

Book review—Evolution of Global Electricity Markets

In this week's Nutwood Josephine Lord reviews *Evolution of Global Electricity Markets: New Paradigms, New Challenges, New Approaches*—a collection of articles edited by Fereidoon P. Sioshansi.

This latest collection of articles is an update to a volume published in 2006 (*Electricity Market Reform: An International Perspective*), which covered the experience of countries around the world that had introduced market reform initiatives in their electricity markets. It aims to provide a comprehensive assessment of the relevant issues in today's rapidly changing electricity market, facing a host of new challenges and issues that were not dominant, or in some cases barely present when the previous book was compiled.

Electricity market reform was initiated in the 1980s and 1990s in a number of countries including in England and Wales followed later by a number of states in the US, the EU, Australia and New Zealand. The aim was to increase the role of market forces with open and more competitive arrangements, and replace the centralised government-controlled approaches, which could be inefficient, subject to political decisions and unresponsive to consumers. While much change has taken place and some market reforms were deemed successful, others experienced problems and in some cases reforms have been paused or postponed.

More recently, and overlaying this less-than-straightforward move towards liberalisation, a host of new issues have emerged that are having a major impact on how governments and regulators are considering the design of energy markets going forwards. Sioshansi identifies these new issues and priorities as: the low-carbon energy mix and the adoption (or planned adoption) of mandatory low-carbon targets for energy sectors; targets for renewable energy; energy efficiency; the impact of the growth of distributed generation; and demand participation.

He also identifies other emerging issues gaining momentum and expected to have a pronounced effect on electricity markets, whether they are restructured or not, including smart meters, dynamic pricing, smart grids amongst a long list of others. These are the new paradigms and new challenges of the book's subtitle that require new approaches. Clearly governments, while recognising the benefits liberalisation can bring, are faced with new policy priorities and technological advances enable a range of other changes to the landscape.

As a collection of articles, the format is well suited to explore in depth the range of new challenges that different electricity sectors around the world face in their specific circumstances. The book is divided into four sections that examine respectively the evolution of electricity market in Europe, the Americas, a section on Brazil, Russia, India and China, and Australasia, and comprises 25 contributions.

Two interesting articles relate to developments in the UK. In the book's first contribution David Newbery describes and explains the evolution of the UK electricity market since 1990 as being at the forefront of reforms to liberalise, through to the development of the government's current Electricity Market Reform (EMR) initiative. He examines a range of criticisms of the draft *Energy Bill* and concludes that the risk sharing through contracts passed through to consumers or taxpayers can greatly reduce the cost of risk. The real problem, he argues, is the well-known agent-principal problem of retaining incentives while reducing the risk, where markets, auctions or benchmarking can all play their part.

One of the main concerns is whether EMR represents a retrograde step, replacing market-driven investment decisions with a single, possible state controlled buyer model; and a deeper concern about whether liberalised electricity markets are compatible with a low-carbon electricity industry. Newbery argues that careful design of the policy instruments needed to support currently uncommercial zero-carbon generation ought to be able to retain the benefits of competition to drive down costs and stimulate innovation.

But he warns poorly designed interventions could easily undermine the liberalised market and raise the costs substantially higher than needed. He argues that it ought to be possible to reduce risk and the resulting cost of capital while retaining and possibly even improving the incentive properties of the current electricity market.

Malcolm Keay, John Rhys and David Robinson look more generally at these issues and in particular whether greenhouse gas targets are incompatible with liberalisation. Is it inevitable that reforms to meet these targets will result in a

reduction in the role of market forces? The authors point out that the main difference between the UK and other countries is that most are not subject to the same degree of urgency—just as the UK was a pioneer in liberalisation so it is in market reform for decarbonisation, and other countries may have the benefit of learning from its experience.

The UK's EMR reform proposals involve a high level of government decision-making. For example, on the capacity requirement and on pricing and technology choices, giving rise to the problems inherent in centralised approaches including risk aversion, conservative decision-making and lack of innovation. The authors consider if there are ways to achieve national goals for renewable energy and emissions reduction that leave a bigger role for markets and competition. They suggest a number of options that might be considered by governments with a less urgent agenda than the UK has acted under to achieve decarbonisation, that might leave scope for the free operation of market forces and consumer choice. These include improving existing markets, a carbon intensity target and a single-buyer approach.

The book's European section then shifts focus onto developments in the French and German markets specifically, and further chapters follow examining the impact on markets of the growth of renewables generation in Europe and the challenges for transmission networks of this growth. In France the challenges imposed by the current dual prevailing tariffs—regulated (set mainly by low cost nuclear generation) and market rates—and the current efforts to address this, and in Germany the fundamental changes being faced as a consequence of its decision to abandon nuclear power, including reform of renewables support and market redesign.

The authors point out that one problem of choosing an optimal market design is that many market developments are at an early stage, for example smart grids and the growing integration of European markets may require an integrated European approach. This theme is explored in a further chapter on electricity market regulation in which Walter Boltz explains a core tendency to move towards more centralisation or better cooperation at European level, following the inability of member states to solve national competition issues.

Contributions to the section on the Americas include an article by Joseph E Bowing on the development of the PJM capacity market and whether it addresses the issue of revenue sufficiency (concluding that although it has ensured reliability to date there are some key flaws that need to be addressed); two articles assessing developments in the Texan and Californian markets; an examination of US competitive retail markets; and a perspective on Canada's fragmented electricity sector. Finally in this section a contribution considers the challenges of trying to improve the integration of energy networks in Latin America.

The section on the growing economies of Brazil, Russia, India and China describes evolution of the electricity sectors and attempts at reforms, while the final section covers a number of important markets in Australia, New Zealand, Japan, South Korea and Singapore.

In the book's epilogue Jean-Michel Glachant, director of the Florence School of Regulation and Loyola de Palacio chair, provides some perspective on all this change. He illustrates how the energy world is inevitably subject to unforeseen developments, considering his own five major examples of these over the past twenty years. The main message conveyed with any such list, he argues, is that imperfect markets cannot perfectly deal with everything: in practice we can only choose a limited set of problems to solve and to find any workable way to deal with. The book draws on experiences that lead us to approach this fundamental trade off: "Doing things better with what we want to achieve while not forgetting how wrong things can go in areas that we did not choose as today's priorities."

Sioshansi acknowledges that with contributions from experts from diverse countries and disciplines with different perspectives the book provides a "mosaic" of ideas, insights and approaches to how the challenges of complex electricity markets are being and/or should be addressed. It highlights the diverse range of issues being addressed in different country contexts, but does not always make it easy to take themes across the piece.

What is clear is the new and existing issues impacting how electricity markets develop still have some way to play out—and that is before the next set of issues come along. In that context this collection provides valuable insights into the issues policy makers, regulators and market participants are currently grappling with.

The book is available from Amazon [here](#).