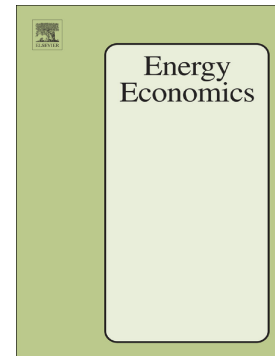


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On the Effectiveness of Tradable Performance-based Standards

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# On the Effectiveness of Tradable Performance-based Standards

Duan Zhang\*      Yihsu Chen<sup>†</sup>      Makoto Tanaka<sup>‡</sup>

## Abstract

Two types of emission trading programs are allowed under the US federal Clean Power Plan (CPP): mass-based cap-and-trade (C&T) program, and the performance-based trading program. While a C&T sets a total emission cap for a region, a performance-based program under CPP relies on trading the emission rate credits (ERCs), which represent an equivalent MWh of energy generated or saved with zero associated CO<sub>2</sub> emissions, to reduce emission costs. This paper examines the theoretical properties of the tradable performance-based policy and compares it to a C&T program. We distinguish two kinds of tradable performance-based policy: (1) a regional policy, under which all states are subject to a regional performance-based standard, and (2) a state-by-state policy, under which each state adopts its performance-based policy within a regional power market while trading of ERCs is allowed. Our findings indicate that under a state-by-state policy, power prices across states could be different even without any transmission congestion, reflecting varying stringency of tradable performance-based standards among states within an interconnected market. We also identify a counterintuitive result that even if ERCs trading is allowed under the state-by-state performance policy, the permit prices could diverge. Two models are simulated in our analysis: three-state and the Pennsylvania-Jersey-Maryland (PJM) regional power market. While the three-state example allows us to illustrate the theoretical properties of the policies, the PJM-based simulation allows us to gauge the performance of the policies. Our PJM analysis shows that a C&T policy is the most effective, while the comparison between a regional and state-by-state tradable performance policy is ambiguous.

**Keywords:** Climate policy; electricity industry; performance-based standards; Cap-and-trade policy, Clean Power Plan (CPP)

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