

BOOK REVIEWS

Handbook of Sustainable Energy, edited by Ibon Galarraga, Mikel González-Eguino and Anil Markandya. (Cheltenham, UK: Edward Elgar, 2011). 612 pages. ISBN 978-1-84980-115-7

The epilogue for this book, comprising 27 substantial chapters, provides a reviewer with an appealing crib sheet for summarising its contents for the purpose of a book review. Reluctantly resisting this temptation, nevertheless I must concur with its author, Anil Markandya, when he begins by stating that summarizing such a book is difficult!

The 27 chapters are rather loosely arranged under six broad headings or “parts”: sustainable use of energy, energy and economics, renewable energy and energy efficiency, other energy and sustainability issues, energy and climate policy, and other dimensions of energy. The vast majority of the contributors are Europe-based (and then largely from Spain) and this determines much of the focus of the text.

In their introduction, the editors describe the book as “an attempt to contribute significantly to the knowledge in sustainability issues from the point of view of energy”. Whether or not it is a successful attempt must be a personal judgement, as potential topics would clearly dwarf in number the 27 covered in this volume. Your reviewer, however, was impressed by the scope of the contributions and their clarity. All appear to have been written specifically for this “Handbook” and all are readily comprehensible without a large amount of assumed previous knowledge. If one felt so inclined, but I’m not recommending it, it would be a relatively painless, and very informative, task to read the chapters sequentially, from cover to cover: I did!

The first five chapters consider the breaking of the nexus between economic growth and fossil fuel use, and the transition to renewable energies and energy efficiency driven by the requirement to achieve a low carbon future. Roger Fouquet opens proceedings with a historical perspective on the relationship between long-run economic growth and sustainable (i.e. renewable) energy use, and a call for the identification of effective new policies that would be capable of managing long-run “sustainably” renewable energy sources in the context of the transition to a low carbon economy.

Geoffrey Hammond and Craig Jones then examine the principles and practice of sustainability in the context of the energy sector. They show that sustainability, the ultimate objective of sustainable development, can be disaggregated into three interconnected pillars: economic, environmental, and societal. Sustainability is reflected in the common area where the three pillars coincide (imagine a Venn diagram). They then address the three pillars separately, returning to pull these themes together with applications in the energy sector. They conclude that sustainability must be viewed in its global context, which has important implications for cooperation between rich and poor nations to achieve this objective.

Continuing the theme of Part 1, there follows a relatively short chapter by Carmen Gallastegui, Alberto Ansuategi, Marta Escapa and Sabah Abdullah on the relationship between economic growth, energy consumption, and climate policy. The chapter reproduces familiar concepts and disappoints in that it adds little that is new to the topic.

Chapter four explores the relationships between energy efficiency and energy security for the European Union and Norway. The authors, Andrea Bigano, Ramon Ortiz, Anil Markandya, Emanuela Menichetti and Roberta Pierfederici, measure energy efficiency in terms of

three indicators: energy intensity, an energy efficiency index for the household and transport sectors, and carbon intensity. Panel data are used to identify and assess the economic variables that could have a significant effect in improving these measures, together with that of energy security. The main conclusion was that energy efficiency policies in the EU do work, but there is no single policy able to address different policy objectives successfully. Perhaps surprisingly, they found that there are policies designed to improve energy efficiency that are more effective in terms of improving energy security than in terms of their original goal.

Part 1 concludes with Timothy Foxon discussing lessons learnt from the UK and Dutch experiences with the transition to a low carbon energy economy. He argues that recent policy measures (the Low Carbon Transition Plan in the UK and the Energy Transition Approach in the Netherlands) largely focus on technological changes and on the roles of government and market actors, and neglect changes in practices of energy use and the role of civil society in promoting a low carbon transition. He concludes by emphasising that it is greater involvement with the latter that will create credible and sustainable pathways to a low carbon future.

