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## Beyond the Carbon Economy: Energy Law in Transition By Donald Zillman, Catherine Redgwell, Yinka Omorogbe and Lila Barrera-Hernández (eds.)

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Anyone who has maintained an interest in Energy law over a reasonable period of time will find it hard to deny that the subject is, indeed “in transition”.<sup>1</sup> From being a discipline focused primarily on issues relating to oil and its relationship to coal as a primary energy source (with even more specialist forays into nuclear power, particularly in the areas of liability, insurance and international co-ordination on safety<sup>2</sup> and proliferation of nuclear materials), attention has shifted to the development of alternative, sustainable sources of energy for the future. Alongside this shift, the process of liberalisation of the electricity and gas sectors has found adherents in many countries across the world,<sup>3</sup> bringing competition, regulatory and trade law questions into

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<sup>1</sup> There is, naturally, perhaps more scope for argument over exactly when this transition began, why, how far and to what end(s) this might be so.

<sup>2</sup> Especially after the Three Mile Island and Chernobyl “incidents”: see P.D. Cameron, L. Hancher & W. Kuhn (eds.) (1988), *Nuclear Energy Law after Chernobyl* (London: Graham & Trotman). See, more recently, C. Stoiber, A. Baer, N. Pelzer and W. Jonhauser (2003), *Handbook on Nuclear Law* (IAEA: [http://www-pub.iaea.org/MTCD/publications/PDF/Pub1160\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/Pub1160_web.pdf)).

<sup>3</sup> See, e.g., D. Newbery (1999), *Privatization, Restructuring and Regulation of Network Utilities* (Cambridge (MA): MIT Press) and P.D. Cameron (2007), *Competition in Energy Markets: Law and Regulation in the European Union* (Oxford: 2<sup>nd</sup> edn. OUP).

the Energy law mix on national,<sup>4</sup> regional<sup>5</sup> and international<sup>6</sup> levels. Blending these disparate and often mutually inconsistent legal rules and systems into a coherent presentation of Energy law today, even in one country let alone globally, is no easy task. Nevertheless, the pressures being exerted on the energy sector, whether through, in spite or because of the law, require careful consideration if the system is to be(come) able to meet the challenges of secure, sustainable and affordable energy supplies in the future. This welcome volume makes a wide-ranging and interesting contribution to scholarly endeavours in the field of Energy law, with particular reference to the challenges of developing the energy system beyond its current heavy reliance upon (hydro)carbon fuels and the role that the law can play in facilitating (as well as hindering) this transition.

That being said, the book does not adopt a perspective which could be accused of lacking realism or context with regard to the extent that these developments will wean the world off its continuing reliance upon hydrocarbons altogether. As acknowledged in Chapter 1's introductory comments, even energy scenarios which rely upon great growth in nuclear and renewable energy supply over the next 20 years would still envisage a growth in demand for oil, natural gas and coal for much or even all of that period and perhaps beyond. Thus, "[f]ossil fuels with their carbon content will be around, and will dominate energy supply for many years to come".<sup>7</sup>

Nevertheless, the introductory first chapter also provides a particularly helpful discussion of the key factors which drive the need to look beyond the carbon economy:<sup>8</sup> these factors provide the context for much of the rest of the book and are worth noting here. Thus, climate change and other environmental damage caused by reliance upon fossil fuels are now widely recognised as key drivers in this regard. In recent years, a second key element has returned to the fore: that of energy security,<sup>9</sup> in all of its many aspects (e.g. adequate supplies available on an uninterrupted basis and at reasonably affordable cost to all). The increasingly difficult geopolitics of access to energy supplies (think of the Russia-Ukraine gas disputes of the past few years, as well as the general instability of the Middle East, where the vast majority of the world's petroleum reserves are located, to name but two examples), allied with increased fears of terrorist attacks on infrastructure targets have rocketed this issue up the political agenda. Third, there is the projected increase in energy demand throughout the world, driven by expected increases in living standards in developing countries (demand for transport, heating, appliances,<sup>10</sup> etc). Of course, such demand has, since this book was written, taken something of a hit in the face of the global economic downturn in the wake of the financial crisis, but it is certain that economic recovery thereafter will herald a concomitant recovery in energy demand. Even if the optimists are correct

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<sup>4</sup> E.g. D. Helm (2004), *Energy, the State and the Market: British Energy Policy since 1979* (Oxford: OUP, 2<sup>nd</sup> edn.).

