BIG energy seminar series

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Optimal Trading Ratios for Pollution Permit Markets

Stephen Holland

University of North Carolina at Greensboro

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Location: ECON 5

Abstract:

We analyze a novel method for improving the efficiency of pollution permit markets by optimizing the way in which emissions are exchanged through trade. Under full information, it is optimal for emissions to exchange according to the ratio of marginal damages. However, under a canonical model with asymmetric information between the regulator and the sources of pollution, we show that these marginal damage trading ratios are generally not optimal, and we show how to modify them to improve efficiency. We calculate the optimal trading ratios for a global carbon market and for a regional nitrogen market. In these examples, the gains from using optimal trading ratios rather than marginal damage trading ratios range from substantial to trivial, which suggests the need for careful consideration of the structure of asymmetric information when designing permit markets.

Bio:

Stephen Holland is an Associate Professor in the Department of Economics in the Bryan School of Business and Economics at the University of North Carolina at Greensboro. He has a bachelor's degree in mathematics from the University of Iowa and served for two years in the U.S. Peace Corps in Botswana. Stephen received an M.S. degree in agricultural economics from Iowa State University and a Ph.D. in Economics from the University of Michigan. He then worked on the staff of the Federal Trade Commission where he analyzed mergers in the petroleum, natural gas and electricity industries. After two years as a visiting researcher at the University of California Energy Institute, he returned to academia for his current position at UNCG. He is the proud father of two girls.

Stephen's work on energy and natural resources has included research on the RECLAIM emissions trading program in southern California; the low carbon fuel standard (LCFS); the economics of peak oil; the efficiency and environmental effects of real-time pricing of electricity; the theory of depletable resources; and the Central Arizona Project transporting water from the Colorado River. This research has been published in the American Economic Review, the RAND Journal of Economics, the Review of Economics and Statistics, the American Economic Journal: Economic Policy, and the Journal of Environmental Economics and Management. Stephen's current research interests include the political economy of biofuel regulation; optimal subsidies for biofuels; and the market design of cap and trade programs.

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