plug-in vehicles replacing gasoline-hybrid and gasoline-hybrid plug-in vehicles. In WAM, by 2030, there will be 1.58% more electric cars in the total LDV fleet in the country, 1.35% more gasoline hybrid plugin, 1.77% less gasoline full hybrid and 0.04% less diesel full hybrid cars compared to WEM (Figure 79). Comprehensively, the energy efficiency measures in the transport sector lead to 8.1 ktoe of energy savings in 2030.

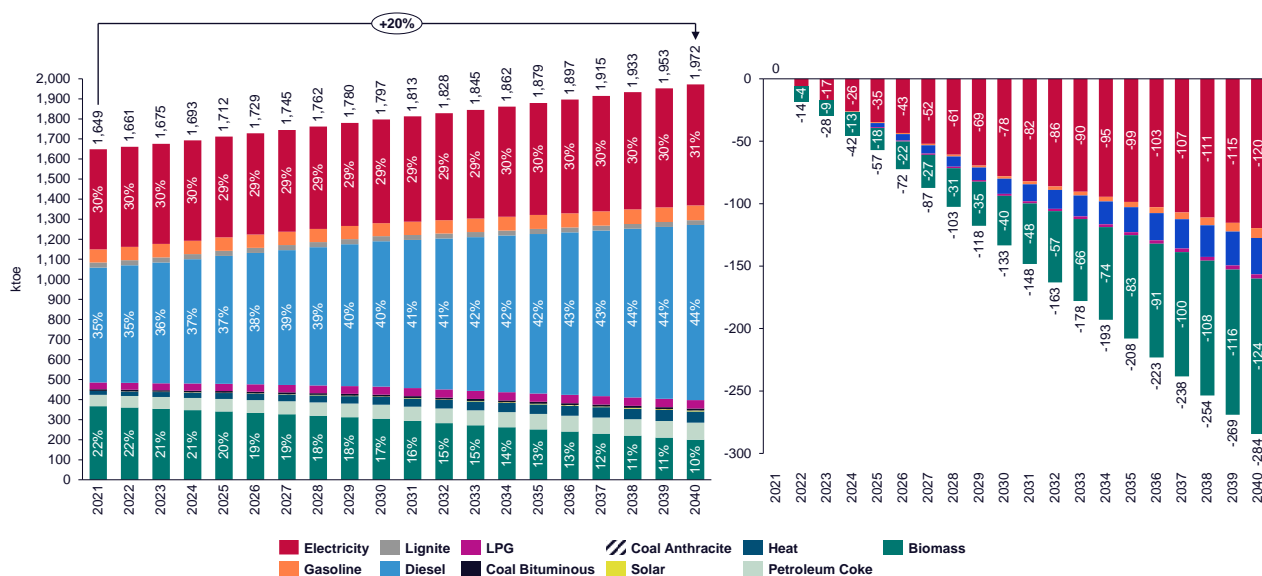
Figure 79. Fuel switch LDVs WAM compared to WEM



Source: own calculations and modelling

Additional demand side energy efficiency measures lead to savings in electricity and biomass consumption of 78.04 ktoe and 39.6 ktoe in 2030, respectively (Figure 80). Compared to WEM, these savings signify a 13% decrease in electricity demand and 11.5% in biomass consumption in 2030. Additionally, savings in diesel, LPG and gasoline amount to 15.6 ktoe.

Figure 80. Final Energy Consumption in the WAM Scenario by Fuel and Differences with WEM Scenario

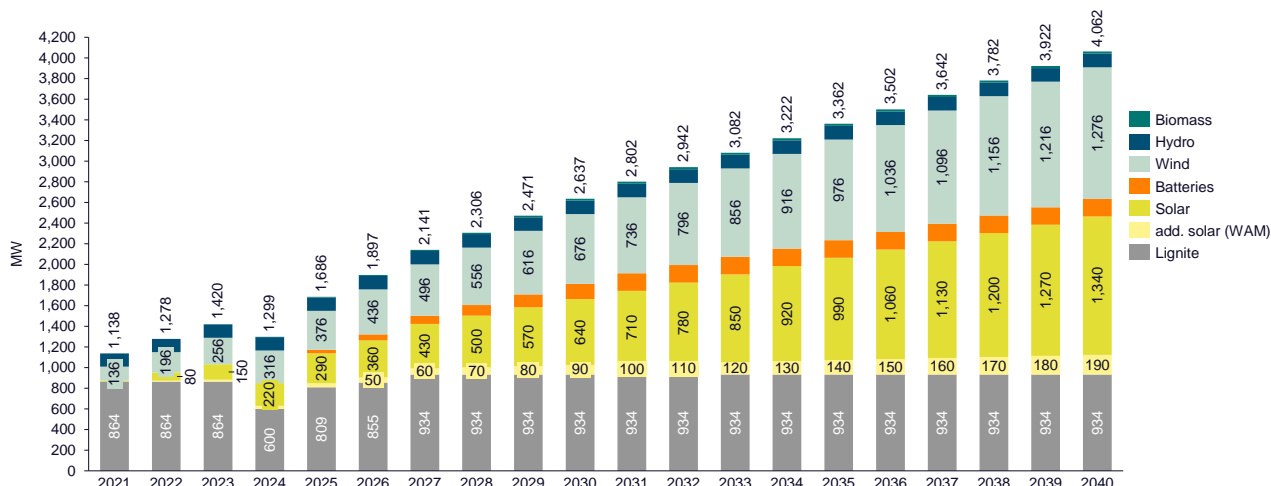


Source: own calculations and modelling

Dimension Energy Security

In the scenario with additional measures (WAM), a more ambitious prosumer solar PV expansion (see Figure 81) combined with reduced domestic electricity demand (see Figure 80 in Chapter 5.1 ii.) would reduce the country’s reliance on lignite-powered electricity generation sharper than in the scenario with existing measures (WEM).

Figure 81. Installed electricity generation capacities in WAM (projection)

