

Appointed Council Member

Appointed Council Member

Appointed Council Member

President
President-Elect
Immediate Past President
Past President
Vice President for Finance
Vice President for Communications
Vice President for Publications
Vice President for Business and Government Affairs
Vice President for Academic Affairs
Vice President for Conferences
Student Representative
Appointed Council Member
Appointed Council Member
Appointed Council Member

Ricardo Raineri Bernain David H. Knapp Gürkan Kumbaroğlu Peter R. Hartley Inga Konstantinavici Eunnyeong Heo Anne Neumann Marisa Leon Almeida Ying Fan Ron D. Ripple Fabian Moisl Reinhard Haas Akinbolaji Iwayemi Machiel Mulder Vilayat Valiyev Shree Vikas Yukari Yamashita

The Energy Journal is a publication of the Energy Economics Education Foundation, Inc., 28790 Chagrin Blvd., Suite 350, Cleveland, OH, 44122-4630, USA, a non-profit organization, in association with the International Association for Energy Economics.

Membership dues for the IAEE include subscriptions to *The Energy Journal* and the *IAEE Energy Forum*. Subscriber and Membership matters should be sent to IAEE, 28790 Chagrin Blvd., Suite 350, Cleveland, OH 44122; phone 216-464-5365, fax 216-464-2737. Non-member subscriptions to *The Energy Journal* are \$475 for institutions, libraries, and individuals. Postage and handling are paid by the publisher. Outside the United States and Canada, non-member subscriptions are \$500.

Articles appearing in *The Energy Journal* are listed in both *Envir. Per. Bibliography* and *The Journal of Economic Literature* and are indexed/abstracted in *ABI/Inform, EconLit, JEL on CD, ISI Journal Citation Reports, Web of Science, SciSearch, Research Alert, Ei COMPENDEX, Trade and Industry Index, PAIS International, DOE Energy, Energy/Enviroline, and Wilson Business Abstracts, and the following EBSCO databases: Academic Search Premier and Business Source Premier.*

Authorization to photocopy articles appearing in *The Energy Journal* for internal or personal use, or the internal or personal use of specific clients, is granted by IAEE provided that you first register with the Copyright Clearance Center. Please access www.copyright.com or contact the Copyright Clearance Center, Inc. (CCC), 222 Rosewood Drive, Danvers, MA 01923, 978-750-8400. CCC is a not-for-profit organization that provides licenses and registration for a variety of uses. *The Energy Journal* is available in reference systems (e.g., microfilm, CD-ROM, full text etc.) produced by the ProQuest Co. (*ProQuest* Information & Learning), the Gale Group (*Info Trac* databases) and the H.W. Wilson Companys Business Periodicals Index. For further information please contact ProQuest Company at 734-761-4700, www.proquestcompany.com, the Gale Group at 248-699-4253,www.galegroup.com, or H.W. Wilson Co., at 718-5888400, www.hwwilson.com, or EBSCOhost.

AUTHORS: Please see back pages for information on the proper style of submissions.

ADVERTISING INFORMATION: For a complete media kit, contact Marketing Department, IAEE Headquarters, 28790 Chagrin Blvd., Ste. 350, Cleveland, OH, 44122-4630. Phone: 216-464-5365, fax: 216-464-2737. E-mail: iaee@iaee.org. Homepage: http://www.iaee.org.

The Energy Journal (ISSN 0195-6574 / E-ISSN 1944-9089) is published quarterly by the Energy Economics Education Foundation, 28790 Chagrin Blvd., Ste 350, Cleveland, OH, 44122 and additional mailing offices. Subscription price \$475, U.S. and Canada; \$500 other countries. Application to mail at Periodicals Postage Price is Pending at Cleveland, OH 44101. POSTMASTER: Send address changes to EEEF, 28790 Chagrin Blvd., Ste 350, Cleveland, OH 44122.

Copyright © 2017 by the International Association for Energy Economics. All rights reserved.

The editors and publisher assume no responsibility for the views expressed by the authors of articles printed in *The Energy Journal*. Printed in the U.S.A.

Editor-in-Chief, Adonis Yatchew Editors, Lester C. Hunt and James L. Smith Managing Editor, Geoffrey Pearce Book Review Editors, Carol Dahl, Maureen Crandall, and Frank Felder

Board of Editors

Adeola F. Adenikinju University of Ibadan

Lars Bergman Stockholm School of Economics

David Broadstock Hong Kong Polytechnic University

Young Ho Chang Nanyand Technical University, Singapore

Ying FanBeihang University

Massimo Filippini University of Lugano ETH Zurich CEPE

Kenneth Gillingham Yale University

Jean-Michel Glachant European University Institute, Florence, Italy

Richard Green Imperial College London

James M. Griffin
Texas A & M University
College Station, Texas

Eunnyeong Heo
Energy, Environmental and
Engineering Economics
Center, Seoul National
University

