

Book reviews

Reconciling Trade and Climate: How the WTO Can Help Address Climate Change

By Tracey Epps and Andrew Green

Edward Elgar, 2010, 280 pp. incl. index,
£75, ISBN 978-1-84980-006-8.

The objective of the book is commendable: to draw attention to synergies between trade and climate policies and promote a more optimistic view of the relationship between the two prominent international regimes. The book begins by describing how the international trade and climate change communities have traditionally viewed each other with suspicion: some tend to see international trade and “globalization” as key sources of the climate problem; others argue that climate policies are harming trade and economic growth. The authors emphasize the importance of finding “solutions that both foster trade (and a rules-based trading system) and support the goal of tackling climate change” (p. 4).

With this important objective in mind, the book contains an interesting analysis of potential “carrots”, such as using the Generalized System of Preferences (GSP) under the GATT to promote climate policies in developing countries (Chapter 11). The authors seem somewhat sceptical about this approach. They warn that preferential trade measures must be designed in a way that is compatible with the GATT’s Most Favoured Nation principle and the Enabling Clause. Furthermore, the authors note that such carrots “may actually function like a sanction if compliance with climate change conditions becomes the only way in which developing countries can obtain preferential treatment” (p. 191). Their overall conclusion is that the Enabling Clause is not a particularly helpful framework for promoting synergies between climate change and trade. The book also discusses ways to increase environmentally beneficial trade by eliminating tariff and non-tariff barriers for environmental goods and services (Chapter 15). While the authors appreciate the potential of this approach, they lament that reaching agreement on this issue has proven difficult during the on-going Doha round of international trade negotiations.

In addition to these two chapters addressing what seem like “obvious” synergies, the book includes several chapters on climate policies—regulations, emissions trading schemes, taxes,

subsidies, and border-tax adjustments—and their relationship with the WTO rules. Here, the contours and complexities of international trade law take a prominent role as the authors go through the details of the relevant WTO agreements and dispute-settlement practice. Their analysis thus largely reflects the traditional focus of international trade experts on whether certain climate trade policies would be compatible with WTO law. However, it would have been interesting to attempt to shift the emphasis more towards potential synergies; identifying which climate policy options might be both efficient in terms of reducing greenhouse gas emissions *and* designed in such a way that is compatible with international trade rules.

Overall, the book is far more comprehensive concerning trade issues than it is concerning climate-policy considerations, leaving this reviewer wondering whether the one-sided emphasis is really conducive to identifying and promoting synergies. For instance, Chapter 5, on “Regulations and domestic emissions trading”, dedicates fewer than five pages to such existing and potential climate policies as energy efficiency standards, eco-labeling requirements, and emissions trading. Such a brief overview clearly cannot capture the rapid evolution of “climate law” in recent years, including the emergence of carbon markets worth tens of billions of euros. In contrast to the cursory overview of climate policies, the same chapter devotes sixteen pages to the relevant trade issues: the national treatment requirement in article III(4) of the GATT; the interpretation of “like product” and “less favourable treatment”; the role of processes and production methods; and the relevance of the WTO Agreement on Technical Barriers to Trade.

Similarly, Chapter 7, on “Subsidies”, remains rather abstract from the climate-policy perspective. The authors do not really answer the question whether this is an area where synergies between trade and climate policies can be found. They note that “economists in general do not like subsidies because they are often not the most efficient instrument to solve a problem”, and they explain why subsidies are “significantly restricted” by WTO rules. As in other chapters, the climate-policy arguments supporting the use of subsidies are not examined in detail. This, however, would have been interesting, in view of the fact that Working Group III’s contribution to the IPCC’s Fourth Assessment Report concluded that subsidies are often critical to overcome barriers to climate change mitigation. Could governments seek to promote renewable energy in ways that are compatible with WTO rules? Are there other WTO-compatible ways to promote an urgent transition from fossil fuels to renewable energy (such as abolishing fossil-fuel subsidies)? Attempting to make a closer connection between the relevant WTO rules and concrete climate-policy dilemmas would have been interesting also in other respects. Promoting renewable energy is popular in developed and developing countries for both climate change and energy-security reasons. Yet, such support schemes are also likely to give rise to WTO disputes. Indeed, the United States has recently requested WTO dispute-settlement consultations concerning support to enterprises manufacturing wind-farm equipment in China. Also, Japan has requested consultations with Canada regarding Canada’s measures relating to domestic-content requirements in the feed-in tariff programme to promote renewable energy.