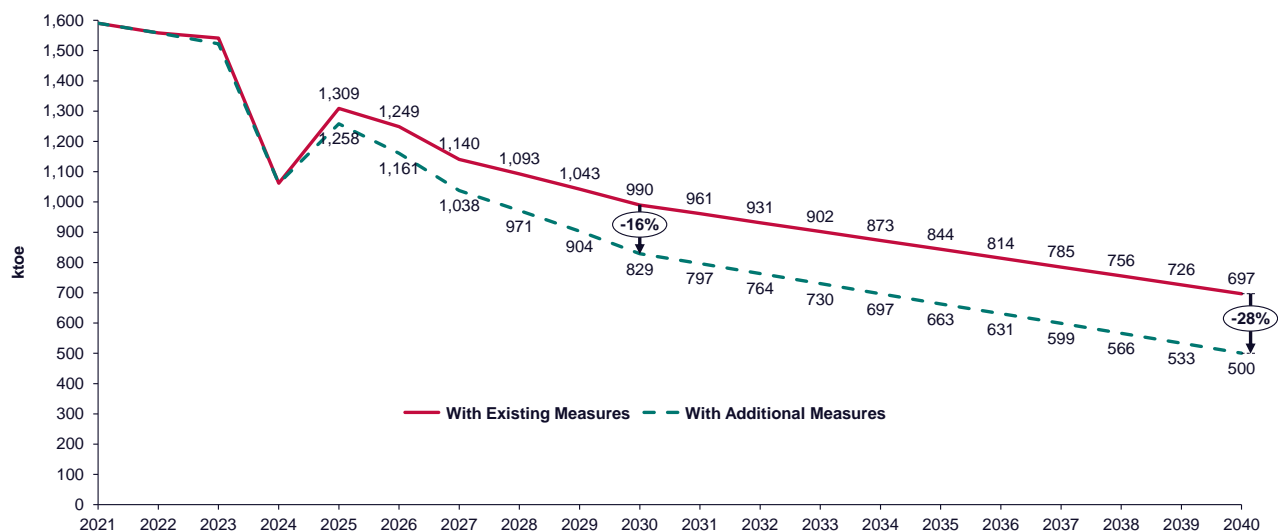


Source: Energy Strategy, ERO, KEK, DH Gjakova, Ministry of Economy, own calculations

Note: For lignite units, available capacities (including strategic reserves) are shown, based on the provided schedule for unit retrofits. Retrofits of units B1 and B2 are assumed to take place in the middle of the respective year.

Reduced lignite-powered generation consequently would lead to reduced domestic lignite production by 16% in 2030 in WAM compared to WEM scenario (Figure 82).

Figure 82. Domestic lignite production by scenario (projection)

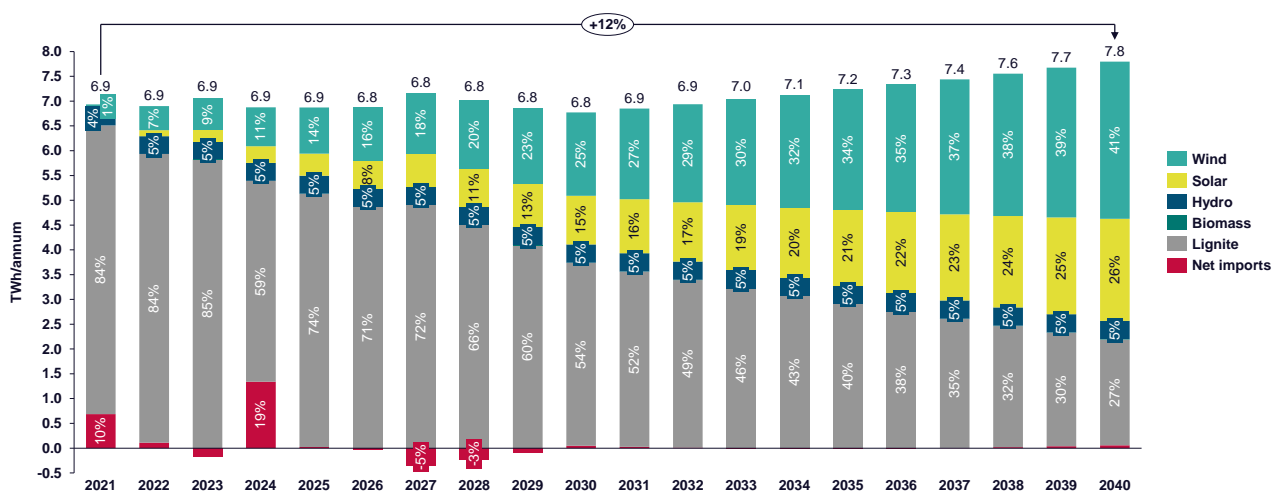


Source: own calculations and modelling

Figure 83 provides an overview of the electricity mix after implementing additional measures in the country. Notably, in the WAM scenario, solar would make up 14.5% of gross final consumption in 2030 (12.7% in WEM) and 26.4% in 2040 (22.2%), while wind makes up 24.8% in 2030 (same in WEM) and 40.7% in 2040 (39.1% in WEM).

The share of lignite is projected to fall to 54.5% in 2030 and 27.4% in 2040 (56.8% and 32.5% in WEM). Net electricity imports in the WAM scenario are projected to remain below 1% of gross final demand after peaking at 19.5% in 2024 (21% in WEM) due to the temporary unavailability of some lignite blocks during retrofit works.

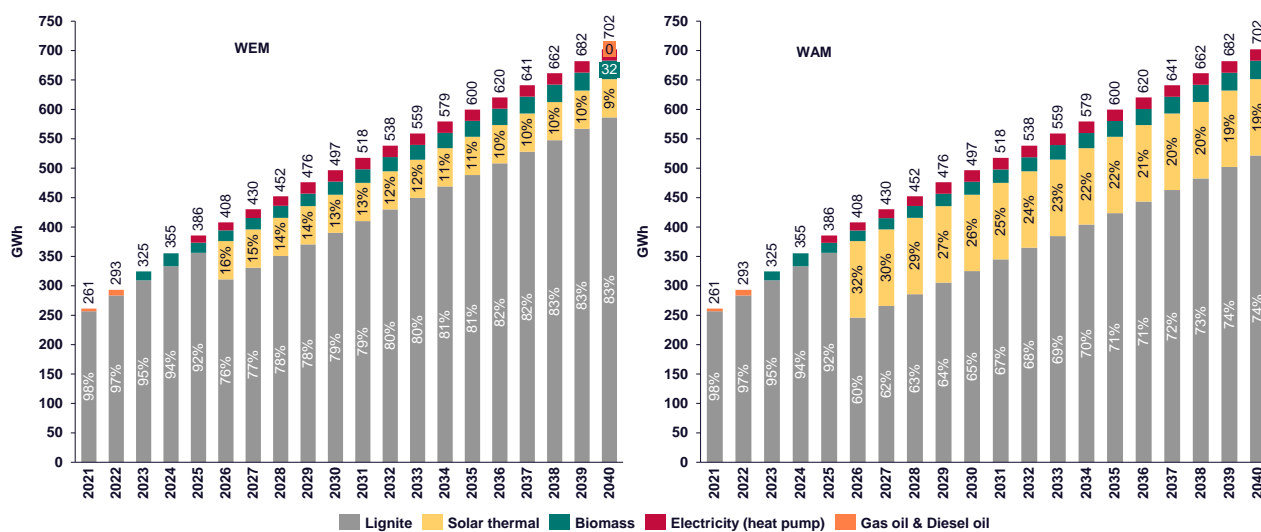
Figure 83. WAM electricity mix in gross final consumption by source (projection)



Source: Eurostat, own projections, and modelling

In regard to district heat, the inclusion of a second solar thermal district heat project, which is currently being developed in Pristina with the same dimensions as Solar4Kosova II, would reduce the country share of lignite in district heat generation from 78.5% to 65.4% in 2030 (83.5% to 74.3% in 2040) in the WAM scenario (Figure 84).

