

Wood Fuel and the Share of It in Estonian Energy Balance

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Summary

This postgraduate work contains nine chapters, summary, introduction, the lists of units, transitions factors and literature and some appendixes. The main content of the work on 93 pages is presented and in addition 40 tables, 28 figures and 6 appendixes on 38 pages (2 figures, 3 maps, 10 tables) complement the topics are discussed in the main chapters.

Wood fuel - one of the main renewable energy sources - importance in the past and assignment of the situation of wood fuel in present Estonia are turned more attention to.

Hitherto little discussed topic in Estonian publications – terminology and classification of wood fuel – in second chapter are improved. There necessary terms and their substance are introduced. To comprehend better the essence of wood fuel in the third – fifth chapter the data of the quality and composition, the sources and overview of wood fuel standardisation are presented.

In three main chapters (6. - 8.) the review about resources, production and using of wood fuel in different region and branches of economy of the state of last decade are put forward. The real share of wood fuel in Estonian energy balance and the vision of the development of this sphere are discussed.

For making clear the fuel consumption and preference of the main consumer group – single-family and farmhouses – on author's initiative and participation was arranged inquiries in nine local authorities of Estonia on 1995 – 2001. The share of wood fuel in the consumption of fuels in single-family and farmhouses, 96 % on 1934 has decreased to 82 % today. The decreasing has occurred due to towns and previous centres of collective farms, but in plenty of rural regions the consumption of wood fuel has stayed pre-war level. Despite the decreasing of 14,5 %, wood fuels are the dominating sorts of fuel in Estonian homes. In other European countries traditionally used wood fuel, the decreasing of consumption has occurred more rapidly in the same period. Official statistics don't reflect adequate the using of wood fuel in single-family and farm houses, house communities, department houses, summer cottages and small enterprises. Average annual wood energy consumption per inhabitant was 3,91 MW·h in Estonia. Wood energy consumption in single-family and farmhouses was 8,02 MW·h/a.

To determine the resources, to show the real consumption by consumers groups and to predict energetical consumption prognoses of wood fuel it was the second large part of this work.

Primary wood energy resource calculated by economically determined source might be approximately 12,5 TW·h or 45 PJ and converted to volume units 6,5 Mm³s. This amount of energy makes 20 % from all primary energy source of Estonia on 2000. There are not take into consideration the part of raw material for producing pulp and paper and arisen by-product black liquor used for energy generation.

If additional amounts of wood fuel (3,4 Mm³s or 6,5 TW·h or 23,4 PJ) would be used for heat production in boiler plants, might be guarantee all need of fuel on level year 2000. Then all need was 26,2 PJ and share of wood fuel 6,2 PJ. Therefore may be assert that resources are hidden in Estonian forests could be supply all requirement for space heating and technological heat in our state.

The share of wood fuel in final consumption, supply for primary energy and resources of primary energy is probably more than presented in statistical reports. The share of wood fuel might be 9,98 % (8,56 %) in resource of primary energy, 11,96 % (10,71 %) in supply of primary energy and 17,0 % (14,75 %) in final consumption of energy. The results are the average of last two years. Data on year 1999 of Statistical Office of Estonia are in brackets.

Assessments of amounts of wood fuel, all types of waste wood among this, and using level needed for planning wood energy load of new power plants, designing new enterprises for producing value-added wood fuel products, fixing export potential and disseminating knowledge of wood fuel among small scale consumers in new living areas.