The second five chapters comprising Part II are grouped under the rather uninformative title of “Energy and Economics”. They commence with a description of how European electricity and gas markets work or, strictly speaking, how they should work, by Monica Bonacina, Anna Creti, and Susanna Dorigoni. This chapter provides a well-executed, and well-referenced, analysis of the wholesale markets, but the networks and retailing sectors do not seem to permit an analysis that can attract the same degree of interest and the chapter finishes rather abruptly. Which turns out not to be a problem, as the following chapter by Ignacio Pérez-Arriaga, Tomás Gómez, Luis Olmos, and Michel Rivier examines the policy and regulatory issues that must be addressed for the transmission and distribution networks arising from the transition to a low carbon power sector and smart grids. Of particular importance in this context is how these natural monopolies can be operated efficiently through appropriate planning, cost allocation, and business models.

Chapter eight switches the focus to energy-economic-environmental (E3) models and their applications by Renato Rodrigues, Antonio Gómez-Plana, and Mikel González-Eguino. It presents a very clear, introductory-level, survey of the evolution of the three main groups of E3 models: bottom-up; top-down; and a hybrid of these two. The challenge of E3 modelling is to construct the “ideal” model where technical explicitness, macroeconomic completeness, and microeconomic realism are fully incorporated, thus providing policy makers with a decision assisting tool that can identify the many trade-offs and objectives that will arise on the path to a sustainable energy future. An excellent, non-technical (almost!), survey.

The modelling theme continues in the following chapter by Karen Pittel and Dirk Rüb-
belke, which assesses the contribution of endogenous growth models to the understanding the long-run potential of economics to overcome the scarcity of fossil energy resources and the potential and direction of technological development.

In the final chapter of this “part”, Reinhard Madlener and Marjolein Harmsen-van Hout provide a survey of the literature on energy consumer behaviour and the quest for sustainable energy use. They start with a quote from the late Lee Schipper which is worth reproducing here: *Those of us who call ourselves energy analysts have made a mistake. . . . we have analyzed energy. We should have analyzed human behaviour.* They commenced their survey by dividing the literature along the main research disciplines involved, identifying the strength and weaknesses and particular views of the various approaches applied. They then assessed the contribution of the various approaches in guiding policy-makers to design appropriate policies that help to steer a course towards sustainable energy development.

Part III commences with a multi-criteria energy diversity analysis by Go Yoshizawa, Andy Stirling and Tatsujiro Suzuki. Supply security issues tend to dominate the logic behind energy diversity, but the authors suggest some less widely recognised benefits such as hedging ignorance, promoting competition, accommodating plural interests, fostering innovation, nurturing context-sensitivity, and mitigating lock-in. From which their definition of energy diversity follows as “an evenly balanced reliance on a variety of mutually disparate options”. They then discuss the degree to which existing diversity indices address these three properties: balance, variety and disparity. The theory is illustrated by studies of the UK and Japanese power supply sectors. Not surprisingly, after one has struggled through the fairly lexicographically heavy text, the observation is made that a common feature that renewable options are effectively as disparate from each other as they are from fossil fuels, and as the latter are from nuclear power.

Helena Cabal, Maryse Labriet and Yolanda Lechón review the world's, and European, renewable energy resource potentials with data gathered from the most recent relevant studies. They consider the theoretical potential, but then introduce geographical, technical, and economic constraints to provide a more realistic upper limit. The conclusions are (a range of) orders of magnitude above the current (which is 2005 for this purpose) level of global power demand. The reviewer finds it difficult to get excited about such studies!

“The cost of renewable energy: past and future” by Kirsten Halsnøes and Kenneth Karlsson is an intriguing title for a chapter covering a subject that should ideally be the subject of a lengthy tome. This chapter, however, is relatively short and focuses on Denmark, concluding with the seemingly unrealistic assumption that “100 percent renewable energy is not very costly given the favourable local conditions for high penetration of wind”. However, all is explained in the next phrase: “(given the) large electricity trade with Scandinavian countries and Germany”. Not all countries are fortunate enough to be in a position to use imports (the technology-source of which is often unspecified) to offset wind's intermittency!

