

# Sustainable use of energy wood resources shows potential in North-West Russia

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Nowadays, humanity faces many challenges; the most serious are poverty, the growing demand for resources and the deterioration of the environment. In order to satisfy the growing demand for wood, forestry in many countries has to be intensified. The forests of the Russian Federation are the world's largest reserve of wood for different purposes. Intensification of forestry in Russia will result in increasing availability of wood for material and energy uses.

A doctoral dissertation completed at the University of Eastern Finland analysed the potential of energy wood resources in the Leningrad region of Russia at regional and district levels. The study discovered significant potential for the intensification of energy wood supply in the Leningrad region of Russia. Maximisation of [sustainable energy](#) wood supply will create new working places and business opportunities. However, several challenges like low productivity of felling operations and technical accessibility of forests have to be solved to intensify energy wood supply in the regions.

The availability of energy wood depends on the actual volumes of annual fellings and is affected by technical, socio-economic and climatic issues. These factors were considered when three scenarios of wood availability were analysed to compare the efficiency of wood supply chains, to estimate employment effects of forest chip production and to analyse cost competitiveness of forest chips. The impact of climate change on the technical accessibility of forests and harvestable volumes of industrial and energy wood was also analysed. The availability scenarios were elaborated taking into account different intensity of forest management.

The "Recent" scenario reflects the potential of energy wood, taking into account the intensity of fellings and sawmilling as it was in 2004. The "Allowable" scenario shows the potential of energy wood assuming full utilisation of the annual

allowable cut, based on current logging technology and increasing sawn timber production. The "Potential" scenario shows availability of energy wood resources in the case of intensified forest management, which means a significant increase in thinnings, full utilization of annual allowable cut based on cut-to-length technology and the increase of sawn timber production according to available sawlog output in the region (no export). The analysis showed that intensification of forestry in the region could significantly increase availability of energy wood. In the scenario Allowable, the availability of energy wood increased from 4.1 to 6.3 Mm<sup>3</sup> (+54%) compared with the scenario Recent. In the scenario Potential, the total volume of available energy wood would be 9.2 Mm<sup>3</sup> (+124% compared with scenario Recent). Comparable results were obtained at the district level, +50% and +83%, respectively.

The average productivity of operations in the Russian logging companies investigated was 20% to 30% lower than that in Finland. The reasons were the lack of experienced operators of forest machines and the bad quality of forest roads. Therefore, in the conditions of the study area forest chips were a relatively expensive fuel due to the high costs of felling and transport operations. Forest chips were 2-3 times more expensive than natural gas and coal but cheaper than heavy oil.

The employment effect from the utilisation of energy wood depended on the availability scenarios and the type of chipper used. The number of employment positions could be increased by 84% in the scenario Potential compared with the scenario Recent. It is important to mention that these working places could be created in rural areas, where unemployment is higher than in cities.

The study showed that climate change affects technical accessibility of forests in the study area and consequently economic sustainability of the

logging companies. Each decade, the duration of the winter felling season will become 3-4 days shorter. Already by 2015, if proper measures such as construction of all season [forest](#) roads will not be undertaken, the potential losses of a typical large logging company could be about 360,000.00 euros/year due to the technical inability of entering forests.

The study area has large available volumes of energy wood but their utilisation is limited by technical and economic factors. The methodology proposed in this study could help logging companies and local authorities predict economic and social effects from the utilisation of energy wood.

**More information:** Goltsev, V. 2013. Estimation of potential production of energy wood in the Leningrad region of Russia. *Dissertationes forestales* 171. 65 p. Available at: [dx.doi.org/10.14214/df.171](https://doi.org/10.14214/df.171)

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