<sup>5</sup> For the European Union, see, e.g., Cameron (n. 3, *supra*) and M. Roggenkamp, C. Redgwell, I. Del Guayo and A. Rønne (eds.) (2007), *Energy Law in Europe* (Oxford: 2<sup>nd</sup> edn. OUP).

<sup>6</sup> See, e.g., Redgwell, 'International Regulation of Energy Activities' in Roggenkamp *et al* (eds.), n. 5, *supra*, Ch. 2.

<sup>7</sup> Zillman, Redgwell, Omorogbe, Barrera-Nernández and Barton, 'Introduction', Ch. 1, at 6.

<sup>8</sup> *Ibid.*, 6-9.

<sup>9</sup> On which, see S. Haghighi (2007), *Energy Security: The External Legal Relations of the European Union with Major Oil and Gas Supplying Countries* (Oxford: Hart Publishing), Ch. 1; and B. Barton, C. Redgwell, A. Rønne and D. Zillman (eds.) (2004), *Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (Oxford: OUP).

<sup>10</sup> See the revealing quote cited in chapter 1 (at 4, n. 3) from P. Roberts (2004), *The End of Oil* (London: Bloomsbury), 156: "[b]efore 1985, only 7 percent of all Chinese had refrigerators; today, the figure is more than 75 percent. The number who own TVs has climbed from 17 percent to 86 percent. Air conditioners have multiplied by a factor of fifty'.

that future exploration, discovery and exploitation of hydrocarbon energy sources will be able to keep pace with such increasing demand, this leads us to the fourth reason to look beyond the carbon economy: the sheer amount that will be required to invest in the energy sector in the coming years simply to maintain current supply levels, much less to meet the forecast growth in demand. Transportation capacity (whether via high voltage power lines, large capacity gas pipelines or traditional maritime shipping for liquefied natural gas) and storage capacity will need to be maintained, upgraded<sup>11</sup> and expanded, and that is before other investment costs are taken into account (e.g. for research and development of new technologies, for oil and gas exploration and exploitation, for the now widely projected new nuclear power plant building programmes in many countries, and for increased costs of building and construction to meet new energy efficiency standards). Finally, but by no means least importantly, the development goals of the global community to raise vast numbers of the world's population out of poverty and starvation are, in many respects, goals with a direct connection to energy: indeed, it may be argued that without access to appropriate energy supplies, the achievement of these goals will be impossible.<sup>12</sup> However, as is noted in this first chapter,<sup>13</sup> the need to supply developing countries with reliable energy does not presuppose that such energy will necessarily be supplied from non-fossil fuel sources: much will depend upon the precise circumstances of individual countries and regions, and on the state of development and deployability of these new sustainable energy technologies in deciding the appropriate way forward for achieving these development goals.

