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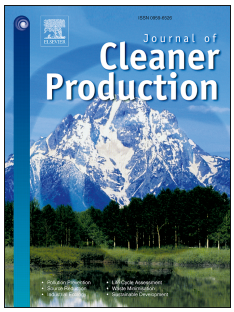

How Carbon offsetting scheme impacts the duopoly output in production and abatement: Analysis in the context of carbon cap-and-trade

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How Carbon offsetting scheme impacts the duopoly output in production and abatement: Analysis in the context of carbon cap-and-trade

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Abstract

In the context of addressing climate change, the carbon emission trading scheme has become one of the main measures adopted by many countries and regions to achieve emission reduction goals. Noticing this current lack of research, based on a duopoly model, this paper quantitatively explores the impact of carbon offsetting scheme on both emission trading participants' profits and industry's output by drawing on advanced experience of carbon offsetting scheme from developed countries, such as US, Switzerland and EU, and thus provides a perspective for government to design optimal aggregate standard for carbon cap-and-trade. Results show a negative correlation between enterprises' carbon intensity and their equilibrium output in the product market, and indicate a threshold for the relative magnitude of the duopoly enterprises' carbon intensity, above which their absolute output will differ dramatically. The incorporation of carbon offsetting scheme into a non-offset quota trading scheme will reduce its equilibrium carbon price, thereby mitigate its negative impact on industry's total output in the product market by a either linear or quadratic form, depending on the design for the proportion ceiling of offsetting quota.

Key words: carbon emission trading, carbon offsetting mechanism, a duopoly model

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