

# **Executive summary**

## **Preconditions for Improved Energy Efficiency and Increased Use of Renewable Energy In the Barents Region**

**Interim report  
2010-05-05**

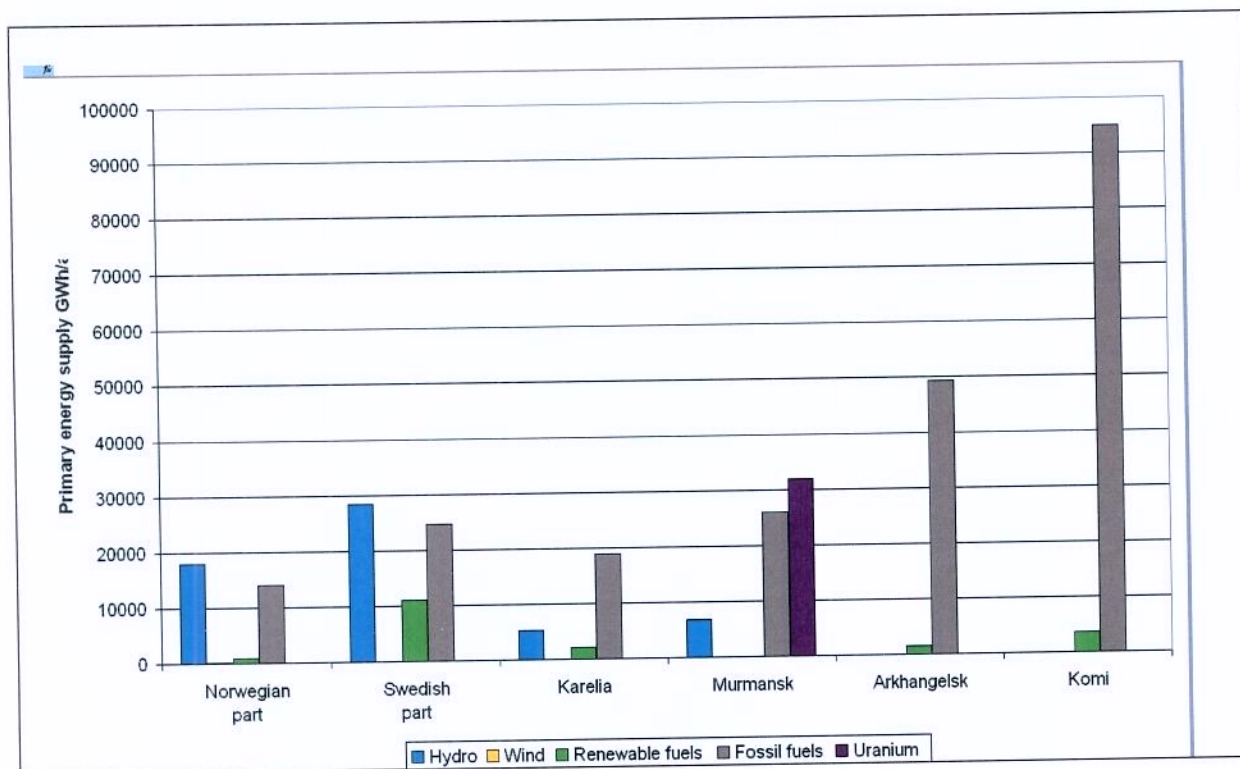
**Preliminary findings and recommendations**

**Report prepared by CENTEK AB, Luleå Sweden  
for  
the Nordic Environment Finance Corporation (NEFCO)**

## Executive summary

This study was conducted primarily to serve as a basis for formulation of guidelines and recommendations for the further use of the funds provided by Sida in Sweden within the Barents Window. It is hoped that the preliminary findings presented in this report can also be useful as input to the Meeting of Ministers of Competitiveness that is scheduled to take place in Umeå on 18th-19th May 2010. The study includes collection and analysis of relevant existing information about the conditions in the Barents region in general compared to those in the Russian parts of the Barents region. Due to limited time and resources, Finland and Norway have only to a very limited extent been included in the fact collection process so far. Inclusion of more data from Finland and Norway will give a better understanding of the status of energy efficiency and renewable energy in the western parts of the Barents region. It is nevertheless believed that the main conclusions will not change when such data are considered.

There are large differences between the energy supply structures of the different parts of the Barents region. This is illustrated by the figure below.



