

IAEE Energy Forum

Fourth Quarter 2017

International Association for Energy Economics

ISSN 1944-3188

IAEE

WWW.IAEE.ORG

INTERNATIONAL
ASSOCIATION for
ENERGY ECONOMICS



CONTENTS

- 1 President's Message
- 5 U.S. Sanctions on Russia: Geopolitics, Pipelines & U.S. Self-interest
- 13 Behavioral Economics and the Tradeoff between Coal and Renewable Energy Capacity Additions
- 15 Germany's Energiewende: A Tale of Increasing Costs and Decreasing Willingness-To-Pay
- 19 Uranium Resources and Security of Supply
- 23 How to Give a Good Presentation
- 33 The Transformation of World Energy Governance: A Brief Overview Focusing on Energy Security.

contents continued on page 4

Editor: David L. Williams

President's Message

Dear Fellow Members:

In early September the 15th IAEE European Conference 2017 took place in Vienna with the theme "Heading towards sustainable energy systems: evolution of revolution?". We enjoyed 5 days with a great program to exchange ideas on energy issues and the challenges ahead. I thank all those who were involved in the organization of the event, the host institutions (Technische Universität Wien, its Energy Economics Group, and the Austrian Association for Energy Economics), our sponsors, Austria and the City of Vienna and its authorities, and all our members that participated and gave life to this successful event. The themes discussed were diverse as are the interests of our community that come from more than 90 countries and we enjoyed the participation of a large number of enthusiastic students who made great contributions in the poster and concurrent sessions, giving us fantastic prospects for the future of IAEE.

For the coming years there is a lot more to come, and I invite you to navigate through and to contribute with your scientific and policy-oriented research to our three leading publications, The Energy Journal, Economics of Energy & Environmental Policy, and the Energy Forum. Also, I encourage you to save the date for upcoming events, including the following:

- 35th USAEE/IAEE North American Conference "Riding the Energy Cycles", November 12-16, 2017, USAEE, Houston - Texas - USA.
- 41st IAEE International Conference "Transforming Energy Markets", June 10-13, 2018, BAEE/IAEE, Groningen - The Netherlands.
- 2019 16th IAEE European Meeting Ljubljana, Slovenia August 25-28
- 42nd IAEE International Conference "Local Energy, Global Markets", May 26-29, 2019, CAEE/IAEE, Montreal - Canada.
- 43rd IAEE International Conference "Energy Challenges at a Turning Point", June 21-24, 2020, FAEE/IAEE, Paris - France.
- 44th IAEE International Conference "Mapping the Global Energy Future: Voyage in Uncharted Territory", July 25-28, 2021, IAEE/The Institute of Energy Economics, Tokyo - Japan.

40 years have passed since this wonderful organization was founded by a group of visionaries in Washington, Boston, and Cambridge (UK). When we look back in time at the beginning of our association, the issue of energy security was at the heart of the energy agenda and discussion, and was a cornerstone theme in IAEE that received a lot of attention from governments, industry, civil society, academia, and the inter-



(continued on page 2)

President's Message (continued from page 1)

national community. It was no coincidence that IAEE was born after the oil embargo in the early 1970s, and just before the Iranian revolution, where Iran cut production and exports and cancelled contracts with some foreign companies, and where energy was one of the key drivers of the economic and geopolitical agenda. From the late 1970's up to today, world population has grown by 80%, the world economy by 200%, and energy consumption by more than 200%. We expect them to increase even further in the decades to come. In these 40 years, there have been big changes in technology and civil society attitudes. We live in a more integrated and connected world, with a different geopolitical landscape, and with increasing social and environmental constraints. Through all these years, during periods of higher or lower stress, the issue of energy security has remained as a central theme given the relevance that energy has as a key pillar for development and economic growth in the modern economy. Commemorating the times when IAEE was founded, main theme for this current issue of the Energy Forum is on energy security.

There is more than one interpretation of energy security, IEA defines energy security as the uninterrupted availability of energy sources at an affordable price; while NATO refers to it in a more holistic manner, in talking about energy security it says that "there's much more at stake than cheap, reliable sources of energy. It's about independence. Energy security is about politics, sovereignty, political stability, democracy and development". This highlights the importance that energy security has for economic and social development, as well as for national security. Beyond the more or less holistic interpretation of energy security we take, energy security challenges are diverse and depend on a diverse set of factors and particular conditions of each economy: as an energy importer or exporter, on the availability of native energy sources, its degree of integration with regional and global energy markets, and the degree of development and commoditization of the different energy sources at the regional and global level, among others.

