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Pages 1-16

Energy, Exhaustion, Environmentalism, and Etatism

by Richard L. Gordon (Pennsylvania State University)

Abstract

Two radically different views compete in energy economics. The first, stressed by academic economists, considers energy as a commodity subject to general economic laws. The tendency to technical progress is viewed as the most critical economic law involved. The second position—favored by those in the energy industries, the national and international agencies concerned with energy, and environmental groups—is that energy is unique in various (usually undefined) ways. I examine here first the question whether the consumption of energy and other so-called exhaustible resources is excessive.

Pages 17-30

OPEC and the Price of Oil in 1993

by Francisco R. Parra (Oil Consultant)

Editor's note: This article is based on a talk given by Mr. Francisco R. Parra—a former Secretary General of OPEC and senior executive of Petroleos de Venezuela—at the Advanced International Petroleum Executive Seminar held by Petroleum Economics Limited in Divonne, from 9 to 11 March 1993. The article first appeared in *Middle East Economic Survey* 36:26, 29 March 1993. It is reprinted here with permission from the author and MEES.

Pages 31-56

The Costs of Stabilizing Global CO₂ Emissions: A Probabilistic Analysis Based on Expert Judgments

by Alan S. Manne (Stanford University) and Richard G. Richels (EPRI)

Abstract

In this paper, we examine the economic costs of stabilizing global CO₂ emissions at 1990 levels. Previous analyses of the costs of emissions abatement have tended to be deterministic. That is, no attempt was made to assign probabilities to various scenarios. Policy-makers need information both on the range of possible outcomes and on their relative likelihood. We use a probability poll to characterize the uncertainty surrounding critical parameters and to construct probability distributions over the outcomes of interest. The analysis suggests a wide range for abatement costs. In order to stabilize global emissions, the annual price tag lies between 0.2 and 6.8 percent of gross world product. This distribution is highly skewed. The expected costs are approximately 1.5 percent.

Pages 57-76

International Trade in Oil, Gas and Carbon Emission Rights: An Intertemporal General Equilibrium Model

by Alan S. Manne (Stanford University) and Thomas F. Rutherford (University of Colorado at Boulder)

Abstract

This paper employs a five-region intertemporal model to examine three issues related to carbon emission restrictions. First, we investigate the possible impact of such limits upon future oil prices. We show that carbon limits are likely to differ in their near- and long-term impact. Second, we analyze the problem of "leakage" which could arise if the OECD countries were to adopt unilateral limits upon carbon emissions. Third, we quantify some of the gains from trade in carbon emission rights. Each of these issues have been studied before, but to our knowledge this is the first study based on a multi-regional, forward-looking model. We show that sequential joint maximization can be an effective way to compute equilibria for intertemporal general equilibrium models of international trade.

Pages 77-93

A Climate Treaty and the Norwegian Economy: A CGE Assessment

by Anne Brendemoen and Haakon Vennemo (Statistics Norway)

Abstract

This paper examines the impact of an international climate treaty on a single country—Norway. A disaggregate computable general equilibrium (CGE) model is used. We discuss the treaty's effects on main macroeconomic indicators, economic growth, distributional impacts, the impact on pollutant emissions other than CO₂, and the secondary benefits of this reduction. The results suggest that CO₂ emissions will decrease compared to the current level. The distributional impacts are modest. Increases in secondary benefits recoup almost one half of the loss in private consumption. We characterize the uncertainty of this estimate.

Pages 95-120

Three Biases in Cost-Efficiency Tests of Utility Energy Efficiency Programs

by Steven Braithwait and Douglas Caves (Laurits R. Christensen Associates)

Abstract

Electric utilities in a number of American states devote significant portions of their resources to demand-side management (DSM) programs designed to reduce their customers' electricity consumption. As other jurisdictions consider similar programs, the public policy cost-efficiency criteria for determining how much utilities should pay for DSM remain controversial. This paper develops the appropriate measure of the economic benefits and costs of DSM, using a conventional economic welfare framework, and compares it to the standard cost-effectiveness tests used in most jurisdictions today. The standard tests are found to be incomplete, suffering from three potential biases. Modifications to the standard tests are suggested to address each of the biases. A numerical example is used to illustrate the nature and potential magnitude of the bias in the current tests.

Pages 121-128

On the Use of 'Adders' by Public Utility Commissions

by John Tschirhart (University of Wyoming)

Abstract

State public utility commissions are developing programs to reduce emissions from electric generation facilities. Programs call for minimizing the total cost of meeting future demands for power, where pollution damages are part of the total cost. In the process of choosing new generation sources, dirtier technologies are handicapped relative to cleaner technologies through the use of "adders" which are meant to measure damages. However, the damage costs are left at the planning stage; they are not

included in electricity rates. This practice coupled with standard rate setting procedures may lead to inferior outcomes.

Pages 129-141

Weighting Nonrandom Samples in Voluntary Energy Conservation Program Evaluation

by Michael T. Ozog (RCG Hagler Bailly) and Donald M. Waldman (University of Colorado)

Abstract

In this paper we examine the endogenous stratification problem in the evaluation of DSM programs and determine the appropriate weighting necessary for consistent estimation. Both the complexity and number of alternative DSM programs create the need for a careful statement of the problems and solutions. We examine two commonly occurring evaluation situations: pure participation models and models of net conservation. A hypothetical numerical example is presented to help elucidate the concepts, and data from a DSM program sponsored by a large U.S. utility is used to examine the effect of weighting. In both hypothetical and actual DSM programs, severe biases resulted when unweighted data was used.

Pages 143-156

Gasoline Demand in Developing Asian Countries

by Robert McRae (University of Calgary)

Abstract

This paper presents econometric estimates of motor gasoline demand in eleven developing countries of Asia. The price and GDP per capita elasticities are estimated for each country separately, and for several pooled combinations of the countries. The estimated elasticities for the Asian countries are compared with those of the OECD countries. Generally, one finds that the OECD countries have GDP elasticities that are smaller, and price elasticities that are larger (in absolute value). The price elasticities for the low-income Asian countries are more inelastic than for the middle-income Asian countries, and the GDP elasticities are generally more elastic.

Pages 157-178

Power Balance and Equilibrium Channel Structure in the Korean Gasoline Market

by Byong-Hun Ahn (Korea Advanced Institute of Science and Technology) and Heon Jung (YUKONG Ltc., and KAIST)

Abstract

This study analyzes how power balance in a vertical channel affects equilibrium channel structure and channel members' profits in an oligopolistic gasoline market. Using a game theoretic analysis, we study an equilibrium channel structure under different power balance scenarios. We show that refiners cannot increase their profits by strategic disintegration when their intermediaries retain more power than they do. We also investigate power balance issues in three-level, unintegrated channels. Finally, we apply our results to the gasoline market in Korea, and discuss policy implications.

Pages 179-191

Coordination of Non-utility Generation Through Priority Purchase Contracts

by Joseph A. Doucet (Laval University)

Abstract

This paper proposes the use of priority purchase contracts as a means to coordinate utility purchases from non-utility generators. It is shown that differentiated contracts should have the potential for attracting more diverse NUG proposals (in terms of technical and economic characteristics). It is also argued that differentiated contracts should permit better integration and coordination of NUG capacity since they come closer to mimicking the utility's resource allocation problem. Several areas for future research are suggested.