

S U M M A R I Z I N G R E P O R T F R O M  
S T U D Y T O U R I N N O R W A Y  
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Projekt je financovaný z grantu Nórskeho kráľovstva prostredníctvom Nórskeho finančného mechanizmu.  
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### PURPOSE OF THE STUDY TOUR TO NORWAY

The study tour to Norway was carried out in the framework of strengthening bilateral cooperation with Norway project partners and the introduction of knowledge of Norwegian experts on logging in forest, biomass processing, using the latest technology and the best practices. The purpose of the study tour to Norway is to exchange experience in these fields which will help to adequate start-up of biomass logistics centre.

The aim of the study tour is to increase the expertise of the project team in the use of innovative technology in practice. Increasing of expertise was achieved by presentations – theoretical lectures and expert commentary on the experience and knowledge of logging in the forest biomass processing, using the latest technology and best practices. Another objective is the gaining of knowledge and best practices in implementing an effective system of biomass in forests (establishment of collection points), the selection of appropriate innovative technologies for processing of biomass and in setting up a laboratory to measure quality parameters. Due to the fact that in Norway such procedures are commonly used the objective of the study tour is to "bring" them to Slovakia and put into practice, in line with economy, efficiency and compliance with gentle treatment of the environment.

Study tour was realized in the form of business trips of members of the project team and representatives of BIOPEL, the project team Slovak project partners Cenžualne spolumajiteľstvo Rajec and University of Zilina.

Study tour lasted five days, was realized in the period from 28.09.2015 to 02.10.2015 and was attended by 14 people. Meetings with Norwegian partners, organizations and institutions took place in Oslo and surrounding towns - Ås, Bøn, Råholt, Vormsund, Aurskog, Hurdal, Moelv.

TIME BEHAVIOUR OF THE STUDY TOUR

**Monday, 29.09.2015**

International Development Norway, Oslo

On Monday, after arriving in Oslo, Norway a working meeting with the Norwegian project partner International Development Norway, represented by p. Rune Stolan was held. At the meeting, the detailed program of the study tour was approved, specified the details of all meetings, united the mode of transport for each meeting and agreed timescale and targets of all agreed meetings.

**Tuesday, 29.09.2015**

Bioenergy research Institute – NIBIO, Ås

On the first meeting, all participants moved to the Norwegian city Ås where we visited **Bioenergy research institute – NIBIO**. We were welcomed by Mr. Bjørn Håvard Evjen and Mrs. Janka Dibdiakova. In the beginning of the meeting we presented the project in which the study tour took place, the targets and objectives of the study tour as well as a short overview of BIOPEL and its project partners.



Picture 1: Research Institute - NIBIO



Picture 2: Presentation - Bjørn Håvard Evjen



Picture 3: Presentation - Dalen Lars

In another part of the meeting it was presented the presentation by Mr. Stein Tomter, focused on the national inventory of forests, productive forest area, growing stock and increment, the development of mining, statistical assessment of state forests, method of data collection for statistical evidence - from the sample area, monitoring methods of carbon.



Picture 4: Presentation – Stein Tomter



Picture 5: Presentation – Janka Dibdiaková

Mrs. Janka Dibdiaková presented the Institute's cooperation with Slovakia - through the green industry innovation program with several organizations. Further she explained that the research institute is focused on combustion research and research of settings ideal parameters from the combustion of wood chips, waste wood. She explained in detail the combustion process, the values that significantly affect the quality of combustion, utilization of ash, which is created as the final product of the combustion process. As the quantity of ash formed by combustion is quite a lot, Norway looked for ways to use this waste material. When burning wood and wood chips comes two types of ash - bottom ash and flue dust ash. Bottom ash while observing optimal combustion conditions is very good and its quality attributes make it ideal to be returned to the forest as fertilizer. As the ash is in the powder form, the ash is pelletized which give it a compressed solid form. In such solid form it can be scattered as fertilizer. Flue dust ash contains large amounts of heavy elements, so its application is found as an ingredient into cement / concrete where the concentration of heavy metals is stabilized such way there is no pressure on the environment.

Bioenergy heating central - Bioenergy heating, Ås

Tuesday's second meeting was held also in city Ås in the heating central – **Bioenergy heating**, where the heating central (combusting woodchips), fuel storage, which allow the air flow and thus the gradual drying of the fuel, was shown.



Picture 6: Heating central



Picture 7: Demonstration of heating central



Picture 8: Demonstration of heating central



Picture 9: Demonstration of heating central



Picture 10: Fuel storage



Picture 11: Fuel storage

**Wednesday, 30.09.2015**

**Wood chip production facility Bøn Biobrensel AS**

On Wednesday, the participants of the study tour visited the facility for production of wood chips **Bøn Biobrensel AS** in city Bøn. Participants were provided with information on how to purchase wood chips, quality parameters, how to use various fuel quality throughout the summer and during the winter, the mode of transport of wood chips in containers.



Picture 12: Equipment of facility



Picture 11: Transport container with special floor



Picture 12: Fuel storage



Picture 13: Fuel storage



Picture 14: Fuel storage



Picture 15: Logs storage

**Bioenergy heating central with local heating grid – Råholt Varmesentral**

Mr. Trond Hammeren provided expert commentary and practical demonstration of the heating central **Råholt Varmesentral** in Råholt - fuel storage, fuel mode of administration, type of fuel, heating control system. Heating centre heats the surrounding buildings such as schools, retirement home, swimming pool. During the tour we have seen fuel storage - wood chips as well as the actual boiler room including transport of fuel, other equipment of the boiler room. The last part of the tour was a visit to the control room from which complete control of the central heating is operated.

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Picture 16: Heating central



Picture 17: Heating central



Picture 18: Isolation of heat distribution



Picture 19: Fuel storage – wood chips



Picture 20: Fuel storage – wood chips



Picture 21: Boiler combustion chamber





Picture 22: Heating central facilities



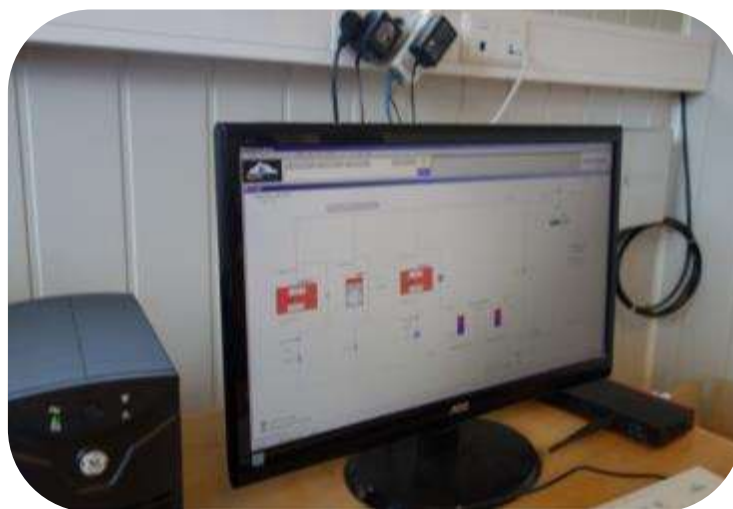
Picture 23: Heating central facilities



Picture 24: Transport of fuel into the boiler



Picture 25: Heating central facilities



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