

Wood Energy in Europe, Commonwealth of Independent States, and North America

Wood: A renewable source of energy

- Historical context within the ECE region: heat, cooking, power
- Role of wood energy among other RES - scale-ability, flexibility: used by industry, residential, commercial, utility sectors
- Beyond energy: wood energy brings people to the forest, fire as part of wellbeing (e.g. traditional fireplaces, grilling, sauna).
- Aim and outline to publication contents

Chapter 1. Wood energy and its multiple functions

Forest management and wood energy

- Removal of wood for energy to enhance forest health, support ecosystem resiliency: integrated with other management objectives (e.g. thinning), reduce intensity of forest fires, manage forest pests (e.g. residues & bark beetle population). Ecological aspects => nutrient cycle, pests, => forest management

- Multifunctional forest management: Utilization of annual increment, increasing growing stock => short- and long-term effects

- Adaptability of wood supply for energy: Forest management concepts tailored to different regions. Example: Nordic vs. Southern ECE member nations; natural and planted forests

Environmental objectives and wood energy

- Integrated use to increase C pools/GHG emission reduction: Carbon circle => Carbon debt => Carbon credit; Carbon stock in forests <=> 2nd Forest => carbon stock in buildings
- Ecosystem services => professional harvesting, effects on recreation & biodiversity (e.g. hunting, manage pest populations)
- Minimize indirect land use effects, no competition with food production
- Minimize 'leakage' effects: e.g. natural gas

Energy objectives and wood energy

- Flexibility: (Cooking, heat, electricity, liquid fuels-transport)
- Scale-ability (e.g. residential, industrial, power)
- Convenience: Energy storage, availability on demand
- Complementary: Feasibility for use with other fuels (e.g. District heating)
- Energy security at national level & household level (e.g. secondary residential heating system, CHP district heating); reduced dependence on fossil fuels

Economic development objectives and wood energy

- Integral to bio economy, adds and complement other values for wood products
- Wood energy already integral to wood product industry (e.g. industry power and heat generation, kiln drying)
- Complementary role of wood energy supply: Wood energy demand => indirect support of wood supply for material uses; greater demand for other wood products, generates more residues to be turned into energy
- Support of local jobs; value added and job creation in rural areas (circular economy)
- Diversifies uses for wood, smoothens up/down cycles in other product demand (e.g. paper)

Chapter 2. The Joint Wood Energy Enquiry

Historical development and background. Review of current ECE/FAO regional statistics and trends of wood energy sources (e.g. direct, indirect, recovered), uses (residential, industry, power, other), consumption indicators (e.g. per capita wood energy, pellet consumption), and transformation of wood sources into wood energy products (e.g. input sources for pellets). JWEE development and data description. Guidelines for good data gathering practices.

Chapter 3. ECE/FAO Wood Energy country profiles

Wood energy profile of ECE JWEE-reporting countries (consumption, production, salient feedstock, consuming sectors, per-capita consumption, trends)

Chapter 4. Wood Energy Fuels

Processing and storage of wood energy fuels

- Managing moisture content for efficient combustion. Recommended storage conditions. Examples of traditional wood energy feedstock: black liquor, briquettes, charcoal, firewood, pellets

Turning wood to energy

- Historical uses: Challenge quality of combustion; inadequate burning devices, emissions per unit of energy generated.
- Modern technologies: High-efficiency stoves, CHP.
- Advanced wood products: Description of R&D trends; future prospects

Chapter 5. Public policy instruments for the support of sustainable wood energy

Motivations

- Foster greater renewable energy, reduce net GHG emissions, enhance energy diversity and security, promote economic development
- Global and regional perspective and challenges (UNFCCC COP 21), EU-level (e.g. EU forest strategy, EU Bioeconomy strategy, EU forest-related strategies), National level (Bioeconomy programmes, Energiewende), US

Policy frameworks

- Mandatory, voluntary, financially incentivized, conditional (i.e. if meeting GHG, efficiency thresholds) tools
- Examples: reduction of capital costs (low/no-interest loans, tax reduction on purchase/installation, subsidized purchase); encourage use of wood as energy source (e.g. no tax or subsidized feedstock), feed-in-tariffs); encourage generation of wood energy (e.g. feed-in-tariff). How are these expenses paid for (e.g. central budget, target taxation)

Multi-purpose/ target instruments

- Public policy instruments integrate economic, energy and environmental objectives (e.g. mandatory forest management plans, chain-of-custody, accounting of LCA emissions and net reduction over given baseline, minimum energy conversion efficiency, others)
- Target groups: industry, district heating, private households, private forest owners

Chapter 6. Outlook to future wood energy markets

Synthesis of current outlook studies

- (a) EFSOS, NAFSOS, RFSOS, IEA WEO, IRENA REMAP, AEBIOM, USDOE AEO, REN21, APERC, EU Wood Study, World Bioenergy Association Newsletter; (b) Scientific publications/scenario analysis (eg Buongiorno)
- Gaps and issues: a. Often a black box; b. Insufficient attention to the use of district heating; c. Inadequate consistency of outlooks and NREAPS

Opportunities for sustainable growth in wood energy use

- Integrated public policy framework (carbon tax, energy security, low carbon economy, fossil fuel dependency)

- Sustainability (Environment, Energy, Bio economy,)
- Technological progress (improvements in residential and district heat efficiency; advanced biofuels)
- Public image (can be improved from that of an ‘old’ technology)

Barriers to further and sustainable growth in wood energy use

- Markets (prices, competing uses including waster)
- Sustainability (concerns over impacts on forests, emissions and human health, long-term wood availability)
- Uncertainty due to private landowner intentions, competing uses, public policy support
- Public image: retro technology, lack of awareness, need education on efficiency

Chapter 7. Sustainable levels of Wood for Energy Removals

- Guidelines for sustainable sourcing of wood feedstock (e..g multi-scale assessment of biomass increment higher then procurement)

GLOSSARY