Figure 84. WEM and WAM district heat generation mix by source (projection)

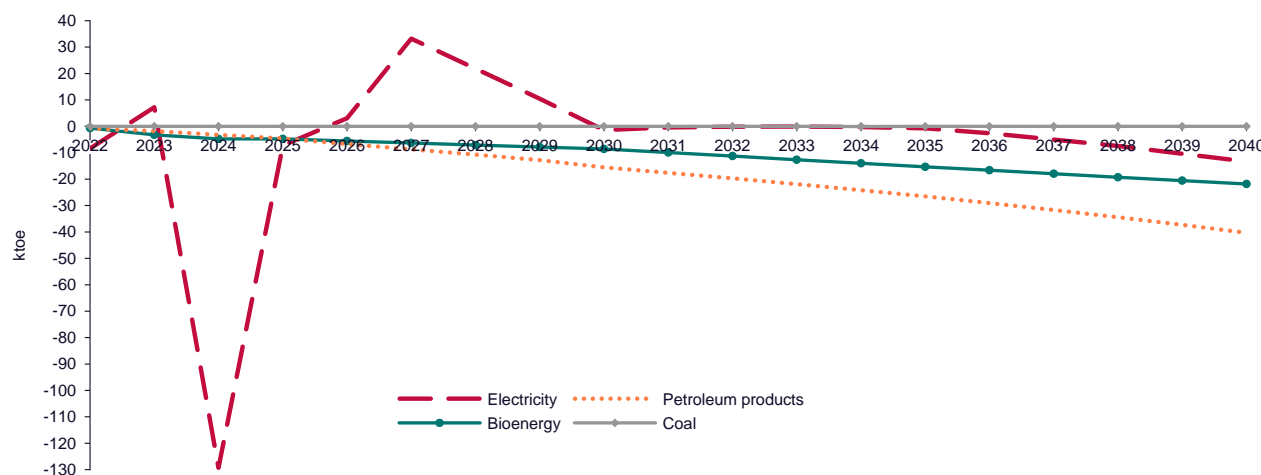


Source: own projections and modelling

The additional measures also impact import volumes of energy carriers. With additional savings, in particular in the transport sector, imports of petroleum products are projected to grow less steep in WAM compared to the WEM scenario. Similarly, imports of bioenergy are projected to fall more strongly in WAM as additional policies reduce bioenergy consumption in the residential sector. The additional measures result in lower net electricity imports in 2024, as well as towards the end of the 2030s but slightly lower net electricity exports in 2027-2029 as can be seen on Figure 85.

Overall, additional policies and measures gradually improve energy security as reliance on imports, especially of petroleum products, is reduced and some additional domestic generation capacity (prosumer solar PV and solar thermal for district heat) is added in the WAM scenario. This reduces reliance on Kosovo’s outdated lignite power plants Kosova A and B. Despite planned lifetime extension and retrofit measures, the plants might continue to pose a non-negligible energy security risk in the case of unscheduled maintenance or temporary outages. At the same time, the country does not plan to retire any additional lignite units in the WAM scenario and keeps two units from Kosova A in reserve mode, same as in the WEM scenario. Thus, the reduced lignite generation shares in electricity and district heat generation do not correspond to reduced capacity in available dispatchable generation.

Figure 85. Difference in net imports by energy carriers between scenarios (projection)



Source: own projections and modelling

Note: Negative values correspond to lower net imports in the WAM scenario.

Dimension Internal Energy Market

Higher penetration of renewable energy and lower domestic electricity demand in Kosovo result in larger volumes of electricity trade with neighbouring countries in the WAM scenario. While the country generally possesses large interconnection capacities with its neighbours, the increased utilisation of interconnectors results in higher congestion rates, in particular at the (smaller) interconnectors with North Macedonia and Montenegro (Table 18).

Table 18. Proj. 2030 utilisation rates and congestion rates of interconnectors (by country)

Country	Utilisation rate (%)		Congestion (%)	
	WEM	WAM	WEM	WAM
Albania	21%	11%	0%	0%
North Macedonia	27%	34%	16%	21%
Montenegro	22%	40%	6%	17%
Serbia	8%	5%	0%	0%

Source: own calculations and modelling

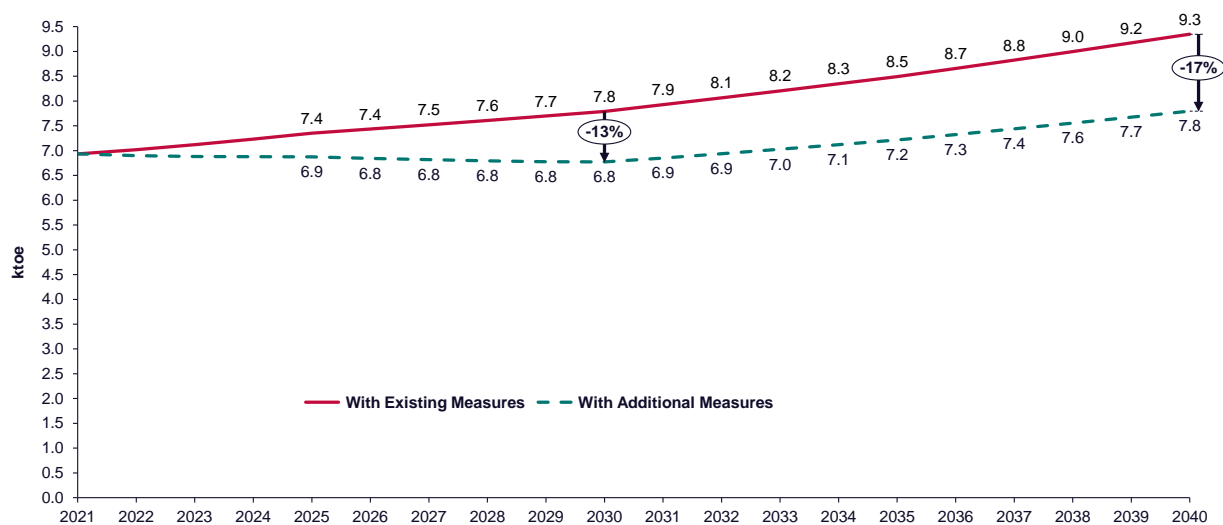
A dynamic flow-based determination of interconnector capacities (not modelled here) would relieve some of this congestion, as foreseen by PaM X.1 These results underline the importance of improved determination of interconnector capacities. For a discussion of projected electricity prices, see section 5.4 ii.