On the topic of the risks faced by an energy importing country, one that integrates its energy markets and/or infrastructure to regional or world energy markets, a key is the understanding of the risk grade that is embedded in its energy imports, an imported risk that comes from outside economies and energy markets. The impacts of risky conditions and the decisions and/or strategic decisions made abroad can be carried to the country through the energy markets when there are no reliable and competitive alternative sources of energy supply. The solution to improving energy security is not one of self-sufficiency but is one of setting the proper safeguards that guarantee a safe supply of energy. As practicable, the chance

**NEWSLETTER
DISCLAIMER**

IAEE is a 501(c)(6) corporation and neither takes any position on any political issue nor endorses any candidates, parties, or public policy proposals. IAEE officers, staff, and members may not represent that any policy position is supported by the IAEE nor claim to represent the IAEE in advocating any political objective. However, issues involving energy policy inherently involve questions of energy economics. Economic analysis of energy topics provides critical input to energy policy decisions. IAEE encourages its members to consider and explore the policy implications of their work as a means of maximizing the value of their work. IAEE is therefore pleased to offer its members a neutral and wholly non-partisan forum in its conferences and web-sites for its members to analyze such policy implications and to engage in dialogue about them, including advocacy by members of certain policies or positions, provided that such members do so with full respect of IAEE's need to maintain its own strict political neutrality. Any policy endorsed or advocated in any IAEE conference, document, publication, or web-site posting should therefore be understood to be the position of its individual author or authors, and not that of the IAEE nor its members as a group. Authors are requested to include in an speech or writing advocating a policy position a statement that it represents the author's own views and not necessarily those of the IAEE or any other members. Any member who willfully violates IAEE's political neutrality may be censured or removed from membership.

IAEE Mission Statement

The International Association for Energy Economics is an independent, non-profit, global membership organisation for business, government, academic and other professionals concerned with energy and related issues in the international community. We advance the knowledge, understanding and application of economics across all aspects of energy and foster communication amongst energy concerned professionals.

We facilitate:

- Worldwide information flow and exchange of ideas on energy issues
- High quality research
- Development and education of students and energy professionals

We accomplish this through:

- Providing leading edge publications and electronic media
- Organizing international and regional conferences
- Building networks of energy concerned professionals

to take advantage and rely upon native energy sources and/or global but competitive energy markets is an enabler for a more secure supply of energy. Some risks that can be faced by an energy importing country are:

- Opportunistic behavior from undiversified sources of supply
 - price instability
 - energy disruptions with deep economic and political effects
 - changes in tax regimes, royalties, contractual schemes in the export country
 - the use of energy as a geopolitical weapon
 - the use of energy and prices to punish/rewards particular behaviors, as a mean of extortion/manipulation
- Changes in foreign regulatory framework, environmental/social safeguards
- Exposure to political decisions, such as energy subsidies, and conditions of turmoil and social unrest in neighborhood or supplier countries
- Exposure to weak Rule of Law and changes in the business environment in neighborhood countries
- Supply disruption that leaves large stranded assets/investments and imposes huge switching costs
- Supply disruption that leaves a dislocated/disrupted energy system with deep economic, social, environmental, and political consequences

These threats, in general, highlight the debate on energy dependency, which advocates diversifying energy sources with access to competitive and secure regional and/or global markets, and for the development of native energy resources/sources.

As importing countries are exposed to risk from global and regional energy markets, energy resource-rich and exporting countries face a different set of risks such as:

- The need to secure a market and a stream of revenues, where government revenues often depend heavily on energy rents, and the loss of those rents can pose severe impacts on social and political stability.
- One of feeding substantial energy subsidies, with a heavy burden on the state and distorted energy prices.
- One of being left with stranded assets due to large swings in energy demand and markets
- Being exposed to opportunistic behavior because of an undiversified target market
 - Risk of price instability or price extortion/manipulation
 - Risk of changes in tax regimes, royalties, contractual schemes in an import country which might affect price and demand
- Changes in foreign regulatory framework, environmental/social safeguards that affect price and demand
- Potential conflicts with communities and civil society that seeks a share from energy rents.

At the risk of being simplistic, and as a rule of thumb, in an exporting country an effort should be placed in the diversification of the target markets, with a broader access to regional and/or the global market, as well as the promotion of sound economic and fiscal policies to bring a proper management of energy rents.