With the advent of carbon pricing, the potential for efficiency gains in coal-based power plants is critical to their future financial viability. Since losses in large scale energy conversion processes can be substantial, particularly given their long life-span, why the potential gains are not being realised is a critical question to be answered. Luis Abadie and José Chamorro address this issue in the EU context, by considering a number of barriers to energy efficiency improvements in this context. However, they conclude that the fundamental problem at the individual company level is the difficulty in evaluating uncertain future savings derived from enhanced levels of energy efficiency, largely due to the difficulty of estimating future fuel and carbon prices with any reasonable degree of precision.

The third part concludes with a study of the potential for improved efficiency in the transport sector by Kenneth Button. He focuses on market and government distortions and the wide range of market-based incentives and command-and-control instruments that governments have at their disposal to control the use of fuels in the transport sector. He concludes with an emphasis on the need to allocate energy efficiently across all sectors and not to simply focus on sustainability on a sector-by-sector basis.

Under the somewhat “catch-all” fourth part entitled “Other Energy and Sustainability Issues”, three chapters address the controversial topics of nuclear energy, carbon capture and storage, and biofuels. Geoffrey Hammond gives a short overview of the chequered history of nuclear power and its prospects over the next couple of decades. Whilst the UK is the subject of most of his narrative, nevertheless his thinly veiled (pre-Fukushima) pessimism of its future role as a low carbon emissions mature technology had more of a global resonance. This is in marked contrast to the optimism of the following chapter on the future for carbon capture

technology by Edward Anthony and Paul Fennell. They concluded, almost convincingly, that “arguably (CCS is) the most promising solution to meet mankind’s major energy needs without grossly exacerbating the effects of anthropogenic climate change”. Peter Hazell and Martin Evans complete the trifecta by addressing the contentious issue of biofuels in the context of their economic viability, their environmental footprint on a full life cycle basis, and food security (and cost). Of course the term biofuels covers a large range of potential feedstocks and the authors conclude with recommendations that are designed to encourage development of technologies that reduce competition with food crops, protect primary forests and peatlands, and lower the cost of biofuels when compared with oil.

Part V is entitled “Energy and Climate Policy” and the first contribution is a review by Julien Chevallier of the market rules and lessons learnt during Phase I of the European carbon market (2005-07). The same author follows up with a second contribution where he evaluates the role of the Clean Development Mechanism (CDM) in the ultimate objective of a world carbon market. This is one of the more technical contributions in the Handbook, and a significant level of knowledge of econometrics is necessary in order to comprehend it. However, his conclusions are straightforward: one European Union Allowance (the currency of the EU ETS, corresponding to 1 tonne of CO₂) determined significantly the price path of already-issued Certified Emission Reductions (the corresponding currency for the CDM), although the latter was characterised by a greater level of uncertainty than the former.

It is worth reproducing the first sentence of the next chapter, by Xavier Labandeira and Pedro Linares: “The debate seems to be well settled among economists that the best policy instrument to reduce carbon emissions is a carbon tax”! Then why did we as a profession allow well-intentioned, but largely economically naive, politicians and environmental scientists to hijack the debate and impose a second-best instrument, an emissions trading scheme, on the world, and subsets thereof? This chapter goes a long way to answering this question with its analysis of policies and instruments that, when combined, will put us on a path to a second best solution, given that the first best is not achievable.

Hege Westskog, Tanja Winther and Einar Strumse address the question of how consumers determine their personal levels of energy consumption. They start from the assumption that the consumer is rational and that what may appear to some to be behaviour that does not conform to this assumption can be explained logically by delving into analyses from the other (i.e. not economics) social sciences. As economists, we tend to put a great deal of emphasis on price as the major factor determining consumer preferences, although we recognise and try to price in to any analysis other external impacts. This chapter extends the latter into a more realistic domain.

