

## Integral solutions for bioenergy policies and strategies

The two-day Bio4Eco study visit in North Karelia, Finland, was arranged 12.6.-13.6.2018 in Joensuu and the surrounding areas. The first day consisted on presentations and experience exchange in the Metla – building and the second day was a field trip day. The theme of the meeting was Integral solutions for bioenergy policies and strategies, which gave several possible approaches to the topic. The arranging organisation Regional Council of North Karelia approached the theme by introducing bioeconomy and bioenergy in our regional policies and strategies and by presenting and visiting different solutions to meet our regional goals to be an oil-free and carbon neutral region by 2040.

The morning session consisted of presentations from Regional Council of North Karelia and we introduced our integral solutions for bioenergy policies and strategies. The first presentation “*Basic for advanced bioeconomy in North Karelia*” was given by our development director Dr. **Eira Varis**. She gave a short introduction to the regions characteristics: our forests provide vast natural resources, we have strong expertise in forest bioeconomy, comprehensive education possibilities and a plenty of common border with Russia. Eira presented also the vision and focus areas of our regional strategic programme and emphasized the role of bioenergy and forest bioeconomy in our strategies.



Coffee break in Metla –building.

Eira Varis from Regional council of North Karelia.

**Anniina Kontiokorpi** gave a more detailed description about bioeconomy and bioenergy use in our region. North Karelia has several strategies, that conduct forest bioeconomy, climate change and energy issues in addition to the RIS3 strategy and climate and energy programme of the region (the policy instrument on the background of Bio4Eco -project). Forest bioeconomy is the other of North Karelia’s smart specialisation choices and it is based on more innovative utilisation of our forest resources.

The goal is that North Karelia should be completely fossil fuel free by 2030. The GHG emissions have decreased especially in electricity consumption and from fossil energy sources but transportation is a challenging sector. At the moment the share of renewable energy in total energy consumption is 64 % and energy self-sufficiency is 63 %. Anniina presented also “*the Roadmap Towards Oil-Free and Low-Carbon North Karelia by 2040*”, which presents tangible steps to achieve the set targets. The roadmap is a part of the implementation of “*North Karelia towards oil-free and low-carbon region*” -project and it contributes also to a Regional Action plan that is drafted in Bio4Eco -project. In Bio4Eco –project, the upcoming “*Smart forest bioeconomy strategy*” will be based on our smart specialisation strategy, regional climate and energy programme and the roadmap.

The interfaces between bioenergy and land use planning in North Karelia were presented by **Jukka Nykänen**. The resource wisdom in forest bioeconomy was emphasised. Geographically North Karelia's bioeconomy concentrates on the key bioeconomy areas. Wood transportation is mainly by road (railway transportation possible only on some routes) and the condition of smaller roads challenges the transportation of wood because the distances are quite long and the condition of the lower road network is partly poor. The terminals smooth a bit the transportation needs and storage of wood and there are plenty of wood terminals in the region; both in common and private use.

Nature themes ("*eko-marking*") and its possible effects on forest bioeconomy and land use in the existing regional planning map caused some suspicious in the regional policy-makers, so a more detailed study on how the new eko-theme affects forestry, tourism, mining and other land use methods was required.

All the previous presentations indicated the **importance of forests and forest bioeconomy** in North Karelia. After the presentations of Regional council of North Karelia some discussion arose about our unemployment rates and how to attract young people studying here to remain at the region after graduation.

**Karri Pasanen** from Natural Resources Institute of Finland – LUKE presented shortly their operations in Finland and in the region. Also a short excursion to the office building was made. Natural Resources Institute Finland (Luke) is a research and expert organization with expertise in renewable natural resources and sustainable food production. In Joensuu Luke concentrates mainly on forest bioeconomy. Finnish forest resource institute Metla and forest research has a long history in Finland and Joensuu and Luke was formed when MTT, Metla, RKTL and Tike's statistic services were merged, so Luke is a quite new organisation. Luke's thematic research programme *Boreal Green Bioeconomy* concentrates mainly on forests. In addition also *BioSociety* is interesting research programme from bioeconomy's point of view. The other research focus areas of Luke are *Innovative Food System* and *Blue Bioeconomy*.



