Sustainable Bioenergy for Georgia: Roadmap key findings

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EU4Energy Programme Overview: 2016-2022

1. **Support the sound development and implementation of evidence-based, medium-to-long-term energy policies…**

2. **…based on improved use of statistics**

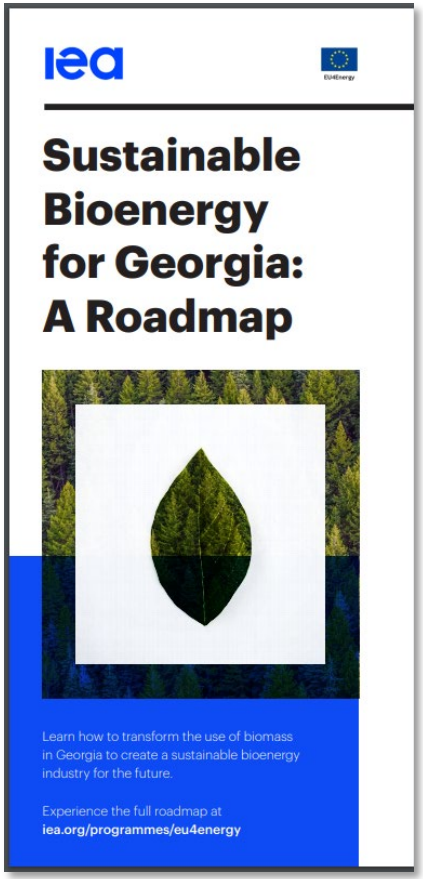
3. **…and sharing of best policy and other practices and EU experience**

11 Focus Countries

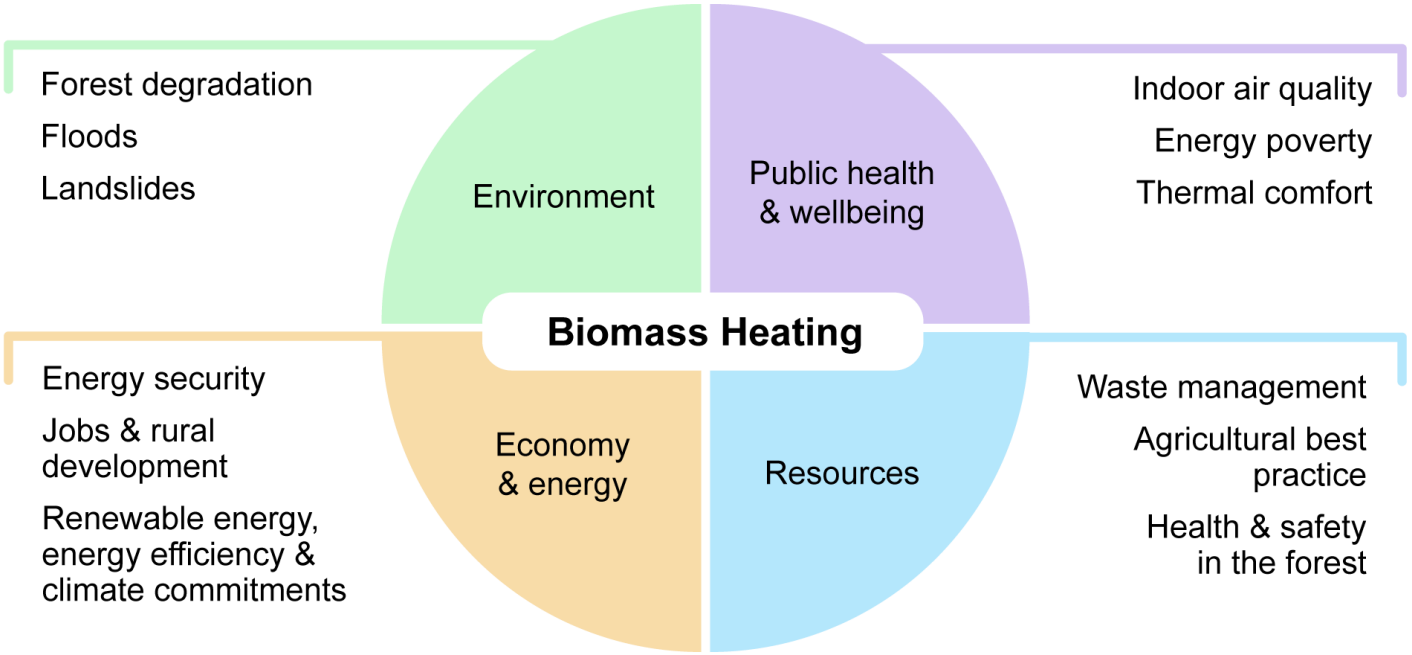
- **Eastern Europe**
  - Belarus
  - Moldova
  - Ukraine
- **Caucasus**
  - Armenia
  - Azerbaijan
  - Georgia
- **Central Asia**
  - Kazakhstan
  - Kyrgyzstan
  - Tajikistan
  - Turkmenistan
  - Uzbekistan

