



Study visit report: **Integral solutions for bioenergy policies and strategies** **“Elements of Wood biomass chain in connection with legislation measures”**

Field trip Slovenia **13th-14th September 2017**

Field trip was organized from 13th to 14th September 2017 in Slovenia as 5th study visit of the project BIO4ECO. Field trip was dedicated to Integral solutions for bioenergy policies and strategies “Elements of Wood biomass chain in connection with legislation measures”. During field trip were presented all steps and approaches in wood biomass chain from the forest to final consumers in following steps:

- Biomass in protected areas
- Forestry operations
- Disaster management
- Heating systems
- Biomass center
- Quality control.

13th September 2017

1.) Visit of the protected area on Pokljuka plateau; Balancing biomass and biodiversity in protected areas

In Central Europe, national parks are mainly designed as protected areas where traditional use of forests is allowed. Forest management strategies must be adapted to national park and nature conservation policies. Sustainable forest management provides also wood for energy use, which is in line with the aim of protection and low-carbon society. In order to properly manage the resources we need appropriate GIS tool. In our research Slovenian Wood Energy Information System – SWEIS from Slovenia Forest Service (SFS) were used to evaluate four different scenarios in Triglav National Park from biomass use for energy and biodiversity view. Firstly the assessment of available forest biomass according to current cut of biomass (scenario 1), allowable cut according to forest management plans (scenario 2), reduced cut due to pursuing the objectives of nature conservation (scenario 3) and increased use of forests with higher cut (scenario 4) was performed. In the second step assessment of present and possible future local biomass demands was analysed.



2.) **Visit of the “Vodnikov razglednik”** Natural disaster management issue in connection to sustainable wood biomass supply

Slovenia Forest Service local unit “Bohinj” covers 19.864 ha of forests owned by 2.481 different owners. 6.684 ha of these forests are protected forests.

Allowable annual cut is 76.000 m³, average growing stock is between 320-430m³/ha and annual increment is between 6,5-9,7 m³/ha/year. The beech forests of the beef prevail, only on the plateau is mainly spruce. In the sunny places, there are thermophile forests of ash tree and black hornbeam. The managing principle is sustainable close to nature forest managing. In this area are 270 km of forests roads. In last decade in this area there were few natural disasters, wind, ice and snow brakes, last one in 2014. The consequence of last ice break in combination with extreme weather condition – hot and dry summers - is strong bark beetle gradation which caused 300% more sanitary cuts. In connection with Forest management plans, Silviculture recovery plans were prepared for all damaged area. Forest management must take in account guidelines to achieve sustainable yields and influence on wood market. Through the Rural Development Programme, State support forest owners with subsidies for buying equipment, machinery for forest production and constructing forest roads and tracks. It was also adopted special law to simplify some procedures concerning constructing forest roads and tracks in damaged areas.

In these extreme situations, strong local forest owner’s association–“Machinery circle Bled” has important rule to allow forestry work to be done properly and in time and at least but not last ensures the purchase of wood of all quality at fair prices.



3.) Forestry operations, forestry infrastructure

Through the Rural Development Programme (RDP) investments are co-financed in the construction and reconstruction of forest roads and skidding trails, the purchase of machinery for work in the forest and measures to eliminate damage by natural disasters.

The level of public support for forest roads is 50% of the eligible costs, excluding VAT. The minimum amount of support is EUR 500. The beneficiary can obtain a maximum of EUR 500,000 for forest roads in the entire 2014-2020 program period. Upon the approval of funds, beneficiary may apply for an advance payment of 30% of the value of public support.

The purpose of the support for the purchase of new machinery and equipment for harvesting and logging is to raise the level of forest management, which is mainly reflected in the increase of forest production, greater professionalization of work, less accidents at work, and the introduction of efficient and environmentally acceptable technology for working in the forest. The level of public support for this measure is 40% of the eligible costs, excluding VAT. The minimum co-financing amount is EUR 1,000. Throughout the program in the period 2014-2020, the beneficiary can receive max. € 500,000 of public support for purchasing new machinery and equipment for harvesting and logging.

Support for the elimination of damage and the restoration of forests after a natural disaster is aimed to eliminate the consequences of the ice break in 2014 and its consequences in order to eliminate damage and enable the restoration of forests. The basis for the implementation of works is the Rehabilitation Plan, prepared by the Slovenian Forest Service. Main eligible costs are:

- the removal of damaged trees from injured forests,
- preparation of areas for reconstruction,
- planting,
- protection of plants on renovated areas,
- material costs (seedlings, cords etc)

This measure has different levels of support. Slovenia Forest Service is entitled to purchase planting material and the rate is 100%. Support rates for individual work is in range from 30% to 100%, depending on the high level of emphasis on ecological and social functions of the forest.



4.) Forest owners association – Machinery circle Bled

Machinery circle Bled (MCB) was established in 2004 as an initiative under Slovenia Forest Service and 67 founding members. Main reason for establishing MCB was preservation of jobs in rural area and forwarding wood production services among the forest owners in region. In 2006 MCB with other forest owners associations established Slovenian forest owners union and started to merge forest owners who carried out forest production, among members. During these activities it turned out that forest owners are not skilled enough for Health and safe work in the forest. As a consequence in 2010 Slovenia Forest Service in partnership with MCB built Forestry Education Center to carry out trainings for healthy and safety work for forest owners. In this step MCB became a commercial service, what is not permitted for such associations. The problem was solved by establishing commercial company Machinery circle Bled – Service owned by MCB. Nowadays over 50 skilled and for forest production registered members' cooperate with them. Machinery circle Bled – Service helps their members with subsidies for purchasing machinery and to be involved in Rural Development Program co-financing system for new machinery and constructing forest roads and skidding trails. Company ensures forest operations for their members and tries to get the best value for wood assortments. For some periods when the lower purchase price of timber is foreseen, for their members they guarantee higher prices.