One intersection between trade and climate policies that the book does not discuss but that continues to surface in the negotiations under the UNFCCC concerns the relationship between

intellectual property rights and access to climate-friendly technologies. Several developing countries have proposed promoting technology transfer by taking advantage of flexibilities in the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), such as compulsory licensing. Developed countries, in turn, tend to see intellectual property rights as catalysts to technology transfer and oppose attempts to relax their protection. The issue thus remains politically sensitive—but important given the urgent need to promote low-carbon technologies in the coming decades. In light of this, it would have been interesting for the authors to explore the link and potential synergies between the TRIPS Agreement and climate technologies.

The book contains an interesting discussion on potential trade measures designed to address carbon leakage. The topic is certainly a timely one. The twenty-year history of international climate change negotiations shows that effective, multilateral climate treaties are difficult, if not impossible to achieve. The UNFCCC (1992) did not include binding mitigation commitments. The Kyoto Protocol (1997) did—but it also applied the principle of common-but-differentiated responsibilities, introducing a legal “firewall” between developed- and developing-country mitigation. As a result, the United States refused to ratify the Protocol. In the on-going negotiations under the UNFCCC, questions concerning the respective roles of developed and developing countries remain difficult. With no comprehensive multilateral climate treaty in sight, carbon leakage remains a concern for countries acting to reduce their greenhouse gas emissions. Against this background, could countries impose trade measures on imports from countries not controlling their emissions—and should they do so?

The authors analyse in detail climate-related trade measures, such as border-tax adjustments (BTAs). Their conclusion is not, however, straightforward, reflecting the legal and political difficulty of the issue. Chapter 8 highlights many of the difficulties, including that the use of BTAs on products from developing countries could undermine the principle of common-but-differentiated responsibilities, and that determining the origin of emissions embodied in a product would be technically and politically difficult (p. 140). The authors thus state: “Unilateral trade measures have some potential to dismantle the roadblocks that stand in the way of both developed and developing countries taking action on climate change. However, the potential is small due to the political factors that make their use largely undesirable”. This seems a reasonable conclusion.

The authors take the analysis a step further in Chapter 14, by discussing the possibility of including trade measures in a climate agreement. The question of trade measures in multilateral environmental agreements has received ample attention in the WTO context. Under the UNFCCC and the on-going negotiations, however, there has been no proposal concerning the inclusion of trade measures. In addition to the WTO law analysis, then, it would have been interesting for the authors to explain in more detail the kind of trade measures that would be useful in the climate change context. To increase developing-country participation, the current focus in the UNFCCC negotiations is on nationally appropriate mitigation actions (NAMAs) by developing countries. A number of countries have communicated their planned actions to the UNFCCC Secretariat. Furthermore, to enhance cooperation between developed and developing countries, the 2010 Cancun Conference of the Parties agreed to create a registry of NAMAs to facilitate the matching

of NAMAs seeking international finance-and-technology support with potential donors. While the current mitigation regime under the UNFCCC remains weak, important advances have been made over the past couple of years, especially concerning developing-country engagement. The current path looks likely to yield better results than a shift in focus to the controversial issue of trade measures.