After having set the scene, the book proceeds first to examine other “scoping” issues, including a helpful overview of the impacts and potential of fossil and alternative fuel sources (Chapter 2), a discussion of the role of the law in promoting sustainable development through the use of renewable energy (Chapter 3) and the important but often neglected topic of the law of energy efficiency (Chapter 4). Then, in Part 2 consideration is given to international and regional approaches to some of these issues, including overviews of developments in both South America (Chapter 7) and Africa (Chapter 8), alongside discussion of international legal responses to such matters (including the Kyoto Protocol, but also other instruments and institutions which have become involved in various ways over the years: see Chapters 5 and 6). Part 3 of the volume, meanwhile, moves to examine the issues from both sectoral and technology-based angles. First, an overview is provided of renewable energy in national legislation (Chapter 9), followed by a helpful discussion of the use of market-based instruments in the move away from a carbon-based economy (chapter 10). Then, the analysis moves to consider a variety of different energy supply technologies and sources, examining oil sands and heavy oil (Chapter 11), biofuels in the European Union (‘EU’) (Chapter 12), wind energy (Chapter 13), nuclear power (Chapter 14) and carbon capture and storage (‘CCS’) (Chapter 15). In Part 4, a wide range of national perspectives is provided, covering China, Brazil, India, Mexico, Australia, Japan, Russia and the USA (Chapters 16 to 23). Finally, Part 5 concludes with an admirable attempt by the editors to “pull the threads together” from the variegated contributions throughout the book (Chapter 24), emphasising the absence of ‘one size fits all’ solutions and considering the role that the law might usefully play in the future in this energy transition.

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<sup>11</sup> E.g., in electricity, to introduce more energy efficient grid management and usage policies, such as distributed generation, and to accommodate increased capacity in general (particularly if wind power's contribution to generation continues to increase at planned rates).

<sup>12</sup> See Omorogbe, ‘Promoting Sustainable Development through the Use of Renewable Energy: the Role of the Law’, Ch. 2, 41-45 for details.

<sup>13</sup> Zillman *et al*, n. 7, *supra*, at 9.

With such a wide range of material, it is inevitably impossible in a short review to consider the arguments and contributions made by each chapter, so, allied with the inevitable subjectivity of any review,<sup>14</sup> I will focus here only on certain areas. But this should not be taken as a judgment that those other matters are of less interest or importance.<sup>15</sup> Given that the main predicted sources of growth in future energy demand will be developing countries,<sup>16</sup> an understanding of their legal and governance regimes, and their progress towards the availability of energy supplies to facilitate their development while improving energy efficiency and diversifying supplies into (particularly local) renewables, will be vital to gain an accurate global picture. In that connection, the achievements<sup>17</sup> and failures<sup>18</sup> of such countries, the relevant national legal provisions and their enforcement and enforceability in practice must be studied. In particular, the consistent commitment of government bodies to such energy goals will be crucial, particularly since legislative measures will be the main focus for legal development in this area given the absence of more general constitutional or other legal provisions relevant to energy problems.<sup>19</sup> While this is obviously a key factor in developing countries,<sup>20</sup> there has long been a (perceived) problem of government short-termism in energy policy in developed countries too.<sup>21</sup> A further important element will be the independence and robustness of the judiciary in upholding the rule of law in the face of other domestic pressures, whether from government or powerful private domestic or foreign interests: on this point, the contrasting discussions in the book on the positive<sup>22</sup> and negative<sup>23</sup> contributions by, and prospects for, the judicial role in this energy transition are worthy of careful comparative study by energy and constitutional lawyers alike (as well as by political scientists and development theorists). In part, these studies are important because there may be lessons for developing countries to learn from the trial-and-error developments which have already taken place or which are still ongoing in the developed world, but their experiences may have important lessons to teach other countries across the world, particularly with regard to the development of more localised electricity generation capacity in the future.

Efforts have been made to stress connections between different chapters throughout the book, where the issues in question interact, overlap or raise similar questions: one excellent example is provided by the flow from the conclusion to Omorogbe's Chapter 3 ("energy efficiency, and not the move away from carbon, is the ultimate solution to slowing or possibly halting adverse

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<sup>14</sup> No doubt revealing (in more or less equal measure) the present author's interests, prejudices and ignorance.

<sup>15</sup> E.g., given the EU's recent adoption of Directive 2009/31/EC [2009] O.J. L40/114 on the geological storage of carbon dioxide, and the subsequent decision to fund a number of demonstration plants to test CCS technology, Bankes and Roggenkamp's discussion of the 'Legal Aspects of Carbon Capture and Storage' (Ch. 15) takes on heightened significance. Meanwhile, with many countries all over the world planning to (re-)commence nuclear power station programmes, Zillman's contribution on 'The Role of Law in the Future of Nuclear Power' (Ch. 14) also appears particularly prescient.

