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**Assessing Emission Regulation in Europe:  
An Interactive Simulation Approach**

by Christoph Böhringer (Centre for European Economic Research (ZEW), Mannheim, Germany; Center for Environmental Economics, University of Heidelberg, Germany), Tim Hoffmann (Centre for European Economic Research (ZEW), Mannheim, Germany), Andreas Lange (Centre for European Economic Research (ZEW), Mannheim, Germany; University of Maryland, College Park, USA), Andreas Löschel (Centre for European Economic Research (ZEW), Mannheim, Germany), and Ulf Moslener (Centre for European Economic Research (ZEW), Mannheim, Germany)

**Abstract**

Reimplementation of an EU-wide emissions trading system by means of National Allocation Plans is at the core of the European environmental policy agenda. EU Member States must allocate their national emission budgets under the EU Burden Sharing Agreement between energy-intensive sectors that are eligible for European emissions trading and the remaining segments of their economies that will be subject to complementary domestic emission regulation. We show that such hybrid emission regulation may lead to substantial excess costs compared to a comprehensive emissions trading system covering all segments of the economy. Furthermore, the hybrid system associated with the current design of National Allocation Plans is likely to discriminate against sectors that are not part of the emissions trading scheme. The interested reader can make use of a web-based interactive simulation model in order to specify and evaluate alternative settings of the EU emissions trading system.

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**Systematic Features of High-Frequency Volatility  
in Australian Electricity Markets: Intraday Patterns,  
Information Arrival and Calendar Effects**

by Helen Higgs (School of Economics and Finance, Queensland University of Technology, Brisbane, Queensland 4000, Australia) and Andrew C. Worthington (School of Accounting and Finance, University of Wollongong, Wollongong, New South Wales 2522, Australia)

### **Abstract**

This paper investigates the intraday price volatility process in four Australian wholesale electricity markets; namely New South Wales, Queensland, South Australia and Victoria. The data set consists of half-hourly electricity prices and demand volumes over the period January 1, 2002 to June 1, 2003. A range of processes including GARCH, RiskMetrics, normal Asymmetric Power ARCH or APARCH, Student APARCH and skewed Student APARCH are used to model the time-varying variance in prices and the inclusion of news arrival as proxied by the contemporaneous volume of demand, time-of-day, day-of-week and month-of-year effects as exogenous explanatory variables. The skewed Student APARCH model, which takes account of right skewed and fat tailed characteristics, produces the best results in all four markets. The results indicate significant innovation (ARCH effects) and volatility (GARCH effects) spillovers in the conditional standard deviation equation, even with market and calendar effects included. Intraday prices also exhibit significant asymmetric responses of volatility to the flow of information.

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### **Decentralizing a Regulatory Standard Expressed in Ratio or Intensity Form**

by Ross McKittrick (Department of Economics, University of Guelph, Guelph, ON, Canada)

### **Abstract**

It is well-known that economic instruments like taxes and tradable permits can improve the efficiency of attaining a target expressed in terms of a single variable, but many energy and environmental regulations are expressed as a ratio of two variables, for instance, as emissions intensity (tons per unit output) or as a renewables requirement (percentage from wind, biomass, etc.). It has been shown previously that conventional formulas for cost-efficiency do not work in this case. This paper shows that even if conventional permit trading is used, the cost-effective implementation is unlikely to be achieved. Alternative rules are presented that permit decentralized market-based implementation of ratio standards to achieve a cost-effective implementation of a ratio standard.

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## **Petroleum Prospect Valuation: The Option to Drill Again**

by James L. Smith (Southern Methodist University (Cary M. Maguire Chair in Oil and Gas Management), Dallas, TX)

### **Abstract**

We examine the value of an exploration prospect that is to be exploited via a series of possibly dependent trials. Failure on any particular trial is assumed to convey bad news, but also provides an option to try again. The pattern and strength of dependence among trials determines the value of this option, and therefore also influences the value of the underlying prospect. We describe the solution to this valuation problem, examine the behavior of the option premium, and characterize potential errors that are inherent in two ad hoc procedures that are often used to estimate prospect value. We demonstrate that the impact of dependence among trials is monotonic: each increase in the degree of dependence results in a further reduction in expected value of the prospect. We also characterize the particular pattern of dependence that is implied by a plausible model of exploratory risk.

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## **The More Cooperation, The More Competition? A Cournot Analysis of the Benefits of Electric Market Coupling**

by Benjamin F. Hobbs (Professor of Geography & Environmental Engineering, The Johns Hopkins University, Baltimore, MD), Fieke A.M. Rijkers (Regulatory Staff, Office of Energy Regulation (DTe), 2511 GA Den Haag, The Netherlands), Maroeska G. Boots (Senior Researcher, ECN, Policy Studies Unit, PO Box 37154, 1030 AD Amsterdam, The Netherlands)

### **Abstract**

If barriers between two power markets are eliminated, what might happen to competition and prices? And who benefits? In the case of the Belgian and Dutch markets, market coupling would permit more efficient use of transmission by improving

access to the Belgian market, by counting only net flows against interface limits, and by eliminating mismatches in timing of interface auctions and energy spot markets. We estimate the benefits associated with the first two of these impacts using a transmission-constrained Cournot model. Social surplus improvements on the order of 108 †/year are projected, unless market coupling encourages the largest producer in the region to switch from price-taking in Belgium to a Cournot strategy due to a perceived diminished threat of regulatory intervention. Whether Dutch consumers would benefit also depends on that company's behavior. The results illustrate how large-scale oligopoly models can be used to assess changes in market designs.

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## **The Economic Effects of Border Measures in Subglobal Climate Agreements**

by Mustafa H. Babiker (Arab Planning Institute – Kuwait and MIT Joint Program on the Science and Policy of Global Change, Cambridge MA) and Thomas F. Rutherford (Department of Economics, University of Colorado, Boulder, CO)

### **Abstract**

The Kyoto agreement as originally drafted sought to mitigate anthropogenic greenhouse gas emissions through policy measures by most industrialized countries. It now seems likely that the agreement will be ratified and implemented without the participation of the United States. Any emissions abatement policies which have a measurable reduction in global emissions will induce changes in the terms of trade and comparative advantage and competitiveness. To the extent that aggressive policies are undertaken to reduce CO<sub>2</sub> emissions, there are likely to be strong calls in the Kyoto coalition for greenhouse-gas related border adjustment measures. This paper uses a multi-region, multi-commodity static general equilibrium model to quantify and assess the implications of such policies.

## **BOOK REVIEWS**

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### ***Angola: Anatomy of an Oil State, 2<sup>nd</sup> Edition***

by Tony Hodges, Fridtjof Nansen Institute, in Association with James Currey and Indiana University Press, 2004  
(Book Review by Graham A. Davis)

*Pages 131-134*

***The Economics of Hydroelectric Power***

by Brian K. Edwards. (Cheltenham, UK: Edward Elgar Publishing, 2003)  
(Book Review by J. Tyler Hodge)

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