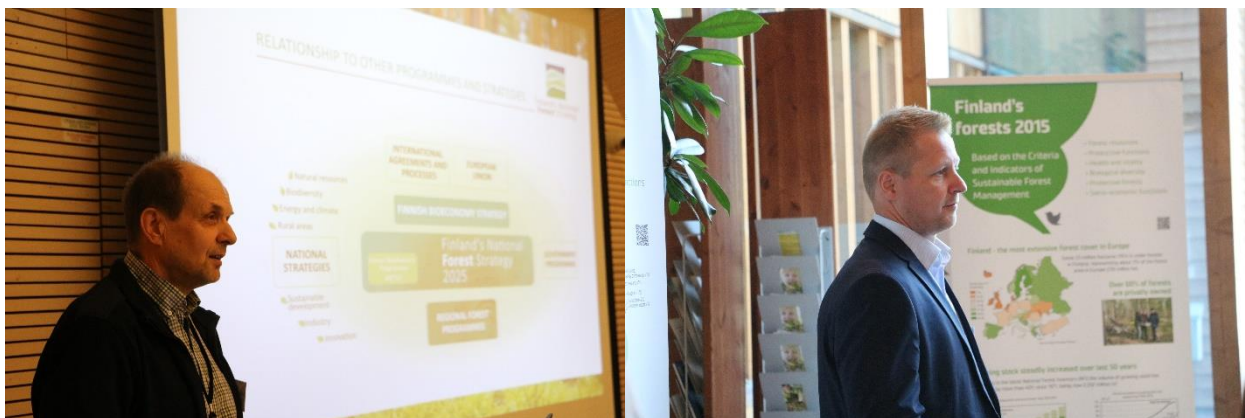
Wooden Metla –building is also furnished according the forest theme especially in Luke's premises.

GreenHUB was selected as one of the three **good practices** from North Karelia in Bio4Eco. The main organisation responsible for GreenHUB is Joensuu Science Park Ltd, but due to cancellation, Karri Pasanen gave the presentation as Luke is also involved in the GreenHUB operation. GreenHUB is an open innovation ecosystem where companies, research institutes, development and educational organisations interact within a common network to facilitate an innovation processes and create new expertise and innovations especially on the field of bioeconomy. The idea is to get the needs of business life to meet the experts, who have the knowledge to solve their problems. The experts meet approximately once in a month and search together solutions to challenges brought to them. When applying similar approaches to new surroundings, openness is the key element in order to get the operation useful. More information about the North Karelian good practices in Bio4Eco's good practice platform.

The forests of North Karelia and our regional forests programme were presented by **Urpo Hassinen** from Finnish forest centre. About 53 % of our forests are privately owned and the average size of a forest estate is 32,5 ha. Our forests grows annually 9,3 million m<sup>3</sup> and the annual fellings are about 6 million m<sup>3</sup> (the sustainable felling amount is 7,1 m<sup>3</sup> annually). Silviculture here is quite efficient and the legislation does not hardly restrict the use of forests. The mission of our regional forest programme is to use forests actively and sustainably, be a competitive environment for forest based business and renew and diversify forest based economy in the region. The programme aims at sustainable use of forests, activating family forestry, promoting the road infrastructure and good forest management, utilizing forest ecosystem services and protecting forest biodiversity. The forest programme was evaluated last year.

Finnish forest centre provides many services to forest owners, e.g. e-services (Metsään.fi), training and direct advisory work. In addition, Finnish forest centre has also a legislative role. After the presentation, we discussed about communication between different groups of interest (forest use and green NGO's). In North Karelia there are also some conflicting interests, but the active use of forests is quite commonly accepted.

**Markus Lier** from Natural Resources Institute Finland gave a presentation about MontBioeco project and the current approaches in EU Member states and at EU level in bioeconomy monitoring. The project aims at screening and comparing the different approaches within the EU Commission and to monitor the progress in the bioeconomy. Integrated part of the study will be the detailed description of the most suitable key indicators and their respective data availability. The study will also support policy makers and technicians who want to measure bioeconomy in their local context by giving them a quick overview on the existing approaches and indicators. The project will publish more information later on.



Urpo Hassinen presented our regional forest programme. Karri Pasanen from Luke.

The afternoon session consisted of presentations from project partners and their local stakeholders. **Petya Slavchevska** from Executive forest agency, Bulgaria, presented their action plan: *“Action plan for energy from forest biomass 2018-2027 - an integral solution for sustainable and efficient use of biomass for energy”*. The preparation of the action plan required plenty of data collecting and analysing e.g. analysis of different policies and regulations and biomass sources and potentials. The goals of the action plan are e.g. to use forest biomass efficiently and sustainably, to improve life quality, environment and air quality, to introduce measures and actions related to the production of heat from biomass, to replace fossil fuel installations with biomass plants and to replace single-house heating systems with more efficient multifamily installations. The mission of Executive forest agency is to propose an integral solution to ensure a coherent, comprehensive and well-coordinated policy for providing the necessary conditions and resources for the production of forest biomass energy. The action plan is divided into 6 priorities and it contains 32 activities. Good and comprehensive availability and delivery of the action plan was seen important.

