

Title: Analysis of biomass potential development in the Czech Republic in relation to landscape functions

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Abstract:

The Czech agricultural landscape is characterized by extremely large managed units and the gradual decline of permanent green elements that have been removed for better availability and usability for large-scale agro-technology. By contrast, the EU average size of the agricultural farm is 33 ha while in the Czech Republic, it is 244 ha. Another Czech specific is the decreasing number of cultivated crop. In addition to production of inputs for food production and energy purposes so called non-production functions should be considered, such as reduction of wind and water erosion, carbon sequestration and increase of water absorption capacity, and agro-biodiversity.

One of the factors for determining the biomass potential is the landscape typology, ie the classification of environmental conditions that determine the production and non-production parameters of energy crops cultivation. Geographic synthesis is used based on the analysis of the main components (PCA) and subsequent segmentation using object-oriented image analysis (OBIA). All relevant environmental variables come into the process of synthesis - primarily climate, relief, and, of course, substrate ratios. Based on these factors, a basic classification of the landscape is made according to the main gradients of the natural environment, when the framework types of natural landscapes are defined.

In order to determine the biomass potential on agricultural land, the yield of individual sources of biomass from agricultural land is determined according to soil and climate characteristics, while respecting the limitations resulting from landscape typology.

The paper describes the methodology of biomass potential determination for energy purposes from agricultural land on the basis of soil and climatic parameters on individual plot, taking into account requirements for biodiversity increase, erosion reduction, etc. Paper also presents selected results of landscape typology analysis and biomass potential for the selected territory of the Czech Republic.

Biography:

Dr Tomas Kralik is a member of a research group dealing with economic and regulatory issues in the energy sector. This group works at the Faculty of Electrical Engineering at the Czech Technical University in Prague and cooperates with various research activities with a wide range of national and international partners. The current research focus of Dr Kralik is both biomass utilization with a special focus on meeting national targets in RES targets and implementation of the European Union climate and energy package for 2030 in national strategic energy plans. He also specializes in the research of lignocellulosic crops for production biomass for energy purposes, focusing in particular on the economic assessment of these crops and the determination of biomass potential.