Georgia: Sustainable Bioenergy Roadmap

- Purpose: Ensure sustainable biomass supplies in Georgia while modernizing the consumption of biomass
  - Sustainable forestry management is key
  - Adoption of more efficient biomass stoves and boilers necessary
- 2030 Vision for Sustainable Bioenergy in Georgia: a modern bioenergy industry that brings economic, environmental and social benefits to citizens
  - By 2030, Georgia has fully integrated biomass into its national energy policy through formalized policies for the use of biomass wastes and residues



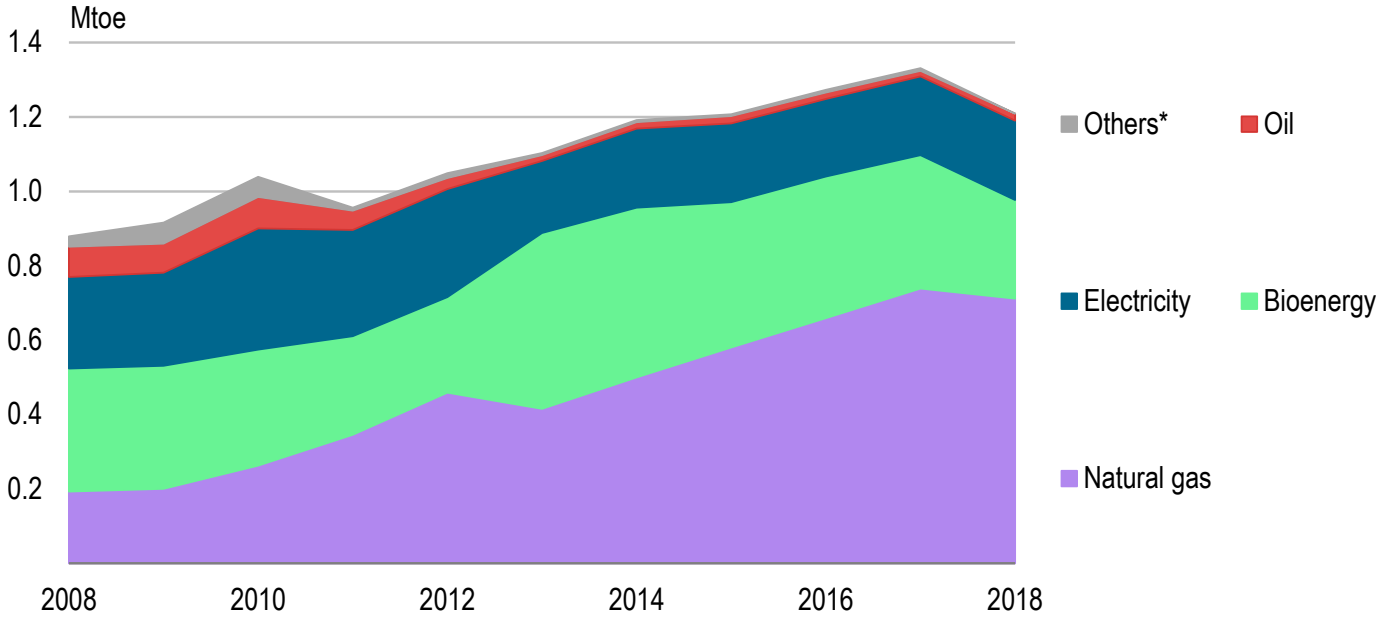
Bioenergy touches on a wide range of policy areas



A modernised bioenergy industry would improve the environment and public health, and deliver job creation, better waste management & support in meeting energy/climate targets.

Bioenergy is an important part of Georgia's energy system

Final energy consumption in the residential sector



Source: IEA (2020), World Energy Balances 2020 (database), www.iea.org/statistics; Geostat (2017), Energy Consumption in Households.
Note: *Others includes coal, solar thermal, geothermal and district heat.

