Price-Responsive Allowance Supply in Emissions Markets

Dallas Burtraw <burtraw@rff.org>
Charles Holt <cah2k@virginia.edu>
Karen Palmer <palmer@rff.org>
William Shobe <shobe@virginia.edu>

Abstract

Environmental policy with uncertainty is often posed as a choice between price and quantity instruments. Adding flexibility to fixed policy instruments can improve outcomes. Roberts and Spence (1976) noted the efficiency advantages of matching emissions allowances supply to the marginal damage schedule. We propose an implementable approach to making that match, an approach we call "price-responsive supply," which treats prices and quantities as simultaneously determined in the allowance auction. For competitive environments, price-responsive supply outperforms fixed-price and fixed-quantity instruments. Price-responsive supply can enhance the performance of real-world regulatory environments through an automatic adjustment mechanism that responds instantaneously to new information about abatement costs. We demonstrate the improved performance of price-responsive supply in experiments and simulations. A price-responsive supply schedule, while offering efficiency advantages, also translates the cost-lowering effects of other, coincident policies into accelerated reductions under an emissions cap thereby helping to resolve the waterbed effect.

Key Words: cap and trade, climate policy, greenhouse gas, climate change, electricity

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