

## PROMIDNORD – SUSTAINABLE DEVELOPMENT IN MID NORDIC REGION

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**ABSTRACT:** The Mid Nordic Region consists of eight regions: *North and South Trøndelag* counties in Norway, *Jämtland and Västernorrland* counties in Sweden and *Ostrobothnia, South Ostrobothnia, Central Finland and South Savo* counties in Finland (Fig.1). ProMidNord (August 2004 - July 2007) is a co-operation project initiated by the Mid Nordic Committee in the BSR Interreg IIIB - program. All eight counties were involved in the project. The project consisted of five different work packages, which all aimed to strengthen the potential and attractiveness of the whole region. Work package 3 concentrated on “*Sustainable Energy Development*” in which strategic focus was to increase and promote the use of RES & RUE while aiming at 100% fossil fuel free Region. This paper will outline the results of work package 3.

**KEYWORDS:** Regional co-operation, Sustainable development, Energy awareness



*Figure 1. Mid Nordic Region consists of eight regions in Finland, Sweden and Norway*

### 1 INTRODUCTION

The Mid Nordic Committee is a nordic bonderorganisation which has lead the co-operation on the region for over 28 years. The aim of the Mid Nordic Cooperation is to be a motivating power for sustainable development – ecologically, economically and socially. One of the priorities is co-operation within energy work. The Mid Nordic Energy Group (MNEG) was found 1981, the group keeps in touch with developing knowledge, technology and structures concerning energy, energy saving and effectiveness as well as environmental aspects. Regional Energy Agencies have been established in most of the Mid Nordic sub-regions. During the years of 2004-2007 the MNEG-cooperation has based mainly on the ProMidNord -project and its contents. The main actors in the ProMidNord-project working group were

- Jyväskylä Innovation Ltd / Central Finland Energy Agency
- Technology Centre Oy Merinova Ab
- Jämtlands County Energy Agency
- Västernorrlands County Energy Agency
- North-Trøndelag County Council
- South-Trøndelag County Council
- SÖT-partners (municipalities of Sundsvall, Östersund and Trondheim, Swedish Road Administration and Norwegian Public Roads Administration)

ProMidNord has been a project initiative of the Mid Nordic Committee to the Interreg IIIB-program (duration August 2004 – July 2007). The partnership in the project has been wide, 26 organisations from eight counties: regional authorities, municipalities, national institutions, colleges/universities, science parks etc. The project consisted of five different areas of co-operations. One of these co-operation areas has been “*Sustainable Energy Development*”. [3]

The main objectives in ProMidNord - Sustainable Energy Development have been:

- To prepare / collect / analyse information for regional Energy balances (supply, use and share of renewable energy)
- To increase the knowledge and co-operation within the regions energy sector due to regular Energy Awareness Actions
- To inform about Energy Performance Building Directive (EPBD)
- To define actors and obstacles and find best practices in Sustainable development in traffic and to promote biofuels in transportation in order to decrease green house emissions

## 2 REGIONAL ENERGY BALANCE

The Mid Nordic region has great resources of renewable energy in terms of hydro power, bio energy and possibilities for solar energy and wind power. During the ProMidNord-project the Mid Nordic strategy has been composed in order to improve possibilities for sustainable growth through an intensified co-operation between Mid Nordic cities, towns and regions with common situation and conditions. MNEG proposed to include a economical, social and ecological sustainable energy strategy in the Mid Nordic strategy by emphasizing four priority areas which are the following

- To increase the rational use of energy ( RUE ) in different sectors
- To increase the share of renewable energy sources ( RES )
- To prevent waste production, to promote recycling and utilization
- Substitution of fossil fuels with less carbon concentrated fuels
- To develop the use of hydrogen from renewable sources and wave power

In most of the Mid Nordic counties the regional energy balance was updated or prepared during the project. In some cases also emission balance was calculated. The data of the energy balance is utilised e.g. as a source information of the regional energy plans.

The energy balance of Central Finland was updated utilising the statistics of year 2004. Central Finland has reached a high position in Finland as a bioenergy producer and consumer. In year 2004 about 51 % of the county's primary energy consumption (traffic included) was covered by local bioenergy and hydro power. Total energy consumption was 19,3 TWh (Fig. 2). Solid wood fuel's share was 23 % (4300 GWh). Majority of wood residues from forest industry were in use and their share was 11 % (2150 GWh). Forest residues were used in energy production in 2004 ~790 GWh. Since year 2000 the use of forest residues has almost doubled and continues to grow strongly. About 800 GWh of fire wood is used annually in single houses and summer cottages. In 2004 the total use of forest industry by-products for energy was about 4450 GWh (black liquor incl.). 23 % of electricity generated in the area was based on local biofuels. Local peat was also used for power and heat production with amount of 2,2 TWh annually. [1], [2]

