



# ROADMAP

## Wood Biomass Production, Market and Use in Kosovo



This guide on the production and use of wood biomass was prepared in November 2023 to meet the needs of the CNVP organization in promoting the sustainable management of natural resources and the development of the biomass value chain.

It aligns with the goals of the "Sustainable Use of Natural Resources for Environment and Economic Development (SUNREED), 2021-2026" project, funded by the Embassy of Sweden in Pristina/Sida.

The printing is intended for distribution to key stakeholders in the biomass sector, aiming to support the improvement of practices for the sustainable production and use of wood biomass.

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# 1 Introduction

According to the latest report produced by the Kosovo Agency of Statistics (KAS) on consumption poverty, about 18% of the population in Kosovo lives in poverty and is unable to meet basic human needs, while 5.1% lives in extreme poverty and is unable to even meet basic survival needs. In addition, to the potential role that forestry can play in the reduction of poverty rates, it can also play a vital role in environmental protection and climate change mitigation and adaptation. If sustainably managed, healthy and growing forests can contribute to carbon sequestration and biodiversity, and at the same time be an important source of renewable energy, which can substitute those that have higher greenhouse gas emissions.

Forests encompassing 42% of Kosovo's territory possess the capacity to provide biomass for energy utilization. Approximately 4,39% of Kosovo's land is designated as legally protected parks. The country boasts a total of 97 protected areas, encompassing natural reserves, regional parks, natural monuments, and national parks. According to the Forest Europe report, the European forest's average growing stock density is 163 m<sup>3</sup> per hectare, while the average growing stock in the Kosovo forests, estimated in the national inventory, is 84 m<sup>3</sup> per hectare. Forest ownership in Kosovo is complex and fragmented, with a variety of stakeholders holding rights to different types of forests. Most forests (75%) are state-owned, while the rest are privately owned by individuals, communities, and non-profit organizations. About a third of the forest area is privately owned. There are about 140.000 private forest owners (PFOs), the vast majority of whom have small parcels of less than 1,5 ha. In recent years, the government of Kosovo has taken steps to address the challenges of forest ownership fragmentation. It has developed a new forestry law that aims to improve the management of state-owned forests and strengthen private forest owners' rights. The government has also launched several programs to support community forestry. However, more must be done to address the challenges of forest ownership fragmentation in Kosovo. The government needs to develop a clear vision for the future of forestry in Kosovo, and it needs to invest in the development of sustainable forest management practices.

The wood biomass sector in Kosovo holds significant potential for sustainable energy production and environmental conservation. The use of wood biomass has a long tradition in Kosovo. As a natural renewable source is most often used for the production of heat in households. Production of wood biomass from forests is increasingly important in Kosovo. The internal need for fuelwood in Kosovo exceeds 2,4 m<sup>3</sup>, whereas the legal supply from Kosovo forests, barely surpasses 1,5 m<sup>3</sup>. Consequently, illegal logging to meet the fuelwood demands of the Kosovar population is widespread, predominantly within state-owned rather than privately-owned forests. Ensuring a better future in Kosovo necessitates a heightened focus on both sustainable development and effective management. In what ways can Kosovo use its natural resources without jeopardizing the well-being of future generations? A roadmap is a **visual representation of the strategic development of the wood biomass sector**: it answers the questions of what should be done, who should be involved in the activities, the details of scope and resource allocation, and how and why certain initiatives were prioritised over others.

## 2 Strategic goals

Strategic goals are visions for biomass sector that have quantifiable or qualitative outputs. This means that achieving the goal must be something you can measure and track, using data like increased numbers, change in behaviour or improved capacity rates.

In first step we identify the strategic and specific long-term goals and then worked back from these to identify all the conditions (outcomes/actions) that must be in place (and how these related to one another causally) for the goals to occur.