Bioenergy provided around 20% of domestic energy supply in 2018. Firewood is primarily used for residential heating, and to a lesser extent cooking, with 80% of consumption in rural areas.

Simple biomass heating appliances result in high indoor air pollution

Typical emissions factors for various biomass heating devices

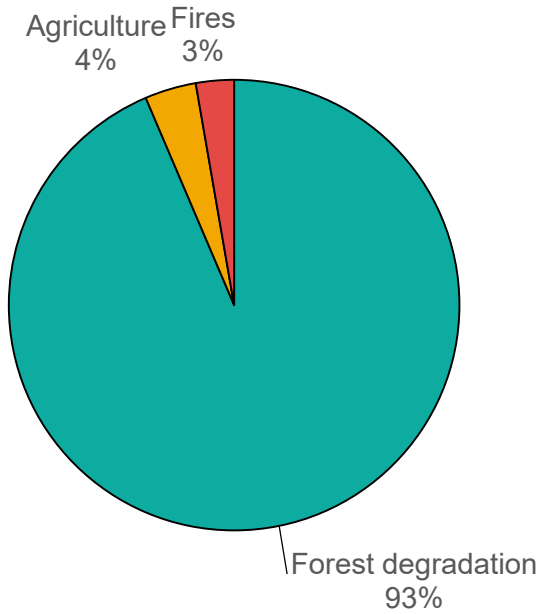
Biomass heating device	PM (g/GJ)	% Organic carbon
Open fireplace	322 - 1 610	40 - 75%
Simple log stove	140 - 225	50%
Modern log stove	46 - 90	20%
Pellet Stove	3 - 43	10%
Pellet Boiler	3 - 29	5%
Biomass boiler without emissions control	28 - 57	3%
Biomass boiler with emissions control	8 - 15	2%

Sources: Koppejan. J and F. de Bree (2018), Kennisdocument Houtstook in Nederland [Knowledge Document in the Netherlands]; Vincente, E.D. and C.A. Alves (2018), “An overview of particulate emissions from residential biomass combustion”.

Indoor air pollution causes 2.5 million premature deaths worldwide each year, and has associated economic impacts. Particulate matter (PM) emissions from modern boilers and stoves are low.

Fuelwood demand far exceeds the sustainable level of supply

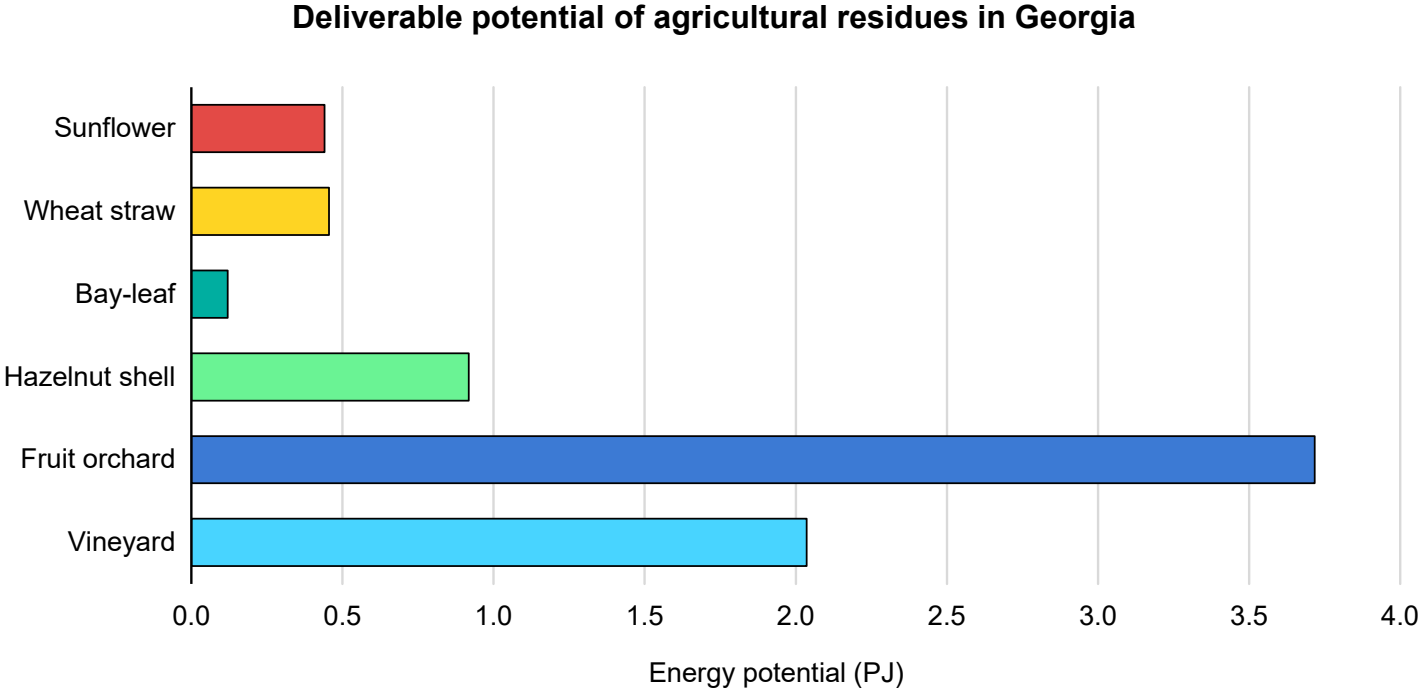
Georgian tree-cover loss by cause, 2000-2018