In Central Finland (year 2004) 57 % of the produced energy was used by industry (10,9 TWh). The share of space heating was 24 % (4,6 TWh), transportation 14 % (2,6 TWh) and other consumption 6 % (1,2 TWh) of the total energy consumption. In Central Finland (2004), carbon dioxide emissions caused by energy production and transportation were 3 million tonnes. The average emissions were 158kg CO<sub>2</sub> per MWh. [1]

A summary of the development needs of Central Finland's energy management from the energy balance point of view [4]:

1. To increase the back pressure production of electricity
2. To replace the heating oil with biofuels in buildings and extend district heating
3. To develop biofuel supply for local traffic
4. To improve the energy efficiency especially within SME-industry as well as within service and housing industry

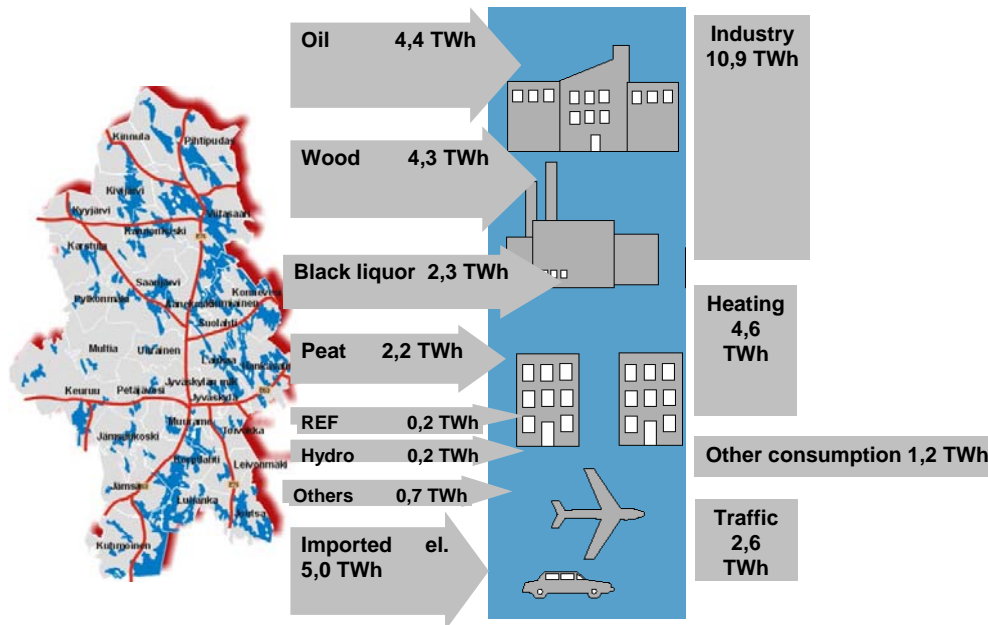


Figure. 2. Central Finland Energy Balance, year 2004 (total 19,3 TWh) [1]

The population in Central Finland is ~270 000 inhabitants and in Jämtland ~130 000 inhabitants. Total energy consumption in Jämtland was ~5,8 TWh in year 2004. The share renewable energy sources is 60,7%, peat 2,2 % and fossil fuels 37,1%. In Jämtland (year 2004) 55 % of the produced energy was used by space heating and service sector (3,15 TWh). The share of industry was 12 % (0,68 TWh) and transportation 33 % (1,9 TWh). The share of renewable energy resources has increased from 55% to 61% from year 1999 to year 2004.

The numbers show that the countys' energy balances are not comparable. Even if the population in Central Finland is doubled to the population in Jämtland, the energy consumption is 3,5 times higher in Central Finland than in Jämtland. This is mostly because of the industry. In Central Finland, Jämsä and Äänekoski subregions are strong areas of industry, especially paper industry.

### 3 ENERGY AWARENESS ACTIONS

The purpose of energy awareness actions have been to increase the exchange of knowledge and experience regarding energy issues among decision makers, companies and public. Other target groups have been forest owners and farmers, SMEs', house-agents and energy consultants. During the project these target groups have been informed about energy awareness events, campaigns and energy saving weeks etc.

