环境科学学报
ACTA SCIENTIAE CIRCUMSTANTIAE

研究报告

黄蕊,王铮.基于STIRPAT模型的重庆市能源消费碳排放影响因素研究[J].环境科学学报,2013,33(2):602-608

基于STIRPAT模型的重庆市能源消费碳排放影响因素研究

Influencing factors of carbon emissions from energy consumptions in Chongqing based on STIRPAT model

关键词：碳排放 STIRPAT模型 影响因素 岭回归

基金项目：国家自然科学基金(No.41071089);国家重点基础研究计划(973)项目(No.2012CB955803)

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摘要：定量分析人类活动对环境的影响,对减少碳排放和建设环境友好型社会具有重要的指导意义.因此,本文采用重庆市1980-2010年能源消费碳排放时间序列数据,基于STIRPAT模型,通过岭回归拟合得到能源消费碳排放与人口数量、人均GDP及其二次项、能源强度、第三产业比重、城镇化水平的多元线性模型.结果表明,人口数量、人均GDP、能源强度、城市化水平每增加1%,将引起重庆市能源消费碳排放相应增加0.963%、(0.398+0.463ln*A*)%、0.059%、0.266%,其中,*A*为人均GDP.可以看出,人口数量对重庆市能源消费碳排放量影响最大.第三产业比重每增加1%,能源消费碳排放将会减少0.093%.

Abstract：Carbon emissions from a city can be analyzed quantitatively to trace the impact of each human activity type on the environment. The analytic results provide useful guidance to carbon emissions policy making and sustainable urban development. This paper built a STIPRAT-based multivariate linear model fitted by a ridge regression to examine the relationship between carbon emissions from energy consumption and a list of human activity indices, including population, per capita GDP, energy intensity, proportion of the tertiary industry, and level of urbanization. For an empirical case study with time-series data (1980-2010) from the city of Chongqing, it was found that for 1% increase in population, per-capita GDP, energy intensity, and urbanization, there was 0.963%, (0.398+0.463ln*A*)%, 0.059%, and 0.266% increase in carbon emissions in the city, respectively, in which *A* refers to per capita GDP.Population contributed the most significantly to carbon emissions. In comparison, every 1% increase in the strength of the tertiary industry led to 0.093% emission reduction.

Key words：energy carbon emissions STIRPAT model influencing factors ridge regression