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PREDICTING CO₂ EMISSION REDUCTION POTENTIAL OF MODERN COAL CHEMICAL INDUSTRY IN INNER MONGOLIA BASED ON LMDI-SD MODEL

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Abstract

Modern coal chemical industry, as a strategic emerging industry in Inner Mongolia, is a major source of energy consumption and CO₂ emissions. In this paper, we combine Logarithmic Mean Divisia Index method - System Dynamics model to explore the factors influencing the change of CO₂ emission and predict its carbon reduction potential of modern coal chemical industry in Inner Mongolia. Results showed that: (1) CO₂ emissions of modern coal chemical industry increased sharply from 2010-2020, with an average annual growth rate of 31.4%, which coal-to-olefin products are the most important contributors. (2) According to LMDI analysis, the economic growth effect and energy intensity effect are the main driving factors for the increase of CO₂ emissions. (3) Without any emission reduction measures, the CO₂ emissions of modern coal chemical industry will reach 107.41 million tons in 2030, and the combination of different low-carbon emission reduction programs is essential to reduce the carbon emissions of modern coal chemical industry.

Key words: CO₂ emission reduction, Inner Mongolia, LMDI-SD model, modern coal chemical industry

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