Part V concludes with a chapter on the role of R&D + i in the energy sector by Alessandro Lanza and Elena Verdolini, where the authors analyse future prospects for the major existing and prospective energy technologies in the context of patent data. They conclude that the broad energy technology portfolio required to meet carbon constraints will require both public and private partnerships to realise the significant investment requirements in innovation, adoption, diffusion, and technology transfers.

The final “part” of the volume commences with a chapter by Rob Bailis that discusses the complex role that energy plays in facilitating poverty alleviation from the perspective of poor countries. It focuses on the concept of “well-being”, particularly where lack of access to energy contributes to the deprivation of individual and societal capabilities that the energy-rich enjoy. In lacking such access, the energy-poor, by extension, cannot access many of the freedoms that are facilitated by having “adequate, affordable, reliable, high-quality, safe, and

environmentally benign energy services". Additional supply alone is not the answer, he argues, as distribution policies that promote access to energy services and associated technologies are also of critical importance.

Thomas Reisz considers the past and future role of regions in the energy sector, focussing on North Rhine-Westphalia, and drawing conclusions about the benefits of decentralisation and energy policy. The study is rather parochial, but nevertheless has a broader context as a result of globalisation.

Remaining with the parochial, although arguably less so due to the size California's economy compared with most nation states, David Heres and Cynthia Lin outline California's energy-related greenhouse gas emissions reduction policies. California became the first sub-national U.S. entity to establish a state-wide enforceable target on total greenhouse gas emissions in 2006, and its cap-and-trade system (in association with four other U.S. states and four Canadian provinces) will commence in 2013. The chapter is largely focussed on six energy-related complementary measures that are already in place: vehicle standards, low carbon fuel standards, regional transportation targets, energy efficiency, renewable electricity standard, and increasing combined heat and power generation. There are some concerns regarding leakage until other states adopt similar policies, but these measures are expected to contribute to almost 60 percent of California's 2020 reduction target.

Finally, and still with the parochial, Jose Hormaeche, Ibon Galarraga and Jose de Ormijana present an analysis of the past, present, and future of energy policy in the Basque region. Due to its heavy reliance (95%) on imported energy the Basque region raises an interesting question: is it economically efficient to address sustainability issues at a regional level when there is a clear EU legislative carbon reduction obligation on the nation itself (not its constituent states)? Surely the optimum policy is to meet carbon reduction obligations at the lower possible cost nationally, with any adverse regional impacts addressed through an appropriate compensation arrangement.

For those who have got this far through this review, it should be evident that this may be a frustrating book to be read cover-to-cover. The reviewer found some chapters both relevant and insightful, others were fairly obscure or lacked rigour. In particular, some of the more parochial chapters could have been omitted and a broader spectrum of international research included in its place. Specifically, issues involving carbon constraints in the context of liberalised markets and long-term energy efficiency is an area where a wealth of issues needs to be addressed, and non-EU contributions would have been very pertinent in this context.

Nevertheless, a very useful source document and many of the chapters represent a good starting point for student research projects.

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Energy, Sustainability and the Environment. Technology, Incentives, Behavior, edited by Fereidoon P. Sioshansi. (Amsterdam: Elsevier, 2011). 640 pages. ISBN 978-0-12-385136-9 (hardcover)

This book may be seen as the natural complement of a previous volume by the same editor titled *Electricity generation in a carbon constrained world* (2009), which explored the

different approaches of de-carbonizing electricity generation. The present book starts from the realization of the editor, after finishing that first book, that an assessment of the present situation leads to the conclusion that “the status quo does not appear to be sustainable” and “the size of the problem is enormous” and that, although much can, and should, be done on the energy supply side, in all likelihood these efforts will not be sufficient, and we must work equally hard on the demand side.

The central message of this new book is that the effort on the demand side should not be limited to improving the efficiency with which energy is used, but should concentrate on altering the nature of the way we work and consume, and, ultimately, examining our values and lifestyles. In this respect the book goes far beyond the usual treatment of energy efficiency and conservation to offer a novel and thorough but refreshing view of the underlying drivers of energy consumption and how they could be influenced by organizational changes, information or social values and priorities, in addition to the customary economic signals, quotas and standards.

