

## LIGNOCELLULOSE COMPOSITION, PROXIMATE ANALYSIS, AND HEAT VALUE OF CERTAIN FOREST AND ENERGY CROP BIOMASSES AND THEIR POTENTIAL AS RAW MATERIALS FOR THE PRODUCTION OF SOLID BIOFUELS

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### ABSTRACT

*Biomass as a raw material is available in large quantities and is inexpensive. Its renewable energy can reduce greenhouse gas emissions, and it depends primarily on the composition of lignocellulose, especially the lignin content. Forest biomass of oak and beech, as well as biomass of the energy crops switchgrass (*Panicum virgatum* L.) and *Miscanthus x giganteus*, were used for this study. The aim of the study was to determine the lignocellulosic composition (proportions of cellulose, lignin, and hemicellulose), proximate analysis (proportions of moisture, ash, coke, fixed carbon, and volatiles), and calorific value of the studied biomasses, as well as to examine the possibility of their use as raw materials for the production of solid biofuels. The research showed that both forest biomass and biomass of energy crops have favourable values of the studied parameters, which is best reflected in the excellent calorific value, ranging from 17.0 to 18.5 MJ kg<sup>-1</sup>. It was also found that the studied samples are ideal raw materials for the production of solid biofuel with lignin content*

**Keywords:** forest biomass, energy crops, lignocellulose, proximate analysis, calorific value, solid biofuel