When we look up the different feelings about energy security, we see that there is a consensus that the integration of energy markets/infrastructure creates wealth and improves peoples' wellbeing. However, from a security/geopolitical perspective, some clouds loom over the belief that the integration of energy markets/infrastructure necessarily enhances energy security. There is a wide diversity of views, of development models, and on the role of the private and public sectors within each region, and on how to distribute the rents from energy resources, as well as twisted models of competition to capture them. In recent years, we have observed unilateral changes on energy contracts, price and supply manipulation, and on the use of energy as a political weapon. All these have happened beside the great business opportunities that exist for the greater integration of regional and global energy markets, creating wealth and improving citizens' living conditions. We are confident that the articles that we bring in this issue of the *Energy Forum*, written by our distinguished fellow members, will convey some answers and solutions to the many questions that come up when we talk about the challenges that an economy faces when confronted with complex issues regarding its energy security.

We thank you for your commitment to IAEE and look forward to having you at our upcoming local and regional conferences, as well as the upcoming 41st IAEE International Conference "Transforming Energy Markets", that will take place on June 10-13, 2018, in Groningen, The Netherlands.

Ricardo Raineri Bernain

Editor's Notes

In this issue we continue our discussion of *Renewables and Conventional Energy Resources: Challenges, Opportunities, Complementarities, Rivalries and Game Changers* and open the discussion of *Energy Security*. The response to our call for articles on the latter has been most gratifying. If you don't see your paper in this issue, the chances are it will be in the next. And our next issue, the first in 2018, will carry the final papers on renewables. Both subjects have been well received.

Before we get to these articles, however, we have a special article on *How to Give a Good Presentation* by **Richard Green**. This should be of particular interest to those planning presentations at coming IAEE conferences. The European meeting in Vienna was a great success and we're fortunate to have an overview of the plenary sessions of the conference put together by **Jaroslav Knappek**. Now on to the balance of this issue.

Mamdouh Salameh argues that the newly-imposed U.S. sanctions on Russia will have very limited impact on the Russian economy. Since the 2014 oil crash, the Russian economy has adjusted to lower oil prices and sanctions.

Travis Roach writes substitution between coal and renewable energy has been a hot topic for some time now, but has received even more attention under the Trump administration. However, this trade-off was made much prior to today's conversations, and may have been influenced by cognitive biases.

Mark A. Andor and **Manuel Frondel** draw on two stated-preference surveys conducted in 2013 and 2015 to elicit household's willingness-to-pay for green electricity. They present evidence that the accumulating cost of Germany's ambitious plan to transform its system of energy provision is butting up against consumers' willingness-to-pay for it.

Sophie Gabriel, **Antoine Monnet** and **Jacques Percebois** examine the long-term availability of uranium resources. They have modeled the ultimate uranium resources and uranium market mechanisms, and have thus been able to conduct prospective studies with, in particular, changes for technical or political reasons of production in a given region.

Kazutomo Irie notes that a bipolar system created by OPEC and the IEA for world energy governance was established in the 1970s. But, entering the 21st century, various international entities proliferated for international cooperation and dialogue on energy issues. He discusses the result; a multilayered intergovernmental system has been formed for world energy governance.

Joseph Cavicchi and **Maheen Bajwa** use real-time pricing data from U.S. wholesale electricity markets to examine the increasing frequency and incidence of negative electricity prices corresponding to the increasing supply of renewable resources. Increased reliance on State renewable resource production-based subsidies will likely lead to more frequent negative prices.

Hongbo Duan and **Shouyang Wang** develop a one-sector energy-economy-environmental integrated framework of China, combining with a series of well-proposed energy security metrics to explore the uni-directional consistency between climate policy and energy security from the national perspective. They considered the potential impacts of emission budgets on China's energy security.

Silvia Andrea Cupertino, **Marcia Konrad**, **Hirdan Katarina de Medeiros Costa**, and **Edmilson Moutinho dos Santos** discuss the diversification of the Brazilian electric matrix as a tool to promote environmental sustainability, security of supply in the country, and national energy policy guidelines. Brazil implemented a federal policy that grants incentive to renewables, but still has a long way to reach an optimum diverse matrix.

With your smart device,
visit IAEE at:



International
Association
for Energy
Economics

DLW

Contents continued from page 1

- 37 Growing Evidence of Increased Frequency of Negative Electricity Prices in U.S. Wholesale Electricity Markets
- 42 Impacts of Climate Policies on Energy Security in Carbon-restrained China
- 51 How Brazil is Addressing the Challenges Associated with Incorporating Renewables into Energy Supply System
- 55 Calendar