The book starts from the assertion that our current economic system—which is based on ever increasing production, consumption and growth and the assumption of cheap and plentiful energy—has resulted in a wasteful and potentially unsustainable consumer-oriented culture, with growing inequalities among the rich and the poor, not just in terms of income or energy per person, but also in terms of per capita carbon and ecological footprint. At a minimum we have to make significant adjustments in our business-as-usual economic, social and ecological paradigms to avoid impending scarcities, including the worst consequences of climate change.

The book is a well-organized selection of topics by an international and interdisciplinary group of authors, who from different perspectives address a common question: Can we meet the basic energy requirements of a growing population with rising aspirations for higher and more equitable living standards in a sustainable way? The editor of the book has allowed the contributing authors the maximum flexibility to express their views—sometimes contradictory—if they are supported by rigorous analysis and reasoning.

The book is divided into three parts, with eight chapters in Part I, six in Part II and five in Part III. It starts with an in-depth review of the drivers behind energy demand, where the consumers’ needs and preferences are examined in detail. It continues with a comprehensive examination of measures to sustainably meet the demand for energy services, where the consumer priorities and changes in lifestyle play an important role. The third part presents an interesting set of innovative initiatives, all over the world, which are well aligned with the message of the book.

Part I starts with a chapter by Fereidoon Sioshansi, editor of the book, showing that there is much flexibility in how the human needs can be satisfied, since the amount of energy that is needed to sustain a given lifestyle is not predetermined and can be adjusted through many different means: prices, substitution, investment, social and cultural norms, influencing habits, policies or standards.

The next chapter (by Frank Felder, Clinton Andrews and Seth Hulkofer) identifies major factors in the future change of energy demand and shows that most of the value of prospective analysis and energy planning resides in facilitating informed discussion on the kind of energy future we really want.

Part of the difficulty stems from the fact that there is no universally accepted definition of what is an “adequate standard of living” and, even if it could be defined, there is no clear

procedure to determine how much energy is necessary to sustain it, or what is a reasonable carbon quota per person, since the answer is so much culture-dependent, as shown in the following chapter (by Françoise Bartiaux, Nathalie Frogneux and Olivier Servais).

The urgency to give an efficient response to climate change before we exceed some critical tipping points, and the barriers that prevent a timely action, are addressed next (chapter by Niels Meyer, Frede Hvelplund and Jørgen Norgård), along with the need for new and supplementary mitigation schemes, based on changes in lifestyles—such as personal carbon allowances or even regulation of birth rates—or a shift towards more relevance of long-term planning and mandatory standards over markets.

The next three chapters offer alternative views to the viability of a sustainable energy model within our current economic system and the associated values. One chapter (by Ted Trainer) presents forceful arguments arguing that the critical assumptions underlying most approaches to climate change—the problem has a solution, without serious disruption of the economy, while increasing the standards of living and maintaining economic growth—are false, and advocates a radically different culture, in which competitive and acquisitive individualism is replaced by frugal, self-sufficient collectivism. On the contrary, the next chapter (by Carlo Andrea Bollino and Paolo Polinori) maintains that the policies required to achieve future sustainability are plausible—based on the customary renewables and energy savings—and therefore there is no need for a major departure from our socio economic system provided there is the political will, with the lack of international cooperation being the major barrier. The third one (by Alan Moran) investigates the costs of carbon abatement across different sectors and uses, as well as the potential impact on the economy of measures that try to force major structural changes, and finally suggests a gradual and progressive response unless there is a clear risk of irretrievable damage.

The final chapter of Part I (by Noah Long, Pierre Bull and Nick Zigelbaum) should rather belong to Part II. It focuses on energy efficiency and proposes a set of regulatory reforms—minimum energy performance standards, removal of market barriers and incentives for high performance—to unlock demand and create incentives toward maximizing the social welfare of energy services.