Overall, the book contains an interesting analysis of the aspects of WTO law relevant to climate change. Chapter 16 also introduces some novel proposals, such as a special WTO Climate Change Agreement designed to clarify which climate measures are acceptable under the WTO. One of the key challenges raised by this proposal, and the book in general, relates to the “fragmentation” of international law and the fact that the international trade and climate communities tend to use a somewhat different logic to understand the world—and have different priorities. Thus, while the book seeks to find synergies, it ends up analysing the situation from a perspective that is dominated by WTO rules. In doing so, it often (inadvertently) overlooks the logic, vocabulary, and concerns of climate change experts. For instance, the book explains in detail why some climate policies might be problematic from a trade perspective, but it does not include a detailed discussion of what climate policies might be necessary to cut the rapid growth of global greenhouse gas emissions. It also does not attempt to justify why the trade perspective should predominate. Why should the international community embrace the proposed WTO Agreement on Climate Change? Why not support, instead, the proposal by the Group of 77 and China to establish a permanent forum on response measures under the UNFCCC, tasked with considering, among other things, climate policies with trade implications? In general, the book constitutes an important step in the right direction. It also illustrates, however, that a lot of work is needed before the international trade and climate communities come to understand each other’s concerns and can work to achieve their priorities in a mutually supportive manner.

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The Common but Differentiated Responsibility Principle in Multilateral Environmental Agreements: Regulatory and Policy Aspects

By Tuula Honkonen

The Hague: Kluwer Law International, 2009, 432 pp.,
hb US\$158.00, ISBN 978-904113-153-9.

Tuula Honkonen’s book addresses what may be the most obstructive stumbling block in climate change negotiations: the differentiation of efforts among nations. There is a wealth of material on which to draw from since the publication of the major works in this area by Philippe Cullet (*Differential Treatment in International Environmental Law*, Ashgate, 2003) and Lavanya

Rajamani (*Differential Treatment in International Environmental Law*, Oxford, 2006). Given the current doldrums in talks, and the interest in this division of labour, now is a great opportunity to pause and reflect. Insights into what is usually termed the principle of common but differentiated responsibility (CBDR) that shed some light on the past, present, and possible future pathways of this concept would be invaluable at this stage. Given the breadth of the topic and the inherent difficulty in coherently drawing together and teasing apart so many disparate strands, this is and shall remain a daunting task.

Honkonen tackles parts of this topic skilfully. The book contains the essential material, many of the core debates are well presented, and in relation to the climate change regime, a wide array of perspectives is laid out. Chapter 4 is especially impressive in comprehensively deconstructing the difficulties and incentives in the application of CBDR, and is worth reading on its own for the author's expert dissection of this area. Honkonen references a staggering range of other writers in the field—a testament to the comprehensive survey of academic literature underlying this book—even if they and their contributions are sometimes rather clunkily and uncritically woven into the fabric of the text.

The topic's relevance today derives from the debate on how CBDR can support a simplistic developed/developing country dichotomy, and this argument has occupied much of the field for some time now. Throughout the book Honkonen makes statements and comes to conclusions that seem to call for a far greater degree of granularity of obligations than this basic bifurcation. It is therefore disappointing that she expressly treats this split as the “most significant” grouping (p. 16), and uses it for most of her analysis. That Honkonen describes the categorization of countries as an “interesting aspect” of CBDR (p. 178) rather than central to current discussion and future development of the concept is surprising. The book improves markedly in this regard as it progresses, with increasingly developed and frank analysis of the shortcomings of this approach, although the reader is not left with an impression of the centrality of this issue in the current debate.

In a similar vein, the nature of the term “responsibility” in CBDR is dealt with in an oddly cursory manner, given its key role in the topic of the book. The strongly divergent attitudes towards this concept present in academia and practice (emphasizing “common” or “differentiated” depending on which side of the developed/developing fence one negotiates from and thus how much responsibility CBDR will force one to shoulder) are considered to be “probably something that just has to be tolerated for the moment” (p. 73). According to Honkonen, the fact that “the need for differentiation may sometimes be so strong that the ‘common’ element of the principle is forced to assume a very minor role” does not “render CBDR principle inapplicable” (p. 131). This is in direct contrast to other robustly argued sections, which are at pains to stress the union of the acronym's “C” and “D”. The tension between these opposing views, strongly related to the issue of categorization, is apparent but not adequately addressed.

