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研究论文

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基于Urban-RAM模型的上海居民生活碳排放研究

Carbon emissions of the household living in Shanghai using Urban-RAM model

关键词：碳排放 碳足迹 Urban-RAM 能源 上海

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摘要：随着全球对碳排放相关研究的不断深入，居民生活引起的能源消耗和碳排放问题引起了研究人员越来越多的关注，但目前鲜有对上海市居民生活整体碳排放的系统研究.本文以2010年为基准年，引入美国劳伦斯伯克利国家实验室开发的Urban-RAM模型，对上海市居民生活碳排放情况进行定量分析，旨在初步掌握上海市居民生活碳排放的总体规模和结构特征，为上海市低碳城市建设和相关决策提供科学依据.研究结果表明，上海市2010年居民生活碳排放总量（CO_2e）为4985.7万t，主要以间接排放为主，间接碳排放和直接碳排放分别占居民生活碳排放总量的64.1%和35.9%；上海市居民生活碳排放在各个消费领域的分布不均，直接碳排放主要来自公共和居住建筑领域，该领域的直接碳排量为1065.0万t，占全市居民生活直接碳排放总量的59.5%；间接碳排放主要来自家庭消费领域，该领域的间接碳排量为1625.2万t，占全市居民生活间接碳排放总量的50.9%，其中以食品消费和衣装消费的贡献最大，分别占家庭消费领域碳排放总量的53.5%和29.5%；综合来看，公共和居住建筑领域的整体碳排量最大，为2231.6万t，占全市居民生活碳排放总量的44.8%.

Abstract：With the in-depth investigation on carbon emissions, attention has been increasingly paid on the energy consumption and carbon emissions from household living. However, studies on the carbon emissions from the household living in Shanghaiare still quite limited up to now.In this paper, the Urban-RAM model, developed by the Lawrence Berkeley National Laboratory (LBNL), was applied to assess the carbon emissions from household living in Shanghai. The general carbon level and the carbon footprintstructure wereanalyzed, which could support the policy makers on decisions about low carbon city construction and relative policies.Results showed that the total carbon emissions from household living in Shanghai in 2010 reached 4985.7×10^4 t CO_2e,among which direct carbon emissions and indirect carbon emissions accounted for 64.1% and 35.9%, respectively. Carbon emissions varied widely by consumption fields. Direct carbon emissions mainly came from commercial and residential buildings, with the emission amount of 1065.0×10^4 t CO_2e, accounting for 59.5% of the total direct carbon emissions. Indirect carbon emissions mainly came from residential consumption, with the emission amount of 1625.2×10^4 t CO_2e, accounting for 50.9% of the tota indirect carbon emissions. Among the indirect carbon emissions from residential consumption, the most important sectors included food and clothing consumption, accounting for 53.5% and 29.5%, respectively. Among all the household living sources, commercial and residential buildings contributed the largest carbon emissions, emitting 2231.6×10^4 t CO_2e and accounting for 44.8% of all the carbon emissions from household living.

Key words：carbon emissions carbon footprint Urban-RAM energy Shanghai

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