Having explored the drivers for energy demand and its expected future evolution, in Part II the book turns to issues and problems related to the required technologies and the regulatory measures that should be adopted. Three chapters focus on different aspects of energy efficiency in residential buildings. The first one (by Meredith Gray and Jay Zarnikau) surveys innovative green building programs and examines emerging technologies for low energy consumption appliances and construction, with the net zero energy home as the objective. The second (by Christoph Weber and Klaas Bauermann) examines different pathways toward a low carbon building stock, and investigates if the measures and standards in the current German regulation are sufficient to tap the existing potential, which in colder climates critically depends on how the buildings are heated. The third one (by Karen Ehrhardt-Martinez, John “Skip” Laitner and Kat Donnelly) looks at households beyond the meter and evaluates the potential role of smart meters and communication devices in reshaping the current energy consumption patterns—habits, lifestyles and choices—and potentially impact the entire production system.

Two chapters explore energy efficiency of the medium and large size consumers. Leading industrial and commercial organizations are increasingly involved in energy efficiency activities by overcoming the barriers to efficiency investments and behaviors that many organizations contain. One chapter (by William Prindle and Scott Finlinson) focuses on organizational

behavior—shifting the focus of energy efficiency and carbon emission reduction strategies from only technological efforts to behavior-based ones—as the most promising means for achieving significant near term results. The other chapter (by Marilyn Brown, Rodrigo Cortes and Matthew Cox) describes the progress made so far in industrial demand, identifies shortfalls in energy productivity in the US industrial sector and estimates the magnitude of the remaining opportunities when use is made of best practices enabled by emerging technologies and innovations.

Finally one chapter (by Douglas Arent, Paul Denholm, Eason Drury, Rachel Gelman, Chuck Kutscher, Margaret Mann, Mark Mehos and Alison Wise) describes how far renewables have come during the past decades and evaluates their potential to provide a much larger fraction of the future energy needs in the US and elsewhere.

In the five chapters of Part III, the book examines several self-imposed initiatives, at local community, corporations or governmental level, as a step towards binding global targets. One chapter (by Bram Buijs) examines the case of China, its significance for the future sustainability of the globe, its huge carbon mitigation potential—particularly in rapidly expanding sectors as housing, transportation and power generation—since it is in a phase of quick development and there are still many degrees of freedom. China's energy policy has a strong commitment to energy efficiency and conservation, as well as to renewable energy sources. However, economic development and not sustainability is the major concern of current Chinese energy policy. A different perspective is brought by the chapter on the “Swiss 2,000-Watt Society” experience in Switzerland and elsewhere (by Roland Stulz, Stephan Tanner and René Sigg), where it is shown how current standards of living in developed countries can be maintained, including the provision of energy services, plus an equitable distribution of the world finite resources among all its inhabitants—2000 Watt per capita equivalent of continuous output—if energy utilization efficiency in industrialized countries is improved three or four-fold. Other experiences include: a) a joint program in California of the Public Utility Commission and the investor owned utilities to achieve zero net energy in residential (by 2020) and commercial (by 2030) buildings and to identify the existing regulatory measures that impede progress towards achieving these goals, as described in a chapter by Nicholas Rajkovich, William Miller and Anna LaRue; b) a voluntary program of the City of Austin, Texas, to make all municipal operations carbon-neutral by 2020, which could be a model for other towns in the world (chapter by Jennifer Clymer); c) other initiatives to improve urban energy efficiency (Clinton Climate Initiative), reduction of energy costs in large computing facilities (Motorola) and the singular case of Masdar City to be fully supplied by renewable energy sources in the final chapter by Benjamin Sovacool.

The epilogue by the editor of the book succinctly presents his personal view of the collective findings and insights.

This book is a must for anybody seriously interested in energy efficiency and how to achieve a sustainable energy model. It convincingly shows that technological and economic approaches are not sufficient, given the scale of the challenges in question, so that we have to focus on less conventional methods that consider values, behavior and lifestyle aspects of individual consumers, communities and the entire society. The book tries to show how more people in the world can enjoy adequate living standards while living in harmony with the environment. This entails using energy wisely, efficiently and sparingly, perhaps frugally, and will require making bold, radical although mostly gradual changes, since “there are enormous

opportunities to achieve far more with far less.” And these opportunities mostly lie on demand, more than on supply.

