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论文

中国各区域秸秆资源可能源化利用的潜力分析

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摘要:

在我国能源需求迅速增长并日益依赖国际市场的背景下,能源化利用秸秆资源是我国缓解能源短缺的重要选择之一。论文在综合相关研究成果的基础上,对我国不同区域农作物秸秆可能源化利用的潜力及资源密度进行了分析。研究表明,2009年中国农作物秸秆理论资源量为7.48×10^8 t,可获得资源量为6.34×10^8 t,可能源化利用量为1.52×10^8 t。中国可能源化利用秸秆资源区域分布极不均匀。长江中下游、东北、华北等区域可能源化利用秸秆潜力较大,分别为0.42×10^8、 0.37×10^8和0.35×10^8 t,青藏高原、黄土高原和西南可能源化利用秸秆资源潜力较低。根据各区域可能源化利用秸秆资源密度,论文对不同省份建造较大规模秸秆发电企业或燃料乙醇企业的适宜性进行了分析。

关键词: 生物质能 秸秆资源 能源化 资源密度

Evaluation on Potentials of Energy Utilization of Crop Residual Resources in Different Regions of China

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Abstract:

China’s demand for energy has been growing rapidly in recent years and its dependence on international energy market has been keeping increase. Using agricultural crop residue as an energy resource is an important choice of developing renewable energy and relieving the energy shortage of China. However, there are still many debates on how many crop residues can be used for commercial energy production in China. On the basis of the results of existing studies and the official statistic data, this paper analyzed the energy utilization potentials and densities of crop residues in different regions and provinces of China. In this paper, we first calculated the theoretic amount of crop residue in different regions of China based on the outputs of different crops and the collectable amount of crop residue which is part of the theoretic amount minus the uncollectable amount, then we calculated the amount of crop residue which could be used for commercial energy production. The results show that China’s theoretical resource quantity of crop residue in 2009 was 7.48×10^8 t, the available crop residue that can be collected was 6.34×10^8 t, among which 1.52×10^8 t can be used for commercial energy production. The distribution of crop residue that can be used for commercial energy utilization is very unequal across China. The quantity of crop residue for energy utilization is larger in the lower and middle reaches of the Yangtze River, Northeast China and North China, where the quantities of crops residue for energy production are 0.42×10^8 t, 0.37×10^8 t and 0.35×10^8 t, respectively. We also calculated the densities of crop residue in different regions of China. The results show that the densities of crop residue could be used for energy utilization in Qinghai-Tibet Plateau, Loess Plateau, Southwest China, and Northwest China are lower than other regions. Given the high cost of collecting crop residue, it is not suitable to construct large-scale crop residue based power plant in Tibet, Shanxi, Qinghai, Sichuan, Gansu, Shaanxi, Guizhou, Ningxia, Liaoning, Fujian, Inner Mongolia, Tianjin, Hebei, Chongqing, Shanghai and Beijing. Only Jilin, Henan, Guangxi, Jiangsu, Anhui, Jiangxi, Heilongjiang and Hubei are appropriate to establish large-scale crop residue based fuel ethanol plants. The results of this study have important implications for the formulation of China’s crop residue utilization policy.

Keywords: biomass energy crop residue resources energy utilization resource density

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