IEA Bioenergy

TWG Forestry within BioEast Initiative

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Bio-hubs as keys to successful biomass supply integration for bioenergy within the bioeconomy

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Current development and perspectives of wood biomass utilization in Slovakia

- Applied research and projects
- Main sources of wood fuel biomass
- Development of forest fuel wood biomass production
- Sources of fuel wood biomass in wood processing industries on non-forest land
- Forecast of usable potential of wood fuel biomass by 2030
- A positive example of the activity of the wood biomass Supply chain of INTECH Slovakia with its subsidiaries
- SWOT ANALYSIS
- Synergy with TWG Bioenergy

Current activities:

Applied research within:

- Wood biomass production
- Technologies of logging, transport and biomass processing for energy utilization
- Technologies of wood biomass energy conversion (combustion, gasification)
- Economic, environmental and social aspects of production and biomass energy utilization

Projects:

BIOCLUS (7FP), IN2WOOD (7FP), FOROPA (SEE), LignoSilva (H2020), ROSEWOOD4.0

National research projects: professional documents for the needs of ministries, cooperation with the companies: INTECH Slovakia, KRONOSPAN, IKEA, Forests SR, etc.

Main sources of wood fuel biomass :

- **Forestry (**wood not suitable for industrial processing, logging residues, tree crowns, bark)
- **Wood processing sector** (residues from mechanical and chemical processing of wood)
- **Non-forest land** (whole or part of trees)

Sources of forest fuel wood biomass
Parameters of of wood resources development in forestry

Parameter	Year		
	2000	2010	2018
Area of forest land, thous. ha	2006	2011	2021
Forest cover, %	40,5	41,0	41,2
Forests usable for logging, thous. ha	1 767	1 779	1 796
Wood stock Ø > 7 cm, mil.m^3	410,0	462,0	481,8
Share of conifers, %	41,9	39,8	36,9
Share of broadleaved, %	58,1	60,2	63,1
Annual growth Ø > 7 cm, mil.m^3	11,20	11,95	12,01
Annual logging Ø > 7 cm, mil.m^3	6,22	9,86	9,86
Total carbon stock in forests, mil. t	464,5	492,2	504,9
Proportion of calamity logging,%	48,6	62,5	58,0

Development of forest fuel wood biomass production

Year	Stock of aboveground[1)] tree biomass, mil.m^3	Production of fuel biomass, thous. t			share in stock, %
		chips	fuel wood	total	
1990	412	2	368	370	0,09
2000	488	5	471	476	0,10
2005	531	130	640	760	0,14
2010	568	250	695	945	0,17
2015	602	615	835	1 450	0,24
2018	622	560	850	1 410	0,23

Note: [1)] Sum of wood and tree bark

Sources of fuel wood biomass in wood processing industries on non-forest land

Annual processing capacities of the wood processing industry from 2010 to 2018

Sector	capacity, thous.m^3
Wood processing industry	2 660 – 3 720
Furniture industry	890 – 1 080
Pulp and paper industry	2 900 – 3 300
Total	**6 450 – 8 100**

Annual average production of wood residues after wood processing between 2010 and 2018

Sector	Production of wood residues, thous. t		
	Own consumption	Supplies to the market	Total
Wood processing industry	282	837	1 119
Furniture industry	99	17	116
Pulp and paper industry	321	175	496
Total	702	1 029	1 731

Note: The average annual production of black liquor is 520 thous. t

Sources of fuel wood biomass on non-forest lands (long - term unmanaged agricultural land covered with forest)

Parameters of wood resources development on non-forest land

Parameter	Year	
	2006	2016
Area of forest land, thous. ha	273	288
Forest cover, %	5,5	5,8
Wood stock, mil. m^3	38,0	46,0
Annual growth Ø > 7 cm, mil.m^3	1,69	2,07
Stock of aboveground tree biomass, mil. m3	50,1	61,5
Carbon stock in biomass, mil. t	16,3	20,7
Annual logging, mil. t	0,15	0,49

Forecast of usable potential of wood fuel biomass by 2030

Source	Usable potential, thous. t		
	Year		
	2020	2025	2030
Forestry	2 774	2 826	2 875
Wood processing sector	1 650	1 670	1 700
Non-forest land	852	942	1 031
Total	5 276	5 438	5 606

Note: The current annual consumption of solid wood biomass, including the wood processing industries 3.5 mil. t

Characteristics of the current development of fuel wood biomass consumption

- The largest consumers are the population (1.0 million t), central heat sources (1.0 million t), wood processors (0.7 million t), energy (0.5 million t).
- Fast growth in consumption was replaced by stagnation - increasing energy efficiency of consumption.
- Fuel biomass production and energy production are not subsidized.
- Low competitiveness of pellets compared to the gas.
- Low level of cooperation between relevant ministries (Ministry of Agriculture, Ministry of Environment and Ministry of Economy SR)

A positive example of the activity of the wood biomass Supply chain of INTECH Slovakia with its subsidiaries

- Operates 9 central heat sources in cities with a total capacity of 48vMW.

- Owns the technological infrastructure for production and transport of chips with an annual capacity of 60 ths. t.

SWOT ANALYSIS

Strengths
- Sufficient wood resources for energy utilization
- Good possibilities of central heat supplies
- Professional level of staff

Weaknesses
- Absence of long-term strategy, resp. its implementation.
- Lack of cooperation between relevant ministries.
- Weak competences at regional level.
- Lack of modern technical infrastructure for forest biomass production (logging).
- The use of renewable energy sources is not a real priority of state energy policy.
- The need to import technologies.

Opportunities
- Increasing energy self-sufficiency.
- Reduction of greenhouse gas emissions (natural gas).
- Regional development.

Threats
- Frequent changes in state policy also in the area of the environment.
- Environmental lobby pressure (NCO).
- Financing of technologies purchase.

Synergy with TWG Bioenergy

- Analysis of the current state in the production of wood biomass and its energy utilization.
- Assessment of unused fuel wood biomass resources in terms of quantity, quality, economic availability and sustainability of utilization.
- Analysis of possibilities to increase the production of electricity, heat, cold or liquid fuels from wood biomass.
- Analysis of the woody biomass supply chains activities efficiency with regard to the deployment of biomass resources, current and prospective consumption sites and proposals to improve their activity.
- Analysis of real possibilities for increasing the quality of wood biomass fuel.
- Assessment of the efficiency of processes of conversion of energy from wood biomass in specific operating conditions and design of procedures for improvement of technical-economic and environmental parameters of energy conversion.
- Identification of legislative, economic and technical barriers complicating the achievement of the objective and proposal of steps to mitigate or eliminate them.
- Suggestion of viable practices to optimize regional energy self-sufficiency, reduction greenhouse gas emissions and economic sustainability.

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