- II. Assessment of policy interactions (between existing policies and measures and planned policies and measures within a policy dimension and between existing policies and measures and planned policies and measures of different dimensions) at least until the last year of the period covered by the plan, in particular to establish a robust understanding of the impact of energy efficiency / energy savings policies on the sizing of the energy system and to reduce the risk of stranded investment in energy supply

The additional energy efficiency measures in the WAM scenario, particularly in the residential sector, lead to substantially lower electricity demand (see previous section). Gross final electricity demand in 2030 is projected to reach 6.77 TWh in 2030 (vs. 7.79 TWh in WEM) and 7.80 TWh in 2040 (9.35 TWh in WEM) (Figure 86).

¹ Due to the limitations of the employed modelling framework, which represents electricity interconnectors through a simplified net-transfer capacity (NTC) approach and does not allow for an explicit representation of dynamic AC power flows, it has not been possible to reflect this planned policy measure in the results presented here.

Figure 86. Electricity demand by scenario (projection)



Source: own calculations and modelling

As described in Chapter 5.1. i., reduced electricity demand in WAM (as well as additional available RES capacities in electricity and district heat generation) leads to lower utilisation of the lignite power plants. The utilisation rate of Kosova B in the WAM scenario is projected at 78% in 2030 (94% in WEM) and 46% in 2040 (66% in WEM). The remaining Kosova A units do not generate electricity after 2028 under normal conditions but remain in strategic reserve to power up under extraordinary conditions (e.g., the outage of one unit at Kosova B during moments of high demand).

The modelling results demonstrate that electricity demand can be met without Kosova A after 2028 under normal conditions in both scenarios. While it could thus be argued that investments in retrofits and lifetime extension of Kosova A units constitute stranded investments, since the units would not be able to refinance these investments on the electricity market, the expenditure could also be viewed as an investment in energy security. With this framing, the strategic reserve of the renovated Kosova A units thus represents a physical hedge against unforeseen or extraordinary events.

It should be noted that with lower utilisation rates of Kosova B units in the WAM scenario, the joint backup capacity of unutilised Kosova B capacity and additional Kosova A reserve capacity is higher than in the WEM scenario. Thus, the WAM scenario entails a larger hedge against uncertainties. While not considered here, it might be assessed whether the renovation of only one unit of Kosova A (while decommissioning two units) might be sufficient for strategic reserve purposes in the WAM scenario.

III. Assessment of interactions between existing policies and measures and planned policies and measures, and between those policies and measures and Energy Community climate and energy policy measures

Policies adopted by the Energy Community Ministerial council are implemented in Kosovo through policies and measures at the national level as presented in Chapter 3. Policies and measures in the WAM scenario are designed such that Clean Energy Package targets for Kosovo in the dimensions of GHG emissions, renewable energy and energy efficiency for 2030 are reached.

Kosovo is projected to overachieve its 2030 targets for GHG emissions and renewable energy in both the WEM and WAM scenario. This is mainly driven by the ambitious plans (in WEM and WAM) to expand wind and solar PV capacities which, on the one hand, prop up the share of renewable energy in gross final consumption and, on the other hand, gradually but continuously reduce the utilisation and resulting GHG emissions of the country's lignite power plants.

The most critical target for the country is the energy efficiency target for final energy consumption (1,800 ktoe in 2030). Ambitious energy efficiency measures across sectors are instrumental for reaching this target. At its core, this entails ambitious renovation efforts across the residential and service sectors, the expansion of district heating in Pristina and Gjakova, as well as the rollout of heat pumps and more efficient biomass stoves in the WAM scenario. Additionally, policies to increase the share of alternative fuel vehicles, in particular efficient battery-electric vehicles, as well as policies and measures to increase the share of rail transport, help achieve the energy efficiency target for final energy consumption in the WAM scenario. Policies and measures to increase energy efficiency in industry are currently neither part of the WEM nor WAM scenario and might be explored in an updated NECP in the future.

5.2 Macroeconomic and, to the extent feasible, the health, environmental, employment and education, skills and social impacts, including just transition aspects (in terms of costs and benefits as well as cost-effectiveness) of the planned policies and measures described in section 3 at least until the last year of the period covered by the plan, including comparison to projections with existing policies and measures

The policies and measures described in chapter 3 will have a significant short-, mid- and long-term impact across a number of non-energy aspects, including on levels of disposable income of Kosovar households, the public budget, employment levels and health. This section specifically provides an assessment on these non-energy impacts of energy and climate policies comprised in this NECP.

Table 19 presents a qualitative assessment of non-energy impacts of selected policies and measures, addressing these aspects. The assessments are conducted on a three-level scale ranging from “negative” over “neutral” to “positive”, indicating the direction of the effect of the respective measure on the outcome. While assessed by section, it is crucial to note that the macroeconomic effects are interlocking and are contingent on aligning policies to ensure minimizing expenses and negative effects while maximising benefits for the government, private sector, and consumers. Additionally, it has to be noted that the macroeconomic effects of interventions are highly variant depending on the source of financing of various energy efficiency and RES-related measures.

Table 19. Non-energy impacts of selected PaMs

Selected PaMs	Qualitative assessment of non-energy impacts			
	Disposable household income	Public Budget	Employment	Health effects
Promoting the utilization of railway transport by restructuring and modernizing the network	positive	negative	positive	positive
Boost the use of bicycles and electric scooters for short distances	positive	negative	positive	positive
Enhanced forest management for increasing forest biomass and increasing net productivity	neutral	negative	positive	neutral
Increase the installed capacities of distributed RES from prosumers	positive	negative	positive	positive
Increase amount of vRES capacity that the network is able to handle/integrate	negative	negative	positive	positive
Installation of solar thermal in different types of building stock in the residential sector	positive	negative	positive	positive
Installation of battery storage capacity	positive	neutral	positive	neutral
Promotion of education of skilled workers for buildings renovation, district heat installation, etc.	positive	negative	positive	neutral
Full phase-out BSA/Financial PSO	negative	positive	neutral	neutral

Power to heat	positive	negative	positive	positive
Consumption-independent support scheme for vulnerable consumers based on improved data and a legal definition	positive	negative	neutral	positive

Source: own elaboration

Disposable household incomes

The policies and measures outlined in this NECP may have large impacts on the average levels of disposable household income in Kosovo. On the one hand, investment into and improvements in energy efficiency (EE) have the potential to increase disposable incomes as households benefit from reduced energy bills and fuel saving more broadly. This can be further increased by installing small-scale solar PV in households to both decrease the amount of electricity needed and to bring financial benefits to prosumers selling electricity back into the grid.

On the mobility front, switching to bicycles, electric two and three wheelers or scooters can further improve disposable incomes due to the lower cost of electricity vis-à-vis conventional fuels and the even lower purchase and operational costs associated with cycling. Regarding electric passenger vehicles, savings can be registered in terms of operational costs, but high up-front investment costs may limit adoption in the context of Kosovo.

Additionally, household incomes can benefit more indirectly from EE and RES deployments through higher living comfort and improvements in living conditions, such as for example through the replace of often hazardous biomass stoves, which may translate into higher productivity as well as decreased spending on healthcare. The policies and measures mentioned may also likely lead to higher employment, including in good, better paying jobs, which will have an impact on average household income and disposable income levels (see section on employment below).

