



Biomass resources distribution and bioenergy technical potential in Kazakhstan: a GIS-based analysis

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Kazakhstan is oil, gas, coal, and uranium-rich country, while the country has a significant renewable energy potential and ambitious national climate and energy targets as well. The country aims to reduce the current level of carbon emissions in electricity production at 40% by 2050 compare to the level of 2012 and increase the share of renewables in the national energy mix at 50% by 2050. International and national projects examine the future energy demand, wind, and solar energy potential, and barriers to renewable energy technologies deployment in Kazakhstan, however, there is a lack of studies specifically focusing on estimation of biomass resource availability and their bioenergy technical potential. Using GIS (geographic information system) approach and calculation of agricultural statistical data, this paper presents the estimation of biomass resources potentially available in Kazakhstan for energy purpose, by taking into account a geographical resources distribution, environmental and technological conditions. It is concluded that a large availability of biomass in Kazakhstan gives a great potential for bioenergy production (the bioenergy potential is estimated about 11.375 million tonnes of oil equivalent (475.52 MJ), which account for about 30% of total current energy consumption of the country), however, there are currently economic, social, and technical issues with respect to bioenergy development that need to be taking into account in future national energy policy and innovation development programs in Kazakhstan.