William W. Hogan Harvard University John F. Kennedy School of Government Einar Hope Norwegian School of Economics and Business Administration

Mark K. Jaccard Simon Fraser University British Columbia, Canada

Paul L. Joskow President, Alfred P. Sloan Foundation, New York

Edward Kahn Analysis Group, Inc. San Francisco, CA Valerie Karplus

MIT Tsinghua Energy China

Andreas Loeschel University of Munster

Karsten Neuhoff DIW Berlin

André Plourde Carleton University Ottawa, Canada

Michael Pollitt Judge Business School University of Cambridge

Ricardo Raineri Pontificia Universidad Católica de Chile

Adam Rose
University of Southern
California
Los Angeles, CA
Luan Possellon

Juan Rosellon CIDE, Mexico

Geoffrey RothwellOECD Nuclear Energy
Agency

Margaret F. Slade UBC, Vancouver School of Economics

Thomas Sterner Göteborg University Sweden

Paul Stevens Chatham House, UK

Christian von
Hirschhausen
Technical University, Berlin

Technical University, Berlin

Catherine Waddams

University of East Anglia United Kingdom

W. David Walls University of Calgary Alberta, Canada

John P. Weyant Stanford University, CA

Franz Wirl University of Vienna, Department of Business Studies, Austria

Catherine Wolfram Haas School of Business University of California Berkeley, CA

Chi-Keung WooDepartment of Asian and Policy Studies, Education University of Hong Kong

THE ENERGY JOURNAL

Volume 38, Number 5, 2017

Table of Contents

Energy Perspectives	
The Historical "Roots" of U.S. Energy Price Shocks Hillard G. Huntington	1
Papers	
Yardstick Regulation of Electricity Distribution—Disentangling Short-run and Long-run Inefficiencies Subal C. Kumbhakar and Gudbrand Lien	17
Achieving the Clean Power Plan 2030 CO ₂ Target with the New Normal in Natural Gas Prices **Jeffrey C. Peters and Thomas W. Hertel**	39
Optimization of Time-Varying Electricity Rates	67
Speculation in Commodity Futures Markets, Inventories and the Price of Crude Oil Sung Je Byun	93
Winter Residential Optional Dynamic Pricing: British Columbia, Canada Chi-Keung Woo, Jay Zarnikau, Alice Shiu, and Raymond Li	115
The Relevance of Grid Expansion under Zonal Markets Joachim Bertsch, Tom Brown, Simeon Hagspiel, and Lisa Just	129
A Stochastic Frontier Analysis Approach for Estimating Energy Demand and Efficiency in the Transport Sector of Latin America and the Caribbean Manuel Llorca, José Baños, José Somoza, and Pelayo Arbués	153
Space-time Modeling of Electricity Spot Prices Girum Dagnachew Abate and Niels Haldrup	175
Policy-Induced Expansion of Solar and Wind Power Capacity: Economic Growth and Employment in EU Countries Jūratė Jaraitė, Amin Karimu, and Andrius Kažukauskas	197
Book Review	
Energy Economics: Markets, History and Policy, by Roy L. Nersesian	223

Subhes Bhattacharyya

Submission Guidelines

The Energy Journal publishes original theoretical and empirical papers devoted to the advancement and dissemination of knowledge on energy and related topics. Content and editorial board composition are international in scope. Although most articles emphasize the economic aspects of their subjects, coverage is interdisciplinary. The Energy Journal quarterly issues include:

- Major, refereed articles that deal with theoretical or applied problems of continuing interest in energy economics and related disciplines.
- Shorter, refereed papers and notes that are topical and that focus on the theory and practice of economics as related to energy and energy policy.
- An 'Energy Perspectives' section which contains refereed papers that review or analyse important current issues from a broader vantage point.
- A 'Book Review' section which examines books and topical government reports (national and international) on energy economics, energy policy and related areas.

Submitting Manuscripts for Refereeing

The Energy Journal uses a single-blind refereeing process in which authors are identified to referees, but not vice versa. Authors, please submit an electronic copy of your paper in pdf format for refereeing, with the authors' names included at http://www.iaee.org/ejsubmit/submitjournal.aspx.

Manuscripts submitted for refereeing should be prepared according to the following style rules, which are based on The Chicago Manual of Style. The submission fee for articles submitted to *The Energy Journal* is \$100. (There is no fee if at least one author is an IAEE member.)

Manuscripts should be double-spaced on a page size of 8.5 x 11 inches or the metric equivalent. The first page should contain the article title, author(s) name(s) and complete affiliation(s), title, and complete mailing address of the person to whom all correspondence should be addressed. An abstract of no more than 150 words must be included. Please include keywords below the abstract. Manuscripts may not be longer than 25-35 pages maximum or 9,500 words.

Mathematical expressions should be set in italic type with all equations numbered consecutively on the right hand side of the page. Articles should carry no more than 12 complex equations (defined as multi-lined equations).

Tables should be numbered consecutively. All tables should have concise titles.