Concurrently, individual or collective EE improvements in the residential sector require significant financing, which may in the short-term decrease household incomes due to the relatively large up-front cost needed for EE investments. As such, financing mechanisms need to be clearly defined and advertised to the population, showing both the costs and benefits. With low energy prices, improvements in EE may not pay off financially, which may require additional sources of funding (e.g. from international sources or donors), as well as mechanisms (e.g. an Energy Efficiency Fund), with careful assessments of the loan vs grant components, the role of individual households and homeowners associations, and the close coordination with both financial institutions (e.g. local banks offering EE products) as well as construction companies. The goal is also to prevent exacerbations in energy poverty brought on by potentially higher energy prices, especially as regulations and subsidies are reduced, the bulk supply agreement between KEK and KESCO is phased out, and the retail market is liberalized, which may require the use of social compensation mechanisms to prevent significant impacts on households' disposable incomes.

Public budgets

The Kosovar public budget can be significantly affected by the outlined policies and measures in multiple ways.

Within the realm of energy efficiency, financial benefits can include both increased tax revenues, as well as lower government expenses. While initially costs will have to be incurred by the government, especially when upgrading EE measures in public buildings, the impact on the budget decreases over time as EE drives lower expenditures for lighting, heating and cooling. Given EE improvements, larger revenues can also be expected from more valuable real estate transactions, including for public and private buildings, as well as industrial installations.

When considering broader EE works across both the private and public sectors, higher tax revenues can be expected due to the increase in construction activity. This also generates other positive direct and indirect effects which can have a positive effect on the budget. Firstly, larger employment within the EE and

construction industry can lead to a decrease in expenditures on unemployment payments, while concurrently boosting the revenue received from income taxes. Improvements in EE (while not necessarily in isolation) can also translate to a decrease in expenditure on subsidies. In the longer-term, budgetary savings also occur due to lower expenditures associated with health and social welfare as living standards and housing comfort improve.

Similar benefits can be seen when expanding RES. As RES expansions are work intensive and require more jobs as well as increase construction activity, the government's tax revenue can increase. Furthermore, the decrease in lignite-based electricity and heat generation as well as lower pollution levels can have a positive impact on spending associated with health and social aspects but will at the same time require designing social safety nets, compensation mechanisms and re-skilling schemes for those workers who may be made redundant.

On the other hand, household consumers may need protection if energy prices were to fundamentally increase, for example in the context of retail price liberalisation and/or the introduction of significant carbon prices, requiring social compensation mechanisms which might incur a strain on public financing. While these can be offset through various mechanisms, including the additional revenue brought in through the aforementioned benefits, well-designed and functioning mechanisms must be created to ensure equity and adherence to just transition principles.

Other aspects which may affect the public budget of Kosovo include the decrease in the quantity of lignite needed for Kosovo's power plants due to the larger generation from RES which will lead to a decrease in lignite production and therefore also the tax rates received from the sector. Additionally, tax revenue may be affected in the short-term, especially if fiscal benefits, tax breaks or longer tax holidays are given to investors in the EE and RES segments.

Employment effects

The policies and measures outlined in this NECP can have a significant impact on labour and employment in the Republic of Kosovo, limited not only to the directly impacted sectors, but also more broadly through spillovers and indirect effects. Direct and indirect employment effects are determined by a variety of channels including primarily (but not limited to): i) the deployment and operation of new electricity generation capacity, ii) the construction sector boom created by energy efficiency installations iii) other sectors interacting with or servicing the EE and RES segments and iv) the creation or expansion of industries providing inputs into the EE and RES segments.

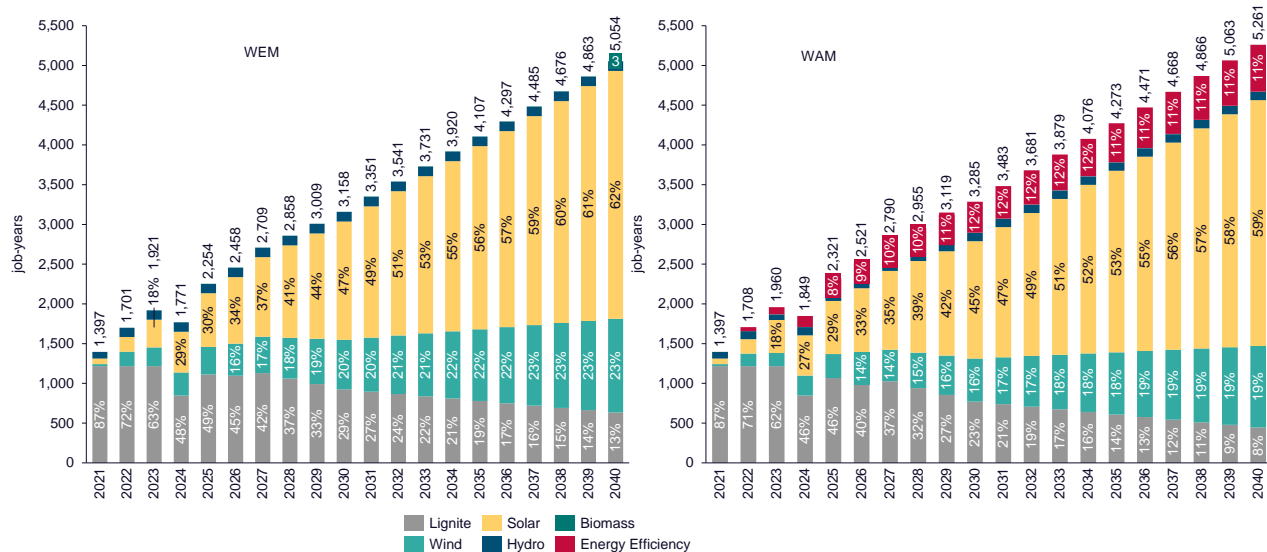
Evidence from various studies has shown that adding EE and RES capacities creates better and more high skilled jobs, on average, than those servicing older fossil-fuel technologies.² Concurrently, the localisation of the manufacturing of EE or RES components can also significantly bolster employment. In the case of Kosovo, companies already operating in this sector may benefit from increased deployment of solar PV, with potential increases also driven by solar deployment by other countries in the region. Nonetheless, large-scale dependence exists in both the EE and RES segments.

In the EE segment, the planned policies will lead to an increase in construction activity but will also create other jobs through the higher requirements for energy audits and the higher performance standards for buildings. Within renewable energy, jobs will be created initially through the labour-intensive construction process, especially in the growing solar PV and wind segments. While labour-wise operations and maintenance requirements for renewable projects may be lower than in other sectors, good, better-paying green jobs will emerge for the servicing and operations of RES and storage assets.

