

# Energy and Environmental Challenges in a Globalized World: Introduction

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Globalization is an ongoing process. It has been underway for some time, yet in recent years there has been a visible rebalancing of the economic and political structures that govern the global economic environment. The inescapable growth of the Chinese economy, in both population and wealth, has been a key driver behind major shifts in global energy market dynamics, and a source of considerable negative externalities from energy consumption i.e. pollutants. At the same time, Europe was tested by the Grexit referendum, then rattled to its core by the ongoing Brexit process, causing the overall policy environment in Europe to need to be readdressed. Political developments in the US, under the current administration, are also having implications to the political economy of global markets. While globalization has numerous obvious benefits, it brings with it many opportunities and challenges, and the current context of globalization is fraught with uncertainty.

The papers in this special issue examine topics of immediate interest in understanding the current challenges facing the global energy-economic environment. They necessarily cover a diverse range of issues surrounding various market mechanisms and contexts, serving as a reminder of the ongoing challenges faced in refining energy policy to meet the needs of our rapidly evolving global economy.

The papers attest to the range of issues that are fresh on the minds of energy economists. For example, we are neatly reminded of the importance of monitoring and understanding the main foundations of energy supply and demand. Mason and Roberts (2018) in their article “Price Elasticity of Supply and Productivity: An Analysis of Natural Gas Wells in Wyoming”, make a persuasive case that natural gas supply profiles are unavoidably connected to geological/geographical features, giving rise to an un-ignorable price inelasticity of supply. They also reflect on what could be done to make supply more price elastic—details of which can be found in their article. On the demand side, Barassi and Zhao (2018) highlight the advances being made in prediction of energy demand profiles in their study “Combination Forecasting of Energy Demand in the UK”. This type of prediction problem is of immediate importance to the daily operations of the electricity industry in establishing market prices and operational choices. Model averaging techniques are shown to outperform any single forecast model, which among other things resonates with an increasingly widely adopted school of thought that there are material advantages in permitting complex heterogeneity in econometric model structures.

Related to the topic of energy supply, and with ramifications for energy demand management, Giulietti et al. (2018) “Analyz[e] the Potential Economic Value of Energy Storage”. Their work connects several overlapping issues concerning technological advances in energy storage, and the deployment of distributed energy systems. The analysis stimulates some interesting thinking about the range of market incentives that may be considered to speed-up the commercialization of electricity storage systems. The emphasis being upon catalyzing a distributed energy generation system that utilizes large battery-technologies charged primarily from renewable energy sources.

Dimensions of financial market development and the role of financial incentives are addressed in two papers examining energy intensity. Davies et al. (2018) in their paper “The Impact of Special Economic Zones on Electricity Intensity of Firms”, consider how the benefits of locating within a special economic zone may be undermined by weak environmental regulations. They observe, using firm level data covering Africa and Asia, that electricity intensity is systematically higher in special economic zones. Aller et al. (2018) looked wider to the role of overall financial system development, using Chinese data in the study: “The Effect of Financial Development on Energy Intensity in China”. They conclude that reductions in energy intensity are impeded by poorly developed financial systems/institutions.

Specific questions targeting energy commodity markets and the evolving interplay with wider commodity and financial markets are of growing interest to energy economists and energy finance scholars. Ghoshray (2018) contributes to the area of research defining and examining energy price shocks and questions “How Persistent are Shocks to Energy Prices?”. The finding supports the idea that energy price shocks cannot be shown to be transitory in nature, or in other words that energy price shocks have enduring consequences to oil price formation. Coronado et al. (2018), conversely explore how oil prices levels stimulate activity in connected markets in the work “An Empirical Analysis of the Relationships between Crude Oil, Gold and Stock Markets”. Using non-linear causality tests they re-evaluate the implications of energy price dynamics to investment strategies for investors whose portfolios cover both commodity and equity markets. The additional flexibility in their econometric design offers some advantages in reconciling results documented by previous work in this area.

Topics concerning climate change and emissions are the focus of two papers. Barassi et al. (2018) examine the relationships connecting “Climate Anomalies and Migration between Chinese Provinces: 1987–2015”. They provide evidence to suggest that climatic variables, such as temperature and precipitation, have consequences to population dynamics and by implication labour market activity. The share of industrial activity in output, and measures of energy consumption are also shown to influence migration patterns. Andre and Arguedas (2018) address the issue of emissions more directly still, and in their study “Technology Adoption in Emission Trading Programs with Market Power”, discuss how technology adoption and market power may have implications for emission permit trading schemes. The implications from this study are especially relevant and timely given the recent expansion of the Chinese carbon trading platform to be nationwide for power sector companies. The implications of and discussions in Andre and Arguedas (2018) are likely to re-emerge in a number of studies over the coming years.

The issue of market power re-emerges in Bello et al. (2018) who examine “Pricing and Margins in the Retail Automotive Fuel Market: Empirical Evidence from Spain”. In a systematic review of the evolution of gross retail margins for automotive fuels in Spain (supported by econometric modeling), they uncover evidence consistent with firms exercising market power, and moreover that they appear to do so more within the recessive phase of the economy.

In summary, the papers in this issue revisit a range of core/fundamental topics in the economics of energy markets, that serve as a reminder of the energy and environmental challenges faced by the global energy economic environment. These are stimulating pieces that provide new insights on contemporary problems in the global energy economic environment.

This Special Issue contains selected papers presented at the V<sup>th</sup> Meeting on International Economics, held in Vila-Real, Spain on July 6-8, 2016. The conference was co-organized by researchers at the Universitat Jaume (Spain), and University of Birmingham (UK). We are grateful to the organizers of the conference and to all the contributors of papers to this Special Issue. Special

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