<sup>16</sup> See Zillman *et al*, n. 7, *supra*, Ch. 1, 4-5 and 8-9 and the references cited therein.

<sup>17</sup> *Ibid.*, 53ff, and see also for further discussion and context: de Alencar Xavier (Ch. 17 on Brazil) Rajamani (Ch. 18 on India).

<sup>18</sup> Omorogbe, Ch. 2, n. 12, *supra*, 49-50.

<sup>19</sup> Zillman, Redgwell, Omorogbe and Barrera-Hernández, 'Overview and Conclusions', Ch. 24, at 549-550.

<sup>20</sup> See, esp., Barrera-Hernández, Ch. 7.

<sup>21</sup> For discussion and one possible solution concerning governments' international commitments, see, e.g., Ismer & Neuhoff (2009), 'Commitments through financial options: an alternative for delivering climate change obligations' 9 *Climate Policy* 9.

<sup>22</sup> See Rajamani (India, Ch. 18), Godden (Australia, Ch. 20) and Gulliver & Wheeler (USA, Ch. 23).

<sup>23</sup> See Barrera-Hernández (South America, Ch. 7), Wang (China, Ch. 16) and Krasnova (Russia, Ch. 23).

effects of exclusive reliance upon hydrocarbons”)<sup>24</sup> into Barton’s discussion of ‘The Law of Energy Efficiency’ in chapter 4. Barton makes a strong case for the need to take energy efficiency seriously as a public policy priority.<sup>25</sup> As a general matter, more efficient use of energy improves individual and corporate wealth and has positive implications for national economic performance. Furthermore, energy efficiency also tallies with a range of other factors and policy goals: as energy prices rise, greater efficiency in usage will become vital; similarly, various uncertainties and shocks may undermine supply security, so that it will be important to husband those available energy resources even more carefully, while greater care in this regard will also reduce burdens on local infrastructure (with regard to capacity, maintenance and management costs). On the environmental side, both the costs and extent of ‘traditional’ environmental impacts (such as air pollution, habitat and landscape destruction, etc) and climate change can be reduced if ever greater energy efficiency can be achieved. Governmental awareness of, and reliance upon, these various rationales in favour of energy efficiency has varied over time and by country,<sup>26</sup> but regularly it seems that energy efficiency ends up as the “poor relation” in energy policy. It is seen as less exciting than the development of new technologies to provide ever more supply to meet burgeoning demand or to create ‘end-of-pipe’ solutions (CCS) to *cure* the pollution problems of greater supply production when, as any good doctor will tell you, *prevention* is usually the better approach wherever possible. Barton is careful also to examine objections to efficiency policies, canvassing the economic literature to justify the need to pursue such policies and emphasising, crucially in the present author’s view, that such policies are far less politically controversial than more recent innovations such as environmental or emissions taxes and the like: many countries have long had energy efficiency policies in hard and/or soft law form, implying that significant strides could be made in many national systems by a stronger commitment to energy efficiency measures in the future.<sup>27</sup> Barton concludes his contribution with a short overview of how one might design and implement a variety of measures to improve energy efficiency, including various “non-price” barriers<sup>28</sup> (which can often prevent individuals from responding rationally to questions of energy efficiency) and the careful design of energy markets to ensure both competitive pressure to promote efficiency in generation/production and supply and appropriate signals<sup>29</sup> to encourage end-user efficiency.

Moving on to discuss the supply side of the energy equation, Ottinger (with Mathews and Czachor) use Chapter 9<sup>30</sup> to provide a very helpful summary of national level barriers<sup>31</sup> to the use of renewable energy and a wide range of examples from numerous national systems of how such

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<sup>24</sup> Omorogbe, Ch. 2, n. 12, *supra*, at 59.

<sup>25</sup> Barton, Ch. 4, at 62.

<sup>26</sup> *Ibid.*, 63-67.

<sup>27</sup> *Ibid.*, 67-73.