Footnotes should be numbered consecutively with superscript Arabic numerals. Footnotes are placed at the bottom of each page.

All figures should be numbered consecutively throughout the text.

Authors submitting a manuscript do so with the understanding that if it is accepted for publication, copyright in the article, including the right to reproduce the article in all forms and media, shall be assigned exclusively to *The Energy Journal*. The *Journal* will not refuse any reasonable request by the author for permission to reproduce any of his or her contributions to the journal.

Submitted papers may undergo electronic webbased analysis to ensure their originality and to identify possible cases of plagiarism. Submission to *The Energy Journal* implies that the authors grant permission that such analyses may be performed.

Style and Format for Accepted Manuscripts

Accepted manuscripts must be submitted in electronic form as either MS Word or LaTeX files. Electronic MS Word files must incorporate all text, tables, equations and graphics. Equations should be in equation editor (or MathType) format. Make sure that they have not inadvertently been converted to a graphic.

For LaTeX submissions, any separate files used in creating the pdf output file must be included, especially graphics files and a bibliography file if it was used to create the list of references. The pdf output of LaTeX files should also be submitted, preferably using the template available on our web site, which will format the article according to our style requirements and allow you to place graphics, tables etc. appropriately. Click here to download the LaTeX template files.

Figures must be submitted as camera-ready copy in a form suitable for reproduction. In addition to the figures placed in the manuscript files, each figure must be provided unembedded as a separate, high-resolution file (at least 300 ppi, and 600 ppi recommended) for typesetting. Acceptable file formats include EPS, TIFF, JPEG, GIF, PNG, BMP, XLS, XLSX, DOC, DOCX, and PDF. The *Journal* does not publish in color. Thus, color figures will be converted to grayscale for the print publication. If such conversion will result in poor distinction between parts of the figure, the author must also submit a separate grayscale version that enhances the distinction.

(continued)

References should be provided using the authordate citation system. Papers should include an alphabetical reference list of all works cited. All works in the reference list must be cited in the text, and citations should be "in-line", or "static text". You may also review past issues of *The Energy Journal* to see our style of references. Examples follow:

Style For Book:

Chandler, Alfred (1977). The Visible Hand. Cambridge: Belknap Press.

Style For Report:

Federal Trade Commission, Bureau of Economics (1979). The Economic Structure and Behavior of the Natural Gas Production Industry. Staff Report.

Style For Journal Article:

Henderson, J.S. (1986). "Price Determination Limits in Relation to the Death Spiral." The Energy Journal 7(3): 150-200.

Executive Summary

In order to improve the accessibility of *Energy Journal* papers, authors are required to submit a short (one to two page) non-technical Executive Summary which contains the following: a) the motivations underlying the research; b) a short account of the research performed; c) the main conclusions; and, d) potential benefits, applications and policy implications of the work. No tables, charts, graphics, equations, etc. are to be included in the Executive Summary.

Authors are encouraged to include the Executive Summary with their initial submission. Otherwise, it must be submitted together with the first revised version of the paper. Failure to provide the extended abstract will result in delays in the review process and potentially delays in publication.

The Executive Summary will be posted on the IAEE website in advance of the official publication date of the issue of *The Energy Journal* that carries the author's article. The purpose of this new, stand-alone document is to communicate the central ideas contained in the research to the nontechnical reader. It is the editors' belief that this will benefit not only authors, whose work will be more widely recognized, but also the broader policy, industry and governmental communities which are constantly in search of answers to difficult energy-related questions.

Revised Article Resubmission

Revised articles, along with the Executive Summary, should be emailed directly to the Associate Editor at *geoffrey.pearce@utoronto.ca*.

Page proofs will be sent to the corresponding author for approval before publication.

Data Availability Policy

The Energy Journal is committed to the principle that results in papers that it publishes must be replicable. Once a paper has been accepted, the author(s) must confirm his/her willingness to make data and programs available to other researchers on a request basis. The Journal recognizes that in some cases, data and/or programs are proprietary or may have required considerable resources to assemble. If this is the case, the author(s) are required to write a letter to the Editor in charge of the paper to explain the circumstances. In such cases it is expected that the author(s) be willing to share their data/programs on the condition that the researcher will use the materials solely for the purpose of replicating the results.

Additional Notes

The Editors of *The Energy Journal* may submit papers for publication consideration by following the procedures and criteria as approved by the Board of Editors. Please visit http://www.iaee.org/documents/EJPolicy.pdf for further information.

Book Reviews

To submit Books for review, please contact Associate Editor Geoff Pearce at geoffrey.pearce@utoronto.ca.

Book Review Editors:

Carol Dahl, Colorado School of Mines. cadahl@mines.edu

Maureen S. Crandall, National Defense University, *crandallm@ndu.edu*

Peter J.G. Pearson, Cardiff University, Pearsonpj@cardiff.ac.uk

Frank Felder, Rutgers University, ffelder@rci.rutgers.edu