To ensure better and more stable market with low quality wood, they supply few local wood biomass heating systems with wood chips. With different approaches to wood production they help forest owners to reduce production costs with their own work. For example broadleaves wood poles production costs for forest owners household is 7,5€/MWh, for selling on wood biomass market when forest owner participate on production activities price is 15€/MWh, regular costs without participation of forest owner is 31€/MWh.

5.) Wood chips heating system in Nursery home in village Srednja vas

Machinery circle Bled supplies wood chips for heating system in local nursery house in village Srednja vas. Biomass heating system has two Fröling wood chips boilers with capacity 100kW and 220kW. System has 10m³ heat storage tank and 100 loose m³ storage for wood chips. Average annual wood chips consumption is 600 loose m³.



14th September 2017

1.) Biomass centre Nazarje

Biomass centre Nazarje is owned by Company Biomasa d.o.o., which was established in year 1998. At the beginning company has been dealing with wood and energy. 15 years ago, company acquired the general representation of the Austrian producer Fröling, who for more than 50 years has been active in developing the latest wood heating technology for wood biomass. During this period, company Biomasa d.o.o., installed in Slovenia and the countries of South-Eastern Europe, more than 3.000 operating systems of heating on poles, chips and pellets. Company successfully cooperates with a number of design and installation companies in finding optimal heating solutions for new facilities, as well as for energy renovations of existing buildings, from one-dwelling houses to multi-dwelling settlements, public and industrial buildings and district heating systems.

In the town Nazarje, company established their own Biomass Centre.

Few facts about Biomass Centre in Nazarje:

- 50,000 m² big industrial zone
- 7,000 m² of covered surfaces
- 170,000 loose m³ of naturally dried chips per year
- 80,000 loose m³ of technically dried chips per year
- 3,000 tons of pellets per year
- 3,150 MWh of electricity from wood biomass per year



The main activity in the Biomass centre area of Nazarje is processing of wood for energy purposes. With powerful machines annually they produce approx. 170,000 loose m³ air-dried chips. With the completion of the investment, company provides an additional capacity of technically dried chips of 80,000 loose m³ per year and produced 3,000 tons of pellets. The processing of energy products is automated and operates 24 hours a day and employs 5 to 10 employees, depending on the season.





Upgrading and continuation of activity in the BBC Nazarje is a cogeneration of heat and electricity from wood gas. The cogeneration system 10 with a total of 450 kW of electricity and 1000 kW of thermal power generates 3,150 MWh of electricity. Produced heat is used for drying wood fuels and thus improving their energy value.

2.) Municipality Vransko, Energetika Projekt d.o.o.

Energy Project d.o.o. is a company with a long tradition in the field of heat distribution, which is performed as a local economic public service with its own production of heat in the municipality of Vransko. In order to ensure connection to the heating system, the municipality adopted a decree that new buildings do not grant a permit for construction without a contract for connection to biomass heating system.

The district heating system for wood biomass Vransko with a total length of the hot water network of 12.25 km consists of two biomass boilers with total installed capacity of 3.2 MW (2 + 1,2 MW), CHP production plant (combined heat and power) of the rated power of useful heat 108 , 5 kW and net power of 45.0 kW and solar collector system.

The system in Vransko is the first system of integration of solar energy receivers and DOLB in Slovenia. The solar receivers installed last autumn will cover the needs of hot sanitary water for the entire Vransko during the summer months. The recipients cover an area of 890 m² and during summer they replace the operation of the boiler on extra light fuel oil, and the efficiency of biomass utilization and thus the economics of heating is higher.

The district heating of Vransko represents an example of the modern energy use of wood biomass. By building a district heating system on wood biomass, the place provides a durable, renewable, environmentally friendly and locally accessible source of energy. The supply of all heat consumers is provided by two modern wood chip heating devices produced by local producer "KIV". In addition to individual houses and apartment blocks, all major consumers are connected to the system: school, kindergarten, health center, production facilities, shops, municipality, guest house, bank, cultural center, agricultural cooperative and post office. The energy use of wood biomass has positive socio-economic and environmental consequences for the development of the region. The project was financially supported by the state's capital contribution to the public company (funds from the World Environment Fund - GEF), with grants

from the Ministry of the Environment and Spatial Planning and loan from the Ecological Fund of the Republic of Slovenia.



3.) Wood pellets Quality control - S4Q, Slovenian Forestry institute

Production of pellets in Slovenia in 2013 amounted to about 80 thousand tons, and in 2014 it is estimated at over 100 thousand tons. The reason for the increased production volume is the higher demand and consequently the rising number of pellet producers. On the basis of the assessment from the temporary external trade data, in Slovenia there was last year imported about 170 thousand tons of pellets and exported about 120 thousand tons. In the first eleven months of last year, most pellets were imported from Romania (40%) and from Bosnia and Herzegovina (30%)

In spite of the growing supply on the Slovenian market, pellets often do not meet the desired quality criteria, which are defined in the international standard SIST EN ISO 17225-1: 2014. The fluctuations in the quality of pellets on the market are confirmed by recent analyzes carried out and published. The main problem, especially among small Slovenian producers, is the maintenance of a constant level of quality, which can be eliminated through the introduction of a quality assurance and quality control system. Slovenian Forestry Institute recently presented a support system and a brand name "S4Q". This scheme enables Smaller Slovenian wood pellet producer to create a simple and cost-effective system of quality control and assurance. With S4Q certificate they are able to prove on the market that they achieve and maintain a certain level of quality.