<sup>28</sup> Such as: lack, or confusing and conflicting abundance, of information provided to consumers; reluctant or ill-informed people in industry (architects, builders, local authorities, building inspectors): see, *ibid.*, 73-74.

<sup>29</sup> Which might include metering, information programmes, labeling and certification schemes. So-called ‘white certificates’ to reward energy efficiency could also be developed: these are discussed in more detail in Banet’s contribution to the book under review, ‘The Use of Market-Based Instruments in the Transition from a Carbon-Based Economy’, Ch. 10 (see, *infra*, text following n. 35).

<sup>30</sup> ‘Renewable Energy in National Legislation: Challenges and Opportunities’.

<sup>31</sup> Such as subsidies, specific legal/regulatory impediments, cost and pricing barriers and other market distortions: see, *ibid.*, 184-191.

difficulties have been tackled,<sup>32</sup> including the identification of key general characteristics of successful national renewable energy policies.<sup>33</sup> They stress the need to assess national and local needs carefully *ex ante* to ensure that national policies meet those needs and obtain the public support necessary to implement renewables policies in practice. Further, any assessment of the success (or, indeed, failure) of national renewables policies requires a well designed, implemented, enforced and well resourced national system for reporting, inspection and enforcement of such policies. This succinct summary of a wealth of experience and practice from many different countries is both clear and stimulating, and should encourage national (and other) policy makers to learn from the experience of other systems in developing their own renewables policies for the future.

To at least some extent, Chapters 10 (Banet on market-based instruments), 12 (del Guayo on biofuels) and 13 (McHarg & Rønne on wind power) were overtaken by events relatively soon after this book was published, thanks to the adoption in 2009 of two new EU Directives on renewables (including biofuels)<sup>34</sup> and the EU's emissions trading scheme ('EU ETS')<sup>35</sup> respectively. Yet these chapters remain extremely interesting and useful reading for anyone interested in their respective subject areas. Banet provides a clear, careful and succinct discussion of the rationale for relying upon market-based instruments, and then proceeds to conduct an analysis of what she terms 'green' (renewables), 'white' (efficiency) and 'brown' (emissions) certificates. She explains the links between such certificates and EU-level measures, the differences between the three in legal and practical terms,<sup>36</sup> and various experiences with the trade of such certificates and the operation of the EU ETS in its first phase. On the evidence of this chapter, the completion of her doctoral work in this area is to be awaited with no little interest.

The analysis in del Guayo's discussion of 'Biofuels: EU Law and Policy' illustrates nicely both the growing awareness of this area on the EU level and its complexity, involving as it does systemic issues of EU and Member State competence, target-setting and national policy and discretion, taxation and the practical achievement of EU and national goals in the area. At the same time, the technical and scientific details of any comprehensive legal framework for biofuels policy are also formidably difficult and pose tricky questions for international law in the fields of trade, subsidies and sustainable development. This is brought out in del Guayo's discussion<sup>37</sup> and (particularly the sustainability question) dominated the tense and complicated negotiation of the

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<sup>32</sup> See, *ibid.*, 191-204. These include national and international, public and private sector efforts, and the authors discuss such issues as: (concerning production support) feed-in-tariffs and other subsidies (production and investment), and policies to encourage technology research and development (including demonstration schemes); and (concerning consumption) renewable energy targets and 'green certificates', consumer subsidies, and education, training and information policies.

<sup>33</sup> *Ibid.*, 204-206.

<sup>34</sup> Directive 2009/28/EC [2009] OJ L140/16.

<sup>35</sup> Originally, the EU ETS was established by Directive 2003/87/EC [2003] OJ L275/32; for allocations from 2012, see now the changes wrought by Directive 2009/29/EC [2009] OJ L140/63 (for a consolidated version, see: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:PDF>).