Scheme suggestion: <https://vectormine.com/item/sustainability-tree-with-green-and-nature-friendly-symbols-outline-concept/>

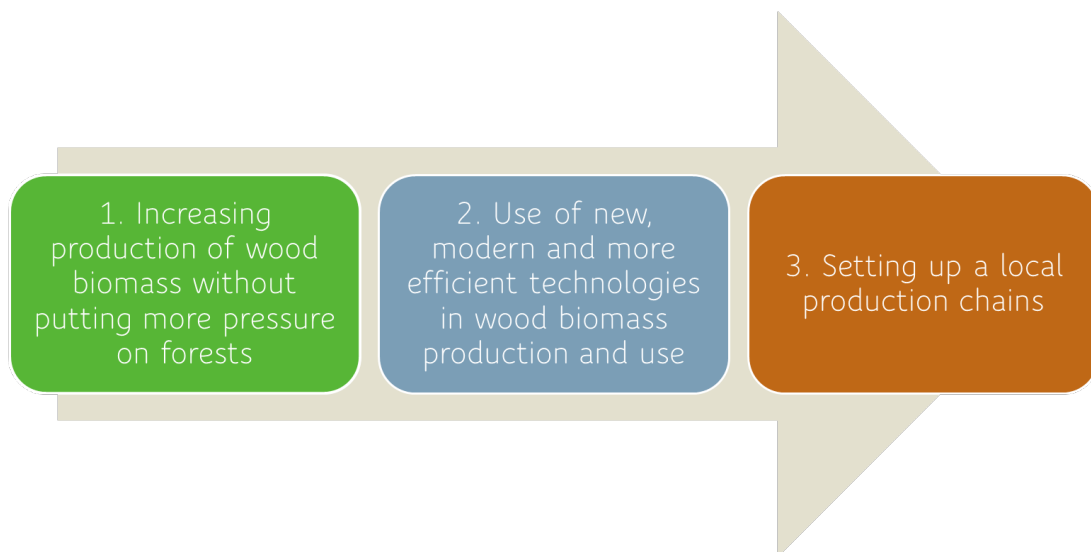
Scheme suggestion on strategic planning: <https://vectormine.com/item/strategic-messaging-or-effective-communication-planning-outline-hands-concept/>

or

<https://vectormine.com/item/strategic-planning-work-with-smart-business-tactics-moves-outline-concept/>

### ***The strategic goal:***

**Increased share of wood biomass as energy source through implementation of modern and efficient technologies but without additional pressure on forests.**



### ***Specific goals:***

1. Increasing sustainable production of wood biomass without putting more pressure on forests
2. Use of new, modern, and more efficient technologies in wood biomass production and use
3. Setting up a local production chain.

To reach the goals we need strategies, or simply actions that should be implemented in the short of long run. These actions or strategies should be drawn from SWOT analysis of present situation. To monitor the development and track changes a system of monitoring of biomass sector should be in place. This system should include:

- Data about wood biomass potentials from forests
- Data about wood biomass potentials outside the forests (Agricultural land, abandoned land, SRC)
- Data about new district heating systems and biomass systems in public buildings
- Data about wood chips and wood pellet producers
- Data about wood biomass collecting points
- Data about stakeholders
- Data about trainings/educations
- Data about awareness raising campaign

### 3 Key institutions and stakeholders

To make a change in wood biomass sector in Kosovo and to reach strategic goal all key actors should be involved from the beginning.

Among key stakeholder we identified at least 4 Ministries (National public authority):

1. Ministry of Agriculture, Forestry and Rural Development
2. Ministry of Environment, Spatial Planning and Infrastructure
3. Ministry of Economy
4. Ministry of Finance, Labour and Transfers

They are responsible for setting up a policy frame and support system as the foundation for development of the biomass sector.

Beside national public authority also local public authorities (like local communities) and public agency (among which the most important are: Forest Agency and Kosovo Fund for Energy Efficiency) play a decisive role in further development of the sector. But also interest groups including NGOs, Business support organisation, Education/training center and school, Higher education and research and forest company shouldn't be neglected in the process of development and implementation of roadmap. To change the behaviour of wood biomass users we should include also general public.