During the project numerous local / regional events were arranged and these events attracted hundreds of people. The success of these events show that people are very interested in biofuels and energy saving as well as worried about climate change. Some examples of energy awareness actions are

- Film shows on climate change ("*An Inconvenient Truth*" by Al Gore) with 630 visitors in Sollefteå, Kramfors and Härnösand
- Annual Central Finland Energy Day, 3 times during the project (average 100 participants)
- During *European Traffic Week* in 16.-22.9.2006 Västernorrland arranged 7 events to disseminate information how to save fuel and money by eco-driving, biofuels and environmental cars, with >300 participants
- Ostrobothnia provided solar thermal collector building courses ("do-it-yourself") and produced a handbook
- During European Bioenergy week in Finland daily events were organised in Central Finland (main topics were forest energy, energy crops, energy saving and energy performance certificates)

Exhibition and Information tour about the Mid Nordic Region started in October 2006 from Jyväskylä, Central Finland. The exhibition was arranged in all the central cities within the region: Jyväskylä, Mikkeli, Seinäjoki, Vasa, Sundsvall, Östersund, Steinkjer and Trondheim during autumn 2006 - spring 2007. The exhibition included short and clear facts about the work in the ProMidNord - project and about the Mid Nordic Region in general. One of the main subjects was energy. During the exhibition time also seminars and debates were arranged related to the theme. For example, in Vasa the topic of the energy seminar was future energysolutions, e.g. alternative energyfuels, biofuel and ethanol.

To gain publicity for the energy awareness events, the events were advertised in local newspapers and event calendars, press releases were sent to newspapers and magazines. Additionally reporters from local radio and TV made interviews and broadcasted the news.

Increasing and promoting the use of RES & RUE are transnational objectives in Mid Nordic counties but the activities are often regional. This is because the energy production is based on different sources in each country or in each county. In Sweden and in Norway the hydro power is the basis as Finland is a forerunner in bioenergy. To deepen the transnational aspect few study tours were arranged during the project. In Västernorrland representatives from the counties (not only the project members) visited e.g. the Snowcool plant (the unique cooling plant at the hospital of Sundsvall) and the Ethanol pilot plant in Örnsköldsvik. In North Trøndelag the group visited at Verdal ScanWind – assembly plant of windmills. Study tours have been an excellent way to facilitate best practices and good experiences of technology and know-how from one country to another.

#### 4 ENERGY PERFORMANCE BUILDING DIRECTIVE (EPBD)

The original plan was to disseminate information of national implementation of EPB directive and business opportunities to potential professionals and companies. However, several EU member states, including Mid Nordic countries, have had considerable difficulties with transposition and implementation of the EPBD, which have resulted in serious delays. As a part of the European Economic Area, the EPBD will be implemented also in Norway.

In Finland, the proposal for legislation regarding energy performance certificates and amendment of related laws and by-laws was well in progress in the beginning of the project. The content of the draft has changed drastically during the several rounds of redrafting. Initially it was indicated that quite detailed calculation based method with tight limitations for accredited consultants is selected but in the end the Energy Performance Certificate will be calculation based for new buildings only and the issuance of certificate will be integrated to building permitting process. For existing building measured consumption based certificate will be used and in apartment houses the certificate will be part of building managers statement (document issued for each rental or apartment purchase).

The original estimation of energy certificate costs were about 10 million euros for public sector and 240 – 360 million euros for housing sector. The estimate now is considerably smaller. Granting of consumption based certificate will take 5 – 30 % of the time required for calculation based certificate and major part of the certificates are issued by building managers as part of their other routines. This means that the energy certificates will bring only small amount of additional work for external service providers. There will, however, be a great number of building managers and main designers who need some training in order to produce the certificates and this will give some opportunities for training organisations.

The difficulties in the preparation of the legislation have affected this project strongly. In Finland, dissemination and training activities were conducted mainly during spring 2007 because present legislation differs completely from the first drafts. In Finland, legislation regarding energy performance certificates and amendment of related laws and by-laws were passed during the first half of the year 2007 but they will in force 1.1.2008 for new buildings and 1.1.2009 for existing buildings.

#### 5 SUSTAINABLE TRANSPORT

Sustainable transport is used to describe all forms of transportation which minimise emissions of carbon dioxide and pollutants. It can refer to public transportation, car sharing, walking and cycling as well as technology such as electric and hybrid cars and biofuels. An information booklet about best practices around Europe on environmentally friendly transportation was made during the summer of 2006 by Jämtland Energy Agency. The booklet contains five subjects under the transportation area. Examples from each area on already existing projects have been illustrated. The five subjects are transportation with biofuel, biking and ways to get more people to start biking, car sharing, Eco-driving / economical driving and driving with ethanol and trying to reach the goals of 2003/30/EC. Only Sweden and Germany have reached the EU-goal of replacing 2% of transportation fuel by biofuels by 2005.