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Competition, Contracts and Electricity Markets: A New Perspective, edited by Jean-Michel Glachant, Dominique Finon and Adrien de Hauteclocque. Loyola De Palacio Series on European Energy Policy, (Cheltenham: Edward Elgar Publishing Ltd., 2011). 312 pages. ISBN 978-1-84980-479-0

The efforts of electricity market restructuring in Europe have been going on for two decades now and it is time to recollect successes and failures. This book contains contributions to a workshop hosted by GIS LARSEN¹ and the Loyola de Palacio Program at the European University Institute in Florence, held in 2009. The line-up of contributions (and participants) includes academia, industry, consultancy and authorities, and promises an in-depth analysis of arguments regarding the diversely discussed relation between competition and long-term contracts in electricity markets.

The book is essentially structured around three foci embraced by an introduction and conclusions. First, the role for long-term contracts and investment decisions is under scrutiny. Second, arguments for and against the achievement of competition with the existence of long-term contracts are presented, before, thirdly, the role for competition policy with regard to long-term contracts is identified.

“Conventional wisdom in electricity restructuring requires limitations of long-term contracts and vertical integration between generators, retailers and large customer. . . . Long-term contracts and vertical integration can be a convenient way to maintain incentives to invest in all technologies of the generation mix.” (pages 1–2). With this opening remark the editors of this volume set the scene for what is to come.

In Chapter 1 Boucher and Smeers are concerned with security of supply, i.e. generation capacities in relation to demand, in competitive markets. In particular the authors argue that there is a difference in risks – security of supply being less risky but with higher probability than “standard” risk of a company. Drawing on the argument of missing markets and given that security of supply risks are not traded, investment will not come forward. Essentially, Boucher and Smeers provide a security of supply argument to the European Commission in order to adjust current legislation in favor of incentivizing investments in generation (other than natural gas fired).

Unfortunately, this comes without a quantification of the costs associated with a disruption of supply. Roques in Chapter 2 then shows how technology choices in generation (with conventional fossil fuels) is related to contractual arrangements for investors in need to hedge the risk associated to fuel costs and electricity prices. It turns out that long-term contracts or vertical integration enables better risk mitigation when it comes to investments in capital-intensive technologies using Monte Carlo simulations of traditional discounted cash flows.

1. GIS Larsen was a joint research lab (Laboratory of Networks and Energy Systems Economic Analysis) between some French research institutions, established in 2006 and laid down after four years of activity.

His policy recommendation points towards incorporating these factors for competition authorities in merger and acquisitions analysis. It remains, however, unclear if this is a European perspective only or if results also hold in an international context.

Finon in his contribution argues that a decentralized market model is not suitable to achieve long-term generation investments through the lens of transaction cost economics. Given uncertainty, hold-up risks and transactional complexity in electricity markets, he concludes his argumentation by confirming the existence of market failure. Therefore, the “more economic” approach in competition policy should balance investment in capital-intensive generation capacities with potential market power abuse and entry barriers.

Using the same framework, Meade and O’Connor in Chapter 4 argue that market imperfections imply a trend towards more vertical integration in electricity markets in order to manage risks. Although (extensive) long-term contracts are regularly seen as quasi-vertical integration, the authors present rationales for the latter in decentralized electricity markets which apparently results in a higher optimal level of retail competition.

The formal theoretical framework for determining this optimal degree of competition is encouraged. Brunekreeft’s contribution in Chapter 5 of the first section deviates somewhat from the topic in a sense that it focuses on i) investment in interconnector capacity, ii) the effect of unbundling of ownership on investment and iii) a comparison to the natural gas pipeline system. He finds that there is a strategic element for a vertically integrated company to withhold investments for congested electricity interconnection capacity. At the same time, transportation of natural gas is prone to contractual congestion in the event of physical congestion. As a result, heterogeneous policy approaches for the two sectors are required to incentivize investments in transportation infrastructure.