<sup>36</sup> See Banet, Ch. 10, n. 28, *supra*, 225-226. In particular, under the EU ETS 'brown' certificates it is the EC Directive itself which requires the acquisition of a permit to participate in the scheme and which defines the 'allowance' to be allocated under the scheme. This is in contrast to both 'green' and 'white' certificates which remain creatures of the EU Member States' national laws, even if the motivation for their introduction was, typically in the case of green certificates, to facilitate Member State compliance with the EC's renewables Directive.

<sup>37</sup> See, e.g., del Guayo, Ch. 12, 266-271.

new EU renewables Directive throughout 2008.<sup>38</sup> After the adoption of the new renewables Directive, del Guayo's call for an integrated EU approach to biofuels, combining disparate policies in a comprehensive legal framework has been answered, at least to the extent that the Member States and the European Parliament were able to agree. One awaits del Guayo's verdict on the success (or not) of the new legislation with interest.

Finally in this cluster of chapters, McHarg and Rønne provide a detailed comparative assessment of the development of wind energy law and policy in the UK and Denmark, carefully locating it within the context of evolving EU law and policy in the field. In its general sections, obstacles to the expansion of wind energy are discussed and the (then) relatively minimalist EU law framework in this area is outlined. The comparative analysis is facilitated by adopting identical frameworks within which to analyse the relevant issues in the two countries, covering support mechanisms, market and regulatory issues, and planning and environmental controls. What comes through strongly from this comparative discussion is the complexity of the interaction between the liberalisation of the electricity sector and policies to promote generation from renewable sources: Denmark had already consistently pursued a strong renewables policy well before it moved to liberalise the sector, while in the UK the two policies have been developed more or less in parallel (if anything, renewables promotion came slightly afterwards and has rarely been given detailed consideration in regular market and regulatory reviews concerning infrastructure, investment and pricing. Many of the concluding points in their chapter are now a reality after the advent of the latest EU renewables Directive: in particular, binding targets for Member States have been introduced<sup>39</sup> but no thoroughgoing EU-level harmonisation of national support schemes was attempted. It is noteworthy that these market-environment and EU-national dynamics were played out in detail in the negotiation process which led to the adoption of the Directive, as both some Member States (notably Germany) and the European Parliament showed great concern that attempts to introduce even a small scope for market-based mechanisms (via inter-private party trade in guarantees of origin) in the Directive would undermine the integrity of national renewables promotion policies.<sup>40</sup> Finally, the authors also stress the importance of public acceptance of the benefits of, and need for, investment in green energy, noting that this is much higher in Denmark than in the UK: this speaks directly to national-level policy and information provision, but perhaps also more generally to the degree of trust that a national electorate places in its political leaders.<sup>41</sup> Neither of these topics is one on which future EU-level policy or intervention will prove likely or, indeed, helpful.

Overall, this collection of essays manages to cluster nicely around the core theme of moving 'beyond the carbon economy', while providing a wide range of perspectives – national, regional and international; horizontal and sectoral; market-making and environment-protecting – on the issues that this ongoing transition has raised and will continue to engage with in the future.

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<sup>38</sup> Indeed, and at least to the present author's eyes, often to the exclusion of other, equally difficult and important matters (such as the question of trade in Guarantees of Origin between private parties, as originally proposed by the Commission but not, in the end, adopted by the EU legislature: see Johnston, Neuhoff, Fouquet, Ragwitz & Resch (2008), 'The Proposed New EU Renewables Directive: Interpretation, Problems and Prospects' EELRev 126 for detailed analysis of the trading issue).

<sup>39</sup> Directive 2009/28/EC, n. 34, *supra*, Art. 3 *juncto* Annex I.

<sup>40</sup> For discussion, including canvassing of the different views on the subject, see Johnston *et al*, n. 38, *supra*.

<sup>41</sup> A commodity which is, it seems, in particularly short supply in the UK in recent years, especially in the wake of the scandals concerning politicians' expenses claims, which has rumbled on into 2010 and seems set to result in at least some prosecutions (as well as, perhaps, effects upon voter turn-out in the forthcoming UK general election).

Policy-makers, academics and practitioners alike will learn much from these contributions and further work from the various authors in this field is eagerly to be awaited.