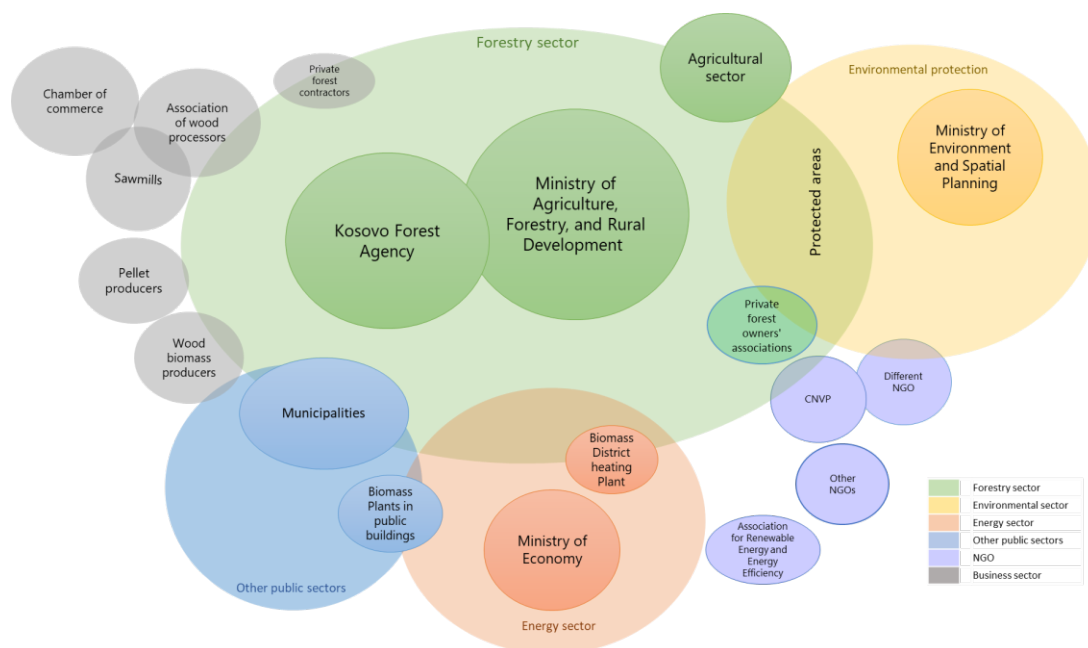


Figure 1: Venn diagram of wood biomass sector in Kosovo

Scheme suggestion on stakeholders “green” alignments: <https://vectormine.com/item/biomass-economics-and-policies-with-green-energy-funding-outline-concept/>

## 4 Ensuring biomass supply sustainability

Ensuring **biomass supply sustainability** is crucial for the long-term viability of the wood biomass sector. Here are some strategic points to be considered:

- o biomass growth, harvesting, collection, storage, transport, processing, and use can impact people, communities, and ecosystems either positively or negatively.
- o sustainable forestry management practices should be implemented to ensure biomass fuel supplies without causing deforestation or other environmental harm.
- o a variety of biomass feedstocks should be considered, including forest residues, agricultural waste, and energy crops.
- o employment in biomass fuel supply, especially in rural areas should be highlighted and further supported.