Using the employment estimation methodology developed by Wei, Patadia and Kammen (2010) and replicated by Kim and Mohommad (2022), the electricity generation profiles in the WEM and WAM scenarios were used alongside technology-specific multipliers to derive the estimate of the number of direct and indirect generated job-years per technology. The results are presented in Figure 87:

² See for example: Kim and Mohommad, 2022, IEA, 2022 or Wei, Patadia, and Kammen, 2010.

Figure 87. Job-years generated in WEM and WAM



Source: own modelling and calculations

In the WEM scenario, 3159 job-years were generated by 2030, with the majority coming from the solar power sector. 5054 job-years were generated by 2040. As the lignite-based electricity generation increasingly composes a smaller share of the total electricity generated job losses are most present in the sector. While in the WEM, total electricity generation is 7.79 TWh in 2030 and 9.35 TWh in 2040, in the WAM these values are 6.77 TWh and 7.80 TWh, respectively, due to an increased focus on energy efficiency. This also reflects in the number of job-years generated. While the total job-year amount for only the generation technologies is lower in the WAM then in the WEM (2895 vs 3159 in 2030 and 4670 vs 5054 in 2040), when accounting for the energy efficiency sector more job-years are generated in the WAM then in the WEM.

In the WAM specifically, the solar PV sector generates 1,476 job-years in 2030 and 3,093 in 2040, while the wind power sector generates 542 in 2030 and 1,024 in 2040. This is mostly due to the relatively higher employment intensity of solar PV compared to the wind sector. Across all of the assessed technologies more direct than indirect jobs are created with the exception of the energy efficiency sector, where induced jobs outnumber the job-years generated directly. 390 job-years were generated by 2030 and 590 job-years were generated by 2040 in the energy efficiency segment alone, accounting for more than 10% of all energy sector jobs by 2040. Further jobs are also expected to be generated in the battery storage segment which, alongside transmission and distribution, was not included in the employment modelling.

Health effects (local air pollution)

Kosovo as a whole and especially its major urban centres suffer from significant levels of air pollution due to the country's current energy mix. Lignite combustion forms the largest share of electricity production, with the Kosova A and B power plants ranking as two of the most polluting power plants in Europe, with levels of pollution in Pristina on par with Beijing, New Delhi and Mumbai. According to a 2019 World Bank study, air pollution accounts for over 760 premature deaths annually only in the Republic of Kosovo, with an estimated annual economic impact of USD 160 m to USD 310 m or 2.5%-4.7% of GDP. Concentrations of particulate matter above 2.5 micrometers or less (PM_{2.5}) significantly exceed national and European Union air pollution standards, with increased risk of severe lower respiratory infections such as trachea, bronchial, and lung cancer; ischemic heart disease (IHD); strokes; and chronic obstructive pulmonary diseases (COPDs). Other significant effects of air pollution caused by Kosovo's energy mix are also recorded in local flora and fauna, including in the agricultural sector.³

³ World Bank, 2019, Air Pollution Management in Kosovo.

Kosovo's energy transition, including most significantly a reduction of lignite-based electricity and heat generation by 34% in 2030 and 56% by 2040⁴ compared to the 2021 baseline, the retrofitting of filters to reduce sulphur dioxide (SO₂), nitrogen oxides (NO_x) and dust emissions of the remaining lignite units in line with the Industrial Emissions Directive and Large Combustion Plants Directive, as well as deployment of solar PV, wind power, solar heaters, heat pumps, more efficient biomass stoves and stricter rules on emission limits for vehicles will have strong effects on pollution, especially in the currently most affected zones. This reduction, including in greenhouse gas emissions containing PM2.5 particulates will have an effect on air pollution levels and will most likely project itself in decreasing preventable deaths, economic loss and destructive effects on flora and fauna.

⁴ Numbers in the text provided for the WAM scenario. 21% and 40% reduction by 2030 and 2040, respectively, in the WEM scenario.

5.3 Overview of investment needs

- I. Existing investment flows and forward investment assumptions with regard to the planned policies and measures

Policies and Measures	Financial investments	WEM/WAM
PAM 1: Study on the effects of CBAM and/or a domestic carbon price	N.A.	WAM
PAM 2: Phasing out one unit of TPP A	N.A.	WEM
PAM 3: Controlled management of solid waste	A total of around 9.9 Mil. EUR (2023).	WEM/WAM
PAM 4: Enhancement of forest resources	A total of 1.39 Mil. EUR is planned for the increase in forest area in 2024, additional investment needs TBD	WEM
PAM 5: Protection of forest resources	N.A.	WEM/WAM
PAM 6: Sustainable and multipurpose use of forest resources	Around 0.22 Mil. EUR in 2024.	WEM/WAM
PAM 7: Sustainable management of natural resources (land, forests, and water) in agriculture	N.A.	WEM/WAM
PAM 8: Improved manure management (methods for storage, preparation, and application)	N.A.	WEM/WAM
PAM 9: Agri-environmental schemes for biodiversity protection	0.5 mill EUR	WEM/WAM
PAM 10: Promotion of organic farming	0.4 Mil. EUR (2021-2024)	WEM/WAM
PAM 12: Promotion of renewable energy in the electricity sector	EUR 900 mn	WEM/WAM
PAM 13: Feed-in tariffs or Power purchase agreement	N.A.	WEM/WAM
PAM 14: Feed-in premiums	included in PAM 12	WEM/WAM
PAM 15: Certificates of Origin for RES	N.A.	WEM/WAM
PAM 16: Enabling environment for RES investors	N.A.	WEM/WAM
PAM 17: Self-consumption scheme	WEM: EUR 96 mn	WEM/WAM
PAM 18: Solar district heating	A total of 60 Mil. EUR is foreseen for both the project realization and the feasibility study, at least partially financed by donors (WEM). For WAM, EUR 121 mn are estimated due to doubling of capacities.	WEM/WAM
PAM 19: Feasibility study for the development of district heating systems in other municipalities	A total of 1.9 Mil. EUR (2022 – 2023), financed by donors.	WEM/WAM
PAM 20: Energy efficiency obligation scheme	17 mill EUR	WEM/WAM
PAM 21: National Strategy for Renovation of Buildings	See investment costs for the respective building classes	WEM/WAM