More fundamentally, this book struggles to get off the ground by not addressing head-on the basic issue of CBDR's structure. There are so many constituent interrelated issues to tease out: economic development, historical pollution, present and future pollution, capacity to reduce

pollution, vulnerability to environmental damage, and capacity to reduce this vulnerability—to name but a few. There is also the issue of how CBDR is applied: upfront in a treaty, by pledge or principle, through subsidiary negotiations or in compliance mechanisms, through pollution controls or through assistance with implementation and capacity. Although all of these issues feature, Honkonen does not clearly set out how some or all of them make up CBDR, or their relative importance and role in its structure. She instead deals with them as they crop up, and on many occasions she does not clarify the ambiguities raised by the obvious complexity. As a result, we are left lacking crucial analytical tools to evaluate both the data and the theory she presents. Stating that CBDR “does not have a strictly fixed content; it is, rather, plagued with controversy” (p. 3) does not enlighten the reader where the—admittedly fiendishly complex—controversies are dealt with on an ad hoc basis and are not faced squarely. As Honkonen’s book takes conflicting lines on some of these key issues, and remains silent on others, confusion rather than enlightenment is the result.

This oversight leads to CBDR being associated with a variety of notions with diminishing clarity on what it actually means, as distinct from an assortment of possibly related concepts. Honkonen takes ideas from political philosophy, jurisprudence, and international relations (which bear a passing resemblance to CBDR and try to achieve similar loosely defined aims) as buttresses to bestow on her focal concept a pedigree and a place in the pantheon of established international (environmental) law principles. Yet because the relevant links, similarities, and differences are not fully explored, and the connections seem occasionally forced and tenuous, her theoretical support for CBDR as a desirable, coherent, and functional element of international law appears weak.

In contrast, when discussing applications of CBDR in the practice of international law, Honkonen does not present a conceptual foundation for this principle, and so it is unclear how evidence from MEAs is weighed in ascertaining the existence, equity, or feasibility of CBDR. Indeed, while the book’s title suggests that Honkonen seeks to analyse CBDR in MEAs, she follows in the footsteps of many authors in this field by examining the Montreal Protocol in some detail, poring over the UNFCCC and its sprawling wealth of material in great depth, and giving an at best fairly cursory glance at the raft of other MEAs. Much of the material in the central chapter alternates between a discussion of the theory, on the one hand, and its application to the UNFCCC and perhaps one or two choice MEAs, on the other. For the most part, the theory is dealt with comprehensively, with flashes of insight and clarity, but her comparison of the theory with the practice feels hasty, patchy, and less than thorough.

In places, Honkonen shows a tendency to take a slightly descriptive and uncritical approach to the subject matter. She focuses on explicit differentiation—where one party is expressed to have a more burdensome obligation than another—and ignores implicit differentiation, which examines the effect of the parties implementing their obligations. Much time is spent listing MEA provisions that might demonstrate evidence of CBDR, especially in preambles (where developed nations are happy to keep CBDR), but rather less time is given to the extent, and to the bases upon which, CBDR is actually implemented, as opposed to being merely aspired to—a failing that the author herself acknowledges towards the end. This is especially visible in the lack of discussion

surrounding how treaties are eventually implemented in line with CBDR by their secretariats and other institutions. In contrast to the author's obviously impressive grasp of international-law jurisprudence, the analytical weakness of most sections dealing with economics exacerbates the disadvantages of taking this light-touch approach to CBDR's application in practice. More generally, when rounding off passages that very ably explore an issue, a conclusion is often either absent or brief, and is asserted without much in the way of justification—while the book treads overly gingerly around some fairly uncontroversial issues.