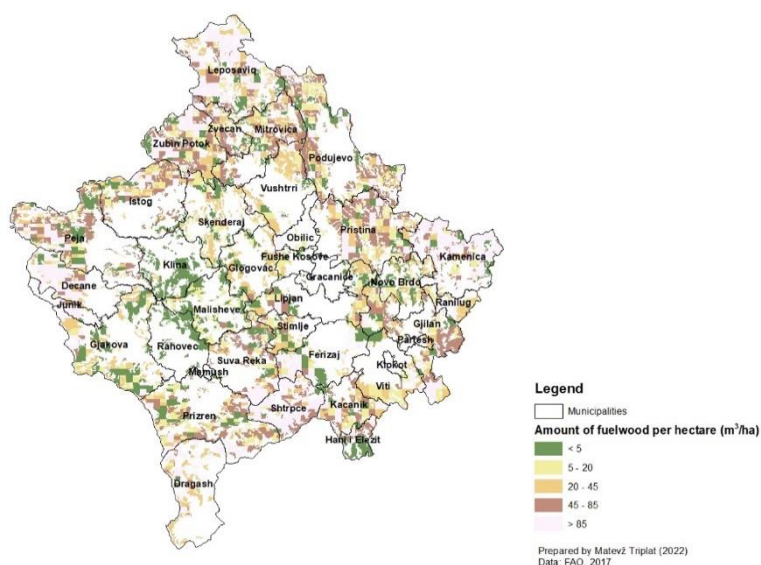


Figure 2: Map of total available biomass for energy purposes (data on NFI, 2012 collected at FAO 2017)

<b>GOAL:</b> Increasing production of wood biomass without putting more pressure on forests
<b>I. Implementation of forest management plans</b>
<b>WHY:</b> Forest management certification emerged in the 90s as a reaction to demand situations to enhance sustainable forest management and oppose the threat of illegal logging and forest conversion to agriculture or other uses. Forest certification standards were primarily enforced to save forests in developing countries.
<b>HOW:</b> forest management plans should be prepared for all forests in Kosovo, regarding the ownership. Finances for preparation of forest management plans should be secured by Ministry of Agriculture, Forestry and Rural Development. A simplified forest management plans for private forests should be developed and tested. NGO incentives acting in promotion and development of forest management plans in private forest should be promoted and supported.
<b>II. Subsidy scheme for silvicultural activities and afforestation</b>

**WHY:** Nature regeneration would take a long time in areas where forests are degraded due to extensive illegal logging. In these cases, artificial regeneration by planting trees is needed. A supporting scheme for buying seedlings, planting, and protecting young plants is required. Through artificial regeneration, the condition of forests could be improved faster and more efficiently.

**HOW:** Silvicultural activities in young forest stands in accordance with the forest management plans should be co-financed through public subsidy scheme. Silvicultural activities and conversion of coppice forests with planting of key trees species in degraded coppice forests should be promoted and co-financed. Thinning operations and conversion of coppice forests into high forests have positive effects on wood biomass production (use of small diameter wood for production of wood chips). A special scheme for cofinancing afforestation of abandoned and degraded agricultural land should be in place and could be part of RDP. Capacity building of forest owners and forest professionals to perform silvicultural activities and to support/implement subsidy scheme in all forests is a key action and precondition to make a change in silvicultural activities.

### III. Implementation of regular national forest inventory

**WHY:** The National Forest Inventory is an internationally recognized methodology for collecting data about forests. Providing accurate information about the extent, allocation, composition, and situation of forests and woodlands and the differences in the area through time. A regular inventory would provide updated information on resource trends, emerging threats, and the effectiveness of past management practices. Furthermore, joining the EU requires adherence to strict environmental regulations. A national forest inventory remains vital for Kosovo in 2023 because it promotes sustainable forest management, drives economic development, protects the environment, and supports broader national goals. Regularly updated and accurate data allows Kosovo to manage its forests effectively and reap their full benefits.

**HOW:** NFI should be performed in all forests every 5 years. Funds for the inventory can be contributed by donors but in long run they should be secured in KFA budgeted. A team of specialists should be trained at KFA to perform the NFI in long run. Capacity building of experts at KFA is important.

### IV) Scholarships for young people to enter forestry sector

**WHY:** Forestry should be given the status of a deficit profession for which scholarships should be regularly promoted. Ministry for Education, Science, Technology and Innovation (MESTI) should be involved and responsible for a permanent system of scholarships for forestry professionals. Close cooperation with the Agricultural University of Tirana and the Faculty of Forest Sciences should be established. The Ministry of Education (MESTI) shall make a long-term agreement with the mentioned University in Tirana. The aim is also to increase safety at work in forests and to provide forest owners who carry out forest work with additional training and the possibility to purchase efficient and tested equipment and modern technology.