*“Promoting efficient use of wood biomass in Slovenia”* was presented by **Uroš Habjan** from Ministry of infrastructure. Within the framework of district heating systems based on renewable energy sources, the use of woody biomass has had many investments in Slovenia during 2009 – 2014; over 16 million € grants, over 59 km of heating network to over 1100 customers and the total value of all co-financed operations was 45,6 million €. In year 2016 there were 7,9 million € grants, 6,7 km network was built and 80 clients were connected to the network with total value of 15,7 million €. For the current period from 2017 to 2020 Slovenia plans co-financing funds in the amount of 8 million €. During this development work one problem occurred however during establishment of one district heating system; problems with the contractor caused also lack of social acceptance.

**Josep Salvador Blanch** from Government of Catalonia presented: *“Clean energy transition in Catalonia”*. The most (about 92%) of the energy consumption in Catalonia is imported and it is about 66 % dependent on fossil energy sources. The share of renewable energy in energy production is currently only 8 % and over half of the energy production comes from nuclear power, so Europe’s Energy and Climate targets are still far away. National agreement for the energy transition includes 6 axes and according to it, Catalonia aims by 2050 to be low-carbon economy in use of renewable energy sources (100 % by 2050), energy efficiency and GHG emissions. Catalonia aims also to give up nuclear power by 2027. In addition, Catalonia aims to increase the use of biomass in energy production, especially in heat production (Catalan Biomass Strategy to promote the energy from forest and agricultural biomass).



Petya Slavchevska from Bulgaria.

Josep Salvador Blanc from Catalonia.

**Neus Puy** from Universitat Autònoma de Barcelona (UAB) gave a presentation about *“Boosting the Catalan biomass- The case of innovation from a biorefinery perspective producing value-added products (torrefied pellets and antioxidants)”* and she presented the Catalan Biomass Strategy to promote the energy from forest and agricultural biomass more specifically. The aim is, that the use of forest biomass, solid biofuel extraction for thermal energy and the area of managed forest should be 2,5 times more in 2020 than in 2013. Catalonia is mountainous area and forest fires are a risk. Need for cooling is bigger than the need for heat. The strategy aims are to promote forest bioeconomy and to obtain added-value products from forests.

Neus gave also a short introduction to chemical composition of wood and wood based compounds. As a result of thermochemical process, in addition to torrefied chips or pellets, a various value-added products like aromes and antioxidants are formed. Torrefication of wood chips/pellets has many advantages, they have e.g. higher heating value and are easier to store. Torrefied bio-oils contain many interesting compounds for many purposes and are a good example of high added-value products.

**Liga Dreijalte and Kristīne Sirmā** together gave a presentation about Latvian Integral solutions for biomass related policies. In Latvia forestry and related industries are developing and the share of fuelwood from total energy consumption has increased during the last decades. The share of renewable energy at the moment is about 38 % and the target for 2020 is 40 %. The instruments for bioenergy promotion are mandatory procurement of electricity from RES and capacity payment and EU co-financing. Mandatory procurement has increased the number of plants using biofuels significantly. EU co-financing has several programmes for renewable energy promotion. The advantages of RES are significant, e.g. increased energy security, reduced network losses due to distributed heat production, supply stability and positive effects on rural development and employment. Challenges are related e.g. to insecurity of policies and the price of RES energy.

Latvian bioeconomy strategy 2030 is based on RIS3 areas, National Development Plan of Latvia for 2014-2020 and Sustainable development strategy of Latvia “Latvija2030” and it was developed by the Ministry of Agriculture and Latvia University of Life Sciences and Technologies together with interministerial working groups and stakeholder workshops. The strategic goals for the bioeconomy strategy are to promote employment in bioeconomy sector, increase value added bioeconomy products and to increase the value of bioeconomy production exports.

The last presentation of Tuesday session was given by **Jose-Antonio Bonet** from Diputacio De Lleida, Catalonia: *“FOREST4LOCAL – Development of a public and local forestry system for the mobilization of forest biomass for thermal use in the Pyrenees of Lleida”*. The area is 64 % covered by forests and the terrain is mountainous. 80 % of the Catalan forests are privately owned. Only 1/3 of the growth of the forests is harvested. The area, especially in mountainous parts, is sparsely populated and the question reflected in the presentation was local perspective to forest based heating plants; could forestry and small scale heating plants be a solution to the decreasing population. Small scale heating plants have many advantages, e.g. they promote local economy and improve the state of local forest.