PAM 22: Renovation of residential buildings	WEM: EUR 33.63 mn p.a. (2021-2023) and EUR 31.79 mn p.a. (2024-2040)	WEM/WAM
PAM 23: Renovation of commercial buildings	WEM: EUR 15.60 mn p.a. (2021-2023) and EUR 14.74 mn p.a. (2024-2040)	WEM/WAM
PAM 24: Installation of solar thermal collectors in the residential sector	WEM: EUR 2.42 mn p.a. (2021-2023) and EUR 2.28 mn p.a. (2024-2040)	WEM/WAM
PAM 25: Nearly Zero Energy Buildings	WEM: EUR 60 mn WAM: n/a	WEM/WAM
PAM 26: Energy certification of buildings	0.26 mill EUR (by 2025)	WEM/WAM
PAM 27: Inspection of heating, cooling and ventilation system	N.A.	WEM/WAM
PAM 28: Energy Service Companies (ESCO)	0.09 mill EUR (in 2024)	WEM/WAM
PAM 29: Improvement and expansion of district heating systems of “Termokos” Prishtina and DH Gjakova	A total of 47 Mil. EUR is foreseen for promoting and expanding existing DH systems in Kosovo, financed by donors and the respective municipalities.	WEM/WAM
PAM 30: Renovation of central government buildings	WEM/WAM: EUR 1.69 mn p.a. (2021-2023) and EUR 5.04 mn p.a. (2024-2040)	WEM/WAM
PAM 31: Renovation of public buildings	WEM/WAM: EUR 5.15 mn p.a. (2021-2023) and EUR 4.86 mn p.a. (2024-2040)	WEM/WAM
PAM 32: Green public procurement	N.A.	WEM/WAM
PAM 33: Energy audit and management systems	N.A.	WEM/WAM
PAM 34: Consumer information programs	0.17 mill EUR	WEM/WAM
PAM 35: Increased use of efficient technologies in the residential sector	Heat pumps: EUR 5.94 mn p.a. (2021-2023) and EUR 5.65 mn p.a. (2024-2040) More efficient biomass stoves: EUR 1.02 mn p.a. (2021-2023) and EUR 1.00 mn p.a. (2024-2040)	WAM
PAM 36: Energy efficiency measures in industry	N.A.	WEM/WAM
PAM 37: Increase the use of the railway	Pending Action Plan of the Multimodal Transport Strategy	WEM/WAM
PAM 38: Railway electrification	Pending Action Plan of the Multimodal Transport Strategy	WEM/WAM
PAM 39: Increased share of alternative fueled vehicles	Pending Action Plan of the Multimodal Transport Strategy	WEM/WAM
PAM 40: Vehicle fleet change	Pending Action Plan of the Multimodal Transport Strategy (~600 mill. EUR)	WEM/WAM
PAM 41: Modal shift for short distance travel	~1 mill. EUR (depending on the length)	WAM
PAM 42: Municipal Energy and Climate Action Plans	N.A.	WEM
PAM 43: Modernization of networks and reducing network losses	A total of 127.12 Mil. EUR (2022 – 2025) is foreseen for network modernization and working towards reducing network losses, financed by KEDS and KOSTT (agg. with PaM 47).	WEM/WAM

PAM 44: Rehabilitation of TPP Kosovo B	The Energy Strategy budgets a total of 178 Mil. EUR (2023 – 2025), financed by KEK and an EU grant.	WEM/WAM
PAM 45: Rehabilitation of one to two units in TPP Kosovo A	A total of 112 Mil. EUR (2023 – 2024), financed by KEK.	WEM/WAM
PAM 46: Improvement of cybersecurity in the energy sector	A total of 1.69 Mil. EUR (2022 – 2024), financed through the public budget and donors.	WEM
PAM 47: Increase amount of vRES capacity that the network is able to handle/integrate	A total of 127.12 Mil. EUR (2022 – 2025) is foreseen for network modernization and working towards reducing network losses, financed by KEDS and KOSTT (agg. with PaM 43).	WEM/WAM
PAM 48: Installation of battery storage capacity	EUR 181.9 mn (agg. investment with PaM 61 until 2030)	WEM/WAM
PAM 49: Improve net transfer capacities	N.A.	WEM
PAM 50: Roadmap retail market competition	N.A.	WAM
PAM 51: Address market concentration	A total of 167.390 EUR (2023 – 2025) from public budgets and donors are foreseen for the BSA phase out and removing barriers to effective market functioning. (With PaM 56)	WAM
PAM 52: Market coupling with Albania	2.56 Mil. EUR (2023 – 2024) are foreseen for day ahead and intraday market coupling with Albania, financed by ALPEX.	WEM/WAM
PAM 53: Couple markets with additional neighbouring countries	0.23 Mil. EUR are foreseen in 2024 for a feasibility study on regional/European market coupling (SDAC, SIDC), financed by donors.	WAM
PAM 54: Joining EU balancing platforms	N.A.	WEM/WAM
PAM 55: Power to heat	N.A.	WAM
PAM 56: Full phase out BSA/Financial PSO	A total of 167.390 EUR (2023 – 2025) from public budgets and donors are foreseen for the BSA phase out and removing barriers to effective market functioning. (With PaM 51)	WEM/WAM
PAM 57: Consider introducing time-of-use consumer prices to incentivise demand flexibility	N.A.	WAM
PAM 58: Consumption-independent support scheme for vulnerable consumers based on improved data and a legal definition	N.A.	WAM
PAM 60: Piloting Power-to-Gas (P2G).	N.A.	WAM
PAM 61: Education and trainings for skilled workers in the area of sustainable energy technologies	EUR 181.9 mn (agg. investment with PaM 48 until 2030)	WEM/WAM

II. Sector or market risk factors or barriers in the national or regional context

Budgetary and human resource constraints within Kosovar Ministries and implementing agencies continue to pose a challenge to developing and implementing policy measures in due time. Budget constraints are particularly significant in less prominently perceived areas such as forest management.

More generally, mobilising the required public and private financing for the implementation of the foreseen policies and measures may pose a challenge. On the one hand, the lack of political recognition of the Republic of Kosovo by certain third countries, its absence from some international organisations and fora, as well as the perceived security risk may translate into a higher cost of capital and potentially reduced interest from international investors. On the other hand, Kosovo possesses a large and economically significant diaspora with an interest in investing in the country and has been the active recipient of a range of bilateral and international donors, development agencies, international financial institutions (IFIs) as well as other sources of public funding. Based on its commitment to ambitious energy and climate policies in the Energy Strategy and this document, the pursuit of conditional financial support linked to the implementation of these policies might help alleviate some of the public financing constraints (see also following section).

Another barrier, first and foremost affecting the Energy Efficiency dimension, is the persistently low price for electricity in the country (see section 4.5.3 i.). Due to regulated and indirectly subsidised consumer tariffs, as well as the absence of an adequately high carbon price, Kosovars have historically been incentivised to rely on inefficient electricity heaters and low-insulated buildings. Low electricity prices continue to make energy efficiency and prosumer investments unattractive, requiring either fundamental electricity tariff reform or substantive subsidies to these types of investments. Electricity tariff reform, such as via the liberalisation of retail prices, remains politically challenging due to effects on disposable income (see chapter 5.2) and will have to be accompanied with a well-designed support scheme for vulnerable consumers as foreseen by

Regarding the dimension Internal Energy Market, there remains a risk that wider regional electricity market coupling might stall due to a lack of political coordination and institutional inertia in some countries. In particular, the prospects for regional integration are highly dependent on, and could be further impeded by, the evolution of political relations between the Republic of Kosovo and the Republic of Serbia. Previously observed issues, such as for example those related to the nomination of available transmission capacity for the interconnector between Kosovo and Serbia highlight barriers to further regional integration. Thus, Kosovo welcomes a regionally coordinated approach facilitated by the Energy Community Secretariat and the European Union, to ensure broadly similar efforts and convergence in regional market liberalisation and market integration.