**HOW:** An awareness raising campaign should be organised to promote forestry as an attractive and modern professions for all women and man. Ministry of Education (MESTI) should be involved and should be responsible for permanent system of scholarships for forestry professionals. The Ministry of Education (MESTI) should make a long term agreement with University in Tirana.



A training centre for forest workers and for wood biomass producers should be established. International funds and donor funding can be used for establishment of training centre. The main aim of this centre is to give the opportunity to non-qualified workers to get a new qualification and on the other side to get skilled worker to work in the forests. The centre is also aimed at forest owners, who can learn how to manage their forests and produce wood biomass.

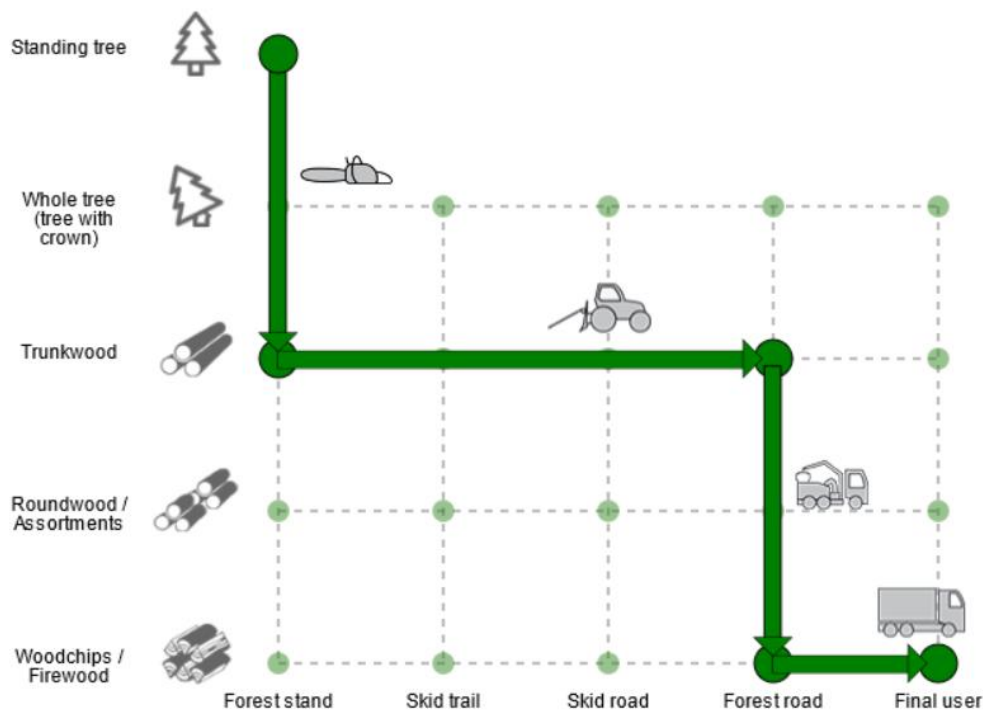


Figure 3: Scheme of motor-manual harvesting system production of wood chip

Scheme suggestion on Subsidy scheme for silvicultural activities and afforestation: <https://vectormine.com/item/reforestation-and-new-tree-plant-seedling-for-green-forest-outline-concept/> or <https://vectormine.com/item/reforestation-project-and-tree-plant-environmental-volunteers-outline-concept/>

Scheme suggestion on “Scholarships for young people to enter forestry sector”: <https://vectormine.com/item/educating-on-biomass-and-learning-about-recyclable-energy-outline-concept/> or <https://vectormine.com/item/environmental-science-and-knowledge-about-nature-in-hands-outline-concept/> or <https://vectormine.com/item/environmental-science-and-knowledge-about-nature-in-hands-outline-concept-2/>

Scheme suggestion on “Implementation of forest management plans”: <https://vectormine.com/item/forestry-resources-as-raw-forest-tree-wood-material-cutting-outline-concept/> or <https://vectormine.com/item/selective-harvesting-process-and-pick-a-tree-for-cutting-outline-concept/>