As the narrative progresses, this lack of critical engagement with the toughest issues makes it difficult to gauge Honkonen's line on some of the key questions she seeks to tackle. Over the course of the book, her bias continually shifts, dealing out everything from trusting acceptance to biting cynicism towards many of the coherent positions that can be taken on CBDR, leaving the reader wondering what Honkonen—whose breadth of knowledge on this topic is clearly almost unmatched—thinks about this issue at an abstract level. One matter that is clear is that Honkonen views CBDR as a tool with political, economic, and social justice as its core aims (rather than effects in its application), just as much as a tool to bring about effective environmental regulation.

The book also suffers from a wider lack of structure: regardless of the quality of each paragraph, it is often easy to lose track of how it fits in with the book as a whole. Honkonen covers almost all of the ground, but the seemingly random path she takes makes it hard to get a grip on where the analysis is leading.

One of the most frustrating elements of the book is that, although novel and fascinating issues are raised, and the raw material necessary for incisive analysis is clearly presented, the author's analysis often stops as soon as the issue is raised, without further exploring its implications. Examples of this include: multiple fora to process CBDR (such as the European burden-sharing agreement); differentiation being a necessary product of difficulties in negotiation; the extent to which CBDR is a help or a hindrance; how in some MEAs increased use of CBDR has been made as the regime evolves; the temporal nature of CBDR and how the principle can be effected by implementing authorities. The same goes for the relative scarcity of links drawn between the subjects Honkonen addresses.

Honkonen's work is a very useful guide for disentangling the theory of applied CBDR and provides a good account of the literature on its legal status. There is occasional insight, and the breadth of material that has been distilled into the approximately 400 pages of text is truly astounding. However, the work is less impressive when we consider what we have seen of CBDR in MEAs to date, and the book's unstructured approach and fluctuating quality of criticism renders it less of a coherent examination of a very important principle than other major works to date.

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This review is written by the author in his personal capacity, and any views expressed are the author's and not those of Freshfields Bruckhaus Deringer LLP.

Global Governance of the Environment: Environmental Principles and Change in International Law and Politics

By Afshin Akhtarkhavari

Cheltenham: Edward Elgar, 2010, 287 pp. (inc. index),
£79.95, ISBN 978-1-84980-255-0.

In this book, Akhtarkhavari explores the function and practical application of environmental law principles from an interdisciplinary perspective. As Don Rothwell points out in the foreword to this book, “In the absence of an overarching global environmental treaty, environmental principles remain pivotal to the further development of international environmental law”. Akhtarkhavari thus addresses an important element of global governance.

The book examines environmental principles in a novel way by taking a “social constructivist” approach. As the author explains, “This approach is relevant for environmental law and politics in particular because the nature of the difficulties that it seeks to address such as ozone depletion and climate change all require that actors work towards sharing a common or collective view about the problems and solutions to them”. The “social learning” focus of the volume is maintained throughout, and in this sense the book departs from others in the area, including Sharon Beder’s *Environmental Principles and Policies: An Interdisciplinary Introduction* and Nicolas de Sadeleer’s *Environmental Principles: From Political Slogans to Legal Rules*.

The book is divided into four parts. The first introduces environmental principles and, more to the point, social constructivism and “social learning as a dynamic for change”. The second part explores the nature and functions of environmental principles. Akhtarkhavari argues that environmental principles have multiple functions, ranging from their ability to create a framework for stakeholder interests to the facilitation role they play in decision-making and negotiation processes. Rather than considering the origin and status of environmental principles, the author investigates their “open-textured” nature and role in social learning. Chapter 5 expands on the specific function of principles and how and why open principles facilitate “strategic action” as well as social, legal, and political change. In the third part of the book the author considers three case studies. They cover a broad array of issues across a significant timeframe: the International Court of Justice and its decisions, the Global Compact and corporate citizenship, and the London Convention and disposal of carbon dioxide at sea. The last of these will clearly be of most interest to those working in the area of climate change. The author considers the recent negotiations in relation to the ocean-dumping regime and the influence that environmental principles, in particular the precautionary principle, had on the contracting parties. The final concluding section considers how environmental principles can act as a vehicle for change in international law and politics. Akhtarkhavari argues that the particular characteristics of environmental principles facilitate engagement of actors with each other and “ideologically frame the social processes which steer common and collective orientations of global actors to environmental issues”.