Source: MEPA (2020), Forest and Land Use Atlas

The long-term overexploitation of forest resources for firewood results in a range of environmental impacts, such as landslides, flash floods and biodiversity loss.

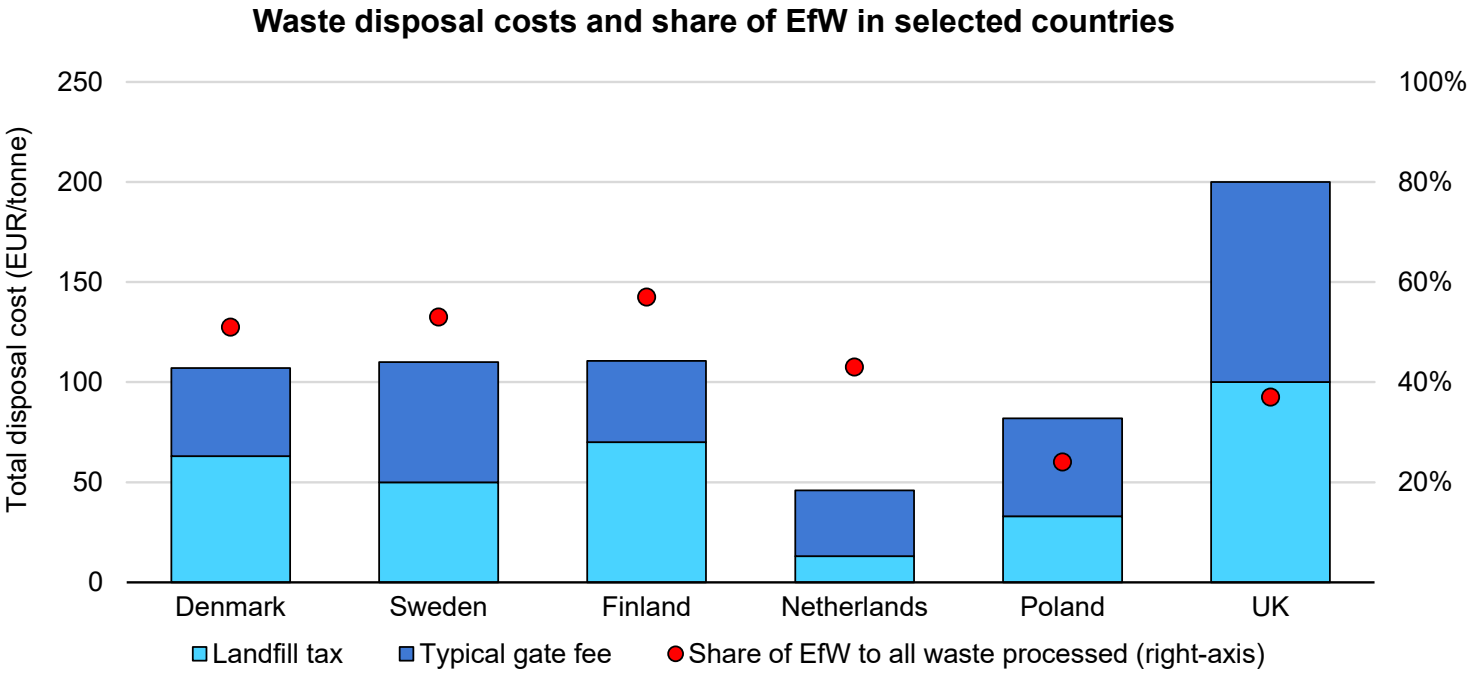
A move towards more sustainable sources of biomass is needed