Section 2 of the book then scrutinizes the importance of long-term contracts in imperfectly competitive markets. First, in Chapter 6 Meunier provides an excellent overview of different views one may take regarding extensive contracts. All theoretical arguments for and against are provided and underpinned with existing analyses. The main arguments (forward contracts, exclusive dealings and investment incentives) are provided and lessons of potential interest for the electricity industry summarized.

Longva in Chapter 7 then represents the view of an industry apparently prone to sign such a long-term agreement. He argues that the most effective and immediate action to be taken is the development of truly competitive spot and forward markets in order to reveal market pricing. According to his argumentation long-term contracts do not represent potential foreclosure, but a risk mitigation strategy of industry.

Mulder in Chapter 8 illustrates the coexistence of competition and long-term contracts for the Dutch electricity market and shows that indeed these contracts are an important element of the market. Given that all transport tariffs in the domestic wholesale market are regulated, there is little need for long-term contracts when deciding on investment. The situation in retail markets appears to be somewhat different since long-term contracts with consumers may hinder competition. He points towards the lack of empirical evidence showing that long-term contracts indeed impede competition and hence advises authorities to focus on factors such as suboptimal use of interconnectors in competition analysis.

The third section of the book takes a more competition policy and juridical view on long-term contracts. Hauteclouque and Glachant balance positive and negative effects and conclude that as long as the European electricity system remains not fully integrated there is a role for all possible types of transactions (long-term contracts, vertical integration and spot trading). The authors deliver a fair description of the current competitive practice in Europe regarding

long-term contracts. Most notably it is argued that “the vague concept of ‘security of supply’ is itself approached with increasing skepticism in competition cases” (p. 225).

Hancher in Chapter 10 draws the reader’s attention to a related view in European law by investigating if long-term contracts should be considered from a state-aid law perspective. In particular, cases from Poland and Hungary are used to nicely illustrate (to economists) potentially legal invalidity of long-term contracts from this perspective. The main conclusion points towards potential legal consequences for state-owned entities signing such contracts in markets that are far away from being competitive.

Chapter 11 by Hautecloque, Mantry and Pillot draws our attention to what is known as the Essential Facility Doctrine and its application/interpretation in European competition policy in the energy sector. Applying the argument to balancing services in the electricity and storage in natural gas markets, behavioral and structural remedies are described. In essence the authors argue that antitrust and regulation are complements and that false positive decisions may impede investment decisions. Thus they need to be in unison in order to increase consumer welfare.

The last Chapter 12 by Hautecloque summarizes the main objectives and points of the workshop and the resulting book. He concludes that i) vertical arrangements are necessary to positively impact spot markets, ii) there is no inherent conflict between liberalization and investment incentives and iii) the relation between the concept of security of supply and long-term contracts is at best unclear.

Jointly, most of the papers use long-term efficiency as argument in their contributions. Hence, it might have been useful to have a first chapter introducing and defining, and outlining the theoretical risk occurring in electricity markets.

The traditional European energy policy triangle has been redefined since its definition. The first ten years of market reforms were working with an isosceles triangle focusing on creating a competitive internal market for electricity. Possibly this pillar was the most obvious and easiest to tackle first, given the existence of theoretical frameworks explaining the overall economic benefit of competition. The second decade of European energy policy then shifted the focus to the development of a sustainable energy future and as a result implemented the Emission Trading Scheme, as well as renewable and efficiency targets. Now we are at the turn again and security of supply has come on the agenda. One could argue that competition reduces producer surplus to an extent that it indeed financially hurts companies with a business model relying on monopolistic market structures. Arguing against competition may be difficult, but a concept such as security of supply can provide arguments to lessen the pain and making the triangle an equilateral one. Given two decades of rent redistribution, hopefully, this will go hand in hand with an increase in welfare, but not at the expense of consumers.

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