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城市生活垃圾处理全过程的低碳模式优化研究

Optimization of low-carbon municipal solid waste processing model

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摘要: 生活垃圾处理过程中的温室气体排放是重要的人为碳排放源.本文提出一种基于城市生活垃圾处理全过程的低碳模式制定方法,通过对不同垃圾末端处理工艺的资源与能源消耗,温室气体排放潜值与资源化率的评价,进行处理情景设计与分析,识别出生活垃圾处理低碳发展的调控措施,并结合约束条件下的定量优化,得到生活垃圾低碳优化处理模式.最后,以北京市为案例点,针对主要调控因子设计不同无害化处理比例的3种情景并开展以上3方面评价.结果表明,垃圾低碳优化处理的措施为降低填埋比例,同时提高堆肥和焚烧比例;垃圾低碳优化处理模式为填埋、焚烧与堆肥的利用比例是23% : 25% : 52%.

Abstract: Carbon emission from Municipal solid waste (MSW) treatment is one of the major anthropogenic sources to cause climate change. In this paper, we proposed an optimization method for MSW low-carbon mode in the overall processing of MSW through evaluation on resource and energy consumption, Green House Gas (GHG) emission potential and recovery rate of different scenarios. This method identified the main regulatory measures and quantitatively set low-carbon processing mode under certain constraints. The method was then applied to Beijing MSW treatment. We designed three scenarios and conducted evaluation on resource and energy consumption, GHG emission potential and recovery rate of the three scenarios. After evaluating resource and energy consumption, GHG emission potential and recovery rate of each scenario, low-carbon development strategies for MSW management were determined. The results showed that the most efficient strategy at present was to decrease landfill proportion, in parallel to increasing composting and incineration proportion. The optimized low-carbon processing mode was to set landfill proportion of 23%, incineration proportion of 25%, and composting proportion of 52%.

Key words: [green house gas](#) [municipal solid waste processing mode](#) [recovery rate](#) [optimization](#) [Beijing](#)

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