Source: WEG (2014), Assessment of Wood and Agricultural Residue Biomass Energy Potential in Georgia

Around 35% of Georgia's territory is agricultural land, meaning there is a wealth of agricultural residues that could be harnessed for energy. Currently these are not valorised, with fuel supply chain development and upgrading needed.

International best practices can guide bioenergy development



Sources: Eurostat (2020); CEWEP (2017)

In the EU almost 30% of waste in 2017 was used for energy. There is a close correlation between waste disposal costs and EfW deployment, as landfill taxes and bans see higher shares of waste diverted from landfill to energy.

Key policies for biomass supply sustainability

- Actively implement the updated Forest Code drawn from best-practice sustainable forestry management principles adapted to the Georgian context.
- Promote an appropriate transition away from the social-cutting policy, with measures that ensure affordable and sustainable alternatives to fuelwood to avoid increasing fuel poverty.
- Establish a regulatory framework for the collection and disposal of commonly produced agricultural residues, which prohibits in-field burning and facilitates sustainable energy uses.
- Formally adopt a strategy for the production of upgraded biomass fuels such as pellets, woodchips and briquettes, identifying key steps to develop self-sustaining businesses.
- With international donor support and using best-practice examples, enact replicable sustainable biomass fuel and waste management pilots to identify those with most promise.
- The roadmap also proposes 8 further specific polices and actions for consideration in the areas of forestry, agriculture, energy crops and waste.

Moving to more efficient biomass heating appliances is crucial

Fuel and delivered heat cost analysis

Fuel	Fuel cost range (GEL/GJ)	Stove type and combustion efficiency	Delivered heat cost range (GEL/kWh)
Firewood	13-18	Basic, 25%	0.18 – 0.26
Firewood		Improved, 45%	0.10 – 0.15
Firewood		Efficient, 75%	0.06 – 0.09
Briquettes	23 - 32	Improved, 45%	0.19 – 0.26
Briquettes		Efficient, 75%	0.11 – 0.16

The cost of delivered heat from briquettes used in an improved stove is broadly similar to firewood in a basic stove, while briquettes in an efficient stove offer lowers heating costs than firewood in a basic stove.

Key policies for modernising biomass consumption

- Harness donor funding and government funds to support programmes to improve biomass combustion (e.g. conduct feasibility assessments, soft loans, purchase efficient stoves economically, and establish upgraded fuel supply businesses).
- Use donors' technical assistance to improve national competences in: a) producing, installing and maintaining efficient stoves; and b) producing upgraded biomass fuels.
- Identify regional clusters of biomass supply and heat demand, and launch focused initiatives to establish upgraded-fuel production businesses in these areas.
- Establish a strategic communication strategy to enhance public awareness of the benefits of higher-efficiency heating appliances and upgraded fuels, best-practice combustion practices, and the health impacts of poor air quality.
- The roadmap also proposes 13 specific polices and actions for consideration in the areas of supporting fuel supply businesses, fuel procurement, ensuring fuel cost competitiveness and increasing combustion efficiency.

Conclusions and next steps

- The consumption of biomass in Georgia is a crosscutting issue with implications both in and beyond the energy sector.
- Modernising how biomass is used will improve public health, reduce environmental impacts as well as creating skilled jobs, supporting energy security and meeting stated energy and climate goals.
- There is considerable scope to improve the sustainability of biomass use by transitioning to diversified set of upgraded biomass fuels and improving the efficiency of biomass consumption.
- Georgia can draw on successful examples of international best practice to guide the development of a modern bioenergy industry.
- The development of effective policies over 2020-25 can deliver a modern bioenergy industry in 2030. The roadmap includes a detailed timeline of policy development needed over this period.

View the roadmap online: https://www.iea.org/reports/sustainable-bioenergy-for-georgia-a-roadmap

Download full roadmap: https://webstore.iea.org/sustainable-bioenergy-for-georgia-a-roadmap

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