Scheme suggestion on “”: <https://vectormine.com/item/sustainability-reporting-and-green-climate-goal-measurement-outline-concept/>

## 5 Modernising biomass consumption

Wood biomass in Kosovo is used mainly in individual houses and small businesses. Old technologies with low efficiency and high emissions of dust particles are predominantly used. Beside old technologies also low quality of wood fuels with unknown origin are used. To address use of old technologies and low-quality wood fuels following actions are needed:

- I. Establishment of wood biomass collection points
- II. Awareness raising campaign on modern technologies for biomass use
- III. Development of transparent wood biomass market
- IV. Promotion of modern and efficient combustion appliances (including decentralized heating systems)

<b>GOAL: Use of modern, and more efficient technologies in wood biomass production and use</b>	
<b>IV. Establishment of wood biomass collection points</b>	
	<p><b>WHY:</b> Collection points will support development of biomass market and secure the supply of wood fuels biomass. Collection points will also contribute to better quality of wood fuels entering the market. First collection points should be established together with bigger biomass systems. Establishment can be supported through international funds or donors funding. The concept of local wood biomass collection points or wood biomass trade centres can bring a new attitude towards wood fuels production and marketing.</p> <p><b>HOW:</b> Promotion campaign would support development, a potential locations should be identified and a feasibility study for potential collection points should be prepared. Financial support to local groups of biomass producers and forest owners should be foreseen through national funds or international donors. National laboratory for biomass to support implementation of quality assurance and quality control at biomass collection points should be established. Public private partnerships should be promoted.</p>
<b>V. Awareness raising campaign on modern technologies for biomass use</b>	
	<p><b>WHY:</b> old technologies are usually chipper and easier to install, there is existing knowledge and infrastructure for installing and maintaining them. For successful implementation of modern technology user should be informed and educated, the network of sellers and qualified installer should be established. Through awareness raising campaign a condition for implementation of modern technologies will be built. The awareness-raising campaign will inform, sensitize, and motivate companies, organizations and relevant actors to place wood biomass higher on their agenda.</p> <p><b>HOW:</b> first step is a communication strategy to enhance public awareness of the benefits of higher-efficiency heating appliances and quality wood fuels, efficient combustion practices, and the health impacts of poor air quality should be developed. The campaign should aim at maximizing the motivation of the actors. The targeted campaign should have an “educational” effect for the general public and specific target groups, and it is an education earned by doing, through experience, rather than through being given information. Showcasing existing examples of how modern biomass technologies are being implemented effectively in other countries or regions.</p>
<b>VI. Development of transparent wood biomass market</b>	

**Why:** The establishment of a transparent wood biomass market in Kosovo can contribute to sustainable development, energy security, and environmental conservation while providing economic opportunities for local communities. To make wood fuel market more transparent the prices of wood fuels should be regularly monitored and published. The prices should depend on quality of wood. This action goes hand by hand with actions I and II. Existing biomass producers should be promoted through a common info point, development of market should be part of awareness raising campaign.

**HOW:** A map of stakeholders along wood supply chain should be prepared and regularly updated. The common methodology for collecting wood fuel prices should be developed, agreed and used for monitoring wood fuel prices. These activities should be supported by public money. Certification schemes and trademark for wood fuels should be implemented and promoted.

VII. Promotion of modern and efficient combustion appliances (including decentralized heating systems)

**Why:** The most effective measure to improve the sustainability of biomass use is transition to more efficient heating appliances. Public buildings are important users of wood biomass. More efforts and also financial support should be available for local communities to invest in modern boilers. Support for the construction of modern and efficient micro or small wood biomass district heating systems where the spatial layout of buildings allows it. This will support the replacement of individual appliances and reduce emissions from individual combustion appliances.

**How:** With international donor support and using best-practice examples, introduce replicable sustainable biomass pilots to identify those most promising. Public sector demand should stimulate market development with long-term supply contracts strengthening the businesses and investments. Support to new efficient-stove production businesses should be considered through financial measures (grants, subsidies) to facilitate investment in development and equipment.