Finally, both regional, national and global supply chain dynamics pose a potential challenge to the rapid rollout of renewables, transmission capacity, electromobility and other technologies outlined in Kosovo's Energy Strategy and in this document. While prices for renewable technologies have consistently been decreasing in the past decade, recent upticks have been observed as a consequence of general supply chain tightness, global political volatility, Russia's war against Ukraine and the price and supply dynamics of the critical minerals needed for advanced technologies. While production capacity for renewable technologies, electrical grid components and electromobility has been steadily increasing, there are indications of possible shortages given the rapid rollout of these technologies globally, not only as a consequence of the push towards a decarbonised economy, but also due to the benefits that these technologies provide in terms of energy security. These dynamics also have an impact on the local and regional level and supply of the technologies critical for Kosovo's energy plans must be secured, accounting for possible price increases or delays.

III. Analysis of additional public finance support or resources to fill identified gaps identified under point i.

There is a growing interest globally from IFIs and other institutional donors and lenders in conditional finance contingent on environmental, climate and social conditionalities. With the recently adopted Energy Strategy as well as this document, both containing ambitious energy and climate targets, policies and measures, Kosovo is ideally placed to mobilise conditional climate finance. Considering the potential barrier that government budget constraints and broader issues of access and cost of financing pose to the implementation of the foreseen policies and measures (see section above), the country should proactively seek the dialogue with IFIs, donors and lending institutions regarding potential programmes in this regard.

5.4 Impacts of planned policies and measures described in section 3 on other Contracting Parties and/or Member States of the European Union and regional cooperation at least until the last year of the period covered by the plan, including comparison to projections with existing policies and measures

I. Impacts on the energy system in neighbouring and other Contracting Parties and/or Member States of the European Union in the region to the extent possible

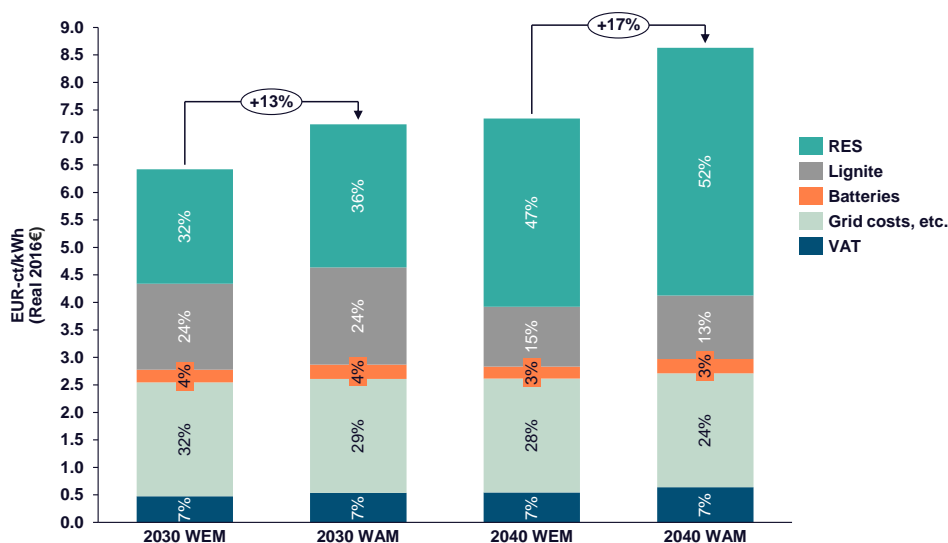
Due to the moderate size of Kosovo's energy system, its impact on energy systems in neighbouring countries, other Contracting Parties and Member States of the European Union in the region remains limited. Nonetheless, Kosovo's ambitious expansion plans for renewable energy, especially when combined with ambitious energy efficiency investments and resulting reductions in energy demand in the WAM scenario, mean that Kosovo becomes an exporter of variable renewable energy in times of excess renewable production. Due to the limited storage capacity within Kosovo, there are significant synergies arising from deeper integration with Albania and other countries in the region with large reservoir hydropower and/or pumped storage capacities. Neighbouring countries are incentivised to import cheap renewable energy from Kosovo especially during the summer, which allows them to save hydropower stored in hydro reservoirs and/or pumped storage plants for weeks of lower renewable generation or later in the year (depending also on the size of the storage). Such a regionally integrated power system with complementary generation and storage assets is expected to result in lower prices across the region.

II. Impacts on energy prices, utilities and energy market integration

The publicly owned lignite plant operator KEK will face decommissioning costs as well as investment costs for renovation, lifetime extension and filter retrofits for its lignite units remaining in operation or strategic reserve. Once the bulk supply agreement (BSA) is phased out in accordance with PAM 49, KEK will be able to pass on those costs to its customers. Furthermore, the distribution and transmission system operators KEDS and KOSTT will face costs for maintenance and grid upgrades for integrating additional renewable energy in the grid and reducing transmission and, in particular, distribution losses in line with the targets in PAM 40 and PAM 43, which will be compensated according to the relevant regulation and passed on to consumers. While, most renewable energy investments will be undertaken by private investors, there might be significant public support costs to mobilise these private investments. Depending on the choice of policy design (currently in preparation), support cost for renewables might be charged to consumers via a levy on retail prices.

The Figure 88 displays estimated cost-covering electricity retail prices which would be required to refinance the respective investments in the system. These prices are not necessarily congruent with future market prices. Rather, the estimates serve as a proxy for retail market prices plus support costs which might or might not be included in final retail prices.

Figure 88. Estimated cost-covering electricity retail price (by year and scenario)



Source: own calculations and modelling

Energy market integration forms an integral part of Kosovo's energy and climate policy. First, and foremost, this entails the impending day-ahead market opening and coupling with Albania within ALPEX. Going forward, Kosovo also plans to open other market segments (intraday, balancing, etc.) and coupling with other countries in the region as well as the European Union. The prospects for regional integration are however highly dependent on, and could be further impeded by, the evolution of political relations between the Republic Kosovo and the Republic of Serbia. Previously observed issues, such as for example those related to the nomination of available transmission capacity for the interconnector between Kosovo and Serbia highlight barriers to further regional integration (also see section 5.3 ii.).

III. Where relevant, impacts on regional cooperation

Electricity market coupling with Albania, as part of ALPEX, as well as other countries and eventually the European Union, is at the core of Kosovo's energy and climate policy. Furthermore, Kosovo is exploring the possibility of co-investing in gas-based power generation in the region, possibly in Albania. Cooperation on balancing reserves with Albania will continue, possibly within a liberalised balancing market once market opening progresses to this market segment. More in general, Kosovo recognises the fact that policy coordination and regional cooperation play an increasingly important role to balance variable renewable energy, plan for generation adequacy, increase resilience to external shocks and adapt to the effects of climate change.