The afternoon session was closed with experience exchange about best practices, problems and action plans and other topical issues in small groups. One concrete conclusion of this conversation was to include climate change aspects more strongly to the strategies. **Jurij Begus** gave examples from Slovenia what kind of effects climate change can have e.g. to the area of distribution of different tree species or to forest damages caused by pest insects.



Bio4Eco -group ready for dinner.

In the evening there was a possibility to try Finnish sauna at Pielisjoki castle, which is the office building of Regional Council of North Karelia.

Region mayor **Risto Poutiainen** gave a short presentation about the history of the Pielisjoki castle and introduced the *“Forested regions Europe - An informal network of regions where forestry plays a central role for the implementation of bioeconomy”*. Regional council of North Karelia has started a network for regions where forests have an important role in bioeconomy. Many legislative operations and initiatives which can have an impact on forests are taking place on EU –level (e.g. LULUCF, Renewable Energy Directive REDII) and the aim of the network is to effect these policies on EU –level. The regions of the network present the following views on current EU policies that concern our regions:

- Regions have a crucial role in implementing bioeconomy
- Resources (financial and enabling EU policies) are needed to ensure transfer from fossil-based economy to a bio-based economy – regional specifics need to be taken into account
- Forest-based bioeconomy has a positive impact on the development of not only rural areas, but also the urban centers within those rural areas, boosting growth and jobs in the whole region. Bio-based products can significantly contribute to climate change mitigation.
- When drafting new and implementing existing legislation, we call the European Commission to carefully evaluate and consider global implications as well as Europe’s competitiveness and European value chains
- We call the Commission to strengthen the role of EU’s Forest Strategy as a guiding reference for any EU policies on forestry. The EU Forest Strategy with its sustainable forest management approach includes all aspects of sustainability.

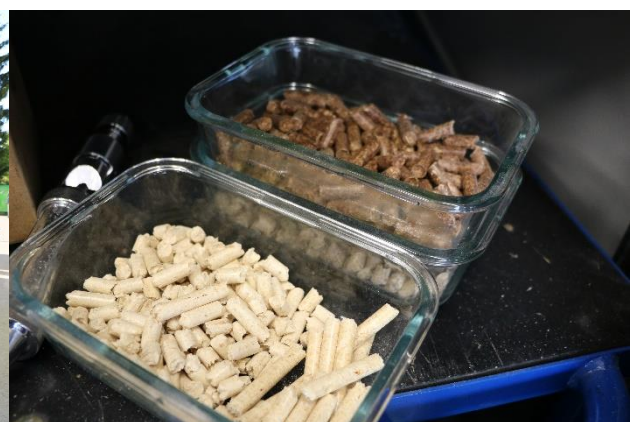
Some suggested co-operation topics are e.g. developing and implementing regional (forest) bioeconomy strategies, identifying successful policies and policy measures and barriers impacting forest-based bioeconomy and developing innovative financing models to boost forest-based circular bioeconomy. The network is open for interested regions (contacts [risto.poutiainen@pohjois-karjala.fi](mailto:risto.poutiainen@pohjois-karjala.fi)).

### Wednesday 13.6.2018, Study visit

Wednesday’s study visit started from the Sirkkala Energy Park which is a research, demonstration and educational platform which promotes both national and regional development goals to increase the knowhow, production and use of renewable energy. Energy Park was selected as one of the three **good practices** from North Karelia. Energy Park collaborates with enterprises and increases knowledge on energy solutions with joint RD&I work. Energy Park improves stakeholders’ ability to adapt to changes in construction and energy system regulations. Sirkkala Energy Park produces information on actual cost structures of renewable energy production and maintenance, as well as creates synergies between enterprises, education and research.



The mobile CHP –plant in Energy park.



Energy Park has also machinery for pellet production.



Pohjois-Karjalan  
MAAKUNTALIITTO

**BIO4ECO**  
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Energy Park is owned by the Karelia University of Applied Sciences and it is an integral part of the Joensuu bioeconomy cluster. **Anssi Kokkonen** gave first a presentation about Energy Park and its facilities and then we had time to get acquaintance to the equipment on the premises, which include e.g.:

- mobile Volter CHP unit with real-time monitoring
- combined wood log/pellet boiler
- nano CHP pellet boiler system
- large collection of solar collectors and panels
- wood fuel dryer and
- a wide variety of laboratory equipment and analysers.

