

CONCLUSIONS

- Wood energy consumption is much higher than anticipated in energy and forestry statistics. Household survey results indicate that the total amount of wood used for energy purposes was 1.37 million tonnes of oil equivalent (Mtoe) in the heating season 2010/2011. This amount is 4.9 times higher than the value reported in the official energy balance of the Republic of Serbia for 2010 (0.281 Mtoe).
- According to project results, wood energy accounts for about 13% of Serbia's total final energy consumption. Future energy scenarios require revision, based on these new data.
- Current use of wood energy substitutes imports of light heating oil in the value of 1.3 billion € or 650 million € in the case of substituting natural gas (Serbian GDP in 2010: 60 billion €).
- Use of wood fuel prevented emissions of about 7 million tonnes of CO₂ from fossil fuels. The theoretical value of these carbon emission currently value 55 million € (8 € per tonne).
- About 6000 jobs are being maintained mainly in rural areas for the production and distribution of wood fuels.
- Serbian forests are managed sustainably. Despite the much higher rate of wood consumption for energy, forests are increasing in area (+1.85 % in the period 2005-2010) as well as standing volumes (+5.8 % in the period 2005-2010) [Source: FAO FRA 2010]. Currently it is estimated, that only 70% of the net annual increment is being utilized. Thus there is even potential for additional wood production.
- Total wood energy consumption was 7.4 million m³ in Serbia in 2010.
 - o 37% or slightly less than one million households in Serbia depend on wood fuels for cooking and/or heating either exclusively or in combination with other fuels. Urban and rural households collectively consume wood fuels amounting to 6.4 million m³ of solid wood equivalent.
 - o Other users, namely: schools, health care centers, lime production, charcoal production for restaurants and meat grills wood processing companies consumed another 1 million m³ for energy in 2010.
- Fuelwood cut and split is the main type of wood fuel in Serbia. 90.6% of wood fuel come from direct sources (58.2% forests and 32.4 outside forests). Only 9.4% of wood fuels consumed in Serbia arise from wood processing co-products.
- Current wood energy applications are not energy efficient and wood fuels are not standardized.
- Modern wood fuels, such as wood pellets and wood chips are unknown to Serbian consumers:
 - o Wood pellets produced in Serbia are being almost entirely exported.
 - o Wood based chips are produced in small amounts for the wood based panel production, but are not known for energy generation.
- Electricity in Serbia is among the very cheapest in Europe, which is discouraging for new, innovative and efficient applications, notable in urban and semi-urban settings.

RECOMMENDATIONS

- **Recognize increased role of wood energy for the energy and forestry sector.** This will require, adjusting national and international statistics and also long term energy targets and projections of energy consumption. The geo-referenced information is a big opportunity for policy makers and decision takers for targeted and sound actions.
- **Build trust.** Develop an informal meeting place for all potential actors involved in improving sustainable and modern wood energy in Serbia. The objective would be to bring in contact the different actors, facilitate build trust and improve cross-sectoral communication and understanding.
- **Develop a holistic, well integrated long-term wood energy policy,** by active coordination and communication between energy and forestry ministries. Such active policy support and guidance would consider following principles:
 - o Ensure sustainability of forest management in Serbia.
 - o Level playing field for different energy sources (electricity)
 - o Maximize value added of wood products – Give preference to wood processing if possible and seek to complement to already existing wood fibers applications. Cascaded use of wood fibers should play an overriding role.
 - o Cost-effectiveness
 - o Maximize energy efficiency of installations
- **Develop and realize demonstration projects.** Functioning modern wood energy applications, notably wood chips for public buildings and district heating plants will ascertain investors and banks that wood energy appliances are technically feasible as well as economically and environmentally viable. They are very likely to have a multiplier effect, since they will server as blueprint or benchmark for future projects.
- **Standardization of fuels and wood burning devices:**
 - o Develop and officially adopt technical standards and norms for modern and traditional wood fuels and wood burning appliances.
 - o Develop and officially adopt terms and definitions of solid biomass. A comprehensive list should include wood fibers from any sources (forests and outside forests, co-products from wood processing industries, post consumer wood, etc.).
 - o Create a neutral national body (laboratory) that could test and certify the quality and efficiency of wood burning applications.
- **Improve wood fuel availability:**
 - o Provide support to private forest owners to organize and coordinate better. Enable forest owners to become energy service provider. Pooling of available resources and joint use of wood chippers will help mobilizing small diameter and poor quality wood for energy production.
 - o Financial support through subsidies, low interest credits and/or tax exemptions. These could benefit all stakeholders in the entire supply chain, from producers of

equipment to end consumers. The first step can be reduction of VAT for all wood fuels to the level of 8% as for firewood.

- Improve forest road infrastructure for accessing and mobilizing forest residues.
- Prepare a national program to increase agricultural production as well as afforestation and reforestation – with the transition to sustainable biomass production, utilization and placement on the market.

- **Development of a domestic modern wood fuel market:**

- Establishment of the announced uniform Government body would contribute to the increase of efficient spending of funds from the budget, grants and other credit lines and could also provide market information for wood fuels. Market activities should be transparent and accessible to all stakeholders and participants – available on the web or in relevant publications.
- Simplify licensing procedure for heat and power production from wood, without omitting any important elements such as safety, meeting energy and ecological requirements, etc. Investors need to know which level of government is responsible for issuing permits at different levels.
- Preparation of promotional material on the significance and effects of using wood fuels. Organize appropriate marketing activities for their promotion (organizing of panels, TV and radio shows) which would contribute to improved level of information and knowledge of consumers.
- Provide capacity building and training for modern wood fuel production, processing and application. This could be targeted to forest workers (e.g. quality wood chipping and storing, carpenters (small scale mobile briquette production) or training plumber (how to properly install a wood boiler).

- **Adjust statistical methodology and data collection.** Benchmark with other EU countries regarding methodology for data collection, verification, presentation and accessibility.