

WENET – FINNISH COOPERATION ON EFFICIENT AND SUSTAINABLE USE OF WOOD FUELS

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Finnish energy policy is aimed at securing a competitive energy supply, while concurrently meeting international commitments. To do this, it encourages diversity in the energy production sector and promotes self-sufficiency in the energy supply. Additionally, it promotes the use of renewable energy sources and energy conservation by different means such as tax and investment incentives as well as launching and supporting research and development programs.

Finland is the forerunner among the member states of the European Union in the utilization of bioenergy. The goal of the European Union is to double the use of renewable energy from 6 % to 12 % by the year 2010. In 2002 as much as 23 % of energy was generated from renewable sources in Finland (Statistics Finland, 2003). In the case of electricity the drafted indicative goal in Finland is to produce 31.5 % from renewable energy sources by the year 2010. In combined heat and electricity production (CHP) the European Union aims at doubling its production to 18 % of the total electricity generation, while in Finland one third of all electricity is produced through CHP. Just over half comes from district heating units and the rest from CHP power stations of the industry. The forest industry, in particular, uses its by-products for energy generation very effectively, incinerating black liquor, bark, sawdust and forest residues. The current energy generation based on renewable sources is a good basis for the new national promotion programme aiming at a share of 27 % of renewable energy sources in 2010 (Enestam, J-E., 2003).

Progress based on research and development programs

Research and technology development are among the principal measures in obtaining the target in production of energy from renewable energy sources. In 1999, the National Technology Agency TEKES established the five years Wood Energy Technology Program to stimulate the development of efficient systems for large-scale production of forest chips. Key targets were competitive costs, reliable supply and

good quality of chips. The main principle of the program was close cooperation between researchers and practitioners with the aim to introduce results to practical application and commercialization. The program consisted of 35 research projects, 35 industry projects and 15 demonstration projects. The main research areas of the program have been planning and organization of chip production, production systems including logistics, quality control, handling and storage of solid fuels, impacts on forestry, energy production and usage. During the first four years of the five-year program, the use of forest chips increased from 0.5 Mm³ to 1.7 Mm³. If the official goal of the Action Plan for Renewable Energy Sources is to be achieved, an increase of 400 000 m³ is required each year of this decade. The program aimed at promotion of large-scale forest chips production ended in 2003. The program was extended in 2002 by a new sub-program focusing on small-scale production and combustion of forest chips. This specific activity focuses on solutions for the small-scale wood fuel production (usually under 1 MW), storage, processing and distribution as well as energy production. This specific topic will continue until the end of 2004 (Hakkila,P., 2003).

Resources of biomass for energy

The following amounts of wood residues were used for production of energy in 2002 (Hakkila 2003): black liquor - 17.7 million m³, bark - 8.0 million m³, sawdust - 3.1 million m³, recycled wood - 0.2 million m³, pellets, briquettes - 0.05 million m³, traditional firewood - 5.8 million m³ and forest chips - 1.7 million m³.

In addition to those amounts there is still a high potential of unutilized forest residues. The theoretical potential of biomass for energy use in Finland is 45 million m³/a. Depending on the criteria employed, the technically harvestable biomass reserve is estimated to be 10 – 16 million m³/a. The goal of the Action Plan is to utilize 5 million m³/a in 2010.

Promotion of bioenergy by strengthening the regional cooperation

Forests, peatlands, lakes and rivers are the most important natural sources of renewable energy and biofuels. Hundreds of modern bioenergy power and heating plants and technologies from farm size up to large forest industry plants and CHP-systems have been installed in Finland.

One of the regions where wood energy is used extensively is North Karelia. North Karelia abounds in unused wood energy resources. It also benefits very much from

the concentration of many institutions dealing with biomass utilization for energy. The Joensuu Regional Development Company JOSEK Ltd. has launch a program to promote biofuel utilization by establishing „The Wood Energy Centre“. The Wood Energy Centre consists of more than 30 organizations involved in education, research and development, consulting companies, wood harvesting companies, producers of machines and equipments for forest operations and heat production, producers of biofuels as well as producers and deliverers of heat and power.

The aim of the cluster is to develop and implement large technology transfer programs by elaborating feasibility studies, pilot projects, know-how transfer as well as by education and research. Technology transfer is based on practical implementation of projects with approved technological chains in compatible conditions. The existing energy plants, supply chains and business models from farm size to large CHP plants together with an exceptional concentration of manufacturers of wood energy technology combine to make up the Karelian network a live model for maximising the use of local bioenergy resources. The Wood Energy Centre has launched a special project **WENET – Wood Energy Net** at the beginning of 2004. WENET offers an effective concept for the transfer of business models, technology and expertise from North Karelia to other parts of Europe and world-wide.

Recently a project on regional cooperation between WENET and Banska Bystrica region in Slovakia is under preparation. We cordially invite all partners interested to join us in the preparation and successful implementation of projects on biomass utilization for energy in Slovakia.

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