From Energy Park the visit continued by bus to Eno, where we got a presentation about another **good practice** from North Karelia, Eno Energy Co-operative by **Urpo Hassinen** and Ahti Soikkeli. Urpo Hassinen shortly introduced the use of wood chips and heat entrepreneurship in Finland.

Eno Energy co-operative has three heating plants (and some solar panels installed to one of the heating plants), which use local forest chips to heat the buildings nearby. The establishment of energy co-operative was a long process, but at the moment the operation is highly appreciated both by local and a numerous visiting groups. Energy co-operative's plants heats up 282 300 m<sup>3</sup> (e.g. school buildings, library, sports hall buildings, health centres, fire station and old people's home). The heating pipe network is 11 000 m long and the annual heat production is 15 400 MW. Eno co-operative has many local benefits such as, local forest owners receive income from selling energy wood, energy wood harvesting entrepreneurs get work, thinning of too dense young forest improves growth and quality of remaining trees, net carbon dioxide emissions are reduced because imported oil is replaced by renewable forest chips (5 million kg CO<sub>2</sub> annually) and local networks are created. In addition the actions employ between 7-10 man/year. Urpo presented also the supply chain of the wood chips. Part of the fuel wood is harvested from local forest owners by local people and comminution is operated by a local entrepreneur. After presentation and coffee served by a local charity group **Parempi arki**, we had a tour in Alakylä heating plant.



Urpo Hassinen presented Energy co-operative and heating plant. A step grate inside the boiler.

From Eno the bus headed towards Koli, where we had lunch at an old style restaurant Kolin Ryynänen. At the bus **Anniina Kontiokorpi** told about the background of our next visiting site, Koli National Park. In Koli national park a different solution was necessary to gain goals to have an oil-free region and national park. Inside Koli National park locates a hotel and a nature centre, which utilise 180 m<sup>3</sup> of light fuel oil annually. Finnish Government has decided to replace fossil oil used for heating up state owned buildings with renewables by 2025. In addition, Koli National Park aims to be fossil oil free national park as a part of national and regional targets. The first solution in mind was naturally wood heating, but Ministry of the Environment decided that bioenergy could not be used for landscape reasons and solar energy could not

be used for the same reasons. The only possible bioenergy solution would have been bio-oil, but the price would have been too expensive and in order to comply the national regulations and regional and local goals to get the national park oil free was geothermal energy. The site is an example of an oil-free solution, when bioenergy cannot be utilised. At Koli we had a possibility to see the construction of the geothermal heating system. As a result of geothermal heating and cooling system the CO<sub>2</sub> emissions will reduce approximately 68 % and heating and cooling costs will reduce 70%.



Geothermal heating system under construction.

“National scenery” of North Karelia from Koli peak.

In Koli Nature centre auditorium **Harri Välimäki** from Development Lieksa Ltd LieKe gave a presentation about the future plans of Koli area: “*Koli Master Plan – strategic development of Koli area from bioeconomy’s point of view*”. Koli is located in Lieksa municipality, which can be called as a bioeconomy city. In Lieksa we have one of our regional bioeconomy key areas (Kevätniemi Bio-Park); plenty of wood based industry, food industry and agriculture and tourism. Area’s economy is mainly based on wood, nature and nonmaterial values of forests and waterways. In addition to Koli, also another national park and national hiking park are located in Lieksa.

Koli area attracts tourists both in winter and summer and the area has long traditions on tourism. The tourism and the attraction of the area is based on nature and so called ecosystem services provided by forests and nature and as multiple use of forests is one of our RIS3 areas, the development of the area on bioeconomy’s point of view was presented. Koli area has extensive growth plans “*Koli Big Picture 2050 development plan – vision 2050*”, which is mainly a strategic land-use plan in compliance with the landscape and the values and the unique brand of Koli. Bioeconomy is self-evidently on the background of the development plan of Koli and natural values are honoured. Most of the buildings planned to the area will be wooden, like Koli Cultura. Fire wood, wood pellets, wood chips and geothermal energy is planned to be utilized in the area. Local Koli residents live mainly from tourism, agriculture and forestry.

During the two-day study visit, we got an introduction to the forest bioeconomy and to the strategical targets and programmes on its background in North Karelia and we got familiarised with all three of our good practiced selected in Bio4Eco –project. In addition we heard also other partners’ integrated solutions to bioeconomy and bioenergy policies.

The organising team Miina, Anniina and Jukka thank you all for your contribution to the study visit, welcome again to North Karelia and Joensuu! The pictures in this report are taken by Anniina.