The author is to be commended on bringing a new dimension to the discourse on environmental principles, which adds to the literature in a number of ways. It is not a conventional legal exploration of environmental principles and therefore may frustrate legal scholars seeking an in-depth consideration of their source, meaning, and status. But such was clearly not the author's aim. Rather, he deconstructs principles in terms of examining their open-textured nature and their potential for social-learning experiences and facilitating change. The theoretical consideration of the role and function of environmental principles is enhanced by the consideration of how they operate in practice, drawing on topical case studies.

The placement of the book at the intersection of law and politics is novel and captures the social and political influences on environmental law. The interconnectedness of international law and politics is clear, but rarely has the literature purposefully explored this area. Perhaps the most important contribution that the book makes is in this interdisciplinary context through the social-learning focus of the text and the approach the author takes "to understand the role and function of environmental principles in international politics". The book would therefore be of most appeal to those engaged in interdisciplinary research at this point of intersection.

This book makes an interesting contribution to the literature on environmental principles in terms of their functions and influences on international law and politics. As well, it assists in the better understanding of the process of change at the global level. Whilst the topic of environmental principles is not new, Akhtarkhavari provides a refreshing perspective, and in doing so the book will be of interest to a range of scholars with research interests in international relations, politics, and law.

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The Social Cost of Electricity: Scenarios and Policy Implications

Edited by Anil Markandya, Andrea Bigano and Roberto Porchia

Cheltenham, UK: Edward Elgar, 2010, 308 pp. (incl. index) plus introduction (pp. i–xv),
£75, ISBN 978-1-84844-350-1.

The Social Cost of Electricity: Scenarios and Policy Implications reports the results of an ambitious project, funded by European Commission, to assess the social costs of electricity and the various policy instruments that exist to address climate change through the promotion of renewable energy. The studies presented in this volume were part of the "Cost Assessment of Sustainable Energy Systems" (CASES) research project organized by the Fondazione Eni Enrico Mattei. More than thirty authors contributed to this volume, reflecting the collaborative nature

of the CASES project (in the interest of brevity, the names of all chapter authors are omitted from this review). A primary objective of the project was “to compile a detailed set of estimates of the external and internal costs of electricity generation for different countries, at the national level for the EU27 countries, and for Turkey, Brazil and China under energy scenarios to 2030” (p. xi).

For the results-oriented reader, a summary of the empirical results from the social-cost method of comparing the various policy approaches to electric-power production appears in Chapter 4, by volume co-editor Roberto Porchia. This chapter presents the results of the coupling of the social-cost modeling techniques (presented primarily in Chapters 1 and 2) with data on the private and market costs of various electric-power generation technologies (presented in Chapter 3). The costs of each technology for generating electricity are taken into account in a way that allows for a direct comparison of each technology per kilowatt hour generated. A handy table (pp. 145–146) summarizes these results, and additional tables rank different technologies across periods in time, showing what cost estimates look like for 2020 or 2030. A notable finding is that the present share of external costs for oil and gas thermal plants is in the range of 20 to 25 per cent, while the share of external costs for renewable plants is in the range of one to two per cent of full costs (p. 151). However, over the period 2010–2030 there is predicted to be a significant leveling of full-generation costs due to technological improvements such as carbon sequestration (p. 152). Chapter 5 reports similar results for non-EU countries.

These results are informed by the modeling methodology used by CASES researchers, also presented in the volume. The volume gives careful attention to the methodology and modeling of social costs of electric-power generation. Chapter 1 calculates externalities for various electric-power generation technologies, taking into account life-cycle assessments of materials and fuels used in power generation. As has become common in studies to internalize the cost of pollutants, the authors consider geographic dispersion, the human-dose response function for various pollutants, and monetization and discounting issues. Their approach goes further to incorporate “missing” externalities associated with climate change—including effects on the “external value of land use change, eutrophication, visual intrusion and the cost of damage resulting from climate change” (p. 35). In this sense, their approach incorporates the impacts of climate change as costs and benefits into the externality analysis of electricity production, a novel extension of traditional cost approaches, but one that may become more frequent as our understanding of the impacts of climate change (and our adaptation to it) improves.