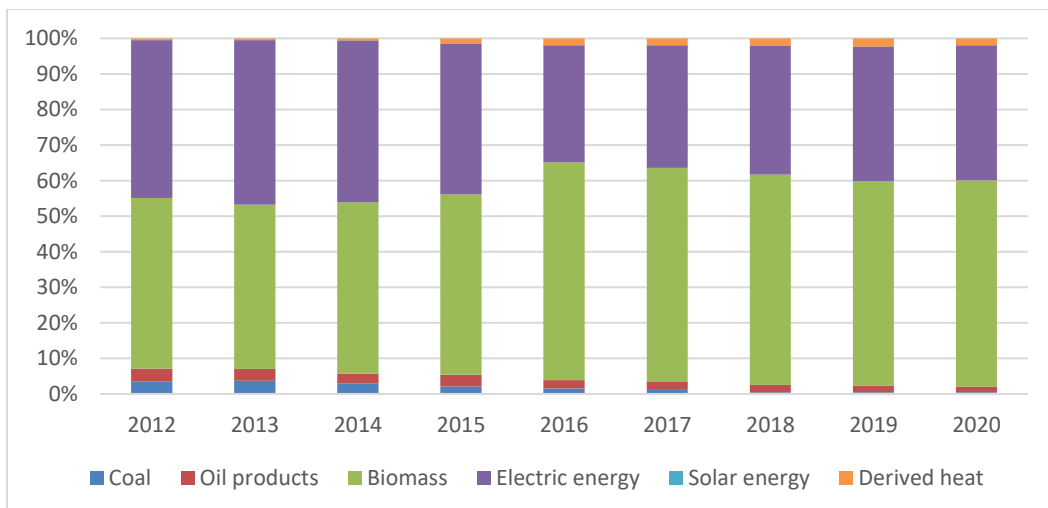


Figure 4: Overview of consumption of all energy sources in the household sector (%) by source and year (Source: Kosovo Agency of Statistics, 2022)

Scheme suggestion: <https://vectormine.com/item/biomass-energy-as-renewable-sustainable-power-production-outline-collection/>

Scheme suggestion on “Development of transparent wood biomass market ” or “Establishment of wood biomass collection points” : <https://vectormine.com/item/sustainable-wood-products-and-ecological-manufacturing-outline-concept/>

Scheme suggestion on “Awareness raising campaign on modern technologies for biomass use”:  
<https://vectormine.com/item/biomass-energy-plant-as-green-electricity-production-type-outline-concept/>

Scheme suggestion on “Promotion of modern and efficient combustion appliances (including decentralized heating systems)”:  
<https://vectormine.com/item/residential-home-energy-efficiency-with-effective-insulation-outline-diagram/> or <https://vectormine.com/item/energy-efficient-house-with-ecology-class-rating-diagram-outline-concept/> or <https://vectormine.com/item/residential-home-energy-efficiency-with-level-measurement-outline-diagram/> or <https://vectormine.com/item/eco-houses-using-sustainable-and-nature-friendly-resources-outline-concept/>

## 6 Sustainable wood biomass sector: a vision for the future

Kosovo faces a unique set of challenges regarding energy security and environmental sustainability. Its heavy reliance on imported fossil fuels exposes it to price fluctuations and geopolitical instability. Additionally, Kosovo has a significant amount of biomass resources, such as forestry residues and agricultural waste, which still need to be explored.

Sustainability of wood biomass use is closely connected with sustainability of its supply and technologies used. To make a change in whole production and supply chain following actions are needed:

- I. Support schemes for implementation of modern technologies
- II. Information exchange platform/forum
- III. Development of local biomass supply chains by supporting wood biomass use
- IV. Development of measures under RDP and other international fund.