*Primary energy supply to different parts of the Barents region*

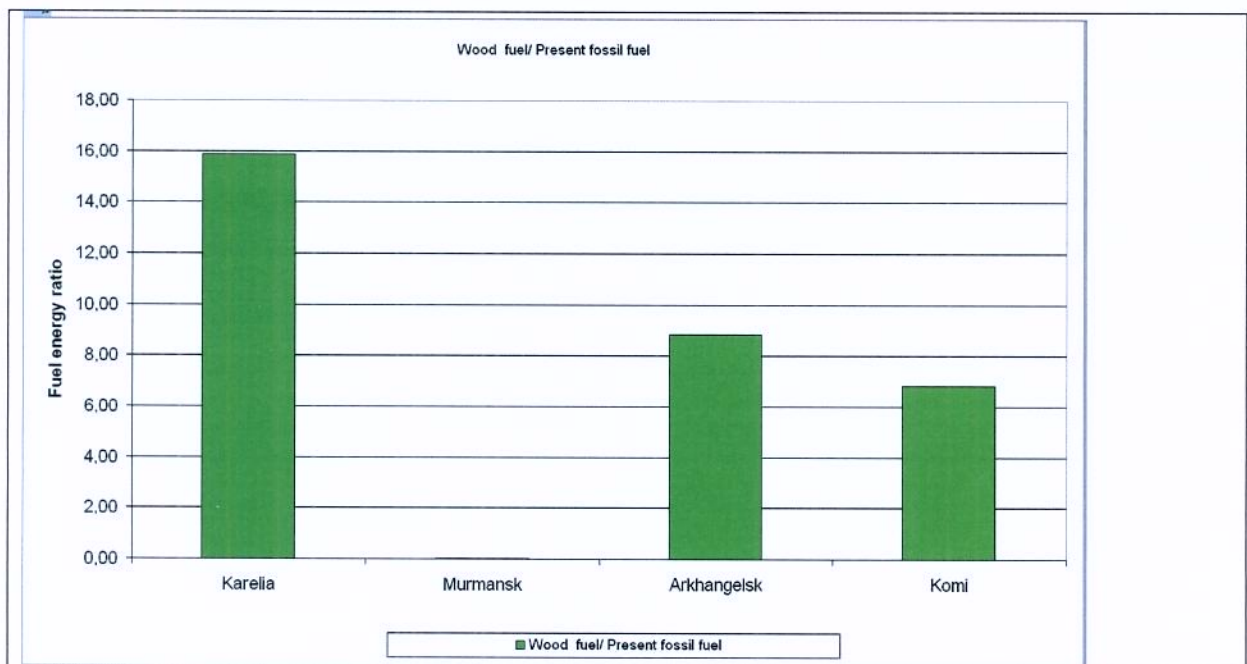
Fossil fuels are much more important in the energy balance of the Russian parts than in the Norwegian and Swedish parts. Renewable fuels (biomass and urban waste) are important in Sweden but not in the Norwegian and Russian parts. Murmansk oblast alone relies on nuclear power.

The available information shows that there is a considerable technical potential for improved energy efficiency in heating of buildings and perhaps also in electricity generation by thermal power plants in the Russian parts of the Barents region. The comparatively high specific

energy use for heating of buildings in Russia has mainly historical reasons, in particular relatively low prices of fuels. Also, standardisation of designs without consideration to climatic conditions is an important reason. As for electricity generation, the lower annual efficiency than in for instance Swedish thermal power plants, may to a large extent be explained by the different structures of the electricity system and by the use of fuels with high sulphur content. Further studies will be necessary to clarify the technical potential for efficiency improvements in that sector.

The available averaged data for energy use in different industrial sectors in the Russian parts of the Barents region do not indicate that the energy efficiency is much different from that in comparable industries in the western parts of the region. This is in contrast with findings in a recent report prepared by the World Bank dealing with energy efficiency in the entire Russian Federation. According to this study, the Russian industry is less efficient. Averaged data are however not effective for identification of possible efficiency improvements. It will be necessary to conduct energy audits for each industrial enterprise for assessment if energy efficiency improvements are financially justified.

The necessary transition from fossil fuels to renewable energy has progressed much further in Finland and Sweden than in the Russian part of the Barents region. In Murmansk oblast the reason is mainly that the technical potential is quite limited. In the other parts of the Russian Barents region there appears to be a significant technical potential for increased use of forestry and forest industry residues, by far exceeding the present use of fossil fuel energy. This is illustrated in the figure below.



#### *Unused technical potential for renewable fuels relative to present fossil fuel energy*

Wind energy can also give important contributions from installations in the coastal areas of the Russian Barents region.

A few pilot and demonstration projects using biomass energy, wind energy, small scale hydro power and tidal power have been implemented in the Russian parts of the Barents region. It

appears as if low prices for fossil fuels are the most important reason for the slow development of renewable energy there. There is an apparent need in the Russian parts of the Barents region for an affordable, efficient and reliable technology for biomass fuelled co-generation plants that are suitable for heat demands below the MW-range, to be used for replacing the diesel generators in isolated electric grids. Development of such a technology should be of common interest to at least Russia, Finland and Sweden.

Significant improvements of the energy efficiency and shift to renewable energy sources in the Russian part of the Barents Region will require substantial investments. Such investments will not be made unless energy prices have reached a level allowing a reasonable pay-back time for the investments. Needs for more information about the existence of suitable technologies and the experiences from using these might be an obstacle to implementation of such technologies. The major obstacles appear to be shortage of capital and lack of effective policy instruments, however.

The changes in the energy sector in the western parts of the Barents Region, leading to more efficient energy use and significant use of renewable fuels since the early 1980's would not have happened without strong government intervention. Reducing the net emissions of carbon dioxide was the main reason for government intervention. But the reduced use of fossil fuels also brought immediate benefits. The emissions of sulphur oxides were reduced with positive effects for the environment. New employment opportunities in the energy sector and in industries making new products for the energy sector and energy users were created. Such effects can be important reasons for promoting energy efficiency and renewable energy.

CENTEK recommends that the four nations in the Euro-Arctic Barents Region agree on carrying out coordinated actions with the objective to improve the efficiency of energy use and increase the use of renewable energy in the region. These activities should include for instance exchange of statistical data, joint research and development projects, exchange of experiences between actors in the public sector. Possibilities for financial support should be provided to public institutions participating in the activities and also for pilot and demonstration projects based on technologies that are not yet commercially proven.