Importantly, Chapter 2 emphasizes energy security in the modeling of externalities for various energy technologies. One underexplored aspect of energy security is the impact on system reliability of the various techniques for generating electric power. The authors deserve great credit for recognizing that system-reliability impacts cannot be ignored: the introduction of new renewable technologies, such as solar and wind, to the transmission grid presents potential reliability concerns, given that these resources are more variable in nature. Effects on reliability and system operation are important variables to integrate into a full assessment of the costs of various generation technologies. Another more common implication of energy security, which

the authors also aim to incorporate into their modeling, is that, historically, many fuels, such as oil, gas, and uranium, are imported.

The second part of the volume evaluates some of the policy implications of the CASES project's social-cost research findings. Chapter 6 surveys a range of policy instruments, including feed-in tariffs, fixed payments, auctions, green or renewable energy certificates, subsidies, and tax treatments of renewable projects, as well as the linkage to emissions trading. The chapter evaluates these instruments in the form implemented in the developing countries of Brazil, China, India, and Turkey, concluding that in all these countries a feed-in tariff coupled with financial incentives deployed through other policy instruments has been essential to investment in renewable energy.

Chapter 7 makes a careful effort to score each of these policy instruments (based on criteria weighted by participants in CASES workshops) and to assess their efficacy to produce low-carbon electricity in a sustainable way and to promote renewable-energy sources. On the goal of producing low-carbon electricity, the authors find that a heavy carbon tax is one of the top-ranked options, using their criteria, as are green-certificate systems and social tariffs to address the burden on the most vulnerable groups (p. 244). For the goal of promoting renewable power, the authors find instruments such as the quota system (known in the United States as the "Renewable Portfolio Standard") and the feed-in tariff to be the most effective, on the basis of their criteria; green certificates are less so (p. 256). As the authors themselves acknowledge (p. 267), the limitation of their analysis is that it depends on selected weightings and does not provide policymakers with a precise mechanism for deciding which instrument is preferable. The scoring approach used in the project is qualitative and does not rely on any observable data regarding the actual effects of various policy instruments, so policymakers are unlikely to be able to make good predictions regarding efficacy based on a study like this.

A concluding chapter evaluates electricity scenarios for EU countries, comparing the CASES model to other models. The chapter highlights the significance of taking a full social-cost approach to assessing energy policy, rather than focusing only on the private and market costs as do many other models. Not surprisingly, when the results are compared, "external costs raise the costs of generating electricity from fossil fuels compared to renewable generation, and over time shift investment away from coal and in favour of wind and other renewable and low-emitting technologies" (p. 290).

The social-cost methodology and data presented in this volume are very useful additions to the literature and policy debates. At the same time, the approach is limited to electric-power generation. There is little discussion of demand measures, although it would seem that a full social-cost approach should also compare production costs to the costs of conservation, use efficiency, and demand/response measures.

The Social Cost of Electricity stands out for its ambitious effort to model and quantify the external costs of electric-power generation. The authors are consistently mindful not only of the social

costs of various electricity-generation technologies in isolation, but of the system impacts of power-generation technologies as a social cost, including important emerging issues such as adaptation and network reliability. A broad range of social-cost issues presented by electricity production are incorporated into the project's modelling, even if the volume's approach is limited insofar as it does not study or attempt to quantify conservation and demand/response approaches. While the volume makes some initial efforts to assess the implications for climate change and renewable-energy policy using qualitative research techniques, much more complete data will likely be necessary for policymakers to be able to assess which instruments are most effective at advancing energy-policy goals. Without doubt, however, the data presented in this volume will be of great interest to policymakers and researchers and will challenge future debates on energy policy.

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