GOAL: Setting up a local production chains	
I.	Support schemes for implementation of modern technologies
<b>Why:</b> The aim is to bust investments in modern technologies of wood biomass, production, processing, and storage. To support the implementation of modern technologies and bust investments in wood fuel production, supply and use a long-term support schemes should be in place for households, public bodies and private investors. The investments in both efficient use and in modern technologies should be prioritized.	
<b>How:</b> Rural development program and other international fund should include also measures supporting development of wood biomass sector, like subsidy scheme for new machinery, for modern boilers and small district heating systems.	
Feasibility studies, as a detailed analysis that considers all critical aspects of possible project in order to determine the likelihood of success, are needed before investments and should be partly financed through support schemes.	
II.	Information exchange platform/forum

**Why:** An Information Exchange Platform serves as a crucial tool for enhancing communication, collaboration, and decision-making within the wood biomass supply chain in Kosovo, ultimately contributing to the sector's sustainable development and better visibility of actors.

**How:** An Information Exchange Platform should be developed and supported by public funding, a initial project could be financed through donor project or through international development funds. Platform should cover all important areas, like: i) biomass potentials; ii) existing biomass projects; iii) map of key stakeholders; iv) information's about support schemes; v) tools and other information's needed for investments

### III. Development of local biomass supply chains by supporting wood biomass use

**Why:** Developing local biomass supply chains and promoting wood biomass use in public buildings offer a holistic approach to addressing energy, economic, and environmental challenges in Kosovo. Strong local supply chains support sustainability, economic development, and resilience while contributing to global efforts to combat climate change.

**How:** different models of short production chains should be tested and presented. For example: state owned forests are given to local community for long term management (concession). Low quality and small diameter wood from these forests are used for wood chips production. Wood chips are used in modern small district heating systems in this communities for heating public buildings and other buildings in the centre of the settlements. Through this kind of models forests are actively managed, local population is involved in all parts in supply chain, income stays in the community, public buildings are heated with locally produced wood biomass.



Figure 5: An example of forestry links in forestry-wood chain

Scheme suggestion on “Development of local biomass supply chains by supporting wood biomass use”:

<https://vectormine.com/item/industrial-biomass-boiler-as-central-city-heating-system-outline-diagram/>

Scheme suggestion on “Development of local biomass supply chains by supporting wood biomass use”:

<https://vectormine.com/item/forest-certification-from-environmental-standard-inspection-outline-concept/>

Scheme suggestion on “Information exchange platform/forum”:

<https://vectormine.com/item/reverse-logistics-as-green-supply-chain-management-type-outline-concept/>

## 7 Conclusions

Old boilers, with low efficiency and high emissions of dust particles, are one of the major problems that need to be tackled sufficiently. Even if some grant financial schemes and some subsidies are available, changing boilers is too slow.

Utilizing domestic biomass resources for heat and power generation can decrease dependence on imported fossil fuels, mitigating the impact of price volatility and supply disruptions.

Enhancing efficient use of wood biomass in Kosovo can have several positive impacts like:

- I. Reduced reliance on imports: Utilizing domestic biomass resources for heat and power generation can decrease dependence on imported fossil fuels, mitigating the impact of price volatility and supply disruptions.
- II. Enhanced energy independence: Kosovo can lessen its vulnerability to external influences by diversifying its energy mix and harnessing its own renewable resources.
- III. Reduced greenhouse gas emissions: Modern biomass technologies offer cleaner combustion compared to traditional methods, contributing to lower carbon footprint and mitigating climate change.
- IV. Improved waste management: Utilizing agricultural and forestry waste for bioenergy reduces landfill burden and promotes sustainable waste management practices.
- V. Stimulating rural economies: Establishing a bioenergy sector creates new job opportunities in rural areas, promoting economic development and combating poverty.
- VI. Attracting investments: Awareness campaigns can attract investments in advanced biomass conversion technologies, fostering innovation and boosting the local economy.
- VII. Reduced air pollution: Modern biomass technologies emit fewer pollutants compared to traditional methods, leading to cleaner air and improved public health outcomes.
- VIII. Promoting energy efficiency: Awareness campaigns can encourage the adoption of energy-efficient biomass appliances and practices, further reducing environmental impact.

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