The municipalities of Sundsvall, Östersund and Trondheim with Swedish Road Administration and Norwegian Public Roads Administration are partners in “Green traffic” SÖT-subproject in order to influence travelling and transportation decisions based on sustainable development – considering traffic safety, air pollutions and noise. A strategy for sustainable transport in SÖT-region has been produced and will serve as a basis for the SÖT-municipalities’ strategy for future cooperation. In SÖT-project, there has been several co-operation areas: car pools and booking systems, environmentally friendly cars, biofuels, EcoDriving, influencing one’s behaviour in traffic, increasing enthusiasm for cycling and promoting public transport.

SÖT-project has produced a common database with information about related projects and actors in SÖT-region working with sustainable development in transport. In a separate database indicators are studied in order to be able to compare sustainable development in transport in participating regions (SÖT). The indicators are e.g. the length of the bicycle route (km), the number of environmentally friendly cars (/1000 inhabitants) and the number filling stations for biofuels. The project actors have minimised their own environmental load e.g. having distance meetings (video and telephone conferences) and disseminating information about these meeting alternatives. With the help of the produced calculator it is possible to calculate the savings which have been caused when having video conference instead of a face-to-face project meeting. The calculator calculates time savings and economical savings as well as environmental savings.

## 6 COMPARING SUSTAINABLE DEVELOPMENT IN MID NORDIC CITIES

During the project five indicators were used in comparing the sustainable development in the Mid Nordic cities. Indicators were chosen based on the availability of data and according to the compatibility with the set of indicators developed earlier in different international and national projects. Indicators were: emission of PM<sub>10</sub>, household wastes to landfill, nature protection areas and length of cycling routes (Tab. 1). [6]

Based on comparison of indicators, it is not possible to draw conclusions on the superiority of one city over another considering environmental protection. The greenhouse gas emissions are lowest in Trondheim where the share of electricity produced by hydropower is significant in the energy mix. On the other hand, the emissions are relatively low also in Vasa, even though the energy is produced mainly with coal. [6]

Air quality measures are affected by the placement of the measurement equipment. The measurement stations are beside main roads in Trondheim and Sundsvall and they register higher concentrations of particle emissions compared to other cities. [6]

The household wastes ending up at landfill site are affected by the waste treatment practices. In Sweden and Norway, unlike in Finland, the combustion of waste is common. [6]

Regarding nature reserves, the share of water areas can quite easily increase the total area of nature reserves. In Vasa, the nature reserves cover 19% of the total city area. The share is ten times bigger than the share in the other cities and can be explained by the large share (90%) of water in the nature reserve. [6]

The length of cycling tracks per inhabitant is always influenced by urban structure, surface area and population. Seinäjoki has most tracks per capita of the Mid Nordic cities. [6]

If trying to compare different indicators between cities, Östersund does well: the greenhouse gas emissions are below average, air quality is good, the amount of waste to landfill is the second lowest per inhabitant and the share of nature reserve areas is average. Only the length of cycling tracks is below average in the city comparison, yet the city is known for its positive approach towards cycling. [6]

Table 1. Comparing sustainable development in Mid Nordic cities with five indicators.[6]

Indicator	Mikkeli	Jyväskylä	Seinäjoki	Vaasa	Härnösand	Sundsvall	Östersund	Trondheim	Steinkjer
CO <sub>2</sub> -ekv. tn/capita/yr	7,8	-	-	3,9	4,9	5,5	4,5	3,1	7,5
PM <sub>10</sub> 50µg/m <sup>3</sup> /day overflows, amounts/yr	7	9	10	9	-	38	(2 <sup>a</sup> )	48	-
Household wastes to landfills, kg/capita/yr	317	260	(376 <sup>b</sup> )	129	144	17	56	89	72
Officially founded Natural reserves, % of surface area	0,7	0,3	0,9	19 <sup>c</sup>	0,3	0,8	0,9	2,0	1,1
Cycle tracks, m/capita	2,4	2,7	3,2	2,8	-	2,5	1,4	1,1	-

a) Only measurements of winter season

b) All wastes to landfill

c) 92% of the area is water

## 7 SUMMARY

Mid Nordic development co-operation was established almost 30 years ago, initiated and led by the Mid Nordic Committee. The eight counties in the region are furthermore European pioneers in sustainable development. Nowadays the regions of Mid Nordic have a profound amount of environmental and energy enterprises and organizations (universities, high schools, research institutes etc.) working for more sustainable way of living. A database of companies, research institutes, faculties/departments of universities, science and technology parks etc. working in the branch of environmental & energy technology and R & D is produced to improve the regional co-operation and business activities. [5]

The co-operation in Mid Nordic region will go on strongly. The aim is that in the year 2020 the Mid Nordic co-operation on regional development will be known as one of the most successful and growth-stimulating examples outside the metropolitan regions in Europe.

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THE MID NORDIC COMMITTEE

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A MID NORDIC PROJECT



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